Fundamentals of Workflow Analysis and Process Redesign

Unit 10.4a

Acquiring Clinical Process Knowledge

Welcome to the Acquiring Clinical Process Knowledge Unit of the Fundamentals of Workflow Analysis and Process Redesign Component. In three lectures, this unit covers the concepts and methods for Acquiring Clinical Process Knowledge in the Health Care setting needed by the Health Care Workflow Analysis and Redesign Specialist.

Before you attempt to set things right,

make sure you see things right.

– Blaine Lee

This quote gets at the heart of knowledge acquisition. [Read quote.] It means that we must understand a process before we attempt to change it. Knowledge Acquisition is the necessary step of gathering information.

In our case, that is gathering information about the processes at a healthcare facility before we change the process by implementing technology, or otherwise. This is particularly important in health care where errors and process problems can harm people.

This unit is about knowledge acquisition. While accurate knowledge acquisition is necessary for improving processes, it is not in itself sufficient.

Blaine Lee, Ph.D. was a founding vice president of Covey Leadership Center and has been a contributing author to books by Stephen R. Covey and Norman Vincent Peale.

Goal of Knowledge Acquisition for Health Care Process analysis and Redesign

1. elicit and document workflow information about a clinical practice
2. so that technology can be leveraged and patient care can ultimately be improved

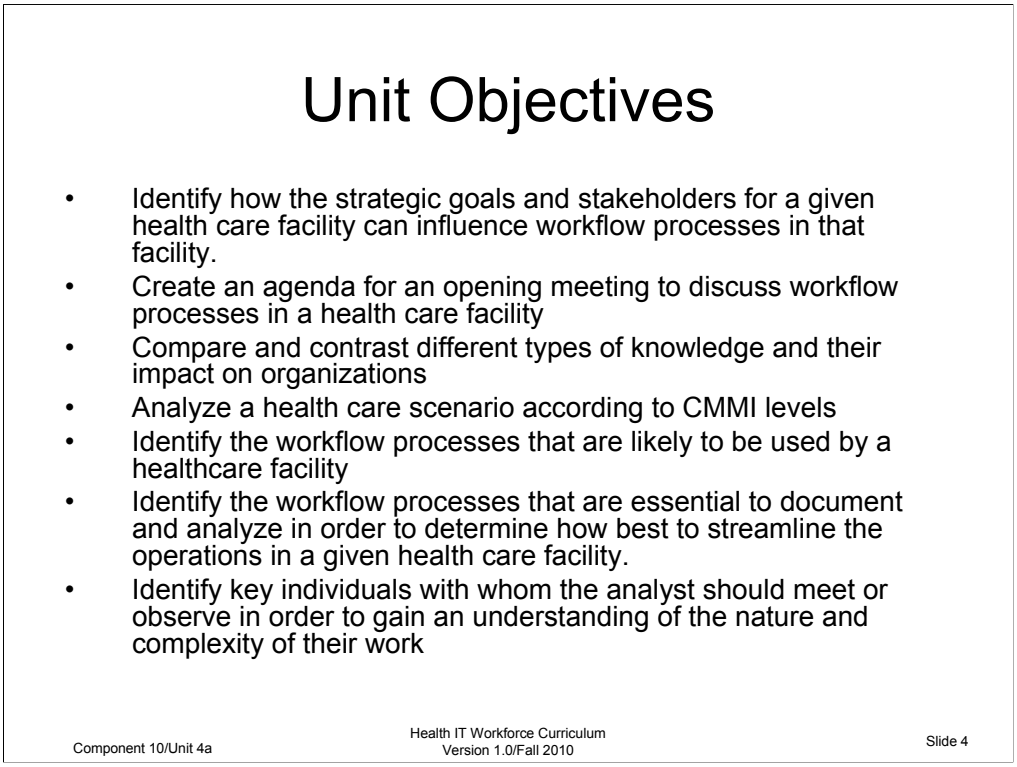
The Goal of Knowledge Acquisition for Health Care Process Analysis and Redesign is to:

1. elicit and document workflow information about a clinical practice
2. so that technology can be leveraged and patient care can ultimately be improved.

Knowledge acquisition is the way that we gain a **thorough** and **accurate** understanding of the present state.

Knowledge acquisition is a necessary step that allows us to identify salient workflow issues, **for example:**

- Which processes are the most important?
- Which are the high volume processes?
- Which processes will present the greatest challenge to implementation of HIT
- Which processes will need to be revised?
- Which processes will disappear?



