

# INTEGRATING COMMUNITIES OF PRACTICE WITH E-LEARNING PLATFORMS TO IMPROVE ON-THE-JOB LEARNING

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## **ABSTRACT**

In knowledge intense business processes, a complex and dynamic body of knowledge is being built bottom-up by experience learning during exception handling and problem solving. Traditional qualification programs do not very effectively provide the special skills required. Communities of Practice are better supporting this dynamic on-the-job learning across hierarchies. Still, CoP approaches and platforms in many organisations can be improved by enriching them with elearning components to create a connection between the unstructured personalisation strategy of CoPs and the structured training materials. Similarly, elearning benefits from being linked to communities. In the article, the connections of both areas are analysed to derive a framework for integration. It proposes an agenda of activities for the two domains people-oriented and content-oriented integration of community management and e-learning. These two aspects affect the handling, configuration and design of software features. In a first stage, the challenge is mainly a management and organisational task. Consecutively, the integration processes can be further assessed in order to identify potentials for IT-automatisation.

## **1. ROLE OF ON-THE-JOB-LEARNING IN KNOWLEDGE INTENSE ENTERPRISES**

Conventional training programs are inappropriate means for fostering organisational learning in knowledge intense enterprises. They mainly concentrate on transferring explicit and standardised content to a number of employees via rather static qualification processes. Their main focus is to continuously inform the workforce about the requirements and competencies of their business processes and to introduce some legal or strategic conditions for improved decision making. This approach works only for routine tasks in structured and highly repetitive processes.

Still, competitiveness of companies increasingly depends on mastering non-routine and knowledge-intensive business processes. In these areas of expertise, new procedural patterns are continuously evolving and improving to become good or even best practices. They are a valuable driver for the agility of the enterprise as processes become engineered and adapted continuously to meet changing customer and technological requirements.

The skills of these processes cannot be trained satisfactorily with the conventional top-down or 'one-to-many' approach to qualification (Phillips 1997). This is due to a number of reasons. Next to requiring advanced skills in application usage, knowledge-intensive processes demand for high service quality, for dealing with various process variants, many exceptions and highly complex cause-effect-relationships. Thus, they often require increased abilities in context interpretation, decision making and problem solving activities. Learned routines become obsolete quickly. Consequently, the knowledge of such processes mainly resides in individual insights, acquired as experience in the actual business situation. As a result, the body of knowledge lies tacitly within the experienced workforce and not within explicated documents. These tacit processes are not easily standardised and packaged for spreading them with conventional training programs.

Despite these obstacles, emerging best practices should be identified and spread to other units. To achieve this, organisational learning cycles together with many-to-many communication support and a bottom-up approach for learning have to be installed, to complement the established qualification programs. One recent approach suitable for these objectives is the implementation of virtual employee-to-employee communities of practice (CoP).

## **2. COMMUNITIES OF PRACTICE IMPROVE AD-HOC EXPERIENCE SHARING**

Virtual Communities of Practice (CoP) are a very important and successful instrument of corporate Knowledge Management (Allee 2000). They enable a direct connection of knowledge workers and foster the transfer of tacit and problem-specific expertise to geographically remote business problems. Their flexible support of employee-to-employee relationships renders them a complementary part to the conventional document-based content repositories.

Although communities do not necessarily require an IT Platform, software applications can play a major role in efficiently supporting large groups of geographically spreaded experts (Hildreth et al. 1998). This is especially important for international enterprises, where

regularly similar functions are spread across different divisions, like for instance in local sales departments.

Community software offers traditional features like discussion boards, urgent request facilities, blackboards, e-mail listservers, or membership directories. Advanced community software additionally includes synchronous communication spaces like chats (text or video-based), document storage, evaluation systems, buddylists, alert agents, mailcenters, and calendars.

From an abstract perspective, two general focuses can be identified: people-centred and document-centred applications. Often, the documented artefacts are semi-formal like discussion contributions or questions-answer pairs. Next to one-to-many and many-to-many communication over a central virtual location, there is decentralised one-to-one communication between the members. These distinctions help to derive the domains for integration as introduced in section 4.

