

# Knowledge Management: A Cookbook for Beginners

Geoffrey Marsh  
Center for Information Technology, NIH  
Building 12A, Room 1011  
9000 Rockville Pike  
Bethesda, MD 20892-5605  
301-594-9683  
geoffm@nih.gov

## ABSTRACT

Knowledge Management is a necessary and integral part of an effective and successful support organization, yet it is also a buzzword that is perhaps over-hyped and over-used. How can a support operation initiate a KM project in a manner that will bring them up to speed quickly, efficiently and at a low cost, while still positioning them to take advantage of current and future trends in the industry?

This paper will explore the lessons learned by one organization, the Center for Information Technology (CIT) at the National Institutes of Health (NIH). CIT initiated a KM project in 1996, building a Knowledge Base that now contains over 10,000 discrete knowledge objects.

The paper's focus will not be on hardware, software, bits or bytes, but rather we will look at what steps an organization can take to build a successful KM initiative from the ground up. These lessons can be applied to any organization regardless of their technical infrastructure already in place.

## Keywords

knowledge management, knowledge database, project management

## 1. INTRODUCTION

So you want to start a Knowledge Management (KM) project of your own? Great. KM is one of the hottest buzzwords circulating in the industry right now. As such, it provides great opportunities for success and equally great opportunities for failure.

This paper will present a capsulation of the main lessons learned by the Division of Customer Support at the Center for Information

Technology (CIT), a component of the National Institutes of Health (NIH). It should be read as a simple, step-by-step primer to get an organization started in KM.

Included at the end of each step are one or more key questions for the beginning Knowledge Manager to ask him/herself as they work through this process.

## 2. PROJECT HISTORY

The National Institutes of Health is the nation's premiere federal biomedical research facility. Located primarily on a suburban campus in Bethesda, Maryland just outside of Washington DC, the NIH performs medical research internally while also distributing grant money in support of research outside of the federal government.

The Center for Information Technology is the component of the NIH that provides computing and networking services and support for use by the researchers and administrative staff.

The central contact point for CIT is the Technical Assistance and Support Center (TASC), a help desk service providing end-user technical support and a gateway to the other services of the center, including computer training, software and publications, system accounts, desktop support, and many other areas.

In 1996, the author built a Knowledge Base for use by the TASC consultants and other staff within the organization. Originally located in a database under Remedy Corporation's Action Request System ("Remedy"), the system (affectionately referred to as the "KB") has undergone continuous upgrade and enhancement and now runs as a web site accessing a Microsoft SQL Server database.

(For a full accounting of the first year of the project, see the author's 1997 white paper "A Help Desk Knowledge Database: The First Year", available at <http://dcs.cit.nih.gov/kbwhite> )

LEAVE THIS TEXT BOX IN PLACE  
AND BLANK

### 3. THE RECIPE

#### 3.1 Step One: Project Identification

The first step of a Knowledge Management project is to identify the area, process or application which you wish to address. This is actually easier than it seems for a couple of reasons.

Current thinking and best practices in the KM industry seem to bear witness to the fact that KM is growing fastest at the grassroots level rather than at the corporate-wide or enterprise level. While there is a lot of interest in building enterprise-wide solutions, the preponderance of successful initiatives are occurring among small groups of individuals [1].

Therefore, a small initiative is probably the best place to begin. If it is successful, you can always expand it; yet if it fails, it will have minimal impact and you can move on to identifying and trying other areas of improvement.

In our case, our effort began many months before the KB was first released to users. A grass-roots project had sprung up among a couple of the help desk consultants who took it upon themselves to compile a small Windows CardFile database of commonly used information, which they then emailed to all the help desk staffers. The file was updated regularly and a fresh copy was mailed out on a monthly basis.

When we initiated the Knowledge Base project, this file proved to be a blessing, for it contained the initial seeds of our database. Coincidentally, the prime author of the informational CardFile left for another position at about the same time that the project started up, allowing the author to assume full control of the information.

In your own project, you may not have such a golden opportunity fall into your lap. But if you look around, you will find that your organization is already participating in many forms of Knowledge Management. For example, how many sticky notes do you have on your computer monitor? How many email messages do you keep in your inbox or other mail files because they contain policy, procedure or other information that you think you may need later on? How many times have you heard a good story around the coffee pot or water cooler about how a coworker handled a situation? Sticky notes, email messages and storytelling are all areas of KM that we already take part in.