After successful completion of this unit you will be able to:

•Identify how the strategic goals and stakeholders for a given health care facility can influence workflow processes in that facility.

•Create an agenda for an opening meeting to discuss workflow processes in a health care facility, in light of that facility's strategic goals and stakeholders, **AND**

•Compare and contrast different types of knowledge and their impact on organizations

•Analyze a health care scenario according to CMMI levels

•Identify the workflow processes that are likely to be used by a healthcare facility

•Identify the workflow processes that are essential to observe in order to determine how best to streamline the operations in a given health care facility.

•Identify key individuals with whom the Practice Workflow and Information Management Redesign Specialist should meet or observe in order to gain an understanding of the nature and complexity of their work

Unit Objectives cont.

- Given a process observation scenario, formulate the questions that would facilitate a productive discussion of the workflow of information, activities and roles within that facility.
- Suggest ways to successfully respond to common challenges encountered in knowledge acquisition
- Given a practice scenario, choose an appropriate knowledge acquisition method
- Given a process analysis scenario including list of observations, create agenda for visit closing meeting and an initial meeting report
- Given a set of diagrams and observations from an information gathering meeting draft a summary report

After successful completion of this unit you will also be able to

•Given a process observation scenario, formulate the questions that would facilitate a productive discussion of the workflow of information, activities and roles within that facility. **AND**

•Suggest ways to successfully respond to common challenges encountered in knowledge acquisition

•When Given a practice scenario, you will be able to choose an appropriate knowledge acquisition method

•Given a process analysis scenario including list of observations, create agenda for visit closing meeting and an initial meeting report

Finally

•Given a set of diagrams and observations from an information gathering meeting draft a summary report

Topics for Unit 10.4

- Knowledge acquisition concepts
- Acquiring knowledge about the practice
- Acquiring process Knowledge
  - Identifying Practice Processes
  - Information gathering methods
    - Interviews
    - Observation
    - Studying existing documents (SOPs, process diagrams)
    - Group processes
  - Documenting the information
    - Process diagrams (Unit 2 and 3)
    - Visit Report
- Initiating a relationship with a practice
- Overcoming Barriers

Three basic topics are covered in this unit:

Acquiring knowledge about the practice

Acquiring process Knowledge

Identifying Practice Processes

Information gathering methods, including:

- Interviews
- Observation
- Studying existing documents (SOPs, process diagrams)
- Group processes

Documenting the information via

- Process diagrams (covered in separate units) and
- Visit Report

Initiating a relationship with a practice

Why Do We Need to Acquire Knowledge ?

- Clinicians and information technology professionals generally have different knowledge
  - Clinicians → providing care
  - IT professionals → how computers work
- We need to make computers "work" effectively in clinical settings

Clinicians and IT professionals have different expertise. However, in order to make computers and information systems effective in clinical settings, knowledge from these two disciplines must be combined or integrated. The knowledge gap between these disciplines is often filled by a health informaticist or a health IT professional. We'll call this individual an analyst here. Either the analyst can work with clinicians and practice staff to understand their workflow, or the analyst can train and facilitate practice staff in doing part of this work. Methodology for the latter is covered in a separate unit. This unit focuses on methodology for an analyst to gather information and document clinic processes such that appropriate technology can be leveraged to improve clinic processes and ultimately patient care.

Why is it Called Knowledge Acquisition

- Gathering and capturing knowledge
- Used in many other disciplines:
  - Management science
  - Computer science
  - Artificial intelligence
  - Cognitive psychology, …
- There is no one general KA method

Knowledge acquisition means what you would think from everyday use of the words: Gathering and capturing knowledge

Knowledge acquisition is a broad term, i.e., it is used in many other disciplines:

- Management science
- Computer science
- Artificial intelligence
- Cognitive psychology, …

There is no one definitive method. Further, methods are customized for particular disciplines AND for the level of detail needed. As Aristotle wrote, "It is the mark of an instructed mind to rest satisfied with the degree of precision which the nature of the subject admits and not to seek exactness when only an approximation of the truth is possible." What he meant was that it is a bad idea to do a more detailed analysis that what is required to accomplish your goal… simply put, too much detail wastes time and other resources. **Therefore**, we present here a method that 1) is focused on health care and matching health IT to clinic processes, and 2) is only as detailed as necessary.