The platform employed for CoPs often resembles groupware applications as used in projects. The difference is the voluntary character of the work of communities as opposed to the contracted commitment in task-forces or project teams. The voluntarism is essential for the momentum of community work but simultaneously requires new ways of management and support (Wenger 1998; Mc Dermott 2000; Gongla and Rizzuto 2001). Especially, pre-defined outputs are hard to be enforced, but have to be facilitated in their emergence. As a by-product of sharing expertise, semi-structured information is being generated; not yet enough for an explicit process description but often containing valuable insights. Examples are intransparent discussion histories, attachments in e-mail answers, short comments to requests, referrals to other experts, undocumented telephone calls, or memos about personal meetings.

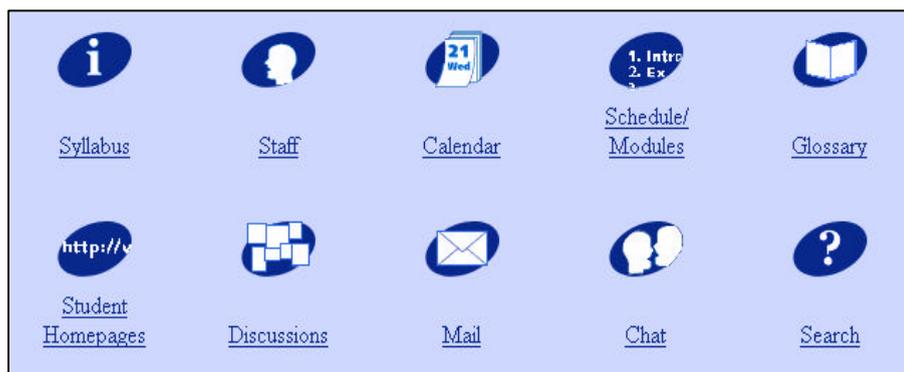
This relation and connection between codified content and people-centred sharing of expertise directly relates to the two major strategies of corporate knowledge management. On the one hand, Codification is leading to pre-defined document-focused knowledge bases with low flexibility. The alternative is Personalisation, focusing people directly, resulting in a more flexible and agile structure, but leaving only few reusable and explicit traces as the experts often provide their knowledge directly and informally to a problem (Hansen et al. 1999).

The connection between the document-oriented and the people-oriented world is often a problem in corporate Knowledge Management implementations. Here, a robust feedback mechanism should be introduced. One example for such a feedback process is Siemens AG. Here, project members are simultaneously participating in CoPs dedicated to their areas of expertise, developing opinions and contents about operational problems. Special community members review these contents and identify, assemble and edit best-practice descriptions and other documents from the semi-formal textual contributions and try to implement them in standards for new projects.

This feedback mechanism integrates bottom-up feedback (via CoPs) from experiences into the organisational standards. It is a practical example for a process of organisational learning. In a consecutive step it is then possible to connect training and competence management to this cycle. Next to conventional qualification, elearning is coming into focus as it is having similar characteristics like CoP-platforms and utilises the same media and communication channels.

### 3. ON-THE-JOB SUPPORT OF E-LEARNING SOLUTIONS

One major field of application for e-learning is the academic sector. The e-learning initiatives in this area are mainly dealing with standardised and fixed content packages that are explicit and easy to transfer to an audience of many. Features are broadband transmission of lecture videos, online-tasks, browser-enabled terminal simulations for software training, or lecture slides together with audio presentations. This mode resembles the classic style of academic education or corporate training, mainly dealing with the delivery of fixed and formalised contents. An example for the available features on an academic e-learning homepage is given in Figure 1.



**Figure 1: The features discussions, mail, and chat are community features.  
Sample taken from <http://www.vgu.org>.**

Next to universities, large enterprises increasingly discover the benefits of e-learning (Chute 1999). For businesses, the return on the investment of creating ready-to-use content depends on the size of the trained workforce (McCrae 2000). The global spread of a quite homogeneous sales force of global manufacturers provides a promising environment for e-learning initiatives. A typical example is the training of corporate salesforce at Cisco Systems Inc. (2003). Annually, the company invited each of its 3000 sales people to several five-day-seminars on new product lines. Each course had to be delivered more than hundred times to reach all relevant employees. Now, this classical on-site training has been migrated to an e-learning platform. The content is mainly treating new technology developments that have to be known in order to produce up-to-date customer solutions. This initiative reduces the costs of education, as no sales force has to be invited for physical meetings and fewer training staff has to be employed. A complex system of contents, tests and certificates ensures the pre-defined service-level and the quality of customer consultation processes.

