

KNOWLEDGE MANAGEMENT

UNIT IV

What is Knowledge?

- Personalized information
- State of knowing and understanding
- An object to be stored and manipulated
- A process of applying expertise
- A condition of access to information
- Potential to influence action

Sources of Knowledge of an Organization

- Intranet
- Data warehouses and knowledge repositories
- Decision support tools
- Groupware for supporting collaboration
- Networks of knowledge workers
- Internal expertise

Definition of KMS

A knowledge management system comprises a range of practices used in an organization to identify, create, represent, distribute, and enable adoption to insight and experience. Such insights and experience comprise knowledge, either embodied in individual or embedded in organizational processes and practices.

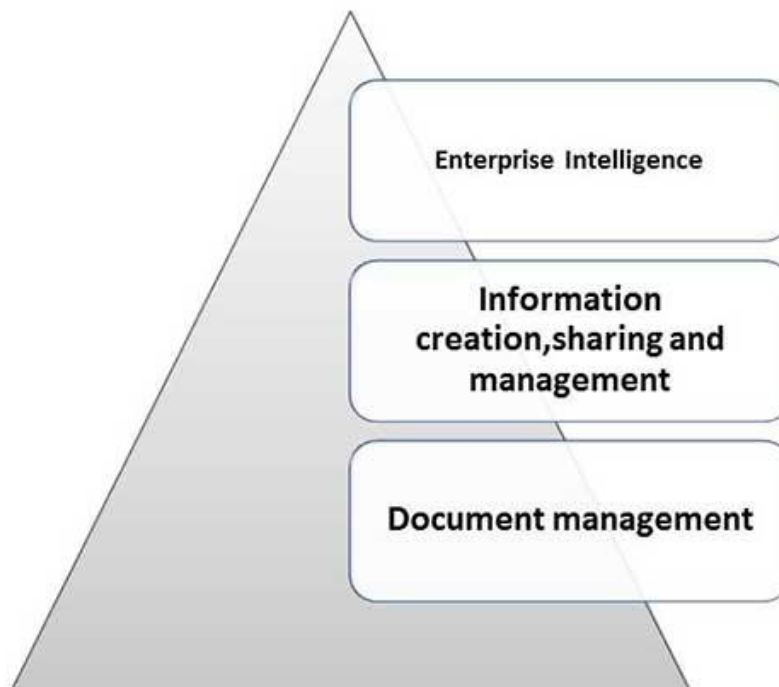
Purpose of KMS

- Improved performance
- Competitive advantage
- Innovation
- Sharing of knowledge
- Integration
- Continuous improvement by –
 - Driving strategy
 - Starting new lines of business
 - Solving problems faster
 - Developing professional skills
 - Recruit and retain talent

Activities in Knowledge Management

- Start with the business problem and the business value to be delivered first.
- Identify what kind of strategy to pursue to deliver this value and address the KM problem.
- Think about the system required from a people and process point of view.
- Finally, think about what kind of technical infrastructure are required to support the people and processes.
- Implement system and processes with appropriate change management and iterative staged release.

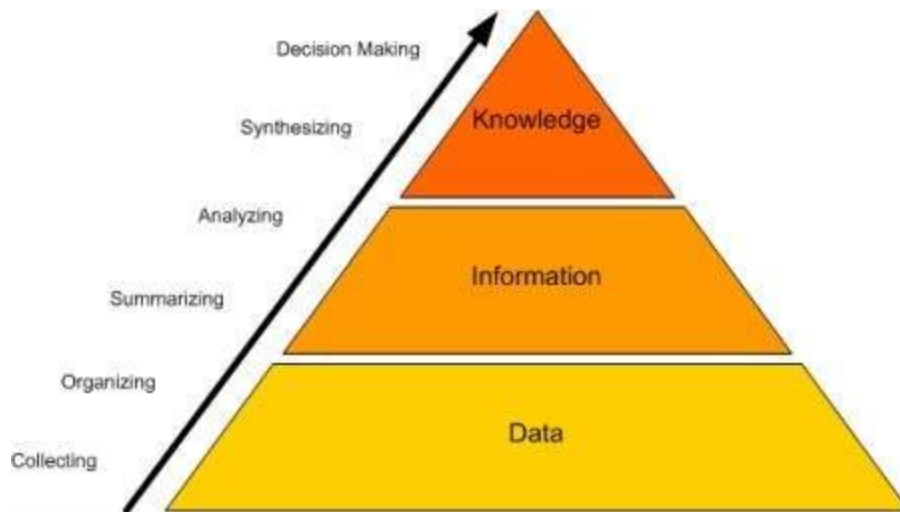
Level of Knowledge Management



The Knowledge Management Process

The process of knowledge management is universal for any enterprise. Sometimes, the resources used, such as tools and techniques, can be unique to the organizational environment.

