Beyond the Basics for Health Informatics Professionals - Retired

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Editor's Note: This Practice Brief supersedes the September 2014 Practice Brief "Defining the Basics of Health Informatics for HIM Professionals."

Data, data everywhere! We are living in the age of "Big Data" and healthcare informatics. The already insurmountable amount of data only continues to grow as organizations strive to meet the data requirements of federal programs such as the "meaningful use" EHR Incentive Program and the Medicare Access and CHIP Reauthorization Act (MACRA), as well as various quality reporting and reimbursement requirements. The need for informaticists will continue to grow—and who better to fill the role than health information management (HIM) professionals?

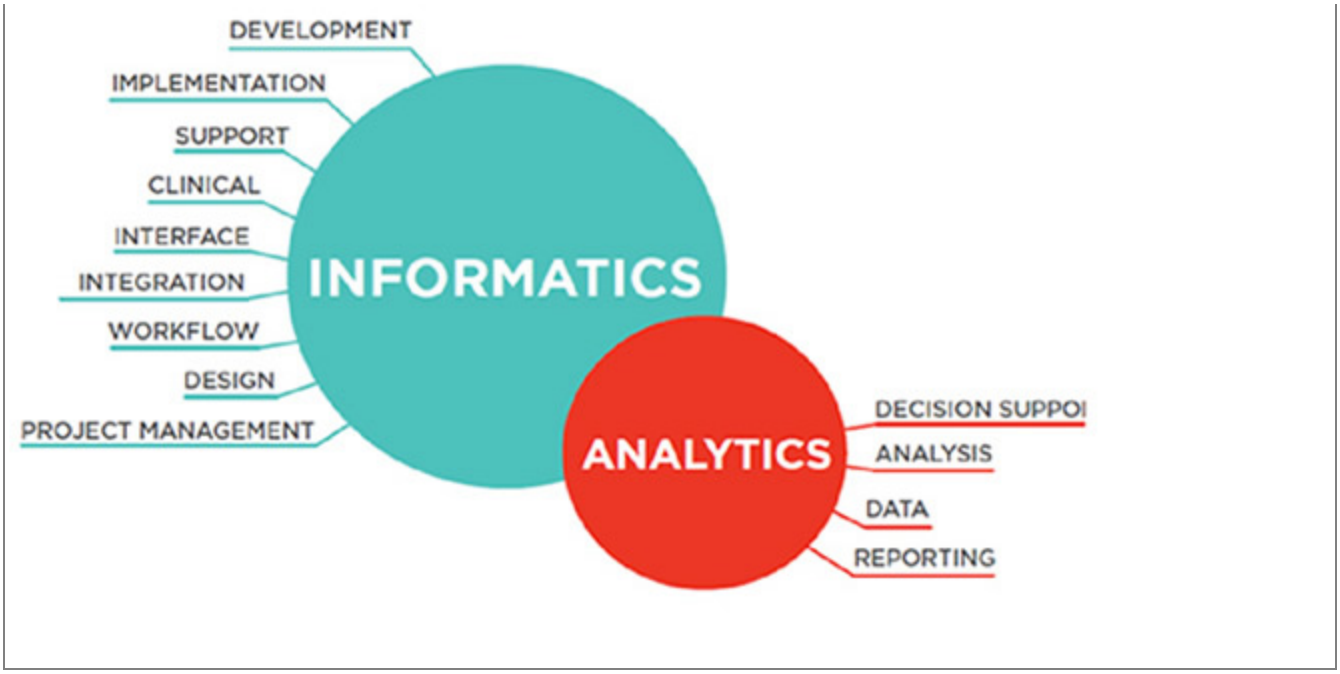
Now is the perfect time for HIM professionals to become experts in healthcare informatics. After all, who is better at analyzing information in the health record, looking for trends, quality documentation, and other data-related functions? As an informaticist, the HIM professional is the liaison between the clinical and information technology (IT) staff—designing and implementing new systems or upgrading existing systems.