Your first challenge as a beginning KM guru is to look at your organization and locate one or more area where technology, process, or both can be improved.

##### **Key questions:**

1. What, exactly, is the mission/function of my organization?
2. What knowledge management techniques and resources are we already using?

#### 3.2 Step Two: Leader and Expert Identification

When we started our initiative, there were no step-by-step instructions for a KM project. Had there been such instructions, and had we known the importance of identifying and enlisting the grassroots leaders, our early days might have gone much more smoothly.

At the time, we were far more interested in centralized control of the information than we were in garnering support the end-user level. A couple of years before, we had made another attempt at building a knowledge base, but it had failed due to inconsistency of the information that techs were entering into the system. Therefore, our primary concern was information accuracy and consistency. All information in the system went through a single person (the author) who entered it into the database. We stuck to this "single point of entry" philosophy for close to two years.

This approach, while it did address the accuracy and consistency issues, also led to a feeling of alienation on the part of the users. They felt little or no ownership for the information in the database. And it took a lot of work by a couple of user-level advocates to really change that attitude, a change that is still ongoing.

To avoid this pitfall, a beginning knowledge manager should work to identify the thought leaders in her or his organization. The term "thought leader" is not meant to imply managers; in fact in most cases you will find that your real organizational leaders are out among the troops. They are the staff members who always seem to have the answer to every question, or who know where to find the answer. They are the ones who other staffers look to as a resource and reference point.

Enlisting these thought leaders at an early stage will reap a couple of benefits. First, they can help guide the project in a direction that will be most beneficial to the staff who are actually using the system. Second, they can become your user advocates and gateways. Since they are already trusted leaders of their coworkers, they can help by collecting all the feedback that the general user population might be reticent to share with you directly. On the other hand, they can become an "inside voice" for you to your user community.

##### **Key questions:**

1. Which coworker does the staff turn to for information and leadership?

#### 3.3 Step Three: Solution Identification

So you have picked an area that needs improvement. What's next?

Chances are, your organization already has some technology in place. Probably your office has a file server, some sort of an email system, a web server, and a lot of software banging around. If you are like many of us, much of that software is hardly ever used, but

there are likely a few packages out there that are used on a daily basis by your staff. That is where you want to focus your efforts.

It is human nature to be resistant to change, therefore the starting Knowledge Manager wants to minimize the initial impact of any changes she or he will be making. In fact, the successful KM guru will take that resistance to change and turn it into a win-win situation by utilizing the tools already in place for the proposed solution.

In our case, we already had Remedy in place as our standard help desk customer- and problem-tracking solution. All our help desk staff used it on regular basis to log customer calls, create and route service tickets, and resolve outstanding problems.

The advantages of using Remedy over the existing CardFile were manifest. Most importantly, Remedy's client-server design allowed us to have a central database which was then accessed via the client tool. This permitted real-time update of data, meaning that if an administrator changed a data field in the database, that change was immediately reflected in the information that the agents were seeing. Plus, the help desk agents were already in the system anyway, so merely opening another database (or "schema" in Remedy-speak) was not too much of a burden.

In your own organization there are bound to be tools already in place and widely used that can be leveraged in a similar fashion.

**Key questions:**

1. What technology tools do we use currently to accomplish our organizational mission?
2. How can these tools be leveraged quickly and easily to improve knowledge sharing among workers (preferably in a centralized fashion)?

### 3.4 Step Four: Knowledge Capture

This sounds complicated, but it really need not be as difficult as it sounds.

In their book *Working Knowledge*, Prusak and Davenport divide knowledge up into two basic categories, Tacit and Explicit [2]. Explicit knowledge is that knowledge that can be codified into written rules, facts and instructions. Tacit knowledge is that knowledge that is more internal and experiential.

For example, the rules and regulations for playing a sport, like hockey, are explicit knowledge and can be clearly stated in a written rulebook. If you asked three referees what player actions comprised a hooking penalty, you would get a pretty consistent answer (hopefully).

On the other hand, the nuances of properly hitting a 90-mph slapshot are tacit knowledge and cannot be readily codified. If you

asked two star players how to hit the goal from center ice, chances are you would get at least two different answers, possibly more.

