SYSTEMATIC REVIEW

Article received on January 12, 2015 and accepted for publishing on January19 2015.

Romanian sanitary system assisted by knowledge management

Daniel. O. Costache[1], Cosmin Dobrin[2], Ruxandra Dinulescu[2], Laura Voicu[1], Raluca S. Costache[1,3]

Abstract: *As the medical sciences advances, so does the volume of information which becomes more and more consistent.*
The health care system is one of the most complex systems encountered in our society. Today, knowledge management practices have been adopted in many Romanian business sectors. However, Romanian health care system is slowly adopting such principles and concepts. This fact is created mainly because of the organizational culture. In the sanitary industry, this barrier is composed both from an organizational perspective and also, from an individual perspective.
Through the knowledge management practices, doctors could benefit from the amount of data spread in different geographical regions.

Keywords: *sanitary system, knowledge management, quality*.

INTRODUCTION

In a normal health care system, the patient must be in the center of all activities and any medical error should be avoided, in order to protect the patient from a fatal result. For this reason, a complex source of knowledge could be of great help for doctors.

Health care delivery involves more than one could know, more than a simple relation between doctor and patient. Health care delivery covers health care professionals like physicians, specialists, nurses, lab technicians, social workers, counselors, etc. Also, it includes further parties like hospital/clinic administrators, managers in finances/accounting/human resources/drug companies/ health care insurance companies etc. What is more, health care partners are dispersed around many areas, even if they are acting on the same patient.

Therefore, it is well understood that the amount of knowledge is extremely relevant and that any data knowledge, created by one of the partners, is of great importance to the others in order to deliver quality care.

The term of "knowledge management" (KM) appeared in the 20th century, from fields like management, cognitive sciences and psychology. The present activity of KM started in the 1980s along with the wide use of information technologies in enterprises. There, the main focus was on what

[1] Carol Davila Central Emergency Military Hospital, Bucharest
[2] Economic Sciences Academy, Management Faculty, Bucharest
[3] Carol Davila University of Medicine and Pharmacy, Faculty of Medicine, Bucharest

knowledge represented as an intangible asset.

Basically, the word KM was revealed in the 80s and the academic field was created in 1995 (*Stankosky, 2005*).

WHAT EXACTLY IS "KNOWLEDGE"?

Basically, there are 3 major elements often used together: data, information and knowledge. Still, there are some differences between them, as specified below:

- Data: represents a specific tact or figure, without a specified context.
- Information: represents a data that is organized.
- Knowledge: built on the information, in order to define a proper context.

The main difference between knowledge and information is that knowledge lets us the power to take action. Therefore, we are able to use it.

According to Bryan Duhon (1998), knowledge management represents a discipline that promotes an integrated approach in order to identify, capture, evaluate, and share the amount of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers.

Basically, Knowledge management is essentially especially for getting the right knowledge to the right person at the right time.The main objective is to create value and to leverage, improve, and refine the firm's competences and knowledge assets in order to meet organizational goals and targets.

When we look to implement knowledge management, we have to take into consideration several dimensions like:

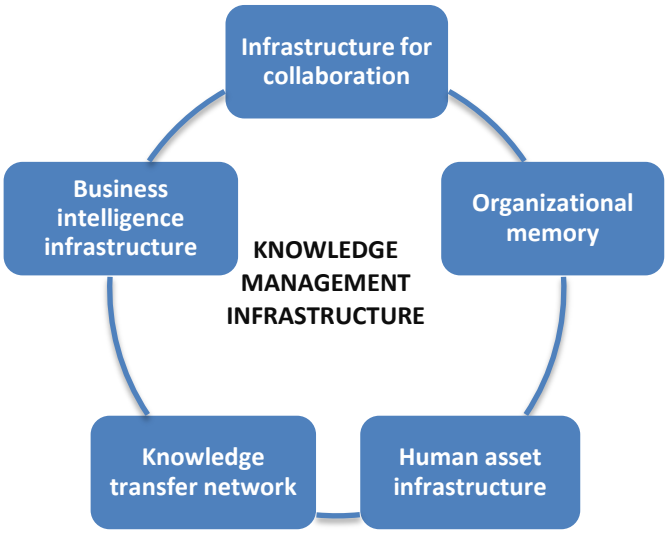
- KM Strategy: Knowledge management strategy must present a certain dependence on corporate strategy. Its objective is to manage, share, and create relevant knowledge assets that will help meet tactical and strategic requirements
- Organizational Culture: The way people interact, the context where knowledge is created, people's resistance towards change and also the way they share (or not) knowledge are easily influenced by the organizational culture.
- Organizational Processes: Are represented by the right processes, environments, and systems that enable knowledge management to be implemented in a certain organization.
- Management & Leadership: KM needs competent and experienced leadership at all levels. There are a wide variety of KM-related roles that an organization may or may not need to implement.
- Technology: Represents by the assembly of systems, tools, and technologies that fit the organization's requirements - properly designed and implemented.
- Politics: The long-term support in order to implement and sustain initiatives that involve virtually all organizational functions, which may require a higher cost for implementation (both from the perspective of time and money), and which often do not have a directly visible return on investment.