Gone are the days of using the paper chart to manage data and information. Now is the time for HIM professionals to step up and fill the informaticist role. This Practice Brief provides an overview of health informatics, potential new or evolving career opportunities for HIM professionals, and the challenges of managing healthcare data.

Defining Health Informatics

Informatics is defined by AHIMA as a collaborative activity that involves people, processes, and technologies to produce and use trusted data for better decision-making.[1] Health informatics is a broad aspect of the development, implementation, and support of clinical information using various technologies; analytics, the science of examining raw data with the purpose of drawing conclusions about that information, is a subset of informatics. Data analytics requires clean and accurate data in order to effectively conduct reporting and analysis. See Figure 1 below for a visual representation of how health informatics and analytics are related. Definitions associated with these terms and others can be found in AHIMA's Pocket Glossary of Health Information Management and Technology.

Figure 1: Relationship Between Health Informatics and Analytics



More is not always better where data is concerned. Data used to make strategic healthcare decisions must be accurate and have integrity. Transforming this data into meaningful information is the responsibility of the health informatics professional. The dependence on and demand for meaningful information continues to evolve as the healthcare industry thrives, producing an increasing amount of data power that has yet to be harnessed.

There are a multitude of external forces and trends such as the pressure to contain rising healthcare costs, expansion of information exchange, tracking and reporting meaningful use of electronic health record (EHR) criteria, reduction of medical errors, cybersecurity threats, and robust patient portals—all of which call for the application of informatics.

Informatics Helps Harness the Power of Data for Healthcare Improvement

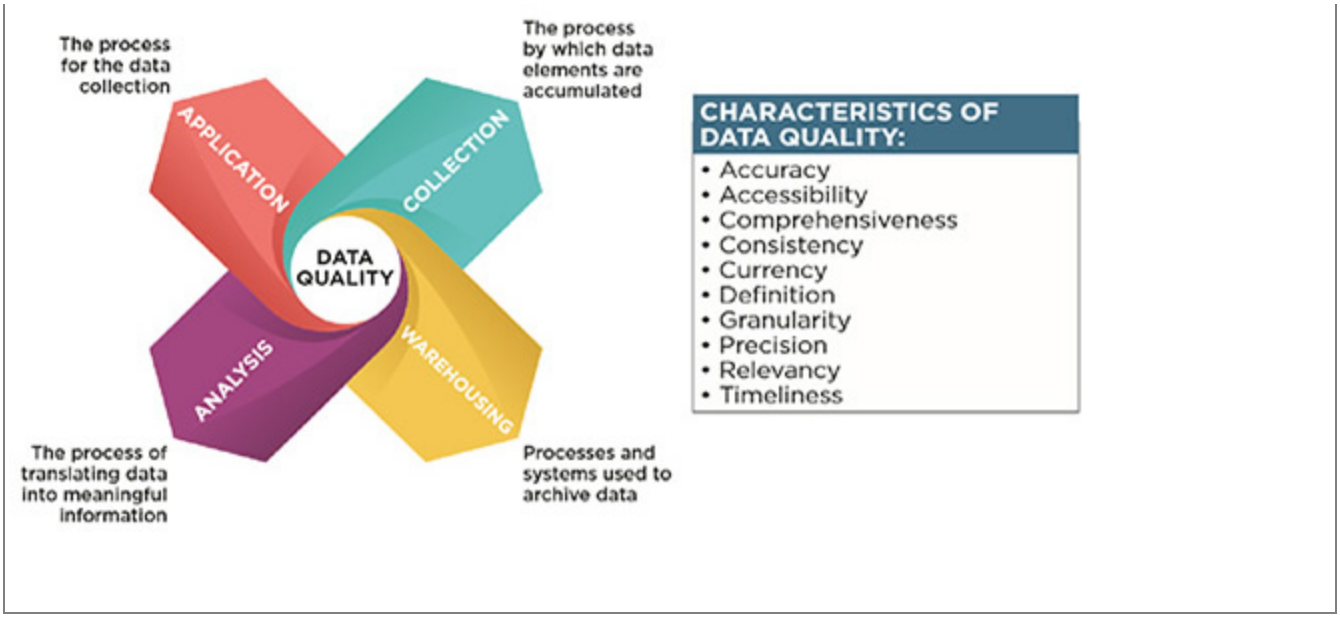
Advancements in health information technology (HIT) have brought together volumes of structured and unstructured data from a variety of data sources and data types. Technology enables data generation at high velocity, which raises concern regarding the trustworthiness or veracity of the data. The role of informatics in harnessing data to bring value to healthcare results from the use, reuse, and analysis of the data from multidimensional and interdisciplinary healthcare sectors.[2] This includes data from clinical, functional, and operational processes as well as external data to form the Big Data scenario for consumption. Informatics provides a pathway with skills and tools to glean data from multiple sources in achieving improvements to healthcare delivery, population health, and efficiency of the services provided.

