
KNOWLEDGE MANAGEMENT IN NUCLEAR R&D INSTITUTES

R. Mukhtar
Pakistan Atomic Energy Commission, Pakistan

E-mail address of main author: rehanamukhtar@hotmail.com

Nuclear Knowledge Management is increasingly becoming important as a tool to provide technology transfer to a younger nuclear work force, provide a solid foundation for power and non-power nuclear applications and advance the next generation of nuclear technology. For the advancement of nuclear science and technology, KM needs to be implemented in R&D organizations. Application of KM techniques should lead to an efficient management of their R&D activities. This paper describes the benefits that can be attained by the adoption of NKM techniques in nuclear research institutes.

The key strategic goal of a nuclear R&D organization is creation of new knowledge with respect to its deployment into products and services. In the context of R&D, KM is defined as an integrated process to capture R&D knowledge hidden in various knowledge based activities and resources, transform it into usable knowledge and diffuse it throughout the R&D organization for future use. According to Malhotra, KM ensures that right knowledge is applied at the right place and time and it is about doing the right thing instead of doing things right [1]. Its application to R&D will avoid unnecessary duplication of research. It can help support both individual and organizational learning from past successes and failures while guiding future actions and changes.

For R&D to succeed knowledge should be collected from all sources both internal and external to an institute. This is a necessary condition for any R&D activity which requires its personnel to continuously enrich their knowledge and use it to develop new information and knowledge. KM can help collect knowledge from multiple areas and integrate it with relevant knowledge from internal and external sources. The process involved can be divided into four steps, knowledge acquisition, knowledge organization, knowledge dissemination and knowledge application. KM focuses on processes or methods to find, create, capture and share knowledge and on technology to store and make knowledge accessible. R&D organizations need to invest in acquiring relevant knowledge and people engaged in research should be able to make use of a variety of knowledge sources which will enhance their ability to innovate.

Research has shown that sharing of knowledge is essential for creating an innovative mindset. Many people are afraid that by sharing knowledge they will lose their importance. A major component of the implementation of KM is to change this culture and encourage knowledge sharing rather than hoarding. In order to promote the flow of tacit knowledge there should be an access to peoples information. Ambrecht et al [2] have proposed that a R&D organization should build a supportive culture enabling knowledge flow, promote creativity, capture knowledge of experts and accelerate R&D process. KM should address organizational level issues such as creating new or revising old processes to generate knowledge, developing incentives to promote knowledge sharing. It should utilize both formal organizational memory (such as databases, repositories and networks) and informal organizational memory (like culture and personal relationships) to store knowledge. Sharing knowledge through communities of practice consisting of individuals with similar skills and responsibilities can be effective. KM can help connect people who will otherwise not be able to meet.

Like all high technology areas, nuclear science and technology depends upon acquired knowledge and accumulated expertise – scientific research reports, data maintenance records

etc. Data preservation is a scientific and professional obligation and absolutely necessary in any R&D institute. The collection and storage of all information relating to a research project should be carried out during the development stage and proper quality assurance ensured. All observations and results relating to a project should be complete, written systematically and in detail. Failures should also be recorded. Development and documentation should be a team effort.

Succession planning is particularly important in nuclear institutes. Highly qualified and motivated professionals have brought the nuclear industry where it is today. A large number of these people have either retired or are retiring taking with them a substantial amount of knowledge and institutional memory. These people are also aware of previous failures and trials (not properly recorded) which is of value for future development. To overcome this problem and preserve the knowledge, sufficient number of well qualified personnel should be available. Conducting training of newly recruited people and continuing education of existing people by these about to retire people is a must.

REFERENCES

- [1] MALHOTRA, Y: Knowledge Management, Knowledge Organizations and Knowledge Workers: A view from the front lines
<http://www.brint.com/interview/maeil.htm>
- [2] ARMBRECHT et al Knowledge Management in Research and Development
Research – Technology Management, 44, 28 - 48, July 2001