Caring

An Undiscovered “Super-ility” of Smart Healthcare

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CONSIDER A COMPLEX, smart healthcare system, whether it’s an assistive or therapeutic device, record management system, diagnostic system, physician-order-entry system, or any healthcare-related hardware or software system. These systems aim to improve the degree of certain qualities or attributes (“-ilities”) such as availability, privacy, reliability, safety, security, and, moreover, their nonintelligent counterparts. Collectively, systems that focus on these qualities are intended to improve health outcomes, reduce costs, and enhance the quality of life. However, these technologies can affect the patient’s perception of caring in a way that no other quality or group of qualities can completely capture.

For example, consider leveraging the Internet of Things (IoT) to build smart healthcare technology. It’s not apparent how a healthcare system, such as one that monitors a patient and delivers medications or anesthetics, can care about the patient’s sufferings, feelings, and emotional needs. We need to more effectively capture the notion of caring so that we can somehow build it into systems that leverage commercial IoT components and services.

What Caring Is

Caring is a qualitative behavioral attribute that encompasses aspects of many attributes, but it’s far more. Caring can be defined as a noun, a verb, or an adjective. Definitions of caring abound in dictionaries and have been given by professions both inside and outside healthcare. In trying to define a notion of caring that’s meaningful to systems engineers, computer scientists, and, most important, patients, it’s advisable to consider the views of those in the profession that’s been rated as the most trusted because of its reputation for caring: nursing.

Definitions of caring and related terms appear in the nursing literature and have been offered by various professional nursing organizations and healthcare institutions. Caring can be described as an act or as a way to approach patients. It can be a person’s trait, and it’s often an adjective describing someone perceived to be a good nurse. Vicki Lachman pointed out that “Caring and nursing are so intertwined that nursing always appeared on the same page in a Google search for the definition of caring.”

For this discussion, we adopt caring as an adjective with this definition:

Displaying kindness and concern for others.

This simple definition allows for the exploration of caring in relation to smart healthcare systems, without being too
specific to a particular nursing specialty or even to healthcare. The notion of displaying kindness and concern leads us to picture the relationship between the nurse and patient. This relationship will look different in a traditional face-to-face encounter without technology than in a smart healthcare application incorporating technologies such as remote monitoring or applications in the IoT.

This definition of caring isn’t unique to nursing or healthcare, but it’s appropriate in our context. We can organize -ilities into hierarchies based on the context, application, and environment. In healthcare systems, at least, we contend that caring subsumes the -ilities we mentioned previously and several others. Seeking improvement in any or all of these other qualities out of concern for the patient is a part of caring, but it’s not enough. Caring is much more than system optimization; because it subsumes the other -ilities, we call it a “super -ility.”

A Nursing Perspective on Caring
Nursing is often described as an art and a science, and people have discussed caring from both these perspectives. Nursing is also a human science that incorporates the art of caring. As of 2015, nurses had been rated as the most honest, ethical profession for the 14th-straight year. This high rating was built on a relationship that combines trust, caring, and a personal connection with the public.

Nursing theory has helped define and build a scientific body of evidence concerning the profession. Many nursing theories focus on caring or its aspects. For example, one of the most recognized and studied theories is Jean Watson’s theory of human caring. From its inception in the late 1970s, it has distinguished nursing from other healthcare disciplines and has highlighted the unique work of the profession.

Watson’s theory has several core concepts; the one that most likely relates to smart healthcare systems and caring is a focus on the transpersonal caring relationship. This relationship encompasses a moral commitment to protect and enhance human dignity. It involves honoring another person’s needs and wishes; honoring that person’s wholeness, not just the physical self; maintaining balance; connecting to human beings; consciously doing and being with another person; and honoring the connection through authentic presence.

At the heart of nursing is the intention to care for the whole person.

