

Chapter 8

Work Process-Oriented Competence Development

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Introduction

At first sight, the restructuring of advanced training in IT is due to a lack of both transparency in advanced education options and a lack of career opportunities for those who have successfully undergone IT training. In addition, the re-structuring has made possible the creation of new designs for advanced education that meet the demands of changed qualification requirements.

As a result of the ever shorter innovation cycles, knowledge gained in initial training can only be a basis for Advanced IT Training. The motivation for lifelong learning lies not only in the employability of the employee. The capital of companies in the knowledge-intensive service industries is literally in the heads of their employees. Until now, the answer to these new conditions has been the intensification of advanced education in the form of courses.

However it has long been shown that these forms of training incur significant loss of knowledge due to the »shot-gun effect« and lack of ways to utilise the acquired knowledge. The main reasons for this are:

- too theoretical
- little individualisation
- not up-to-date enough
- insufficient development of autonomous learning competence
- problems in teaching social and methodical competence

This is not to say that institutionalised learning forms lose their importance. It is, however, necessary to create conditions in the work place that encourage learning, which in turn combine formal advanced education with informal experience-lead learning at work. Therefore, the concept »work process-oriented learning« [APO in German] was developed, a methodology which closely combines learning and work.

Learning at work

Learning at work must be oriented towards the work process. The work process thus defines the relevant actions from which the learning goals and contents are derived.

Since work processes differ significantly in their fundamental conditions and task distribution, it is necessary to define the relevant processes more precisely. Especially in the IT industry, however, there are few occupational titles which have a generally approved definition of the tasks involved. However, in the functional descriptions of the Federal Institute for Vocational Training we now have standardised definitions of the work-related tasks of IT Professionals which allow us to define work-related processes relevant for advanced training. In addition, universally valid descriptions were established in close co-operation with IT organisations and through the alignment with real projects. These have been documented in so-called

event-process-chains, which depict the sequence of individual work steps. Due to the different methods, tools, and technologies used in the individual work areas the description of the processes can only be very abstract. However, independence from the short innovation cycles is guaranteed in this way.

This process can be represented using the example of the Network Administrator:

- Definition of the tasks [e.g. configuration, operation, supervision and maintenance of data and telecom networks]
- Definition of the core work processes [e.g. change, performance, fault and security management],
- Sequencing the reference processes, i.e. the work processes are put into a logical series [e.g. fault warning, localisation of the fault, detection of the site of the fault, limitation of the site of the fault, fault definition, fault recovery action],
- Modelling the work processes from the event-process-chain.

