
Evaluation and validation of competencies in certificated IT trainings

Work process oriented trainings in the IT sector

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Fraunhofer Institute for Software and Systems Engineering



- ... was founded in 1992
- ... has two institute divisions (Berlin, Dortmund)
- ...is an organization of the Fraunhofer-Gesellschaft for the Promotion of Applied Research
- ... works in the fields of continuous software engineering, information logistics and learning technologies
- ... has been involved in the developments and research concerning the Advanced IT Training System and the implementation of work process oriented trainings.

Agenda



Background: Why do work process oriented trainings make sense ?

Concept: What are basic elements of work process oriented trainings ?

Quality assurance: How are competencies measured and certified ?

Conclusions: Experiences, Pro's and Con's

Agenda



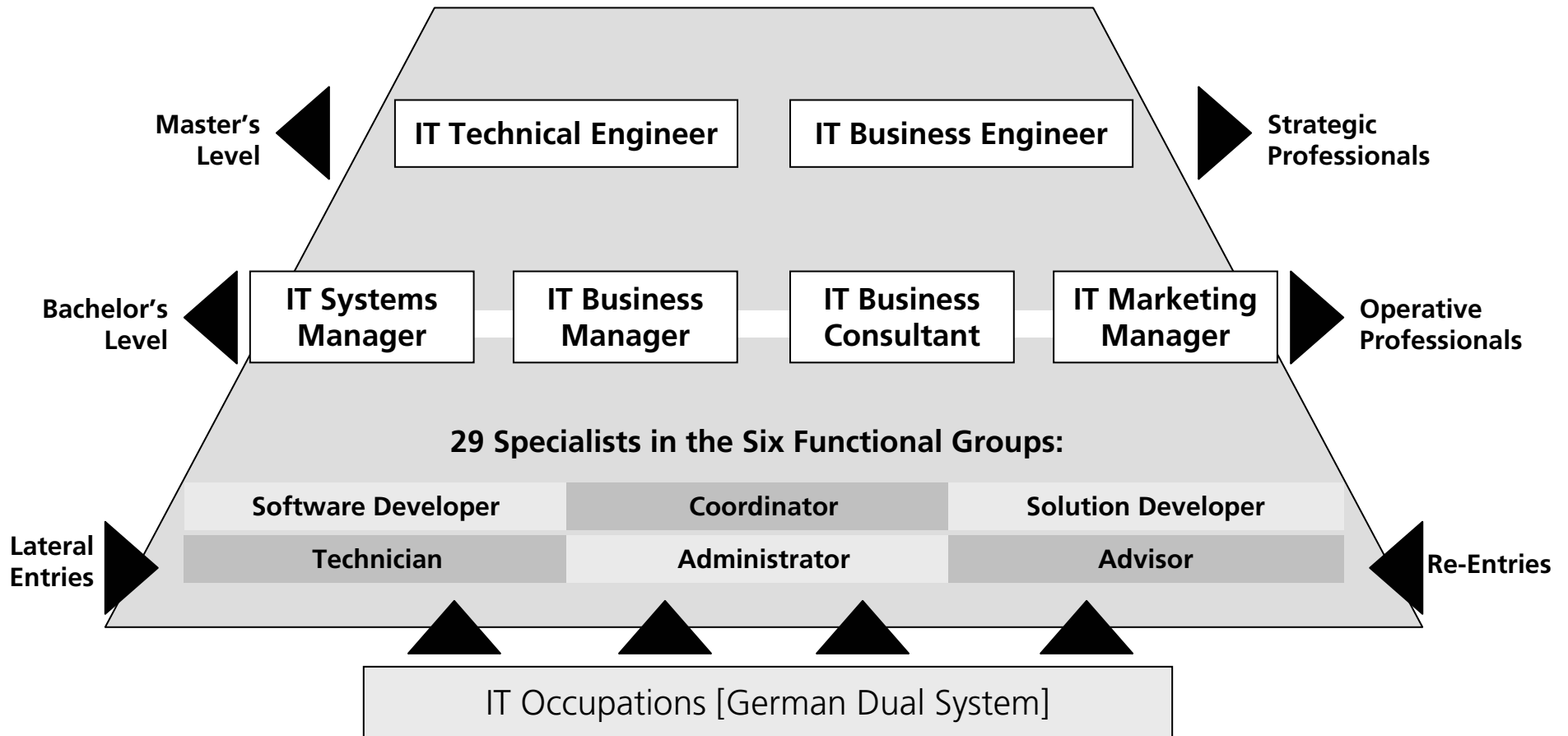
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Concept: What are basic elements of work process oriented trainings ?