The decision for including new contents into such an e-learning program has to be founded on financial considerations. If for example the new products are created every six to nine months, like in the semiconductor industry, the process of generating standardised knowledge about the product plus editing, creating and hosting a well-designed lecture has to be compensated by cost savings in personal trainings, business travels, hotel accommodation, and working hours.

This highlights a major shortcoming of e-learning contents. The investment in content packages can only be recovered, if sufficient learners can use the content. The longer it is valid, the more return. Further, to broadcast content, it has to be developed to fully explicit and media-rich descriptions and can not remain semi-structured or even problem-specific. Hence, ad-hoc insights generated in knowledge intense processes cannot be utilised by merely migrating to e-learning platforms. Where socially embedded knowledge emerges, the roles of expert (teacher) and trainee are constantly changing. Hence, instead of pursuing static one-to-many communication with a listening audience, many need to contact many in dynamic networks.

Although e-learning cannot directly reuse semi-structured contents, it indicates another interesting development in the area of on-the-job learning. After having managed technical content delivery, e-learning managers increasingly engage in building interactive and motivating learning environments. The major objective of this second step in many e-learning initiatives is to overcome the isolation of individuals and the lack of group impression. That is why interactions between trainers and students as well as interactions amongst students are focussed. Collins and Bielaczyc (2000) describe the underlying style of group learning in communities as follows: “members of the community share their individual efforts towards a deeper understanding of the subject matter under study. Students learn to synthesise multiple perspectives, to solve problems in a variety of ways, and to use each other’s diverse knowledge and skills as resources to collaboratively solve problems and advance their understanding”. Subsequently, proper design and inclusion of technical features like moderated discussion groups or chats is becoming a crucial element for the creation of strong social ties between the learners. As a result, communities of trainees are emerging in e-learning environments, benefiting from very similar characteristics like Communities of Practice. Table 1 shows further community characteristics that can influence e-learning.

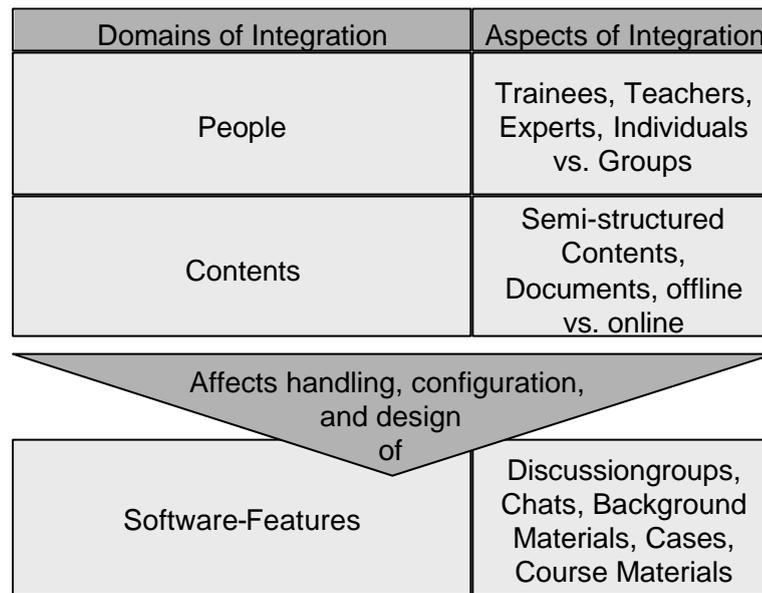
Community characteristics	E-Learning characteristics
Dynamic networks with changing experts using many-to-many communication channels	One lecturing expert is teaching a big audience
Deals with tacit and semi-structured explicit contents	E-Learning mainly transfers static and structured contents to the audience
Allows for ad-hoc and problem-specific expertise sharing	Sharing insights prerequisites a costly and time-consuming content production process and requires a minimum amount of reuses
Communities emphasise group learning and social networks	E-learning is often mainly individual information processing
Communities employ moderators and facilitators to foster content development	E-learning defines fixed instructors
CoPs increase trust and motivation for enhanced networking between members	Networking is no primary objective
Communities are directly connected to concrete business problems	Training often uses abstract or simplified problems to generate a straight solution