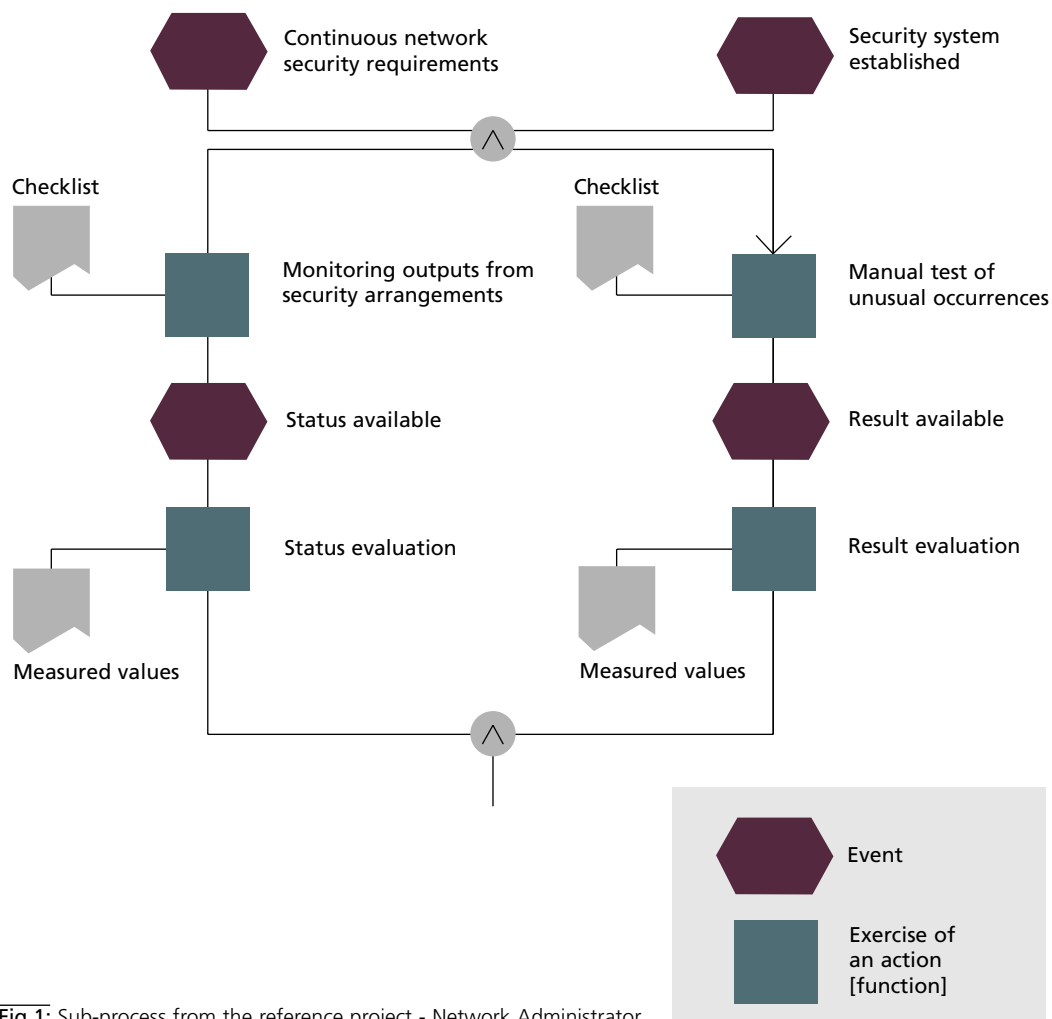


Fig.1: Sub-process from the reference project - Network Administrator

The result of this process, which is repeated several times, is the so called reference project. It is the abstract description of work processes typical for an occupational profile. A sub-process of the reference project Network-Administrator is illustrated in Figure 1.

Competencies and therefore learning content necessary for the accomplishment of the individual work steps can be derived from the work processes. These learning contents include specialist, methodological, social, and human competencies as part of the professional competence, and can be assigned to individual processes. This assignment then produces the basis for a process-orientated curriculum. The structuring of the learning content is decided therefore not on the basis of a formal organisation of the subject, but rather on the basis of the work process.

A reference project thus enables the identification of a number of work processes relevant for advanced training in a company, which contain similar processes and learning contents despite their individual characteristics. The reference project serves as a template, which is filled with company-specific content and procedures. A project does not have to be a whole process. Sub-processes can be carried out within different projects.

Due to the complexity of reality, employees are going to be confronted comprehensively with the requirements of their occupation. This means they will have to deal not only with specialist problems but also with the imponderables of everyday working life in its technical and social complexity. Participants will prove their competence by the accomplishment of the tasks provided by this challenge. They will be supported according to their abilities.

In order to achieve lasting results, a basis of workable knowledge over longer periods is necessary, i.e. it is not only application-related knowledge they must have acquired, but also knowledge of basic theory and technology must be acquired. In order to support these processes and the appropriation of self learning competence, the participant will be continually supported by a coach, technical experts, employees, other participants, and a media infrastructure.

Implementation - Advantages from the Point of View of the Organisation

With the help of advanced training it is possible to organise, improve and make transparent largely unconscious learning processes at work. For the specialists in the process of acquiring further qualifications this means that their successes are acknowledged, but at the same time it also offers a range of advantages for the organisation.

- Learning at work combines productivity with personal development, as the effort of learning results in real results for the worker.
- Personal development can be integrated into project work. The transfer of knowledge is more direct than is the case with many external training establishments.
- Internal potentials are better utilised, because the technical knowledge of the experts is deliberately distributed within the company.
- Know-how is made available beyond the individual by means of the need to document material for advanced training.
- As more persons are included into advanced training processes, knowledge will increasingly be systematised, deepened, extended, and updated.
- A knowledge pool will emerge, which can represent the beginning of knowledge management within the company.

- The methodical procedures of WPO advanced training require a learning environment and culture within the organisation which promotes life long learning.
- This can be used for structural improvements of the learning organisation.
- The improvement in leadership abilities of the participants resulting from the coaching tasks in the Advanced Training System is a useful »spin-off«.

What will now have to be done on the organisation's side in order to realise these potential development opportunities?

The Sequence of Advanced Training

Employees who are to take part in the working process-orientated advanced training must be selected and must take part in an appropriate personnel development discussion. The appropriate occupation profile [from 29 specialist profiles and 6 IT Professional profiles] must be selected for those participants who want to obtain qualifications through APO advanced education; the formal entrance criteria of the participants must also be examined and approved.

In the future, there will be documented reference projects with sub-processes in accordance with every profile. These will be obligatory for proceeding towards the qualification. Alongside these reference processes, complex current projects must be found in the organisation; these are called »transfer projects« on which the participant can work independently or as part of a project team. This search can be the first task of the future Specialist or Professional. The trainee not only has to work on these, but must also become responsible for these sub-processes. It will frequently happen that several projects and perhaps a longer qualifying stay in a further work area [or department] are necessary in order to define all processes of a profile.

