

# **Workplace Process Integrated Learning and Knowledge Organization**

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**Abstract:** Standard based management systems (as ISO9001 quality, ISO14001 environmental, ISO27001 information security, ISO 22000 hygiene management systems and others) are widely implemented and based on common principles: objectives and strategies, business processes, resource management and continuously optimization. These systems must also be documented, communicated, implemented and continuously improved. Therefore they represent an optimal basis for an integrated learning organization, if the requirements of management systems are completely implemented. This documentation contains the explicit organizational knowledge, but it is almost felt as additional workload with a little or no advantage and it is not totally corresponding with the lived processes. Therefore it is hardly used as reference book for workplace need-oriented process integrated learning to improve the organization. Based on this situation we prepared the system documentation according to media-pedagogical and didactical principles and published it on organizational learning and knowledge system based on constructivist theory. In the case study the documentation support a confidence-based, open and fault-tolerant corporate and learning culture by promoting a need-oriented workplace process integrated learning, shorter initial training periods for new collaborators and a continuous optimization of the organization for securing a sustainable success for the organization.

**Keywords:** standard based management systems, e-learning, workplace learning, knowledge management, optimization of organization

**Categories:** K.6.4, SD G.1.6, SD K.3.2, SD I.2.6, K.4.3, I.2.4

## **1 Introduction**

Many organizations of different sizes and scopes are implementing, already since several years, management systems, such as ISO9001, ISO14001, ISO27001, ISO22000 or others, which are based on international standards with common principles: organization objectives and strategies, business processes, resource management and continuously optimization of the organization. The established management system must be documented, communicated, implemented and continuously improved.

The need of developing an integrated solution for organizations and the shift to holistic management systems, which fulfill optimally all requirements of organizations, influenced the introduction of knowledge management in such standard-based management systems. Thereby the system documentation contains the entire actual explicit knowledge and supports the knowledge distribution for promoting the knowledge implementation by establishing a basis for the knowledge generation.

The documentation of standard based management systems (system documentation) was distributed for long time as books, whereby the collaborators received one-time the information and used them afterwards for possible questions scarcely ever. In the last ten years the system documentation was distributed more electronically

through web-based intranets, document management platforms or as pdf. The delivered system documentation is in these way used a little more as reference book for solving ad hoc learning needs. But changes proposal are not related to the documentation and the collaborators are not able to discuss new ideas or questions in a context-sensitive way. The change and improvement processes of the management system are isolated from the documentation.

Therefore the primary use of the system documentation is as a tool for the process optimization during the system introduction and afterwards it is primarily for the auditor to fulfill the standard requirements. It is usually changed only once a year, if at all and it frequently does not correspond to lived processes. Moreover in addition to it instructions and forms are developed as hidden system.

Sometimes also external sample manuals are used, but they do not correspond with the lived processes and are providing no contribution to the organizational knowledge base.

The requests for always shorter change cycles, the ever stronger IT involvement and the great importance of the system documentation as knowledge base for organizations led us to the extension of a constructivist learning platform as an organizational learning and knowledge system [Back and Bendel, 2002], [Bick and Pawlowsky, 2007] for distributing the system documentation of a standard based and knowledge integrated management in accordance to media-pedagogical and didactical principles.

Firstly we present the common requirements of international standards for management systems. Based on these requirements we describe the project objectives and our approach. Finally we document the project experiences and results of the implementation in different organizations with distinct management systems.

## 2 Main requirements of standard based management systems

The standards for management systems have different specialized focuses, but are all based on common principles [Osanna et al. 2002], [EN/ISO 9001:2000]:

- organizations objectives and strategies must be established regarding customer requirements;
- all business processes including management process, support processes, resource processes and optimization processes must be defined and promote the optimized fulfillment of the organization objectives under the focus of the respective standard;
- process oriented resource management must be promoted including personnel development, IT – management and other infrastructures, tools and instruments;
- the organization and their objectives and strategies must be continually optimized according to established processes in sense of a PDCA cycle (plan, do, check, act);
- the established management system must be structured and systematically documented and communicated within the organization and the collaborators must be continually motivated for implementing the system and for recommending improvements.