**Table 1: Community Characteristics can improve current e-learning approaches.**

#### 4. INTEGRATING COP'S WITH ELEARNING PLATFORMS TO IMPROVE ON-THE-JOB LEARNING

As indicated in the last section, elearning can employ community networks to become a major instrument for the creation of improved training strategies and the establishment of a feedback loop from experience to contents and back to experience. This implies synergies of integrating e-learning and virtual Communities of Practice.

Potentials for integration can be analysed systematically by dividing the problem into the domains people (teachers, trainees, experts, individuals vs. groups) and contents (semi-structured vs. structured, online vs. offline). These two segments affect the handling, configuration and design of the software features concerned (compare Figure 2). Now, these domains will be analysed in greater detail to derive an agenda for integration.



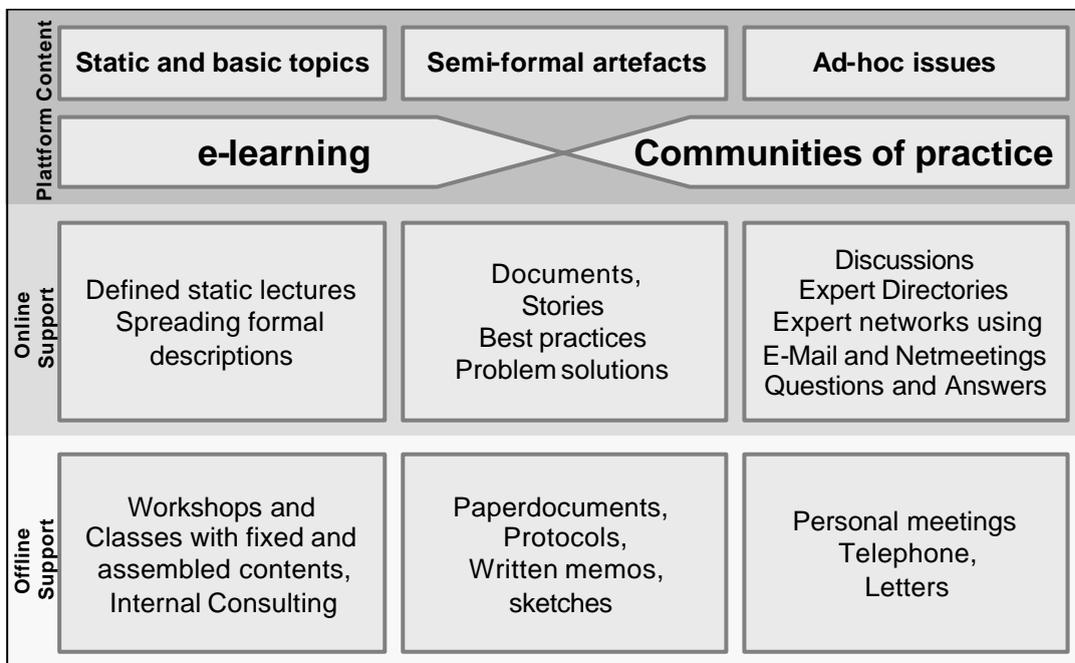
**Figure 2: Domains of Integration.**

People-centred integration tries to connect trainees, teachers, experts on the individual and the group level. As shown in the previous sections, e-learning and CoP platforms both are hosting communities. Hence, implementing co-membership can connect the members of communities of experts and of trainee communities. For example, the trainees of process technologies in manufacturing and the expert communities for developing these process technologies can be brought together. Here, the training issues can be discussed in the communities and be adapted to the real problems. For example, the expert community could be augmented by a special thread for newcomer questions or trainees are directly admitted to expert CoPs. Further, experts could be receiving special incentives, if they help trainees. They could be invited as moderators for discussions and chats about training topics on the e-learning platform. Similarly, experts could open new topics in their CoP-environment that can be researched and discussed by trainees. These mini-projects can produce valuable results for the expert domains afterwards. Finally, trainees could also provide valuable methodical backgrounds to CoP discussions.

