

Whither pharmacy informatics

A quick overview of responses in the ASHP listserv in the section of Pharmacy Informatics and Technology revealed that responders who think of themselves as pharmacy informaticists have a variety of backgrounds and experiences. Although most pharmacists today have little or no formal training in informatics, many are migrating to the informatics industry that, until recently, has been the only environment where pharmacists can express their interest in automation. As the scope and complexity of automated systems that service pharmacy practice have grown, so has the need for individuals who manage them. The need for individuals who approach informatics technology in an informed, analytical, and structured way has also grown. Informatics is becoming a specialized pharmacy practice, and it is worthwhile to explore what makes that practice unique and meaningful.

Informatics as a specialized practice is different than the informatics and technology that are increasingly being required of pharmacists in general. With the burgeoning volume of information, and the growth of more and more sophisticated tools to deal with that information, pharmacists who lack certain basic skills in dealing with computers are clearly at a disadvantage in their practice. A discussion of this basic informatics education is beyond the scope of this article.

Hersh¹ reviewed the role of clinical informaticists and found that formal training was minimal and the skills some personnel found the most valuable were not technical but organizational, problem-solving, leadership, and change management skills. He stated that such “bridge” personnel are critical to the success of clinical information technology (IT) initiatives because they provide vision and guidance in the development and implementation of clinical IT solutions.

One of the subspecialties of medical informatics is pharmacy informatics, which can be defined as the use and integration of data, information, knowledge, technol-

ogy, and automation in the medication-use process for the purpose of improving health outcomes.² A pharmacy informaticist is someone whose primary practice *is* informatics—someone who provides the information and automation tools that enable, perhaps even drive, the evolution of pharmacy practice. What is that unique skill set that distinguishes a pharmacy informaticist from a pharmacist? What value does that person bring to the practice of pharmacy?

A valuable informaticist brings perspective on two distinct, different realms: pharmacy practice and informatics. Having been trained in both, the pharmacy informaticist looks at practice with the analytical eye of the design engineer

and at informatics with the experienced eye of the practicing pharmacist. An informaticist has a true interest in informatics; a grounding in fundamental principles of data, information, and automation design; an ability to see both the grand picture and the functional detail; a willingness to approach an old problem in new ways; a firm grasp of the fundamental principles of pharmacy practice; an under-



The Informatics Interchange column gives readers an opportunity to share their experiences with information technology in pharmacy. AJHP readers are invited to submit their experiences and pertinent lessons-learned related to pharmacy informatics. Topics should focus on the use of information technology in the medication-use process, informatics pearls, informatics education and research, and information technology management. Readers are invited to submit their ideas or articles for the column to ajhp@ashp.org or ASHP, c/o Karl Gumpfer at 7272 Wisconsin Avenue, Bethesda, MD 20814 (301-657-3000).

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standing of change management; and a clear recognition that information management and automation are not an end in itself but a means to the end of better patient care.

Knowledge and understanding of pharmacy practice. There are other informatics professionals who can program data, manipulate data, manage infrastructure, and drive development. It is the pharmacy informaticist, however, who can critically evaluate technology in light of pharmacy practice and, conversely, evaluate current pharmacy practice and therapeutics in light of available technology. Clinical appreciation and clinical practice are implicit in this heading. Representation of clinical concepts about drug therapy to health professionals in a manner they can best use comes from some practice as a clinician. Similar to the five “rights” of medication management,³ the four “rights” of clinical

decision support are the right information, in the right format, at the right time, in the right hands. Knowing the way clinical data are used and implemented will enhance the value of a pharmacy informaticist.

Knowledge and understanding of automation. The informaticist must have a clear understanding of the elements of automation that affect practice, a basic approach to the adoption of information management, and knowledge of the technology that helps identify other technologies that are likely to benefit the medication-use process.

Project management skills. The adoption of technology requires careful planning and attention to detail in order to ensure that all bases are covered. This includes realistic planning for infrastructure, resources, time, and materials.

Change-management skills. It has been postulated that implementation

of electronic records and automation is driven by 90% people and 10% technology. The adoption of technology necessarily changes workflow. Changes in workflow create anxiety among people who have become accustomed to it. In order to manage the implementation of technology, the informaticist must be able to recognize and plan for the temporary sense of displacement that all health professionals will feel as they adopt to a new (and hopefully better) way of doing things.

Analytical skills. The informaticist must continually ask, “Why do we do things that way?” and “If we applied this technology, how could we do things more effectively and more safely?” He or she must also be able to look at a challenge, break it into manageable pieces, and organize the solution.

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Communications skills. The informaticist must be able to speak two languages fluently: the professional language of the pharmacist and the pragmatic requirements language of the system designer. The informaticist must also be able to translate between these two languages. The ability to write clearly, concisely, and dispassionately is also important.

Understanding of basic software and database design. The informaticist does not need to be a database architect or administrator but must be able to anticipate the effect of implementation of a specific architecture on the workflow of a medication-use process. The informaticist must be able to determine whether or not an application captures and manipulates data appropriately and whether or not it will permit the output of those data in useful forms.

Ability to follow program logic. The informaticist does not need to be an experienced programmer (although that may help), but he or she does need to be able to follow program logic in order to understand what an automated system is doing and to identify places where that logic may lead to inappropriate results. Ultimately, the logical syntax of any system consists of a relatively small number of structures that, when understood, form the basis of all programming languages. Understanding the logical syntax allows the informaticist to think in disciplined ways that will make him or her more effective.

Familiarity with basic data management tools. The informaticist must be able to approach any given system and determine how to best achieve a par-

ticular end goal. The abilities to attach to databases, perform queries, manipulate spreadsheets, and perform statistical analyses are very useful.

Familiarity with the automation devices currently available. The informaticist must maintain awareness of the automation tools currently available to the pharmacy and, if possible, those under development in order to help direct the practice site to an appropriate automation plan.

Familiarity with informatics standards and initiatives. Much of the lack of progress in health care informatics can be traced to the lack of standards or the lack of observance of standards. The informaticist must know what standards exist, how they can be used to advance the development of automated solutions, and how to avoid being entrapped by proprietary solutions.

Risk analysis skills. A significant element in deploying technology involves realistically evaluating the potential of that technology to create new hazards and to develop plans to mitigate those hazards. Frequently, this requires developing a clear picture, not only of the technology itself but of the workflow that will result from the adoption of that technology. Fault-tree analysis and failure-mode-and-effect analysis should be in every informaticist's tool kit.

Acquisition/request for proposal (RFP) skills. The informaticist must be able to communicate requirements to potential vendors during an acquisition process, to assess the RFP responses, and to provide a rational and complete comparison of the respondents.

It is therefore axiomatic that a pharmacy informaticist must maintain close ties with the practice of the profession.

Without those ties, the primary value (being an interpreter between the pharmacy and informatics communities) becomes lost. As informatics practice becomes formalized, it is hoped that these points will guide the development of specialized training programs for people interested in this field.

1. Hersh W. Who are the Informaticians? What we know and should know. *J Am Med Inform Assoc.* 2006; 13:166-70.
2. American Society of Health-System Pharmacists. ASHP statement on the pharmacist's role in informatics. *Am J Health-Syst Pharm.* 2007; 64:200-3.
3. Stead WW, Lorenzi NM. Health informatic linking investment to value. *J Am Med Inform Assoc.* 1999; 6:341-8.

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