Data Collection and Quality

The quest for healthcare improvement starts with the ability to collect and store quality data. Data quality refers to accuracy, accessibility, comprehensiveness, consistency, currency, definition, granularity, precision, relevancy, and timeliness of data. See Figure 2 below for a visual representation of data quality functions and characteristics. Applications designed to augment workflow through quality data collection promote the user experience and work toward gathering reliable data for use. The importance for standards of terminologies and classifications becomes paramount in promoting interoperability of disparate systems. Workflow analysis can also be used to achieve process improvement to optimize a process with efficiency as it blends work activities to reflect the data flow required for subsequent uses. This cannot be achieved without educating and training the workforce in the utilization of the technology and leadership skills to engage the staff in change management, as well as creating a culture of data stewardship. Informatics has a role in each of these phases.

Figure 2: Data Quality Functions and Characteristics

Data Quality Functions

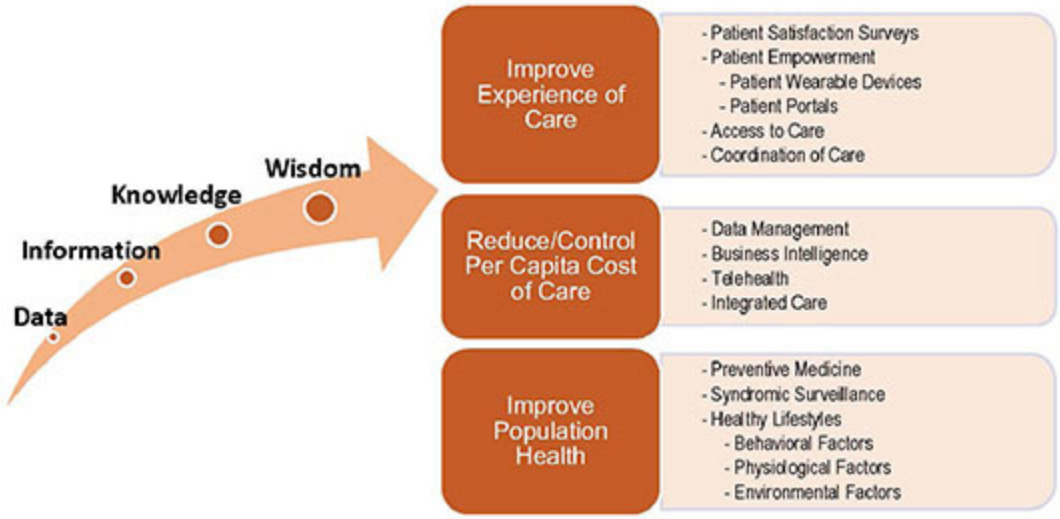


Data an Asset for Management

Data warehousing unites the information for an organization to meet their needs for confidentiality, integrity, and availability of data storage. The information stored in the enterprise data warehouse (EDW) represents an asset for managerial activities aligned to the strategic planning of the organization to bring value through data-driven decision-making. See Figure 3 below for a visual representation of how data can be used to inform decision-making. Informatics applications and data analytics serve to aggregate data for reporting, and query analysis enables a holistic approach to decisions for the organization based upon the union of data generated from clinical, financial, operational, and functional processes. This information brings knowledge for practical uses such as scheduling and business functions, as well as predictive analysis for improving facets of healthcare. Dashboard graphic representations can allow volumes of data for better understanding through visual consumption.

