

# **Integrating Knowledge Management and Human Resources via Skill Management**

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**Abstract:** Knowledge is more and more a key factor within companies. Nearly 40 percent of all employees are so called “knowledge workers“. Distribution and inquest of knowledge within companies are supported by skill management systems. Although not all aspects and potentials of this instrument are yet utilized skill management systems have spread widely within business organizations. This paper summarizes the requirements, scopes and problems for skill management system within the company.

**Key Words:** requirements, knowledge management, skill management

**Category:** H.1.2, J.4

## **1 Main fields of application**

Skill management as a knowledge management instrument deals with the knowledge of the company’s employees on different levels [Böhme 2001]. Main issues of skill management are the qualifications and skills that are important for production and surplus within the company. To track those skills the company uses business information systems to keep the latest profiles with the rated skills in hand. Though skill management is no IT-based approach, it is more based on cultural and organizational changes within the company. The main areas of application are expert finding, personnel recruitment, personnel development and project management.

Expert finding is the functionality easiest to implement and use of a skill management system. Expert finding makes it possible to find and search for employees with certain and needed skills.

Recruiting personnel is strongly supported by skill management systems. The human resources department can look for certain skills and compare the skills of an employee with the needs of certain job opportunities . Those inquiries create the possibility to start internal promotion [Kreitmeier et al. 2000]. The company is able to save costs that otherwise apply to placing adverts for job opportunities in journals and magazines, sighting the application of all candidates and losing working time because of long application audits.

The personnel development department can also benefit from skill management [Blandin 2003]. The system makes the qualifications and skills of each employee transparent. Gaps and needs for development become more and more clear. The lack of important skills will become visible.

Within a project-oriented organization employees can be scheduled like any other resources for projects [Deiters et al. 1999]. Comparing job description and skill documents of an employee creates the possibility to find the most appropriate employee for a certain vacancy. But the fact that a successful team is much more than just adding the best skills should not be omitted.

## 2 Costs and Savings

Doing knowledge management oriented projects there is often a problem concerning the return on investment. The money saved by the skill management system can not be quantified. The developing and implementing costs do not have direct return on investment. Newer trends dealing with the mapping of human capital might have effects on skill management. There are certain questions which have to be asked [Ackerman et al. 1999]: What costs does the skill management system cause? Which costs can be saved using the system? Which costs accumulate when skill management is not implemented within the company?

The capital outlays for the system are determined particularly by the kind realized at the beginning: Is the system introduced only for a certain range, for example for the project management? How many personnel specialists have to be trained? What is estimated on person days for the project? Further the kind of the data acquisition plays with the costs a not insignificant role, the development of target/actual goals costs time and is important for the success from the very beginning. Running costs play only a small role compared with the initial capital outlays [Kreitmeier et al. 2000]. The resulting costs of the actualization of the data profiles and the current server costs and personnel expenditure are the biggest. These costs are however quantifiable, savings are not. A skill management system sets free monetary values by the optimization of the personnel employment in different kinds of work time [Faix et al. 1991].

## 3 Improvements by skill management

Simplifying the search for experts, problems can be discussed faster with the correct employee. The system helps the project management to prevent wasting valuable work time of experts on too simple tasks and to assign appropriate tasks to them. Further improvement potentials lie in the adjustment of the staff to the requirements of the market, the enterprise recognizes by the collection of the abilities of the employees positions, which do not have to be placed [Faix et al. 1991]. Further training of the employees can be directed to the

correct knowledge topics, expensive, redundant training courses do not occur. The last large potential lies in the saved costs of the employee procurement. Enormous amounts are saved through the transport of internal employees over internal recruitment advertising and training programs [Kreitmeier et al. 2000]. Internal procurement is not only favorable for working climate, but the costs are only half as high as the costs of external recruitment.

This potential leads to the negative effects, if skill management is not realized. Fluctuation costs by personnel changes are lowered by the internal promotion, which minimizes probability of core knowledge carriers to be pulled out of business by insufficient career possibilities. The damage by insufficiently qualified employees is quantified hardly, just like the costs, which result from double qualification, if employees regard knowledge as their private property and do not share it.