For the beginning Knowledge Manager, sticking to the explicit and leaving the tacit for later is your best bet. As your project grows and flourishes, tacit information will arise spontaneously if you focus on explicit information at the outset.

In our case, the CardFile that the author inherited contained explicit knowledge, mostly who to call for what kind of problem, as well as instructions for some common procedures. That provided us with the starting knowledge for our project, but we didn't stop there. Some of the techniques we have used to gather information over the years include:

- **Sticky Audits:** On several occasions, the author has walked around the help desk area and talked to individual techs about the information they had on post-it notes stuck to their monitor.
- **Activity Reviews:** Our system is designed to record user queries and hits so that we can review them regularly and look for information that isn't in our knowledge base but should be.
- **Ticket Reviews:** On a regular basis, an Administrator will review the log of help desk service request tickets looking for information that would be useful in the Knowledge Base.

When starting out, you want to capture as much information as you reasonably can, but you don't want to be so intrusive that you invite animosity. Prying Rolodex cards from an unwilling employee's fingers is not good knowledge gathering technique. Presumably, if your initiative is a success, your staff will willingly supply you with all their secret information stashes before too long.

A good place to focus when beginning your project is on the proverbial "Frequently Asked Questions". These are the questions that seem to come up again and again. Creating a single unified repository of these common questions accomplishes two things: first, it frees up some of you subject matter experts to focus on the more interesting and challenging problems instead of answering the same question over and over again; and second, it increases the likelihood that someone using the system will find what they are looking for.

A commonly used rule that we have found to be true is the "10% / 90% Principal". Namely, 10% of the domain of possible questions will solve 90% of the incoming problems. In other words, in the whole realm of possible questions and answers, 9 out of 10 of the questions asked can be answered by only about 10% of the answers. It's your job to identify that 10% of the answers.

**Key questions:**

1. What are our "Frequently Asked Questions"?
2. What are the 10% of the solutions that will answer 90% of our incoming problems.

### 3.5 Step Five: Information Entry

As already mentioned, this is an area that needs to be handled very carefully. In the early stages of the project, information entry is as much about setting expectations and standards as it is about conveying knowledge. We took the approach that all information in the database had to come through a single staff member, an approach that led to a consistent and even feel to the information, but little ownership on the part of the database users. While this approach is good in the short term, as a long-term strategy, it proved to be a poor choice.

In the beginning of a KM project, the project leaders are going to have to take the initiative and act as the gatekeepers of the system. It is up to them to set the standards for style, clarity and conciseness. And even over the long haul, the leaders and administrators need to stay involved enough to ensure that the standards are being followed. However, once the initial standards have been set and laid out in the early stages of the project, the task of information entry should fall on as many shoulders as is practical.

At this stage, your thought leaders identified earlier in the project can be used to maximum advantage. They can either be recruited as data administrators themselves, or they can help enlist other staff members to fill the role. Either way, your best information managers are the folks with the subject matter expertise. This is a lesson we learned the hard way and are still learning.

#### *Key questions:*

1. What style and format expectations do we want to set among our users?
2. Can our thought leaders also act as information administrators for the system?
3. How can we bring our subject matter experts into the fold?

### 3.6 Step Six: Deployment

As difficult as it may be, resist the temptation to wander from office to office removing sticky notes from monitors...

When we first went live with the centralized database and indicated to staff that the old CardFile would no longer be updated, there was some resistance. We know of at least one staff member who held on to (and updated) an old copy of the CardFile for close to a year rather than change their habits. They only changed when their computer operating system was upgraded to Windows 95, which did not include the CardFile program. Only then did they reluctantly embrace the new system and process. Chances are, you will have an outlier or two such as this within your own organization.

However, here again you can call on your thought leaders. If they are on-board with your project and are using the new system regularly, that will count a lot towards getting their coworkers on-line as well. If staff sees the respected grass-roots leaders going to the proverbial well, they will follow.

Incentives of one form or another can be very helpful in spurring staffers to change their habits. In our case, we had the information incentive: the most current and up-to-date information was in the new system, and the old system was no longer updated. In your case, you should look for similar incentives, or carrots, to lead your staff to the new system.