Figure 3: Using Data for Decision-Making

Using Data for Decisions



Qualitative and quantitative data are transformed into information that permits descriptive analysis as well as predictive trending. The use of healthcare information asset management, business intelligence, and predictive models with a focus on best outcomes can transform data to information and then to wisdom in making informed decisions.

Assisting with the Triple Aim

The "Triple Aim" was created by the Institute for Healthcare Improvement (IHI) to further optimize healthcare performance. The three tenets of the Triple Aim, according to the IHI website, are:[3]

- Improving the patient experience of care
- Improving the health of populations
- Reducing the per capita cost of healthcare

Health informatics can facilitate the Triple Aim in many ways, such as improving EHR functionality, supporting use of health information exchanges for electronic sharing of information, and analyzing patient information from specific populations of patients.

In March 2018, Seema Verma, Centers for Medicare and Medicaid Services administrator, announced that the program formerly known as the "meaningful use" EHR Incentive Program, which was created under the HITECH Act of 2009, was being renamed "Promoting Interoperability." Its goal is to increase the interoperability of technology used by providers and healthcare organizations for patients. Under the program, providers and hospitals are required to use the 2015 edition of certified EHR technology to demonstrate its meaningful use of EHRs in 2019. This includes updates to EHRs and related technology that would allow the use of application programming interfaces (APIs) so that patients can collect their health information from multiple providers and potentially incorporate the health information into one single portal, application, program, or software. Companies such as Apple have already created this technology and engaged healthcare organizations to participate.[4] The revamped Promoting Interoperability program will also focus on removing unnecessary, duplicative, and process-driven measures from its quality reporting and pay-for-performance programs, which should create a significant cost savings for hospitals. Hospitals will be required to provide more pricing transparency to potential patients and will be encouraged to value quality over volume. This focus will support more engagement by patients in their own care, support a higher level of quality of care, and help drive down competition and increase value through better understanding of pricing and costs.[5]

The use of business intelligence and other EHR tools can further support the goal of the Triple Aim. Informatics, analytics, and business intelligence can enable organizations to gather and compare data through the EHR and create and implement treatment plans to reduce variations in care, increase quality, and decrease cost.[6] Informatics tools—such as patient portals—can increase patient engagement and provide easier access to health information. Use of health information exchanges by providers and hospitals can also improve access to health information, promote the use of the EHR, and increase patient safety and quality of care through electronic sharing of patient information.[7] These technologies can reduce staff labor and organization costs, which may help to lower the cost of care overall.

Two of the competencies of AHIMA's Information Governance Adoption Model (IGAMTM) are Data Governance and Analytics, both of which tie into informatics. Scoring high in these areas can help to further enhance and support an organization's information governance program. This can be accomplished by creating greater interoperability and sharing of health information, and by making it easier for patients to access their own health information—especially using patient portals and APIs. Treatment variations can also be reduced by creating more robust informatics programs, which can improve the overall integrity of the health record, thus also supporting the Triple Aim.

Health Informatics Career Opportunities

The career opportunities for HIM and healthcare professionals in the health informatics field are boundless. This is a growing field, with primary areas of specialization that include:[7]

- Clinical informatics
- Clinical research informatics
- Consumer health informatics
- Dental informatics
- Mental health informatics
- Nursing informatics
- Pharmacy informatics

- Primary care informatics
- Public health/population informatics
- Telemedicine and mobile computing informatics
- Translational bioinformatics
- Veterinary informatics

Within these specialty areas there are a variety of roles and tasks that one could perform, including:

- Research scientist using data mining, statistical analysis, and data modeling
- Design of tools and templates to collect and measure data
- Design, test, and implement software applications
- Data and information governance
- Trainer for new and updated health information systems
- Helpdesk support and troubleshooting for information systems
- Consult with clinical personnel to ensure the accuracy of health record(s) to ensure health records are filled out properly, accurately, and completely
- Assign codes to patient data
- Reengineer business process(es) to analyze and address logistics of technology in direct patient care
- Project management to oversee a wide variety of projects in healthcare organizations
- Healthcare analysis (i.e., business analysis, data analysis, and systems analysis)

To learn more about the transition into and through the informatics career path, review the AHIMA Career Map at https://my.ahima.org/careermap. This career map depicts how health informatics professionals can begin and advance their careers. For example, a health informaticist can start out with a Health Information Management Clerk position, move on to a role as an Electronic Health Record (EHR) Trainer, and then advance into a management role such as Director of Clinical Informatics.