These standard based management systems are implemented more frequently in a holistic way. In accordance with the organizational purposes and objectives are integrated in a management system different aspects like quality, environment, hygiene, data security, occupational health and safety, as well as personnel development, re-

source management, IT - management, communication management, controlling and also knowledge management.



Figure 1: Main requirements of standard based management systems

### 3 Project objectives

How can the system documentation be modified and communicated in order to contribute to the organization success and to be considered, used and improved as organizational knowledge base?

By preparing the system documentation in accordance to media-pedagogic and didactical principles and managing it on an organizational learning and knowledge system by extending a constructivist learning system we expect to foster:

- workplace need-oriented process integrated learning,
- organizational development and knowledge generation,
- employee involvement and knowledge exchange,
- practice-oriented system documentation
- more quickly initial trainings for new collaborators,
- optimization of the organization and improved achievement of its objectives.

Thus the learning, knowledge generation, knowledge representation, knowledge communication and knowledge application should be optimized and the organization will be promoted in achieving its objectives including knowledge objectives.

### 4 Approach

Firstly the system documentation must be established [see 2 Main requirements of standard based management systems]. Considering the needs and expectations of all interested parties we establish the organization policy with consistent strategies and goals integrating knowledge objectives and plans. Afterwards the applied processes are analyzed bottom up by interviewing the collaborators involved and by integrating knowledge management and optimized in accordance with the objectives of the organization. The necessary resources, tools, instruments, trainings required for achieving the objectives and for improving the management system must be identified, made available and continually optimized. Also the training and human resource development processes must be optimized and established. The organization must also plan and implement the monitoring, measurement, analysis and optimization processes

needed to continually improve the effectiveness of the management system. Thus also knowledge management and learning organization must be integrated and their improvement must be structured and systematically planned. The entire system documentation must correspond with the lived processes. All improvements or changes must be approved by the involved collaborators, documented, communicated and implemented.

After the development of the management system documentation, it must be prepared regarding media-pedagogical, motivation-psychological and didactical principles [Reinmann-Rothmeier, 2002]. According to these principles it must be divided into small modules, which must be typecasted and functionally well structured. Thus, we use a constructivist method for organizing the content. In order to support the collaborators need-oriented workplace process, the way for accessing the single modules should be as short as possible, optimal structured and practice oriented.

All needs and expectations of the collaborators must be analyzed and considered as early as possible. They demand particularly an efficient and effective search function and a clear structured system. Therefore we need effective indexing and different start assistances (for new collaborators, department oriented, management oriented, topics referred, based on the standard and others). Apart of the self-driven learning approach, the system must also offer guided learning for new collaborators or for collaborators with little IT competences.

After the appropriate editing the system documentation can be published on the organizational knowledge and learning system. The upload of the content should be user-friendly and simply, because it is normally an activity done by the system manager, which has organizational, managerial and controlling competences and competences in developing management systems and must not be an IT expert. The constructivist approach in learning requires the possibility of linking concepts and objects following one's own needs. This feature must be available also for graphical objects and different document and media formats, which are widely used in hypertext contents.

To promote the acceptance of the system the collaborators must be trained on the handling the system and acquire also the necessary media competence.

Subsequently, questions will be answered by means of the discussion forum, the help desk and personal partners, e.g. the knowledge and/or system manager. Using the constructivist organizational learning and knowledge system every collaborator can introduce his/her suggestions, ideas or questions directly in a context-sensitive way by referencing all the possible objects of the system documentation. Thus, ambiguous formulations in the documentation are showed up and the system documentation - organizational knowledge base - becomes the basis for the continuously optimization of the organization. Thereby we integrate also optimal process modeling, process standardization and transparency with need and objective oriented flexible process implementation. The collaborators have sometimes problems to distinguish between problem and optimization, or they do not know to which section of the system documentation they should relate their suggestion or question. Therefore we have integrated the organizational knowledge and learning system with the existing workflow driven problem reporting system (help desk system).

