

**THE INFORMATION/ KNOWLEDGE FLOW WITHIN A KNOWLEDGE ORGANIZATION  
– IT'S ALL ABOUT PEOPLE –  
A CASE STUDY OF THE GERMAN AEROSPACE CENTER DLR**

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**Abstract**

Last year German Aerospace Centre - DLR – started to reorganize its knowledge management processes. DLR faces a huge necessity of knowledge gaining but has also the need for knowledge logistics, e.g. capturing, storing and distributing. Knowledge that flows along these processes is not concentrated within one organizational unit but flows along several units across the whole organization. The process-oriented knowledge flow gives a different view of the organizational and behavioral attitude of how an organization shares and captures its knowledge.

There is a huge knowledge database regarding all the different aspects of knowledge in DLR. The first idea was here to install a pure project database. But this could not be enough. Knowledge is more than data and information and can only be created by individuals. We found out that not the Information Technology is the key to a successful knowledge management but the people are.

Therefore a new project was launched: “Establishing an integrated knowledge management system”. Within this and among other activities a more social-network oriented and also basic knowledge sharing platform is going to be introduced within DLR. This is not only an IT-based platform but deals also with ideas, events, trainings, discussions and so on. By asking the employees we learned a lot about their needs concerning knowledge. Many synergies could be found and still can be raised out of the knowledge pool which consists mainly of employees. Their special needs focused on a more social-network based knowledge sharing platform, which is going to be introduced within DLR.

The purpose of the paper is to show how DLR plans to organize knowledge along processes and people within its organization. One important outcome of the analysis is the clear need for transparency of the interfaces, and the chance for the employees to publish their knowledge to other employees easily. An overview over this project named “Establishing an integrated knowledge management system ” will be given.

**Introduction**

DLR as Germany's national research center for aeronautics and space does extensive research and development work in aeronautics, space, transportation, energy, defense and security and is integrated into national and international cooperative ventures.<sup>i</sup> As Germany's Space Agency, the German federal government has given DLR responsibility for the forward planning and implementation of the German space programme as well as international representation of Germany's interests.

In this way, DLR contributes the scientific and technical know-how that it has gained. It also promotes the next generation of scientists and provides advisory services to the German government.

Approximately 7000 people work for DLR; the center has 32 institutes and facilities at 16 locations in Germany.

This wide range of activities makes it obvious that many synergies can be raised if there is an inter-branch knowledge management (KM) that supports the distribution and exchange of knowledge.

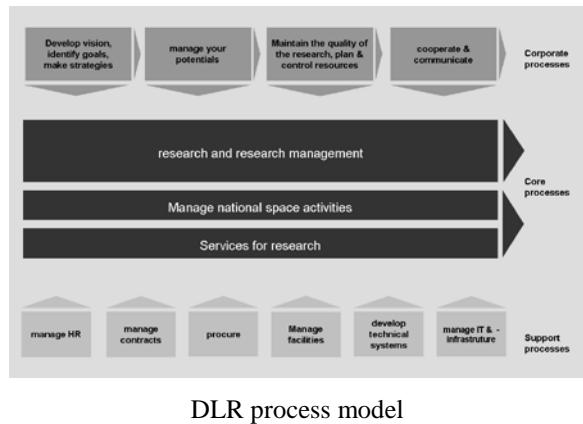
DLR's output is always knowledge. Even though the “products” are not always declared as knowledge output, they are always in a context of research and bound to the knowledge of DLR. The knowledge-output itself can be e.g. in the form of prototypes, services, project results, scientific statements, applications, papers etc.

DLR needs knowledge as a first input, it needs knowledge in every process step to create new knowledge as an output and is therefore a knowledge organization.

But also the internal methodical knowledge, for instance to manage a project, is an important value for DLR. It has to be sure that new employees are able to get all information to work motivated and efficiently. Besides, all employees need to be prevented from doing any redundant work that has already been done

by someone else. Therefore an Integrated Knowledge Management System is going to be established at DLR in the project “Establishing an Integrated Knowledge Management System” (EIWis).