With the continuing advancements in technology and the increasing demand for qualified health informatics professionals, AHIMA has developed a new Certified Professional Health Informatics (CPHI) credential that demonstrates the competency, credibility, and recognition of individuals who possess the required knowledge and expertise of health informatics.

The CPHI exam consists of seven domains:

- Data Analysis and Utilization
- Data Reporting
- Data Management, Privacy, and Security
- Management of Health Information Systems and Processes
- Database Management
- Health Informatics Training
- Project Management

Additional information regarding the credential's eligibility requirements, exam application process, and study guide information can be found online at www.ahima.org/certification/CPHI.

The two most prevalent roles in informatics are data analytics and workflow engineering.

Data Analytics

The science of examining raw data with the purpose of drawing conclusions about that information is referred to as data analytics. This includes data mining, machine language, development of models, and statistical measurements. Analytics can be descriptive, predictive, or prescriptive.[8]

The application of data analytics is critical to the health information professional in today's environment of increased external payer, regulatory, and government compliance audits. External agencies and individuals are using publicly available healthcare data to apply data analytics tools to identify relationships between clinical outcomes reporting, services reimbursed, and disease

tracking. By and large, analytics tools are an effective way of identifying potentially false claims and discrepancies in clinical outcomes reporting.

The Office of Inspector General (OIG) reports that it is increasing its efforts in using data analytics to better detect potential fraud cases:

> Recent financial and economic conditions have prompted greater scrutiny of government spending, highlighting the important role that oversight and law enforcement agencies play in identifying and eliminating fraud, waste, and abuse. A number of these agencies are increasing their ability to do their work by using data analytics, which uses a variety of techniques to analyze and interpret data. For example, predictive analytic technologies can identify fraud and errors before payments are made, while data-mining and data-matching techniques can identify fraud or improper payments that have already been awarded so that agencies can work to recover those dollars.[9]

As both government and private payors continue developing data analytics to enhance their audits, health information professionals should implement similar analytic tools and applications. Applications should be developed to automate the analysis of data to a large extent through the implementation of user-defined rules, logic relationship checks, etc. The health information professional has the unique advantage of understanding the rules and relationships to assist business informaticists in implementing those rules into program-based logic.

Business Process Re-engineering: Workflow Management

The Agency for Healthcare Research and Quality (AHRQ) defines workflow as follows: "Workflow is the sequence of physical and mental tasks performed by various people within and between work environments. It can occur at several levels (one person, between people, across organizations) and can occur sequentially or simultaneously."[10]

Managing workflow processes in the healthcare setting requires documentation of each step, task, stakeholder, and expected outcome. Any time a new system or change in process is planned, careful consideration should be taken to assess and detail the current state of the environment, followed by the future state. There are various tools available for assessing, mapping, and documenting processes. These tools have an application in clinical and non-clinical processes.

Some tools endorsed by AHRQ are:

- Flowchart: Flowcharts visually convey the steps in a process. This is one of the most commonly used tools.
- Workflow Diagram: A workflow diagram demonstrates movement through a process. The diagram is comprised of a map (such as a floor plan) of the area where the process occurs and uses lines to show movement of people, materials, and information. The diagram demonstrates where redundant motion and inefficiency is present.
- Cycle Time Chart: A cycle time chart portrays, in a graph, the amount of time spent at each step in a process. In addition, it may demonstrate the costs associated with each step as well as whether the steps add value.
- Decision Tree: Decision trees are tools that can be utilized to navigate several courses of action to arrive at one choice. Their structure allows one to evaluate multiple options and explore what the potential outcomes are from choosing a particular option. Decision trees are useful for comparing strategies, projects, and potential investments because they provide a view of each of the decisions, risks, and rewards.