Knowledge Acquisition Activities

reproduced from Gaines' research report Organizational Knowledge Acquisition [1]

Component 10/Unit 4a

Health IT Workforce Curriculum
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Slide 9

Brian Gaines, a recognized Knowledge Acquisition expert from the University of Calgary conducted a research project where he worked with Managers involved in an ongoing project on knowledge modeling of manufacturing processes in small companies. This provided us a concept map (reproduced here from Gaines' research report[1]) of the routine ways in which organizations acquire knowledge, i.e., the universe and scope of Organizational Knowledge Acquisition.

Several of these methods are applicable to our work in Health IT Adoption and clinic process improvement. For example, the clinics who hire process analysts and redesign specialists or who receive this expertise through their regional extension center are "Recruiting people with expertise" and "Gathering advice from consultants". Professional process analysts routinely "gather advice from professional literature" through conferences and reading trade and scientific journals. Some of the Regional Extension Centers are establishing local support groups that give clinic leadership and staff the opportunity to "participate in communities of practice". When clinics approach a Regional Extension Center, they are "Contracting with other organizations". Through working with the Regional Extension Centers, clinics are engaging in "Process improvement through experience in use", "Process improvement through process analysis", and "Process improvement through purchase of technology". This and related units teach methodology for "Process improvement through process analysis", and "Process improvement through purchase of technology".

Aspects of Knowledge

- Internal – external[1]
- Coded - tacit[1]
- Active – passive[1, 2]
- Transmitted - experiential[1]
- Declarative – procedural[3]

Without spending too much time on theory related to Knowledge and Knowledge Acquisition (and there is a lot of it), we present two important concepts in this and the next slides. Seven aspects of knowledge are given. The important thing to understand here, is that knowledge is what we call a multi-dimensional concept, that is, there are different aspects. Although Gaines' work does not provide definitions for each of the dimensions, we will explain them by example. Let's look first at internal versus external knowledge. Some knowledge is internal to us (in our minds) while other knowledge is external (in the world). When we use a GPS while driving, it is usually because we do not know the way, or maybe the quickest way, thus we do not have internal knowledge and we rely on the external knowledge that resides in the GPS system.

Knowledge can also be classified as coded or tacit. Tacit knowledge is knowledge that individuals have. When we hire a senior craftsman or performing artist, they are special because they can do something in a way that no one else can. In cases like this, the knowledge that they have that enables them to such unique and expert performance is innate in them. It is not written down, there is no step by step process that one can follow, in fact, such experts often can not articulate the knowledge that is the core of their expertness. This is tacit knowledge. Coded knowledge, on the other hand, is knowledge that is written down in step by step manner such that others can use and apply it. In clinical practices, there is a lot of tacit knowledge (knowledge that is not documented in procedures and resides within individuals) part of the job of an analyst acquiring knowledge is to take in this knowledge, document it (in writing or diagrams, i.e., turn it into coded knowledge) and thus, make it explicit.

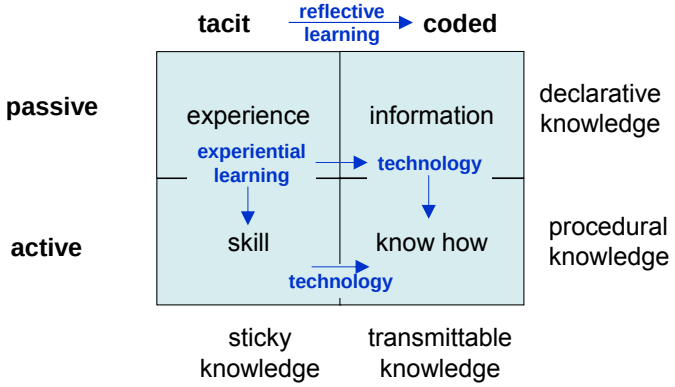
Aspects of Knowledge

- Internal – external[1]
- Coded - tacit[1]
- Active – passive[1, 2]
- Transmitted - experiential[1]
- Declarative – procedural[3]

Still others have made the distinction between active and passive knowledge in the way that knowledge is used by the knower. Active knowledge is something that is used by the knower to do something, for example, a Nurse uses their knowledge every day to take care of patients. Passive knowledge is different, it is knowledge or experience that is encoded by the knower such that others can actively use the knowledge. In passive knowledge, the knower does not apply the knowledge, they structure it so that others can. Another way to look at knowledge is whether the knowledge has been or is best learned through transmission, i.e., taught or read, or whether the knowledge is experiential, i.e., learned by doing.