#### 4 Problem areas of skill management

*Structuring the skill catalogue:* It is a crucial decision how the data is tracked. If data is tracked as continuous text, we will be able to support individualists properly, they can describe their project experience, personal record in detail. Therefore, the data tracked has to be structured and categorized in clear categories and/or afterwards categorized in further smaller categories. Apart from the content advantages by structuring there are also technical advantages, since the data can be seized so more easily in the data base [Hüneke and Zimmermann 2000].

*Equal chances for each employee:* Normally there is no problem with exaggerated self-portrayal when tracking competencies and skills in a strongly structured database. Which skill is tracked and which is not is very important to the employee, it is in fact essential. If some skills of an employee are not tracked by the system, the employee might not be in the expert directory [Deiters et al. 1999]. No other user can ask for his expertise.

*Different types of skills:* The skill catalogue first of all only clarifies which skills are tracked, but not their type. It has to be distinguished between hard and soft skills [Ackerman et al. 1999]. The so called hard skills are proven skills and competencies, workings areas, educational ways and skills, certified degrees et al. Soft skills include more or less capacity for teamwork, leadership qualities, toughness. This information is very sensible and diffuse.

*Tracking and judging the competencies:* The problem of tracking the competencies is not that easy to be solved. Yet there are few known solutions to solve this problem [Gronau 2003]. The normal way is to use software engineering methods for system analysis to create a repository of known skills and to

estimate future needs. The employee maintains his data on his own. If an employee rates himself too high, he gets more questions from other users, if he can not supply right answers, his reputation within the company will suffer. The tracked skills therefore might be more trustworthy [Dingsoyr and Royrvik 2000].

*Data protection:* The skill management system tracks by majority personal data, which is subject to a special protection. Special rights of codetermination are entitled to worker's unions due to this fact. This problem area is of crucial importance during the introduction of skill management.

*Up-to-dateness of the data tracked:* The lifespan of knowledge in enterprizes is small, the data topicality over projects and advanced training of the employees even smaller. Data quality must be correct for the acceptance of the system. The data must be again and again maintained and updated, which naturally causes costs in the form of work time [Deiters et al. 1999]. Skill management systems are only useful if the data, on which expert information is based, are not several years old and the experts meanwhile possess only historical knowledge.

*Acceptance of the system:* If the problem of acceptance is not solved, then skill management will fail. Both the management, the personnel department and the staff can bring the project to failure, if the respective group does not feel enough represented [Gebert and Kutsch 2003]. Teams may not only be arranged with the help of the system, a employee discussion may not be replaced, since frequently the desired developments of the employee are not seized and tracked by the skill management system [Deiters et al. 1999].

## 5 Requirements for skill management systems

### 5.1 Requirements as regards content

*Meaningful structuring of the data:* The skill management system has to seize the data structured, so that it can be entered for the employees more easily [Ackerman et al. 1999].

*Meaningful skill catalogue:* The skill catalogue must be provided carefully. In addition, the requirement catalogue should be derived from modelled enterprize processes and not from job descriptions, since information could be lost.

*Structure equality of catalogues:* The job requirements should offer the same evaluation possibilities as the skill profiles of the employees.

*Granularity of the skill catalogue:* The catalogue should be quite fine granular, in order to offer equal chances during the collection of the abilities.

*New competencies for the catalogue:* The employee should be allowed to submit new competencies for the skill catalogue.

*Collection of sensitive competencies:* Personal and social competencies should not be seized because of their sensitive character. It is critical because they are not objective or representable.

*Necessity for the rating:* In order to use a skill management system purposefully, a rating of the competencies should absolutely take place.

*Data acquisition and evaluation by self-assessment:* The data for the system should be determined by self-assessment, which saves time in the HR department and can provide an entrance into self-development for employees.