Since DLR has already established a quality management system and is widely organized in processes, the internal preconditions at DLR for knowledge management are already set.<sup>ii</sup>



DLR process model

### **Knowledge versus Information**

There is a widespread misunderstanding between information and knowledge. Sometimes both words are even used similar. The project group of EIWis defined knowledge for DLR as a step between information and wisdom. Information is data in a specific context or syntax that gives it an own sense. Knowledge has more worth for us because it enables people to act and to decide. For example “28°C” is only data, the information could be “it is warm” and the used knowledge could result in the decision to wear summer clothes. It is obvious that only an own experience or known insights from other people can help us to get new knowledge. Because knowledge is always personal it can only be created and transferred by humans. This is in contrast to the fact that many organizations tend to focus on the tools that enable information transfer. Sometimes knowledge management is referred to by the tools’ name. DLR uses SharePoint for KM. We found out that people begin to believe that the tool is knowledge management or that it provides the collaboration or knowledge transfer. These tools are not more KM today than the Guttenberg printing press was KM when it enabled publishing, or the telephone was KM when it enabled voice connections or the television when it revolutionized information transfer from one to many.

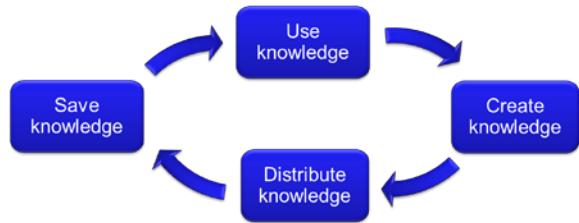
DLR has had its tool discussion already ten years ago. The result was the possibility to share information with some tools much easier and the decision to use one basic intranet-system. But only a few employees and divisions really used the new tools and

so there was no real knowledge management. Our Lessons Learned were that we had to understand how technology, organization and especially people form an organization and work together.

### **Knowledge Management at DLR**

Knowledge Management at DLR is intended to bring the right knowledge to the right people whenever they need it. The objectives are to create new knowledge efficiently, to raise transparency and to enable collaboration.

Especially the core research processes have a KM process included, which consists of creating, distributing, saving, and using of knowledge. Often, this process gets disturbed by outer events or human actors. The task of knowledge management then is to ensure that the process will continue. This can be done by control measurements, process design, redundant tasks, tools and so on. But most important are people who are aware of the worth of knowledge and kick off the knowledge process again, e.g. for the saving of knowledge.



Knowledge Management process<sup>iii</sup>

The key factors to realize KM at DLR are people, organization and technology. The most important factor are the people or the employees, as we learned from the tool discussion. People decide whether a solution – IT or non-IT – will be successful. A pure IT solution cannot guarantee the exchange of knowledge. The organization and especially the upper management must support the activities for a better knowledge transfer. They need an understanding for the needs of their people and how they can support them. More than that there has to be a significant usage of a knowledge management system by the employees which means that they have to be convinced to use it and that they see the advantages of the components. This cannot be enforced by regulations or orders, as knowledge is not material and everybody can decide whether he tells something he knows or not. Because of these difficult cultural and organizational impacts we decided to develop and establish our knowledge management system in a project.

## Project EIWIs

The project to establish an integrated knowledge management system at DLR (EIWIs) was launched by a decision of the advisory board in April 2011, after a community of knowledge-management-interested employees wrote down many hints for developing and improving the knowledge processes at DLR into a pre-concept. EIWIs is divided into two major phases. Phase I is the Analysis and Implementation phase which consists of three steps. The first step was the initiation in which the major organization of the project was set. New project members who were willing to support the idea of an internal knowledge management system were involved in the project. Therefore, internal marketing and an information offensive were launched in the first step.

The second step of phase one was the most important one: the analysis of needs and suitable measurements. DLR started a stakeholder analysis according to internal knowledge, an environment analysis and a tool analysis. Most important was the stakeholder analysis and a survey among all employees.