The Knowledge Management process has six basic steps assisted by different tools and techniques. When these steps are followed sequentially, the data transforms into knowledge.



Step 1: Collecting

This is the most important step of the knowledge management process. If you collect the incorrect or irrelevant data, the resulting knowledge may not be the most accurate. Therefore, the decisions made based on such knowledge could be inaccurate as well. There are many methods and tools used for data collection. First of all, data collection should be a procedure in knowledge management process. These procedures should be properly documented and followed by people involved in data collection process.

The data collection procedure defines certain data collection points. Some points may be the summary of certain routine reports. As an example, monthly sales report and daily attendance reports may be two good resources for data collection. With data collection points, the data extraction techniques and tools are also defined. As an example, the sales report may be a paper-based report where a data entry operator needs to feed the data manually to a database whereas, the daily attendance report may be an online report where it is directly stored in the database.

In addition to data collecting points and extraction mechanism, data storage is also defined in this step. Most of the organizations now use a software database application for this purpose.

Step 2: Organizing

The data collected need to be organized. This organization usually happens based on certain rules. These rules are defined by the organization.

As an example, all sales-related data can be filed together and all staff-related data could be stored in the same database table. This type of organization helps to maintain data accurately within a database.

If there is much data in the database, techniques such as 'normalization' can be used for organizing and reducing the duplication.

This way, data is logically arranged and related to one another for easy retrieval. When data passes step 2, it becomes information.

Step 3: Summarizing

In this step, the information is summarized in order to take the essence of it. The lengthy information is presented in tabular or graphical format and stored appropriately.

For summarizing, there are many tools that can be used such as software packages, charts (Pareto, cause-and-effect), and different techniques.

Step 4: Analyzing

At this stage, the information is analyzed in order to find the relationships, redundancies and patterns.

An expert or an expert team should be assigned for this purpose as the experience of the person/team plays a vital role. Usually, there are reports created after analysis of information.

Step 5: Synthesizing

At this point, information becomes knowledge. The results of analysis (usually the reports) are combined together to derive various concepts and artefacts.

A pattern or behavior of one entity can be applied to explain another, and collectively, the organization will have a set of knowledge elements that can be used across the organization.

This knowledge is then stored in the organizational *knowledge base* for further use.

Usually, the knowledge base is a software implementation that can be accessed from anywhere through the Internet.

You can also buy such knowledge base software or download an open-source implementation of the same for free.

Step 6: Decision Making

At this stage, the knowledge is used for decision making. As an example, when estimating a specific type of a project or a task, the knowledge related to previous estimates can be used.

This accelerates the estimation process and adds high accuracy. This is how the organizational knowledge management adds value and saves money in the long run.

KNOWLEDGE MANAGEMENT TOOLS

Critical knowledge grid

The critical knowledge grid² used by the Tennessee Valley Authority (TVA) is an excellent tool to map who has the critical knowledge and how much risk there is of losing it. Figure 1 shows the TVA critical knowledge grid.

Figure 1: TVA's critical knowledge grid, showing the criticality of the knowledge and the predicted risk of losing it.

Leave within 2 years					

Leave within 6 years	Duplicate skills exist in company or easy to get in market		Tacit knowledge but easy to transfer		Tacit knowledge critical to going forward; hard to find in the market
	Criticality of knowledge				
	Generally known				Irreplaceable

The lab manager can use the grid to document and manage knowledge transfer based on which staff have what levels of critical knowledge and when they might be expected to leave the organization. Retirement is not the only reason, as people often exit the organization for transfers, promotion, or personal reasons, so being aware of workforce transitions is critical.

Knowledge retention tools

Sharing knowledge with colleagues is an excellent way to retain knowledge within the organization. Lab managers should use the tools in Table 1 during cross-training to retain specific knowledge in the organization.

Table 1: Knowledge retention tools for cross training

Tacit Tools	Explicit Tools
Storytelling	Documentation
On the Job Training	On the Job Training
Mentoring	Wiki

Lessons Learned	
Shadowing	
Wiki	

Storytelling enables senior staff to tell some of their favorite stories, and they usually talk about why in addition to what and how. Effective examples of how NASA uses storytelling to transfer knowledge are given in DeLong.³

On-the-job training and shadowing are related tools. In shadowing, the student watches the teacher execute a task, and in on-the-job training, the teacher watches the student work.

Mentoring provides the opportunity to pass not only tactical knowledge but also culture from experienced staff to younger people.

Writing internal wikis enables staff to explain pertinent details of the work and explain why different decisions are made.

Lessons learned enable the lab manager to establish a learning culture and take advantage of both positive and negative outcomes for learning for the whole organization.