Measuring Caring
In relation to nursing research, Watson developed a tool to assess perspectives of caring practices: the Watson Caritas Patient Score (WCPS). The WCPS is a survey instrument based on a seven-point Likert scale that rates caregivers on certain caring practices. These practices include the environment, concepts of trust, meeting human needs, and feeling valued. The WCPS has been translated into five languages, and versions exist to assess the caring practices of hospital staff, colleagues, and peers.

Ngozi Nkongho developed another scale—the Caring Ability Inventory. This self-administered instrument uses four theoretical assumptions: caring is multidimensional, we all have the potential to care, caring can be learned, and caring is quantifiable. Both Watson’s and Nkongho’s work provides theoretical support for measuring caring and provides tools to help requirements engineers, systems builders, and test engineers evaluate their systems from this perspective. These measures could also be used to compare systems and provide opportunities to improve healthcare delivery.

Whatever mechanism is used to measure caring, the degree to which a patient feels cared for depends on the patient’s perception. Static mechanisms, such as measuring contact time or analyzing words exchanged between the caregiver and patient, can provide quantitative evidence of caring, but only if the patient agrees that he or she feels cared for.
Caring Systems

Systems can’t care about people, except, perhaps, in a Turing test sense (that is, the system behaves indistinguishably from a human), although a person might have the perception that a system cares or doesn’t care about his or her well-being. Also, the patient might have still complained about (or possibly praised) a smart healthcare system had that system been a human and capable of caring. But, setting aside this AI sense of caring, how do you incorporate caring into a smart healthcare system and measure that quality?

A system might increase or decrease the “caring distance” between the caregiver (for example, a nurse) and patient (see Figure 1). This distance could be determined by some administration of the WCPS or Caring Ability Inventory. For example, we could use one WCPS component for the caring distance or use all the components and treat the caring distance as a vector. We can estimate the change in the caring distance through controlled studies of nonsmart (for example, local) versus smart (for example, IoT-enabled) systems using the WCPS or another metric.

We might assume that technology will increase the caring distance. However, caring could be estimated higher in a smart healthcare system than in its nonsmart equivalent. For example, as nurses become more aware of technology’s benefits in caring for patients, this increased knowledge might enhance caring relationships. The nurse’s comfort level in using technology could affect all parties’ perception of caring.

We expect that smart healthcare systems will have specific requirements for caring—for example, to minimize the increase in the caring distance to comply with some standard. Research to determine that standard minimum level of caring will also be needed.

For healthcare systems to continue to advance, technology must be an early, ongoing part of the conversation with stakeholders, particularly nurses. Nurses lead the day-to-day care of hospitalized patients and are usually the healthcare providers having the most patient contact. Technology can help nurses provide better patient care, but nurses must value and integrate these technologies and not see them as an impediment. Nurses must be involved early in requirements elicitation of smart healthcare systems.

FIGURE 1. An Internet of Things–based healthcare system increasing the caring distance between the nurse and patient. A goal is to design smart healthcare systems that can decrease this distance.
systems to assure that the human connection isn’t compromised or lost.

The -ility of caring shouldn’t be limited to healthcare systems. It could be a desired quality to be optimized in virtually every system that interacts with humans—for example, in smart transportation, smart homes, and smart cities. Caring should also be an important consideration in systems that interact with certain nonhuman entities such as animals and the global environment.

Nurses often struggle with balancing technology and patient contact because technology can remove them from direct contact with patients. Conversely, technology has helped improve patient care by allowing for better assessment, surveillance, and treatment. Software and systems engineers need to have the same conversation about balancing technology and human interaction while learning from the nursing profession before building smart healthcare systems (whether or not the systems are based on IoT services and products).

The challenge in healthcare is to use smart technology to improve patient care while preserving human contact. Caring is about relationships, those forged between the nurse and the patient, family, and community. These relationships might manifest caring in different ways, and we need to recognize and acknowledge these differences.

Caring is an -ility for smart healthcare systems that’s complex and difficult to capture, and it deserves further study. Because caring is so important, it must not be lost; that’s why we designate it as a super -ility. Technology can augment the human touch but can’t replace it.

References

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