Knowledge management could be described in 3 ways:

- Explicit: represented by the information or knowledge set out in a tangible form. Also, is represented by the information that is easy to capture, to structure or share with other people. For example, in a hospital, an explicit knowledge could be represented by the hospital's documentation, like internal policies and procedures, clinic methodologies etc.
- Implicit: represented by the information or knowledge that is not set out in tangible form but could be made explicit.
- Tacit: represented by the information or knowledge that would have extreme difficulty in an operational process setting out in a tangible form. What is more, this kind of knowledge is composed of the amount of experience and skills that a doctor can acquire overtime and apply to problems.

Unlike the explicit knowledge, tacit knowledge is sometimes difficult to capture, to structure and/or transferto other individuals[5].

Figure 1. Key elements that constitute the knowledge management infrastructure (*from Wickramasinghe and Sharma, 2004*)



TYPES OF HEALTHCARE KNOWLEDGE

a. Provider knowledge – also called "practitioner knowledge". This type of knowledge is the most obvious one especially due to the fact that medical professionals in this capacity have both explicit and tacit knowledge.

An example is sustained by the fact that doctors have to know standard medical information easily comprehended from different reference materials such as text books. Still, some may consider that one of the most important types of providers' knowledge is of tacit form.

b. Patient knowledge – this type of knowledge consists also in tacit knowledge. Nowadays, patients have complex knowledge in past and current medical conditions that doctors may not know about. However, such knowledge is mandatory for doctors to know.

c. Organizational knowledge – this type of knowledge consists in sum of knowledge elements like medical diagnostic systems, text-based materials, etc. What is more, this field contains medical land treatment that is strongly recommended by an institution or medical society.

Why Romania needs to adopt knowledge management practices in its clinics and hospitals?

According to a report from the World Health Organization in 2014, in Romania there are almost 40,000 doctors with free practice. This number is relatively small, with a position that represents a total of 2,5 physicians reported at 1000 individuals.

As we can observe in the above figure, in 2014 Romania was occupying the last position regarding the number of medical personnel. Countries like United Kingdom, France, Germany and even Bulgaria, were in front of us.

Even if, in Romania there is not a huge number of physicians, the information needs to circulate as well as possible. That is why, every doctor has to have knowledge of every new information that appears regarding a medicine, a treatment, a diagnostic, etc.

Here are several reasons why KM needs to be adopted by the Romanian sanitary system:

1. A significant amount of data is in multiple places. Data collected from healthcare tend to be stored in multiple places-from different systems like HR software, to different departments, like radiology or cardiology. Practically, healthcare data comes from the entire hospital/clinic.

Another example is that healthcare data is under

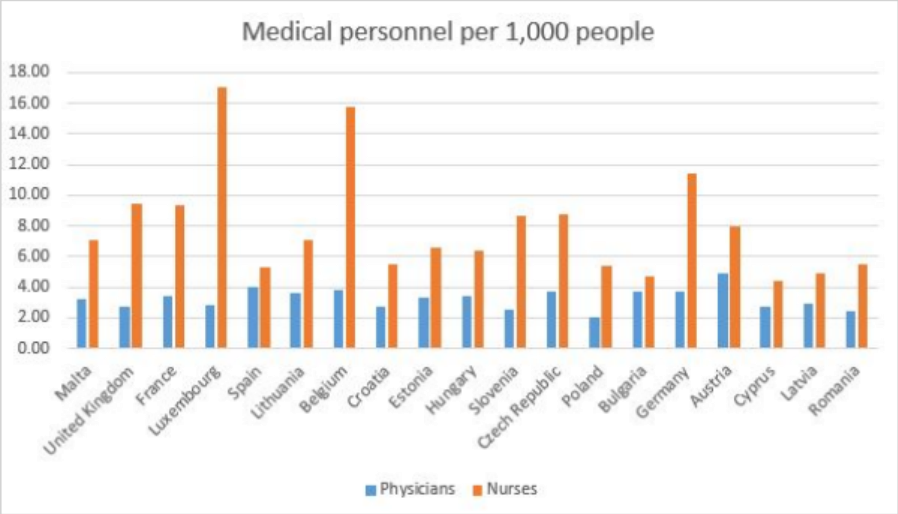
multiple forms (like text, numeric, paper, digital, etc). There are times when the same data exists in different formats and in different systems

What sanitary institution could do, is to aggregate this data into a single and central system, accessible to every physician.

2. Healthcare data could be structured or unstructured. In present, Romanian sanitary system is strong related to the National Healthcare Insurance House (NHIH), which created a software that is able to capture consistent data from patients. This would be helpful, but the software appeared only 3 years ago, and before it, all the information regarding the patients' state were wrote down on a paper folder. This is way, hospitals and clinics need KM – to gather all the structured and unstructured data in the same place.

3. Variable definitions; new research practices are coming out daily. Often, healthcare data have variable definitions (regarding a certain treatment, diagnostic etc). There are cases when there may not be a level of consensus about a particular treatment or definition. What is more, the parts that are conducting a certain discussion about a medicine, treatment, etc. are constantly discovering new data knowledge.