Knowledge mapping

Knowledge mapping⁴ enables the lab manager to choose a specific process important to the organization and follow who requires specific elements of knowledge, who has it, and when it is needed. For many technical organizations, the knowledge map resembles other process maps that are familiar to technical staff.

There are several benefits of constructing knowledge maps. The process of creating the map forces lab managers to think critically about what knowledge is needed. Using the maps emphasizes the importance of knowledge sharing and generates an effective tool for less-experienced staff. Of course, there are also challenges in creating effective knowledge maps, including getting the right people

in the room and motivating people to share and manage organizational knowledge instead of hoarding knowledge. As with any other effective business process, an important challenge is to institutionalize the process so that the knowledge is always up to date.

Community of practice

Figure 2 shows the Air Products knowledge management model based on communities of practice.⁵

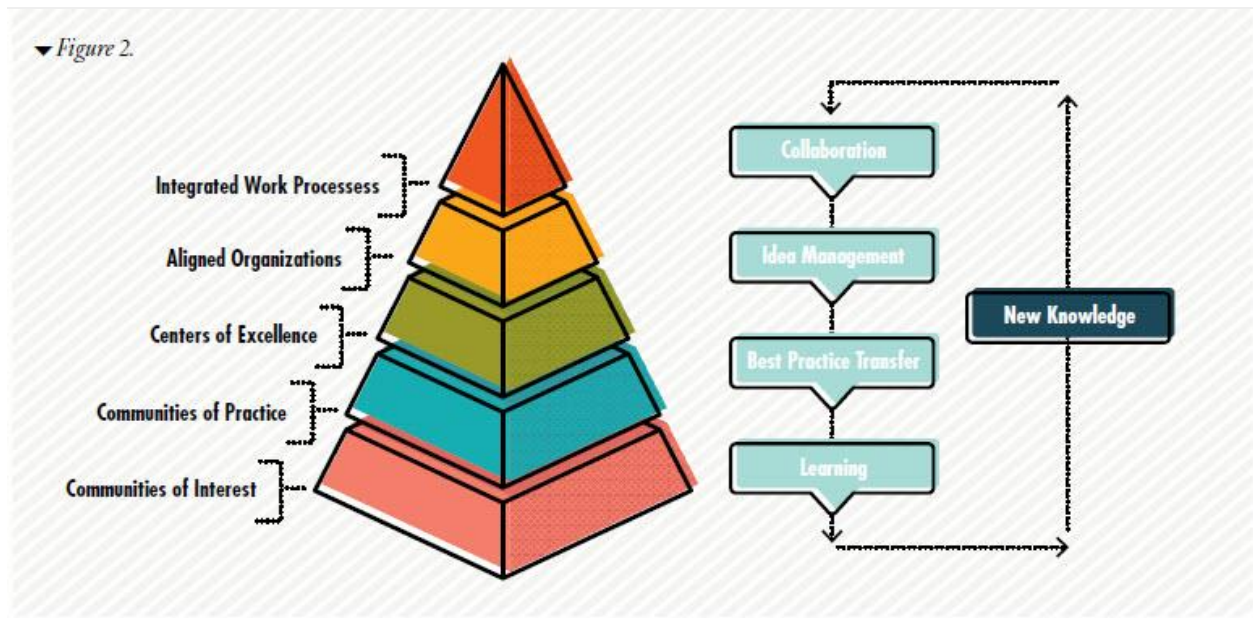


Figure 2.

Communities of practice (COPs) are focused on a general area of interest. The object is to bring a group of volunteers together with responsibility to achieve the community's business goals. COPs are self-managed, hold regular meetings and events, and communicate regularly about the benefits they generate. The outcome of a COP is to nurture knowledge sharing and mutual learning from others within the community.

Idea management⁵

New challenges require new ideas. As lab managers, we need to have mechanisms to encourage, attract, and evaluate new ideas. There are many ways to ask for new ideas; for example, a physical idea box, a virtual idea box, email, dropping by to chat, the Internet, networking, and brainstorming. A management

process that requires active management of ideas through submittal and workflow will work well for an organization.

Once new ideas are generated, the ideas need to be sorted and evaluated. Mind-map software⁶ or other nonlinear tools can be very effective in sorting new ideas. All new idea submissions must be evaluated. That needle in the haystack may be there. In addition, all submitters must be notified about their ideas. Lack of feedback will stifle the flow of good ideas. Good ideas need to be developed. Some relatively small fraction of ideas will hit the mark.