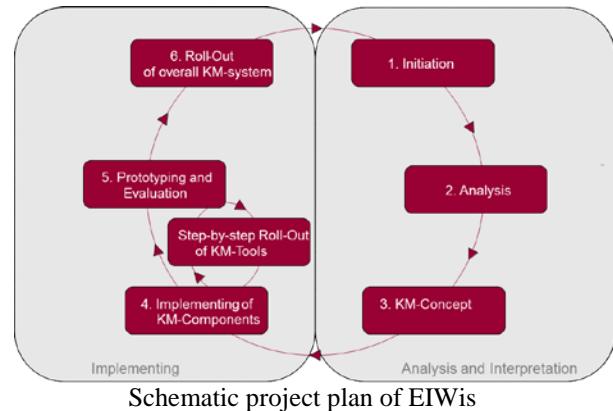
The third step of phase I was to interpret the results of the analysis, to find adequate components to meet the requirements and to bring this into a concept. This concept got approved by the advisory board.

In phase II of project EIWIs the components of the knowledge management system will be implemented. There is a serial roll out of the components. Each component will be tested by two pilot institutes which analyze if the measurements are meeting their needs concerning knowledge exchange and knowledge management. After each component of the knowledge management system is implemented the complete system will be rolled out to all employees. This will require an information campaign and activities to raise participation.

EIWIs has recently reached the implementing phase after several discussions with the stakeholders about the concept. It was important to give information to all stakeholders and especially to the employees. The project team therefore launched an internal website and published the objectives, ideas, measurements and results in the internal DLR employee gazette and within internal employee conferences and meetings.

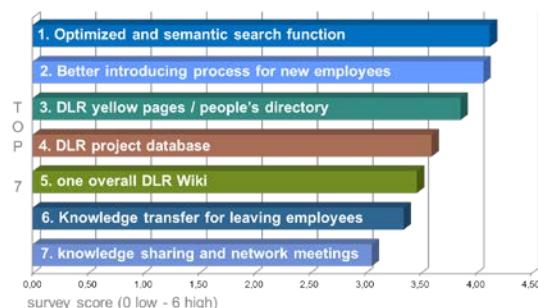
## Results of EIWIs

There are two important results of the analysis: the result of attitudes and needs and a concrete evaluation of needed KM components. The analysis of needs gave many hints that knowledge management is absolutely needed and important to support further growth of DLR.



The major needs were more transparency and the strong need for knowledge exchange. 55% of DLR employees claimed, that they do not find the relevant knowledge inside DLR they need for their work. 71% mentioned, that they have many redundant tasks in their work because of missing knowledge, e.g. about the work someone else already has done.

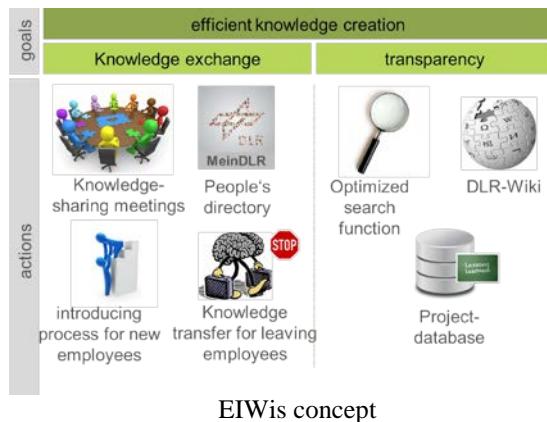
On the other hand we asked our employees to evaluate the most important improvements that had to be implemented in a new KM system. First we did a pretest in form of interviews with 20 identified stakeholders. Then we took the questions and answers and transferred them to an online poll. We found out that seven measurements had a strong voting to get implemented which will be shown in the picture below.



EIWIs survey result

We took these measurements and brought them into the concept. It was soon clear that the employees voted for a balance between components that are IT tools and components that help to personally exchange knowledge. It is easy to understand that our employees do not want to communicate only via IT-tools. The personal contact helps a lot in communication and cannot be substituted by IT like E-Mail and Wikis. But on the other hand people need more transparency to find the knowledge and information that already exists. Especially IT-tools are good in helping people to get an overview. The two supporting objectives for an efficient knowledge creation are therefore

knowledge exchange and transparency. We sorted the required components to our goals as shown below. All components will be implemented by partial project managers who come from central DLR divisions, e.g. human resources, IT management or project management support.



The components will be explained in the following.