Figure 2. World Health Organization, Medical personnel per 1,000 people



4. The complexity of data. Searching for different developing standard processes that are able to improve quality has always been a main objective for health care providers. Still, the number of data variables involved makes this process more challenging. In health care system, doctors are not working with machines or computer; instead, they work with individuals, more precisely, with human body, which is an amalgam of complex information in constant changing.

Seeing these reasons, we can be sure that healthcare data will not get simpler in the future. On the contrary, it will advance; it will need more than simple software and will present challenges that only a complex and well organized sanitary system could cope.

A POSSIBLE EXAMPLE FOR APPLYING KM IN ROMANIAN SANITARY SYSTEM

From the beginning of 2015, in Romania has been implemented the so called "national health care card", which is nominative for each patient. Its role is to show the doctor what medical treatment has the patient followed, what was his diagnostic and at what medical sections the patient went. In this way, if a patient has firstly went to his family doctor, who diagnosed him and gave him a certain treatment, the second doctor (let's say for example, the dermatologist) would be able to see (with the help of this new system by card) the day when the patient

was at his family doctor, the medicines prescribed and the exact diagnose. So far, everything is in order.

Issue that needs to be solved through KM: The new system shows the information only beginning with the date that the card was introduced. In other words, if a 40 years old patient comes for 10 years (since 2005) at the same family doctor, and only this year he had the card (2015), that means that the information area from 2005 till 2015 (regarding his treatments, illness, diagnostics, lab tests etc) is missing on the software program (the doctor is able to see the medical history from a patient only starting with 2015).

Practically, this represents a gap both for physician and also for the patient (of course that the information from 2005 exists, written in the patient's medical record – a notebook, in most of the cases- but is not inserted in the medical informatics system).

Solution of KM: If KM practices would be applied, the present informatics system could be extended, in a manner that would include the whole patient's history from the beginning. Also, the system could specify, for example, if a patient is allergic to some substances (when the doctor prescribes a medicine, if the patient is allergic to a certain substance from that medicine, the program would alert the doctor and in this way, the doctor would prescribe something else – it is also a way of avoiding medical errors).

MAIN BENEFITS FOR IMPLEMENTING KNOWLEDGE MANAGEMENT

The main advantage of introducing knowledge management in Romanian sanitary system is that the information between doctors is easily shared, and most of all, that information is not lost if one of the doctors is sick or has another reason for leaving the cabinet earlier.

In this way, hospitals could be able to have substantial savings. Doctors are brought up to speed, and valuable knowledge assets are not lost (this translates into fact that the hospital or clinic do not lose time and money when doctors need to learn new information quickly).

In a hospital, knowledge management has the power to increase innovation and also to create better patient relationship. For example, if a certain clinic has a global team, knowledge management can create a more powerful workforce when all cultures are brought together in order to share assets (in Romanian clinics, this example is more suitable for private sanitary system).

Another important advantage is that KM could reduce the medical errors and their cost, by providing a decision support.

Next, we will present another KM advantages for healthcare:

- Cooperation between different health care providers;
- Innovation;
- Quality of care;
- Efficiency of work;
- Cost reduction.

All in all, knowledge management gives doctors the capacity of knowledge they need to do their jobs better. In this way, they become more productive.

CONCLUSION

The adoption of knowledge management practices into the Romanian sanitary system could become either a success or a failure. Like any other project, just because a system has been put in place, with the help of the appropriate methodologies or practices, this does not mean that it will become successful in terms of adoption and use.

Because healthcare data is so complex, it's more than relevant that a traditional approach to manage it will not be able to succeed.

This is why, a different approach is needed. The new approach needs to handle multiple sources, structured and unstructured data, variability, the complexity within a constantly changing environment.

The use of KM in sanitary industry promises to enhance the quality of care for patients. Its implementation will allow healthcare partners to conduct evidence based practice, and also to

collaborate relying on the best knowledge available.

To sum up, the implementation of knowledge management practices and systems is a topic of great interest for the healthcare community around the world.

A complex KM system for health care industry would represent a huge step, both for doctors (preventing medical errors) and for patients.

References:

1. Abidi, S. S. R. (2001). Knowledge management in healthcare: towards 'knowledge-driven' decision-support services. International Journal of Medical Informatics, 63(1-2), 5-18

2. Ardichvili, A.,Maurer,M.,Li,W., Wentling, T., & Stuedemann, R. (2006). Cultural Influences on Knowledge Sharing Through Online Communities of Practice. Journal of Knowledge Management, 10(1), 94–107. doi: 10.1108/13673270610650139

3. Choudhry, N. K., Fletcher, R. H., & Soumerai, S. B.(2005). Systematic review: the relationship between clinical experience and quality of health care. Annals of Internal Medicine, 142(4), 260-273

4. Thomas H. Davenport and John Glaser, Just-in-Time Delivery comes to Knowledge Management, Harvard Business Review

5. Awad, E. M. (2010). *Knowledge Management* (2nd ed.). North Garden, Virginia, USA: International Technology Group, LTD