Probably the most widely used dimension is declarative versus procedural knowledge. Declarative knowledge is the knowledge of facts, i.e., properties between things and concepts and the relationships between them. Procedural knowledge on the other hand is the knowledge of how to do something. A recipe or a standard operating procedure would be an example of coded procedural knowledge. Gaines and others have described other aspects of knowledge that are, for example properties of an organization's intent for acquiring the knowledge, or how it will be used, but these are not properties of the actual knowledge and are less important for our work here.

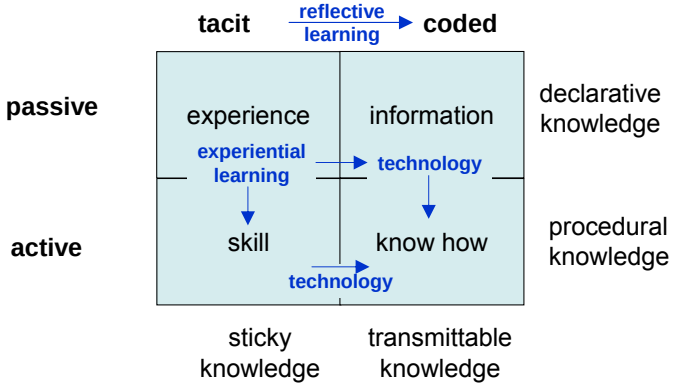
Framework for Understanding Knowledge and It's Impact on Organizations



adapted from Gaines' research report Organizational Knowledge Acquisition [1]

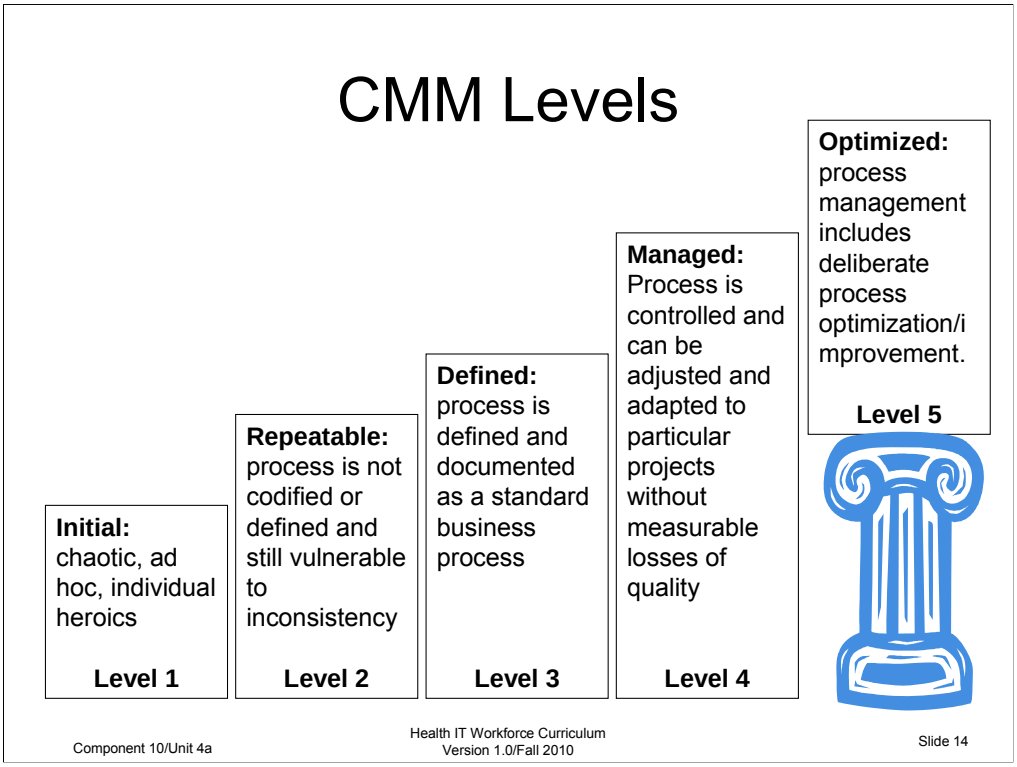
The 2 by 2 diagram in the slide shows the relationship between passive, active, tacit, coded, sticky , transmittable, and declarative and procedural knowledge. A third dimension was added to this framework, declarative and procedural knowledge. In the **Left Upper quadrant** is experience. Experience is both passive and tacit knowledge. Through science or reflective learning, tacit knowledge can be acquired and captured in coded form. Coded knowledge is in the **Right Upper quadrant**. Coding tacit knowledge creates information, i.e., facts – declarative knowledge. Creation of coded knowledge adds immense value because then, the knowledge is accessible to others. For example, where an organization has coded knowledge, that knowledge resides with the organization and provides consistency of performance, rather than residing and leaving with individuals. Where knowledge resides with individuals rather than with the organization, organizations are NOT in control of their consistency and ultimately quality and performance. Coded knowledge is transmittable, manageable, and sharable! Importantly, active, coded knowledge, **Lower Right Quadrant**, is coded knowledge in action, i.e., know-how that can be transmitted to others. Moving back to the left, in the **Lower Left quadrant** lies skill. Skill is tacit, active knowledge. It is the alternative to coded knowledge, skill is sticky knowledge, i.e., it comes and leaves with individuals.