Challenges to Health Informatics

Critical challenges in health informatics are evolving today in the United States. Challenges reside in different aspects of the health informatics enterprise, such as:

- Ensuring quality of data management and data use
- Establishing and strengthening standards and regulation in response to rapidly growing technologies and devices
- Increasing qualified staffing resources
- Increasing financial support
- Improving system integration, interoperability, and information exchange

These challenges must be overcome to successfully achieve healthcare reform and patient safety initiatives, and to demonstrate improved quality of care with reduced cost in the United States.

The modern healthcare industry struggles to manage data. In the quest for data, EHRs have been created to import large amounts of data, storing every keystroke and data point. In fact, in today's era of Big Data, frivolous, meaningless, and unstructured data is collected and stored next to meaningful data. While computers and hard drives are exceptional at sorting through mounds of structured data, humans are not. Health data generated in EHRs and other electronic sources create data complexity with large amounts of unstructured data and different types and formats of data. Computers cannot distinguish good data from bad data and unstructured data is more difficult to parse. Human interaction is required to interpret the data. It is essential to balance usability with functionality.

With advanced and rapidly growing information technologies and mobile devices, privacy and security are rising, critical health informatics concerns. Patient-centered healthcare and personalized medicine permit patients to engage in more of their care decisions and have better access to and control over their health data. Meanwhile, other stakeholders such as researchers, business associates, system designers, and analysts are seeking more data control and access. Healthcare professionals constantly learn of and experience illegitimate external forces working diligently to violate informatics systems for criminal or malicious purposes. Protection of patient privacy and system security is especially complex and important, requiring eternal vigilance to stay ahead of external forces working against healthcare information professionals. More effective security strategies and tools are always needed to prevent security issues. It should also be noted that regulation and policies are needed for informatics and mobile health devices.

Emerging Technology Brightens the Future of Informatics

Technology continues to change the healthcare landscape and brings with it the opportunity for HIM professionals to transition into new and exciting careers in informatics. As traditional non-healthcare corporations enter the market and new applications are developed to manage healthcare as well as the EHR, HIM professionals can bring unique skills and knowledge to assist with these efforts. Below are a few examples depicting the transformation of health informatics in the marketplace today:

- Artificial intelligence (AI) is being developed in many healthcare products, such as coding systems, radiology, oncology, and payer systems, just to name a few. AI voice assistants are being used in healthcare to schedule appointments, search wait times, and perform other tasks. Voice assistants can be used in patients' homes to allow the patient to live at home.
- While AI programs can assist the user in searching through volumes of data, it will not replace the user. The user plays an important role in providing feedback for the machine learning required for AI.[11]
- Genomics and precision medicine will have an impact on the treatment patients receive based on their individual response to the treatment, which will have an impact on the structure of the EHR and how information is managed.
- Amazon, Berkshire Hathaway, and JP Morgan Chase are entering the healthcare market to create a non-profit healthcare company.
- The explosion of the DNA testing market has raised serious questions regarding the privacy of DNA. One example of how the DNA data collected by various companies can be used to track and identify individuals—even if the individual in question has not submitted their own DNA, but a relative has done so—is the recent investigation that uncovered the identity of the Golden State Killer. HIM professionals are the privacy experts in the health record and can serve as a knowledge expert to navigate the serious privacy issues that are emerging in this space.
- Apple entered the healthcare market with Apple Health Records on March 29, 2018 with 12 health systems and 27 more ready to launch the service.[12]
- Blockchain technology is being researched for use in the healthcare environment.
- Virtual reality is being used to help addicts in recovery.
- Avatars are being used in some settings to allow mental health patients to have remote group therapy.
- There is speculation that Walmart may acquire Humana, and it is uncertain how that will impact the industry.
- Telemedicine continues to expand, which then expands the opportunities for enterprising HIM professionals.

This is just a glimpse of the changes occurring in healthcare that can open new and exciting opportunities for the HIM professional.

Notes

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