### 1. Knowledge sharing meetings:

The knowledge sharing meetings are not similar to conferences. The new way of these meetings is mainly that there is no real agenda for these meetings. Even the topic will be found by a competition. The only central organization will be set from the EIWIS project group to start the competition and the evaluation of topics by experts. The content will be created completely decentralized, so that a scientific discussion can run without any financial, political or other barrier.

### 2. Introducing process for new employees:

New employees need to know where they can find knowledge or whom they can ask, if they have any questions. That helps to keep them motivated and makes the first days in our organization more efficient. We want to give them an overview of the KM system and of DLR. On the other hand there will be a special introduction for each institute.

### 3. Knowledge transfer for leaving employees:

Leaving employees always leave with the knowledge they have achieved. Together with human resources EIWIS develops a transfer process for leaving employees who are willing to transfer their knowledge. There will be different scenarios depending on the amount of knowledge and experience the person has, beginning from a checklist up to a whole workshop where all colleagues try to find out the relevant knowledge together with the leaving employee.

### 4. People's directory

Together with the IT management EIWIS created a people's directory in the DLR intranet. The contact data of each employee is automatically shown on the profile page. DLR employees can upload their photograph and write down their expertise, so that people can be found not only by their name but by their competencies or their experience. The network feature is not ready yet but will be improved, so that people are able to ask a question to a complete network community inside DLR. On the other hand, these communities can build up in the people's directory and spread into a real meeting.

### 5. Optimized and semantic search function:

The optimized search function is a pure IT tool but helps to get a way through the unstructured information in all electronic information resources. This can be the intranet, a hard disk, the internet, databases, etc. The old search function had no semantic technology so that the relevance of the search results could not be optimized. With a new technology the search engine will be able to "understand" the search topics and will also show results which have the same meaning but not necessarily the same wording as the original search request.

### 6. DLR Wiki

Wikis enable everyone to write down and publish what he knows whenever he is willing to do so. Wikis are easy to use without the need of reading a manual. There are several Wikis in several institutes of DLR, but no one of them is connected to another one. Besides there are several wiki engines which are not able to work together. But wikis are important for a knowledge flow, because they enable people to write down implicit knowledge that does not exist in an explicit way. Especially methodical knowledge about processes, procedures and links to other information resources can be captured in a wiki. The main task is to build up a new wiki that can connect to the other wikis and helps to structurize the existing knowledge. Besides the DLR wiki needs to be compatible to the rest of the intranet to connect the content directly and to link to the people's activities.

### 7. Project database

The project database will be like a collection of wanted posters for all projects of DLR. The main information will be filtered out of the SAP system, which contains all administrative project information. Each project manager will be able and encouraged to add relevant project information. An important feature will be the upload function for Lessons Learned documents. That means that project information and project experience will be shared with others and the

project managers can be contacted for collaboration, follow-on-activities or any knowledge exchange.

### **Way ahead**

DLR is temporarily implementing all components of its planned KM system. Most of DLR's knowledge is located at the people who work for DLR. Therefore the components were chosen by the majority of DLR's employees. This will help to meet the people's needs according to knowledge management.

The optimized search function and the people's directory have already been implemented and are being evaluated by the pilot institutes. The implementation of the other components of the planned KM system got already started through partial projects.

The discussion in DLR about the knowledge management activities has led to more awareness about knowledge and its worth. The EIWis project team must constantly evaluate each component of the KM system whether its effects are positive for knowledge sharing or not. Key performance indicators will be designed to measure the effects. Every KM system can only be a success when it meets the people's needs and gets used. Therefore an information campaign will be started to motivate people for using the KM system.

Never before so many knowledge management activities were launched at DLR. The future will show if the system will meet the objectives of EIWis. People will decide with their usage of the KM components.

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<sup>i</sup> [http://www.dlr.de/dlr/desktopdefault.aspx/tabcid-10443/637\\_read-251/](http://www.dlr.de/dlr/desktopdefault.aspx/tabcid-10443/637_read-251/)

<sup>ii</sup> Ruediger Suess: "Coordination of the information/knowledge flow concerning project management issues within a process-oriented organization – a case study of the German Aerospace Center DLR", IAC-11-D5.2.11, DLR 2011

<sup>iii</sup> downsized illustration, according to Probst, Raub, Romhardt: Wissen managen, 6.th issue, Wiesbaden 2010, p. 28