Framework for Understanding Knowledge and It's Impact on Organizations



adapted from Gaines' research report Organizational Knowledge Acquisition [1]

Through it's immense amount of contracting experience, and prompted by contracting for software, the United States government realized the need to be able to assess an organization's likelihood to consistently deliver a quality product on time. This is described by the Capability Maturity Model, initially developed by the Software Engineering Institute (SEI) at Carnegie Mellon University. The **Capability Maturity Model (CMM)** was developed through a US Department of Defense funded research project where data was collected from organizations that contracted with the U.S. Department of Defense. At it's heart, the Capability Maturity Model describes five levels of increasing codification and institutional management of knowledge. The uppermost (5th) level is an ideal state where processes are systematically managed by a combination of process optimization and continuous process improvement. The CMM/CMMI model is important to have a feel for, because as an analyst, you will encounter clinics at all levels of process maturity, your job will differ depending on the CMM level at which the clinic operates. For example, if you find an organization at a lower level, much of your time will be spent eliciting tacit knowledge and helping the clinic leadership and staff codify it. The knowledge acquisition and process analysis phase will take longer where this is the case. Alternatively, when you encounter a clinic at the higher levels, there will be existing documentation of clinic processes that you can use as a source, and your acquisition and analysis phase will be shorter. When you encounter a clinic at Level 5, your work as a process analyst may fit into their existing process improvement framework as part of their continuous improvement.



There are 5 levels of the Capability Maturity Model:

Level 1 - *Initial (Chaotic)*

It is characteristic of processes at this level that they are (typically) undocumented and in a state of dynamic change, tending to be driven in an *ad hoc*, uncontrolled and reactive manner by users or events. This provides a chaotic or unstable environment for the processes.

Level 2 - *Repeatable*

It is characteristic of processes at this level that some processes are repeatable, possibly with consistent results. Process discipline is unlikely to be rigorous, but where it exists it may help to ensure that existing processes are maintained during times of stress.

Level 3 - *Defined*

It is characteristic of processes at this level that there are sets of defined and documented standard processes established and subject to some degree of improvement over time. These standard processes are in place (i.e., they are the AS-IS processes) and used to establish consistency of process performance across the organization.

Level 4 - *Managed*

It is characteristic of processes at this level that, using process metrics, management can effectively control the AS-IS process (e.g., for software development). In particular, management can identify ways to adjust and adapt the process to particular projects without measurable losses of quality or deviations from specifications. Process Capability is established from this level.

Level 5 - *Optimized*

It is a characteristic of processes at this level that the focus is on continually improving process performance through both incremental and innovative technological changes/improvements.

References

1. Gaines, Brian R. (n.d.) Organizational Knowledge Acquisition. Accessed August 1, 2010. Available free from http://pages.cpsc.ucalgary.ca/~gaines/reports/KM/OKA/index.html
2. Passive Knowledge Versus Active Knowledge, March 4, 2010. Accessed on August 2, 2010, available from http://www.beyonduni.com/2010/03/passive-knowledge-versus-active-knowledge/
3. Milton, N.R., Knowledge Acquisition in Practice: A step by step guide. Springer, London. 2007