Another success factor to watch early on is "hit quotient", that is the probability that an action by a user will result in actual relevant information being located. If a user tries the system a couple of times and gets nothing useful, then chances are they are not going to go back. Therefore, a certain amount of expectation management is in order. Explaining to the user community at the outset what kind of information is currently available in the system and what is not will be helpful in enhancing your hit quotient.

#### *Key questions:*

1. Are our thought leaders on-board? If not, how can we bring them in line?
2. Do we have staff who are reluctant to change their habits? Who are they and how can we steer them towards the new approach?
3. What incentives can we provide for those who take up the new system and process?

### 3.7 Step Seven: Feedback

It is our experience that the most critical factor in any project like this is open lines of communication.

If your new KM project is being championed by individuals who are perceived as being outsiders or out of touch with the needs of the users, then the channels of communications are going to be difficult to establish or maintain. However, frequently it is impossible to overcome such impressions quickly enough to benefit a project such as this. Therefore, once again, you should turn to your thought leaders.

If you have identified and enlisted your thought leaders from early on in the process, they can become your communication channel. They can be the ones who garner the collective feedback of your staff and pass it on to you, while acting as your advocate to your user community.

Your thought leaders will, by definition, be hearing the "word on the street". Having them pass that word on to you will help you immensely.

There are other ways of gathering specific feedback as well. One way is to allow users who find an error in the system to submit some kind of a problem report. In our system, we have an option where users can flag a record for follow up by an administrator. At the time they flag the record, they are given the option of entering a comment about why they flagged a record as well as an email address where they can be notified when an administrator addresses the comment and unflags the record. The email address can also be useful for following up with the user in the event that the administrator has questions about the user's comments.

Another, somewhat more surreptitious method we use for garnering feedback is via query monitoring. All queries and hits by users of the system are recorded and reviewed regularly by administrators. This gives us a window into the information that users are looking for, thus allowing us to try to populate the database with more useful information. It also allows us to follow up on specific queries that may have gotten no hits.

As you garner feedback, you will need to take action to address it. Thus, this step becomes an ongoing and continuous loop.

**Key questions:**

1. What lines of communications are established for feedback?
2. What is the "word on the street" that our thought leaders are hearing?
3. How can we address this feedback?

#### **4. BEYOND THE BASICS**

What's next? If you have taken the process outlined above through to completion, and made a few iterations through the Feedback loop (Step Seven), you have probably begun to gain some insight into how the system is used and what your users need. This meta-knowledge (or knowledge about knowledge) is priceless.

Based upon this new knowledge, you are now in a position to make some key decisions.

For starters, you now have enough information about your own organization's knowledge needs and expectations to evaluate some of the commercial "Knowledge Management" products currently available on the market. Your experience provides you with a baseline, or benchmark, against which to measure the myriad such products out there. In our case, after the project was about six months old, we brought in a commercial package to test out on a trial basis. However, the reviews were so overwhelmingly negative that we stuck with the homegrown software.

Second, you should have some numbers available about usage, along with some anecdotes or stories about how the project has helped out in some crucial situations. These are useful as justifications for personnel and/or money. For us, the personnel issue was far more important than the money, as the system was growing rapidly and the data needed constant attention. In our favor, there was a wide acknowledgement that the system had reduced the training time for new staff dramatically. In an emergency, a rookie barely off the street could take help desk calls as long as they had enough training to know how to use the telephony, the problem tracking system and the Knowledge Base.

Third, you have probably begun to identify some other areas that your project can help out in, and you have a proven track record.

At this point, you have the tools necessary to justify moving your project out from the shadows of a grass-roots effort and into the limelight.

#### **5. ACKNOWLEDGMENTS**

The author would like to gratefully acknowledge the following individuals for their input and assistance with this paper: Doug Margulies, Leslie Barden, Max Cohoon. Additionally, I would like to acknowledge the management of the Center for Information Technology for their ongoing support of the Knowledge Base project.

#### **6. REFERENCES**

- [1] Delio, Michelle, "Grass Roots Are Greener," *Knowledge Management Magazine*, 3(2), 47-50 (February, 2000).
- [2] Davenport, Thomas H. and Laurence Prusak. *Working Knowledge*, Harvard Business School Press, Boston, MA, 1998.