The discipline of knowledge management

The Knowledge Cycle

The Delft Cluster Research Programme was founded to meet the knowledge requirements of organisations involved in the development and management of delta areas. Through this open network of research institutions, knowledge and experience is widely shared to obtain high level output. Implementation of knowledge takes place by means of close collaboration with stakeholders.

Determining knowledge needs, sharing information, and implementing results of research are all part of what we call the 'Knowledge Cycle' (figure 1). Addressing all stations of this cycle is essential to good (i.e. eventually useful) applied science. The Knowledge Cycle itself illustrates part of what is generally called the discipline of 'knowledge management': an array of tools and practices applied by organisations to identify, create, share, store, present, and disseminate knowledge. This article explains the different steps in the Knowledge Cycle, with specific references to the way it has been applied to water management.

Ambitions and knowledge needs

The first stage of the Knowledge Cycle involves identifying the relevant social and technological trends, and the way in which these trends will influence society. Jules-Verne-like visions of the future are sometimes constructed that suggest how society could look in 10 to 20 years from now.

The Delft Cluster institutes involved stakeholders – water companies, water boards, industries – in analysing their ambitions and accomplishment strategies within the context of a continuously changing world. The knowledge required
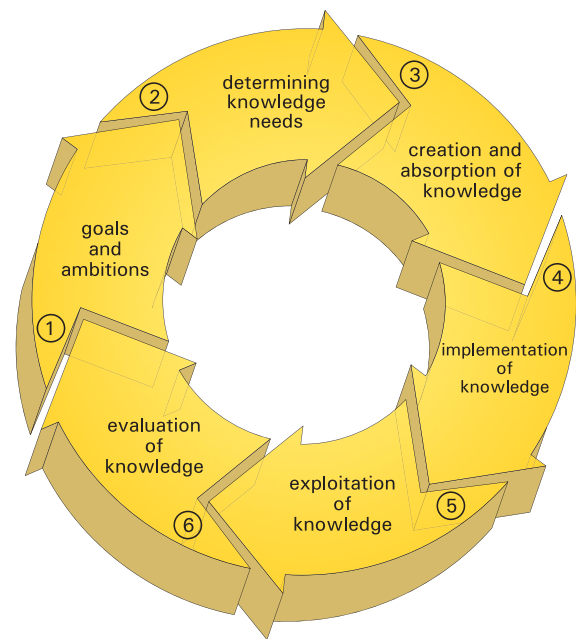

Figure 1
The Knowledge Cycle.

to deploy these strategies was then determined, together with the extent to which this knowledge was already present within the organisation. If vital knowledge was lacking, how this could be obtained in a timely fashion was determined.

Knowledge creation and anchoring for future use

Although research is a sound means to obtain knowledge, it is sometimes also possible to simply buy readily-available knowledge elsewhere. In this third phase of the cycle, we also examine available knowledge that needs to be saved for the future. Is knowledge shared in an appropriate way? Or is it only available for a particular 63-year-old researcher?

Knowledge management:

essential to collaborative

research

Willem Koerselman,

Kiwa Water Research

In such cases, we have to look at how knowledge can be preserved for the organisation when this researcher begins his well-earned retirement. How do we ensure that knowledge is preserved for the future? Storing it all via intranet is certainly not the solution! Intranet is only capable of storing information. Although it is extremely useful, it is often forgotten that knowledge is more than just information. It also comprises a range of competencies and (especially) experience to apply the information correctly. By definition, knowledge is within people and never within systems. Knowledge is the ability to apply information. After all, a word processor doesn't make you a writer.

Implementation of knowledge

In the next step of the Knowledge Cycle (stage 4), we concentrate on effective dissemination of the research results (knowledge) to those who will work with this information. Within the Delft Cluster Programme, this often means the transfer of knowledge from one organisation (the knowledge institute) to another (the organisation that will apply the knowledge). Knowledge management offers a variety of tools to facilitate this knowledge transfer. Digital tools are all too familiar, but they don't suffice in transferring the knowledge to the end user. This nearly always involves physically bringing people together: researchers, and end users of the knowledge. Ideally, the end users are already closely involved with the actual research. If this is the case, a process of continuous iteration can start between knowledge development and future application of this knowledge. This limits the risk that, despite a clear definition of the knowledge needs, knowledge is developed that insufficiently meets the needs of the end user.

Exploitation of knowledge

"The proof of the pudding is in the eating" is certainly applicable to knowledge. Only when knowledge is being implemented does it become clear whether it is practically viable or not. Problems in applying the knowledge often emerge during the implementation phase. It is of the utmost importance that end users can turn to the knowledge institutes for help at this point. Practical experience in the application of knowledge ("this works in situation A, but doesn't in situation B") must be fed back to the researchers, so that the knowledge can be improved and adjusted to actual situations. Once again,

an iterative process involving close communication between researchers and end users is of vital importance.

Evaluation of knowledge

Although the final phase of the Knowledge Cycle is probably the most important, it is often omitted. In stage 6, we check whether all the steps have in fact contributed to realising the goals that were set. After all, that was the original intention. What went wrong en route? Where did it go wrong? And most importantly why did it go wrong, and how can we do better next time? We strive to further improve the Knowledge Cycle during this stage and to learn from experience. Knowledge institutes and knowledge users need to work together in doing so.