This must be taken into consideration in large organisations where the reference processes are worked on in different departments, and the attachment and the competence of those undergoing advanced training must be extended into these areas.

In order to achieve a regulated qualification, the advanced training process is accompanied by a number of specialist advisors [their exact functions are described below]. These learning advisors should come, if possible, from the organisation. These can be different people during the course of one or more transfer projects. However, a coach, who supports and accompanies the entire advanced training process, is necessary. Up-to-date information sources, as aids for work on the project, are available also in the Internet and Intranet, and there must be easy access to these. A budget [time and money] for additional external Specialist courses is reasonable, but not always necessary. It is expected that the participant will also spend his or her spare time in the advanced training.

The advanced training process begins with the qualified description of the transfer projects and of the problems to be solved or the products and services to be developed. The representation covers the description of the sub-processes as well as the associated content and personnel requirements. It must be done without using in-house abbreviations and formulas in order to guarantee a qualified outside-evaluation.

This representation, which is also the application for advanced education, will be tested and evaluated against the reference project to determine whether it has the necessary complexity and professional depth of the advanced education profile; if necessary, it will be rejected. It is in this manner that a first work or advanced education plan description will be provided

by the trainee, the milestones of the operation identified, the work and qualification goals described, and the specialist experts found and nominated.

The individual necessary technical, personal and social learning requirements for the specialist or professional must be identified and agreed in a goal agreement between the employee and the coach for the learning process in the work processes. Times for meetings to evaluate the work and learning experiences corresponding to milestones in the project are agreed in order to ensure meaningful reflection. At least six coaching meetings form part of the training process. The duration of the advanced training depends on the work routine in the organisation and is not standardised.

The participant will work out the processes of the transfer project himself, will obtain the necessary background information and knowledge, will contact experts, and will document his work. Working and learning are interwoven.

The technical and procedural steps of the project, the communication processes and challenging situations, e.g. decisions, conflicting aims, and difficult customer conversations etc. are described in the documentation. During the course of work, time-tables and dates can change; these will then be agreed upon again and documented.

The form of the documentation is fixed and must satisfy certain formal requirements. This gives independent assessors the chance to examine to which extent all relevant work processes were actually achieved.

Documentation of Advanced IT Training

There are several advantages to the documentation requirement. On the one hand this is of course a necessary condition for a financially viable test procedure. The methodological goals are just as important. In addition, it is important for the participants

- to develop their ability to express themselves so that they can make themselves understood before non-specialists.
- to learn to structure complex contents.
- to become aware of implicit knowledge and understanding by the act of writing.
- to be able to retain newly acquired knowledge and understanding by renewed mental and linguistic processing.
- to become aware of the context-dependence of knowledge and understanding.

Last but not least, the employee has his own documentation which will give a fascinating insight into the extent of his competence for the purpose of either internal or external job applications. [The start of a personal portfolio]. These employees are the future carriers of responsibility in the organisation. They will increasingly negotiate with customers and will lead people with the widest possible range of expertise, personal and social competences in projects or departments. This means that they must pass on their knowledge in an easy-to-understand manner.

They will become familiar with the structural conditions of learning at work using their own experience with the documentation, which serves as a practical example and whose internal structure is a complete work process itself and is only finalised by means of reflection and inspection of the acquired knowledge.

The documents

- are within the organisation but are, in addition, a component of a knowledge pool, which is to be developed and/or extended by the documentation itself
- improve the reconstructability of the work already completed [as is well known, many companies in the IT industry have their problems with this]
- are also learning material for colleagues.

Accompaniment in Work Process-oriented Advanced Training

Small and middle sized organisations will rarely be able to provide all the advisors themselves. Therefore external specialists can also take on individual functions.

Four significant accompanying functions are necessary for the advanced training process itself:

1. to enable and encourage the participants' personal development in the enterprise,
2. to secure the organisation of Advanced Training,
3. to respond to technical questions and be a one stop resource [specialist advice],
4. to assist in the self-help process of the learning process [learning advice/coaching].

The functions 1 to 3 can each be shared between several persons; function 4 must be continuously monitored by a single coach or process advisor.

Item 1.] Personal development

It will probably be the immediate superior who can judge whether the employee has the potential and personal maturity to successfully cope with this advanced training and who can decide whether it is desirable and in the best interest of the organisation's development to advance the training of a certain Specialist or Professional profile. Apart from that, he is the one who can motivate his employees to venture such a measure, and who influences the basic economic and technical situation as well as the acceptance of such an advanced training in his immediate surroundings. [In large organisations, these tasks usually require co-operation with the Personnel Department.]