Following the management system requirements also clearly structured processes for the introduction of new collaborators, for the maintenance of the system documen-

tation and for the management of questions, optimizations and problems must to be established, documented, implemented and maintained.

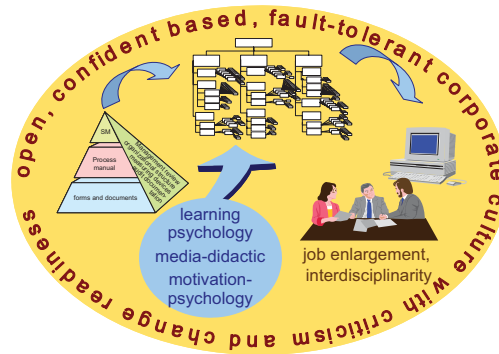


Figure 2: Integrating need oriented workplace process integrated learning and standard based management systems

#### 4.1 Requirements for an organizational learning and knowledge system

Based on our project experiences an organizational learning and knowledge system for standard based management systems demands, in addition to the general requirements of learning or knowledge management systems, the following particular characteristics:

- It must be simple and intuitive to handle, it must provide the possibility to use different views of (or leading to) the same object, different start facilities, comfortable search functions, filtering of content using object types, simple uploads of content and links to external literature and it must promote individual learning and organization by allowing personal bookmarks, annotations [Auinger and Stary, 2005], summaries and notes, as well as glossary, FAQs, etc..
- It must offer secure context-sensitive communication to all elements (discussion forum, chat), as well as newsgroups, wiki, newsletters and whiteboards, support the knowledge distribution, the collective knowledge generation and collective learning.
- Uploading and the administration of new content must be simple, with as large didactical and media pedagogic support as possible. There must be the possibility to insert, annotate and discuss context sensitive the content of most different document and media formats (as text, graphic, table, picture, sound records, video). Also creativity tools should be integrated.
- Due to the requirements of the standards for management systems, we need the administration of access rights, the support of change processes, versioning with change history and the efficiently and traceable distribution / communication of new or changed content. Depending on the organization culture also testing and examination tools for the traceable learning must be integrated.
- The ideas of the collaborators, their discussion contributions and problem reporting must be implemented in accordance with the established systematic and structured

process following the standard requirements and their effectiveness must be evaluated.

- Open interfaces must be available for fostering optimal connectivity with other systems in order to support process integration and simplify the administration. Within the controlling process all measured values should be evaluated by the responsible departments and consequently changes and optimizations should be implemented using the organizational learning and knowledge system.
- The web-based accessibility of the organizational learning and knowledge system supports mobile and working hour's independent learning and teleworking, making also easier the integration of absent collaborators.

#### **4.2 Success factors for an organizational learning and knowledge system**

Corporate culture processes and IT technologies must be integrated optimally according to the objectives of the organization, to the collaborators needs and requirements and considering media-pedagogical and didactical principles, in order to successfully introduce an organizational learning and knowledge system into management systems. The system is thereby only a tool, which supports the optimization of the organization so far as this is admitted by the culture. Therefore we need an open, confident based, fault-tolerant corporate and learning culture with criticism and change readiness. The collaborators should be interested in new knowledge, able for self-driven learning, have personal employment, team ability and change willingness apart from necessary IT-competences. All managers must use constantly and actively the system and motivate their collaborators in following these principles, promoting in this way learning and new knowledge generation. A strengthening point for achieving this is maintaining an optimal communication internally as well as with external partners.

By introducing this system the system manager and/or knowledge manager extend their own job, needing also the acquisition of the necessary media-pedagogical and didactical knowledge for preparing the content and the necessary skills for supporting e-learning and knowledge management.

Sufficient IT-infrastructure and IT-support are also very important for the project success. Only by using an organizational learning and knowledge system, which meets as far as possible the stated requirements [see 4.1 requirements to an organizational learning and knowledge system] and by promoting a workplace need-oriented process integrated learning, a continuously optimization of the organization, in accordance with its objectives, and a sustainable organization success are secured.