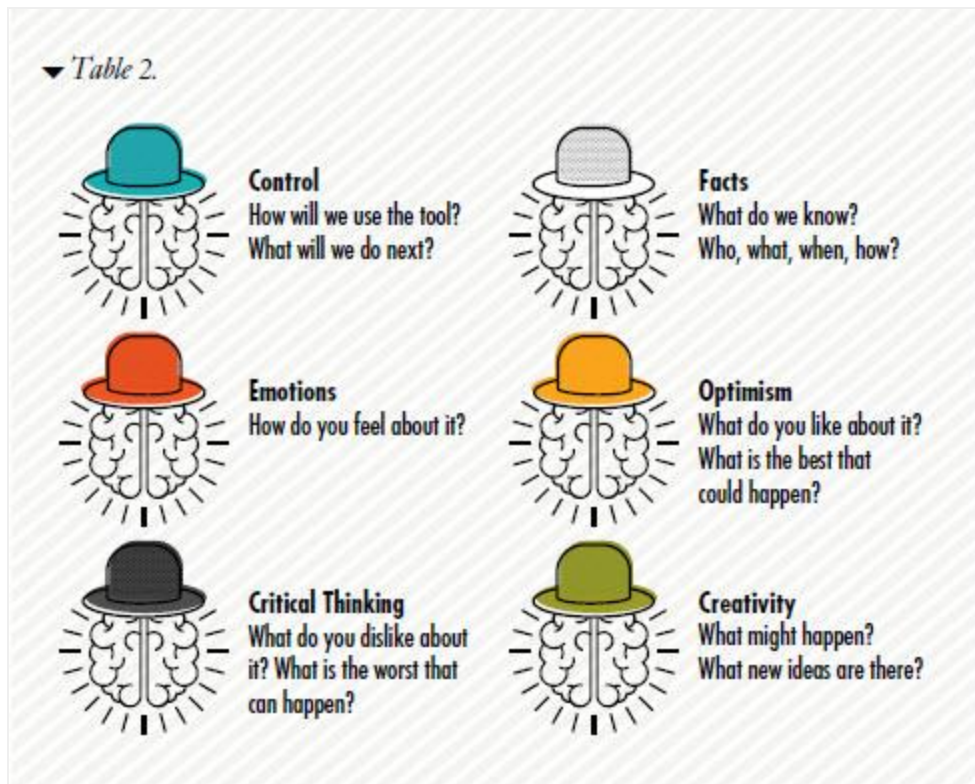
De Bono's six hats

All humans carry unintended bias into most decisions. Lab managers need ways to counter the natural bias. Some common biases that need to be addressed include:

- Confirmation bias—selective search for evidence
- Premature termination—accepting the first alternative that might work
- Cognitive inertia—unwillingness to change
- Selective perception—screening out information
- Wishful thinking—seeing things in a certain (usually positive) light
- Choice-supportive bias—distortion of memories of chosen and rejected options to make the chosen options seem more attractive

One useful tool to counter unintended bias is de Bono's six hats.⁷ Using the tool provided by de Bono enables a more objective way to evaluate ideas or make decisions. The six hats approach enables a group to effectively consider all sides of an issue. Everyone wears the same hat at the same time, and everyone participates in every part of the discussion.

▼ Table 2.



Once the new ideas have been sorted and evaluated, some can be tried. The good old scientific method is often a good way to experiment with new ideas. Demonstrated ideas can be implemented. Implemented ideas can be good practices. Some good practices can become best practices— maybe it will work for someone else too.

Best practices

A best practice is the current best way of doing work that has been implemented.⁵ The method is generating measurable benefits, and the idea can be replicated elsewhere in the company.

Best-practice sharing brings many advantages to the organization, including helping it:

- Save money
- Share best vendors and pricing
- Rapidly share proven solutions to common problems
- Rapidly get input on possible solutions
- Seek proven solutions
- Rapidly share experience globally to related operations
- Connect people from different areas, businesses, or regions

- Rapidly share opportunities

Lessons learned

As mentioned above in the discussion of knowledge retention tools, lessons learned can be a powerful tool to create and propagate a learning culture. A popular and highly effective process for the capture and fast transfer of lessons learned is the after-action review.⁸ Lessons learned are designed to enable individual and organizational learning. The tool can be utilized before, during, or after any event or project. The lessons learned approach is primarily a tacit knowledge tool; participation is the key. It brings insight to not only what, how, or when things were done but also why they were done.

A lessons learned tool consists of five questions:

1. What did you expect to happen?
2. What actually happened?
3. Why did it happen?
4. What can we learn?
5. What do we need to do based on our learning?

Both positive and negative results should be discussed. To enable full participation, no blame or finger-pointing is allowed.

Lessons learned can bring significant benefits to the organization:

- Create a culture of learning
- Create a psychologically safe environment
- Share what people know
- Prevent the repetition of undesirable outcomes
- Appreciate new ideas
- Impart tacit knowledge that is difficult to express in writing
- Give background, context, and history; explain why
- Describe issues encountered
- Reveal how problems were solved
- Help align a team with their work