Some Keys for Successfully Building Knowledge Management Systems

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Abstract

This paper describes three key concepts that are important to building a successful knowledge management system: Ownership, Value, and Information Integrity. These concepts are described in the context of help desk scenario but are applicable to other kinds of knowledge management systems as well.

Introduction

Knowledge management (KM) is about providing information to the right people at the right time. Often the first hurdle to having a successful KM project is just obtaining the information[1] in a form that can be shared. The field of Artificial Intelligence has had to deal with this problem almost from its inception. One of the major goals of machine learning is to remove the knowledge acquisition bottleneck from expert system development. Unfortunately, AI has not been as successful as we had hoped. In this position paper, a number of techniques are discussed that can be used to facilitate the collection and maintenance of knowledge. These techniques have not been scientifically proven, but have been observed to work in a number of KM solutions and are intuitively appealing. The techniques are not technology focused, but rather people and process centered. Where appropriate, technology (especially AI technology) enhancements are discussed.

Some Keys

The following three items have a significant impact on the success of a knowledge management project:

1. **Ownership:** Allow users of the information to be the owners of that information.
2. **Value:** The people providing the information, especially the initial information, must receive value from capturing the information
3. **Information Integrity:** The information must be accurate in order to be useful.

Each of these items will be described in the context of developing a Case-Based Reasoning (CBR) system (Kolodner 1993) for help desk applications. This is one flavor of a KM project that uses AI technology. Personal experiences indicate that these three key areas are important for other types of KM projects as well. Figure 1 illustrates a typical help desk scenario. A user (field engineer in this scenario) phones into a customer success center (help desk) requesting information. If the level 1 support person (customer advocate) can provide the information, the user's request is answered. If the customer advocate is unable to fulfill the request, the request is escalated to a level 2 support person. Level 2 is typically staffed with domain experts. A call center may have more than two levels of support depending upon the complexity of the problems being solved. For this example, the KM project is to provide the knowledge of the level 2 support person to others through an Intranet as illustrated in Figure 2.

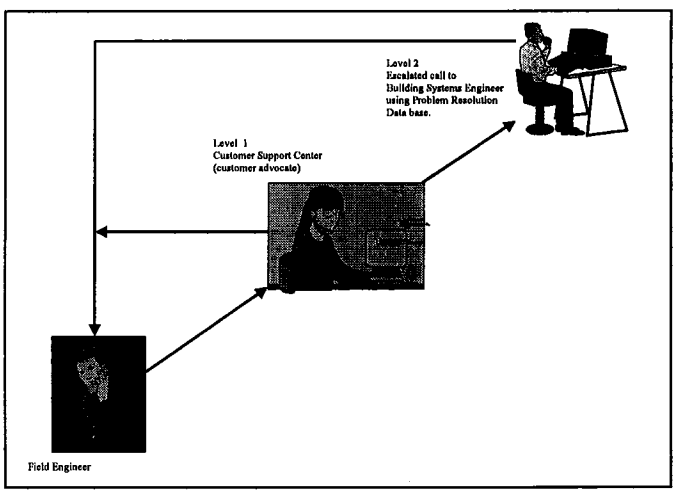

Figure 1: Typical Help Desk

[1] Through out this paper I will avoid getting into the discussion of the difference between knowledge, information, and data. I will assume that systems can provide information and it is the context and experience of the user that can convert that information into actionable knowledge.

Ownership

The ownership of the information should belong with those who can identify the problem. In the scenarios given, the level 2 support person definitely should have ownership. A call reaches this level because there is not enough information available at lower levels. When creating the initial solutions knowledge base, it is the expertise of the level 2 support person that needs to be captured. This person must be able to get some pride of ownership and accomplishment from creating the solutions knowledge base. We have found that many support experts already keep a private solutions knowledge base. They are often very proud of their expertise. It is part of their job to share that knowledge and they do so effectively over the Intranet by putting the knowledge in a form that can immediately be rolled out to the lower levels. Structuring the knowledge is required to publish the knowledge in a form that non-experts can use.

As call advocates and field engineers use the information in the solutions knowledge base, they too should start to obtain a sense of ownership. Unlike the situation where the problem is phoned in, the Intranet users will be identifying areas were the solutions knowledge base is incomplete or inaccurate. They must feel responsible for growing the knowledge.

Many knowledge management projects have come up short because the ownership of the knowledge was separated from the users of that knowledge. It is difficult to get a community of practice established if the members of that community do not have a sense of ownership of the information and obtain value from it.