Item 2.] Advanced education organisation

The PD or training and advanced training department of an organisation or an external training institute must secure the action framework of the participant. This does not include the procurement of transfer projects or the release of the trainee from actively looking for »learning sources« in the work process. The tasks are:

- representation of the advanced training profiles and basic conditions for potential participants: conditions for entrance, disciplinary regulations, transfer projects, documentation requirements and learning accompaniment,
- if necessary, the conclusion of agreements with external providers of learning materials, seminars, coaching, the certification body etc.,
- the definition of the advanced training profiles and procurement of the appropriate reference processes and documentation files,
- agreements about working tools, budgets, and access to learning and information resources internally and externally
- setting up of learning groups and organisation of participants' meetings,

- if necessary, informing or training of internal coaches and technical experts for the role of learning companions or advisors.

Item 3.] Technical experts

The concept relies on self-management of the learning process and the independent development of specialised knowledge and skills. Since the qualification takes place in the work process, the trainee will frequently come up against the limits of his technical competence and will have to acquire new knowledge for himself, whether in text books, on the internet, from manufacturers and experts in their own fields. It is sensible that this person is the project leader of his transfer project.

The task of this expert consists of discussion with the trainee colleague in order

- to define the question or the problem precisely, or
- to recognise, where the colleague got lost and to point out ways and means, how and where he can acquire the necessary specialised knowledge, and/or
- to point out possible ways towards the solution.
- to pass on knowledge, even if self-learning has priority.

Whenever there are very heterogeneous competence requirement profiles, it makes sense to designate more than one technical expert. This ensures reduced capacity of one expert [economy] and a greater availability of contacts.

Item 4.] The Coach

Coaching is an obligatory support for those who wish to obtain increased efficiency as a result of extra responsibility and self-management, and therefore aim to improve their own competence for this purpose. Therefore, the coach accompanies this development method by helping the participant to improve his understanding of himself and to be able to consider his actions retrospectively as if from outside. He helps the participant to gain knowledge and insights into the technical, personal and social challenges of his work and to value the competencies this brings. He thus learns to judge the extent to which these were adequate or where there are new learning needs. The coach also advises the trainee on the organisation of the learning path and its integration into the work process. The task of the coach consists in particular of mentioning those aspects which the participant fails to see. He helps him to uncover situations he had not recognised before and thereby enables them to be evaluated. By doing so, he enables the trainee to learn from his mistakes. It is not his task to judge the technical correctness or elegance of project handling but rather to support the development of the participant. He is the specialist for learning from experience and provides guidance for the self learning processes.

These different tasks are to be understood in this context as roles which can be shared amongst various people in the manner described. Thus company resources are to be integrated into the advanced training process. If experienced colleagues are acting as technical experts and if superiors are conscious of the duties of personal development, this form of advanced training means not only the development of an individual person in the organisation, but the development of the entire organisation into a learning organisation.

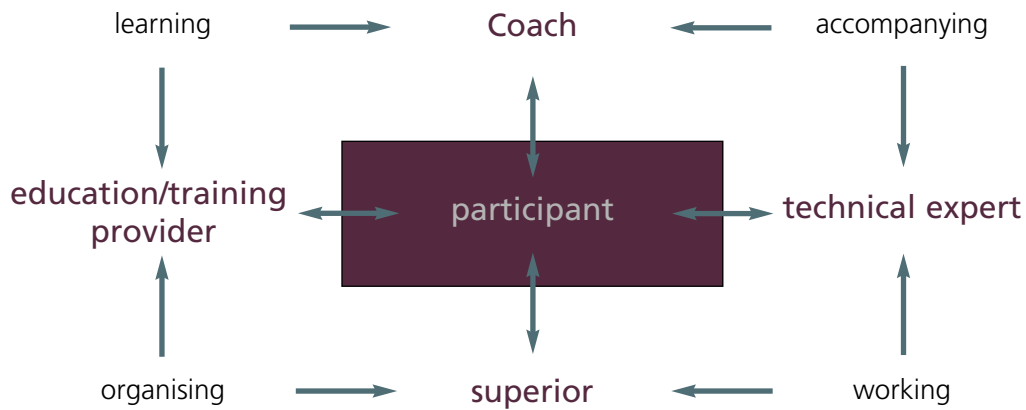


Fig. 2: Task Distribution

In smaller and medium sized organisations different functions will be fulfilled by a single employee. Sometimes the superior will function as a coach, a technical expert and as supervisor of the advanced training. But time and personnel resources are not always available. In such cases it could become attractive for small and medium sized organisations to form networks. If, for reasons of competition, this co-operation is not wanted, external education providers can take over the accompaniment and/or organisation of the advanced training as qualified neutral experts.

* »Arbeitsprozessorientiertes Lernen – APO« Work process-orientated learning – WPO [as alternative]

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