## 5.2 Requirements as regards technical factors

*Flexible data updating:* The employee should be able to update the data at any time when he wants and needs to. There should be also the possibility of storing and of further processing of incompletely filled out profiles later .

*Continuous text fields:* Specialized knowledge should be entered into continuous text fields and thus can be searched for keywords.

*Ratings:* Should at least cover 5 levels within the scale, if it is an ordinal scale, an explanation with examples for the user, so that he can decide exactly should be provided . If the system does not use an ordinal scale, there should be also the possibility of indicating intervals for abilities if the user is not sure about his rating [Deiters et al. 1999].

*Topicality of the data:* The topicality of the data is of crucial importance. Each profile and/or each skill document should be provided with a time stamp to examine when the data was updated last and if necessary an agent in the system can simply delete long outdated data. If data should have become outdated, an agent could not only simply delete the data, but also send a message to the document owner that his data became outdated and he may update them [Gebert and Kutsch 2003], [Deiters et al. 1999].

*Complex search functions:* The system should make a complex search for skills for the user possible and offer a complex search logic. Furthermore exten-

sive possibilities are necessary for the target/actual comparison and it should provide general overviews of the data within the system, which corresponds to most frequently formulated searches .

*Simple operability and configuration:* The system is not only used by personnel specialists or IT developers, therefore it should offer a simple and fast understandable user interface, which can be used without larger training courses for each employee using the system This applies both to the data input and to the search.

*Integration and embedding into the system environment:* The skill management system should be integrated as good and neat as possible into the IT environment of the enterprize and provide connections to at least the intranet, the personnel system, the e-Learning environment [Blandin 2003], training course planning, the project management system and the knowledge management system.

### 5.3 Requirements as regards organizational change

*Participation:* During the system development and conception all groups should take part to fulfill their needs and requirements. This leads to increased acceptance and supports the project.

*System introduction:* The system should be developed with a meaningful procedural model and also introduced with such a model. A test operation should take place before the start using a critical mass, which later secures the data quality for the start of the system.

*Motivation for the care of the data:* The data quality is essential to the system. Therefore incentives must be created for distributing the knowledge. This should be easier than in other knowledge management measures, which often only want to externalize knowledge, since the expenditure of time is smaller when just trying to say which knowledge is present. It must be examined how often profiles are updated or looked for and provide a form for feedback if meaningful assistance was provided.

*Frequency of the actualization of the skill documents:* The frequency of the actualization should not be set too high, so the employee feels not chicanerated, additional work time should be defined or declared officially for knowledge management measures .

*Capital outlays:* The management's acceptance for the fact that immediate quantifiable yields for initial investments are not provided must be created. Skill management must be understood as long-term enterprise-strategic measure.

## 6 Conclusion and perspectives

To introduce a skill management system effectively, it is necessary to have a meaningful model for the system introduction. The enterprise must get accustomed slowly to knowledge management and the pertinent techniques. Much time cannot be invested apart from the daily business [Gebert and Kutsch 2003]. A recommendation is to implement the aspect of skill management, which shows most and immediate advantages in the operational business with priority i.e. to introduce the expert search with evaluation possibility [Ackerman et al. 1999]. The skill catalogue for the enterprise should be raised with the help of a process analysis, as it is possible to create the foundation for further knowledge management measures [Gronau 2003]. The system should be as expandable as possible, favorable and well administerable. The aspect of cost for the technical measures such as hardware and licenses should always be considered. Established standard software has to be preferred, expandabilities and further possibilities of the skill management approach should always be in mind. Testing with a critical mass should precede the start of the system in the enterprise, those users will finally supply the productive data for the start of the system. Official work time for the care of the data should be granted to the employees, so that they do not only connect the introduction to knowledge management with a lot of work. In case of success the employees should fast recognize the use in the daily business and later further knowledge management measures [Kreitmeier et al. 2000]. Regular examinations of the skill catalogue, topicality of the data and feedback to the employee, will secure the success of the system beyond the starting phase. If these points are considered, skill management can contribute to the entrepreneurial success in the future.

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