Another important argument for integrating both parties comes from Wenger (1998), who asserts, that insular expertise in Communities of Practice can become a liability and proposes to put more attention to open boundaries and to assure that they help to constantly renew learning. Here, trainees and their specific and up-to-date perspective on topics help to achieve this target.

Nichiani (2000) describes, how the integration affects instructors: “When it comes to the role of instructors for an online learning community, the instructors should act more like facilitators”.

Attached to the people domain, explicit contents have to be connected. The two opposite forms are structured contents used in training, like standard course material, case studies, or tasks versus semi-structured contents residing on the CoP-platform. Their elicitation can be done by knowledge stewarding services provided by corporate knowledge management. Additionally, trainees could assist this process and learn from compiling a process description or other descriptive materials from the various raw contributions in the respective field. The generated semi-structured content, shown in the middle column of Figure 3, can then be used for updating standard operation procedures, as proposed in section 2. Additionally it can be blended with training materials shown in the left column of Figure 3.



**Figure 3: E-Learning and CoPs - potentials for content integration.**

For example, training can use practical and up-to-date project templates in a project management case study or memos, containing recent experiences in the compatibility of new product components when they learn about creating customer solutions.

All these activities directly affect the handling, configuration and sometimes even the design of software features (compare Figure 1). Major functions under consideration are discussion groups, chats, and the features hosting background materials, cases or tasks, and course

contents. For instance, the integration of discussion groups of both realms is a challenging task. If there is no integration for several discussion groups possible, a feature could offer the individual compilation of a list of links to various specific threads for each student.

Still, achieving a better integration is primarily an organisational management issue. For people-centred features like discussion boards or chats, the employees themselves form the link, so that only few system changes are required. Further, connecting contents requires the employment of knowledge stewards or similar services. Nevertheless, in a second stage, these processes can be analysed to identify potentials for automatisisation. Moreover, the integration process can include predeceasing steps in the value chain like the content production process of e-learning.

An overview about the benefits from integrating e-learning with Communities of Practice is given in table 2.

Benefits	Expert Community	Trainee Community
<p>People integration (Integrate both originally separated communities by co-membership)</p>	<ul style="list-style-type: none"> <li>• Experts can learn about wider backgrounds and theoretic foundations</li> <li>• Experts can influence and improve their future colleagues by highlighting practical issues</li> <li>• Trainees could be made responsible for preparing field studies in order to solve practical problems (task forces)</li> </ul>	<ul style="list-style-type: none"> <li>• Trainees can easily post questions into practitioner communities</li> <li>• Experts can become coaches for special topics</li> <li>• Contacts to experts can be maintained after the training</li> </ul>
<p>Content integration (Create feedback loops for document elicitation and transfer)</p>	<ul style="list-style-type: none"> <li>• Experts can access background materials for their field</li> <li>• Experts can access standard descriptions</li> <li>• Experts can access new developments in their field</li> </ul>	<ul style="list-style-type: none"> <li>• Trainees can access concrete methods, processes and problem solving strategies</li> <li>• Trainees can check if their materials can help in practical scenarios</li> </ul>

**Figure 4: Benefits for integrating CoPs and e-learning.**

## CONCLUSION

There are benefits of integrating the two strands of e-learning and Communities of Practice. Connecting people via co-membership or via transferring contents can create benefits for both domains. Especially, e-learning is taken over the limit of merely delivering standard content to include dynamic and up-to-date insights from practical operations. This relationship can be attached to an organisational learning feedback loop that constantly updates standard operating procedures. In this way, elearning and CoPs can become an integral part of a corporate knowledge management strategy. The tasks necessary for this integration are primarily organisational, like eliciting descriptions and best practices or moderating integrated discussions. Nevertheless, in a second stage automatization potentials can be assessed and the integration process can be extended to include the content production process. In the end, training is about enabling people to solve real-world problems and the shortest way to achieve this is learning from them directly.

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