### **5 Project experience and results**

The concepts expressed so far have been implemented successfully in several organizations with different management systems.

The interdisciplinarity was a great challenge. Knowledge about organization theory, management methods and standards were required for the preparing and structuring the content, information-technical knowledge were needed for extending the learning platform to meet the requirements of an organizational learning and knowledge sys-

tem; didactical, media-pedagogical and communication science knowledge were required for editing the contents.

The implemented learning system was improved and meets now some of the requirements stated for an organizational learning and knowledge system.

### 5.1 Achieving the project objectives

The described concept has been implemented in medium-size service organizations by integrating knowledge management into management systems. Most of the organization's collaborators own good media competences and use frequently e-tools.

Nevertheless the platform used in the case studies fulfills only some of the system requirements [see 4.1 requirements to an organizational learning and knowledge system], the adoption of the organization adapted system documentation according to media-pedagogical and didactical principles and taking into consideration a confident based fault-tolerant corporate culture, leads the following case study results collected by measuring the system accesses / user contributions and interviewing the leadership and collaborators:

- Workplace need-oriented process integrated learning: the accesses to the system documentation are increased monthly at averaged two accesses per collaborator.
- Integrated learning organization: we receive five times more suggestions and ideas, which improves the organization.
- Employee involvement and knowledge sharing: the communicated ideas, problems and suggestions are discussed and read on the average by a quarter of the collaborators. Thus, the advantages and disadvantages of ideas are discussed and examined by all departments before their possible implementation and they are substantially more balanced and more considered for implementation.
- Practice oriented documentation for workplace requirements: while conventional system documentation is usually adapted only once a year, now unclear formulations or missing regulations are soon analyzed and immediately changed according to established processes and automatically communicated to all. Thus, the documentation is adapted optimally to the changing requirements of the organization.
- Shorter initial training periods for new collaborators: new collaborators are quickly introduced into the system at their first working day and afterwards they learn in a self-driven need oriented way, all relevant contents for their specific work. The lead time could be abbreviated around a quarter. New collaborators identify themselves substantially earlier with the corporate culture, they feel themselves also more integrated into the organization, can execute their tasks faster well, whereby the productivity increase and possible errors are avoided.
- Knowledge optimization by learning, knowledge generation, knowledge representation, knowledge communication and knowledge use: the collaborators bring in their ideas and questions and improve thereby the knowledge base (system documentation) and the organization itself. Thus, also the achievement of the organization objectives including the knowledge objectives is optimized.
- Promoting an open, confident based, fault-tolerant corporate and learning culture with criticism and change readiness: the manager of an organization with an organizational knowledge and learning system is particularly enthusiastic for the culture promotion.

## 6 Outlook

Learning or knowledge management systems must be extended [see 4.1 requirements to an organizational learning and knowledge system] to organizational knowledge and learning systems for need-oriented, workplace process integrated learning.

By introducing an organizational knowledge and learning systems for standard based management systems with integrated knowledge management all success factors should be considered [see 4.2 Success factors for an organizational learning and knowledge system].

The training of system managers should consider more the principles for didactical and media-pedagogical restructure of system documentation.

Also e-learning experts should analyse more the requirements of standard based management systems and knowledge management systems.

The standards for management systems should underline more and promote the importance of an open, confident based, fault-tolerant corporate and learning culture, knowledge management and integrated learning.

## 7 Conclusion

Integrating knowledge management and standard based management systems, restructuring the system documentation in accordance to media-pedagogical and didactical principles and implementing it on a constructivist organizational learning and knowledge system with an open, confident based, fault-tolerant corporate and learning culture promotes workplace need-oriented process integrated learning and a continuous optimization of the organization by means of collaborators ideas and discussion contributions.

Thus by fostering workplace need-oriented process integrated learning and improved knowledge management, the sustainable success becomes guaranteed.

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