Value

Most (if not all) knowledge management projects are concerned with bringing value to the organization. But value must be brought to all the contributors of the knowledge as well. It is not enough for someone further down the information food chain to obtain value from my hard work. I must obtain value from it. If the effort of the knowledge provider does not provide payback for them, at some point in the future the effort will stop or be completed haphazardly in spite of best intentions. This is not a unique problem to KM projects. Software engineering has been fighting this battle for a long time. Software developers claim they will go back and document a system after it has been completed. Often the result is documentation that does not match the actual code and is far from complete. Why? There is little value to the developer at that point in time. They and their management are anxious to get started on to the next big problem.

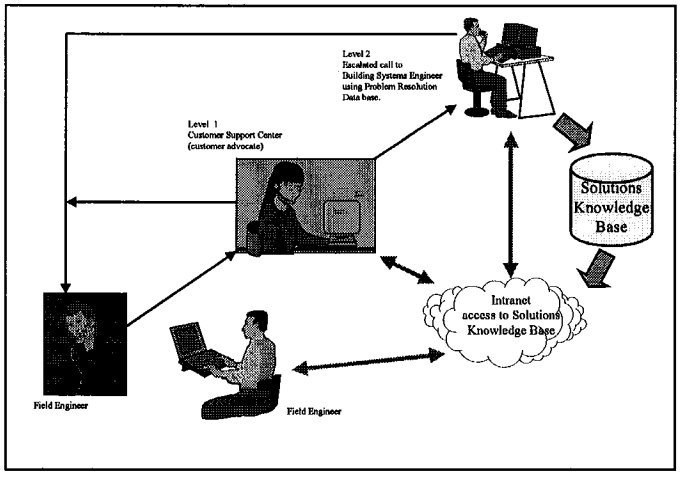

Figure 2: Help Desk w/ KM Solution

In the help desk scenario, the level 2 support person must obtain value from the creation of the solution knowledge base before the system is complete. As mentioned earlier, many experts keep private knowledge bases because they understand the value of being able to quickly obtain this information. If an expert has not kept such a knowledge base, it must be constructed so that they obtain value almost immediately. Using case-based reasoning techniques, an expert can add cases to the solution knowledge base and retrieve them when calls are answered. Quickly the expert can make the information available to level 1 support personnel in order to reduce the number of calls passed up to them. This reduces the expert's work load and allows time to focus on the harder problems which are considered the more challenging aspect of the job.

As the solution knowledge base is made available on the Intranet to different users, they too must obtain value. Value can be gained by getting better solutions, more consistent solutions, solutions quicker, etc. The users must value the contributions of others enough to want to offer their own solutions and experiences. In other words, the value must be great enough that the users have a vested interest in ensuring the longevity of the knowledge source. Developing this community of practice is vital to the long-term success of the knowledge management project. All users must understand that the community values their expertise. This is one of the more difficult aspects of a KM project. It is often not the users' job to provide feedback, yet for the project's success it must be encouraged. Obtaining value and the ability to do a better job are strong encouragement for a user.

Information Integrity

Now that information owners and users have taken ownership and are getting value from the system it is essential to maintain the integrity of the information. Maintenance of the knowledge base is not a trivial task. Often it is a task that cannot and should not be handled by the experts or the users alone. Experience has shown that it is useful to have a librarian or knowledge technician perform the following duties:

1. Incorporate feedback from users into the knowledge

base. In the given scenario this might include asking the expert to provide a case for an area that was missing or to modify a case to handle a special situation. The librarian need not be a technical expert, but they must be able to identify knowledge gaps and incorporate new information.

2. Remove or modify outdated information. As equipment, situations and organizations change the information must be modified. A simple examples is information on who to call for a certain type of problem If that person leaves the company, the knowledge base needs to reflect that change.
3. Provide easy access to the information. The knowledge librarian needs to understand how the knowledge base is being used and provide the information in a form that is most useful.
4. Identify duplicate information. When many users are suggesting changes to the knowledge base, they might propose the same information or information that already exists. It might not be obvious that the pieces of information are the same. The librarian can use this "duplication" to help build up a lexicon for the knowledge base. The lexicon should help everyone communicate more effectively.

These tasks are time consuming. However, if the knowledge base is out of date or users feel their input is not being added in a timely fashion, the project may fail.

Closing Remarks

This paper has discussed a number of key areas that are important in the development of knowledge management systems: establish ownership, provide value, maintain the integrity of the information. While these keys seem like common sense, they are often over looked.

References

Kolodner, Janet. 1993. *Case-based Reasoning.* San Mateo, California: Morgan Kaufmann Publishers, Inc.