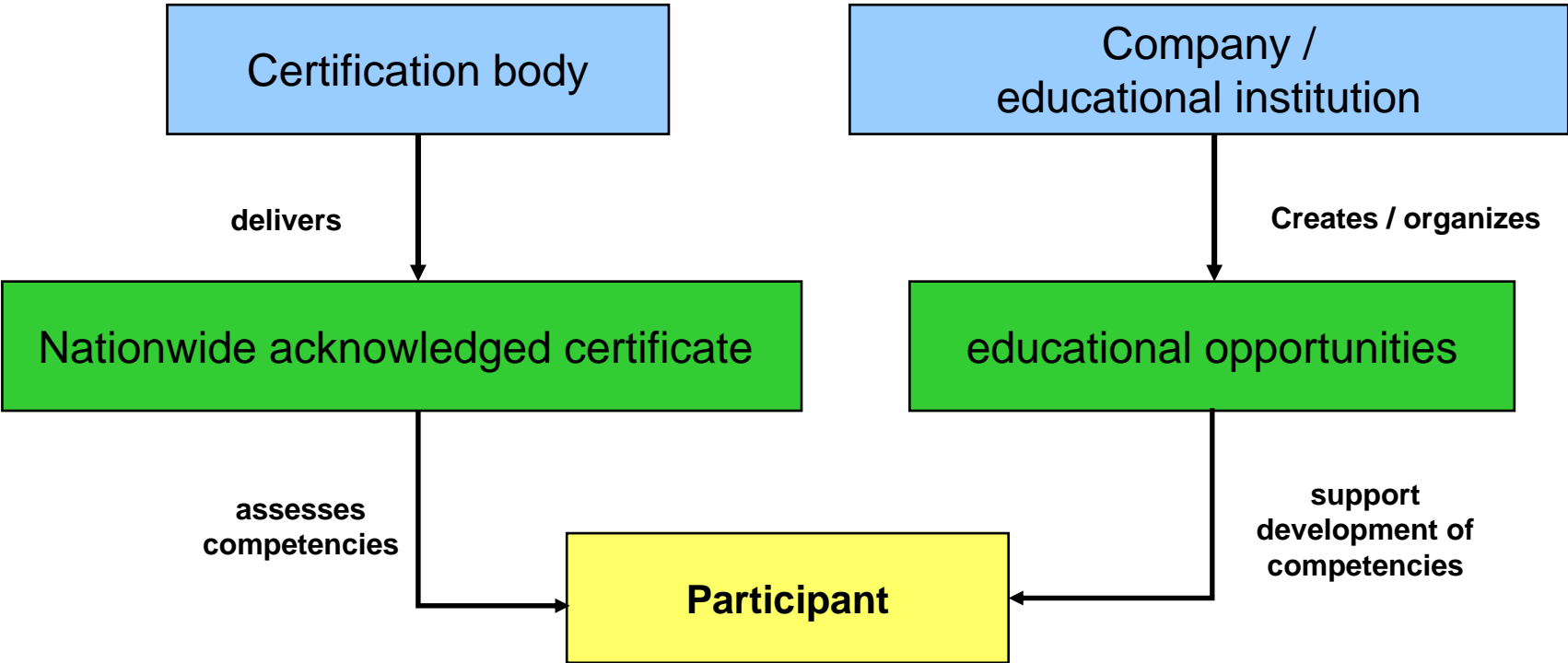
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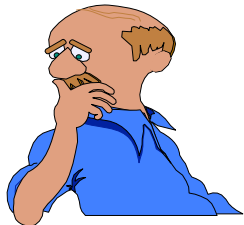
Structure of the Advanced IT Training System



Separation of certification and educational opportunities



Reasons to reform Vocational Training in IT



- VT in IT was badly structured
- The value of certificates is not transparent for both, employers and employees
- Skilled employees scarcely have the chance to withdraw from projects
- Traditional training forms (seminars, courses, sandwich courses) are increasingly criticized

Demands in IT Business

- IT specialists are expected to***
- Cope with changing tasks (,multi-specialists', project management)
 - Acquire new knowledge within their work processes
 - Work in interdisciplinary (global) teams
 - Think and act customer oriented

Competencies to meet these demands can not be taught under „artificial“ conditions (e.g. seminars).

-> A new paradigm for training measures is needed !



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Activities of Fraunhofer ISST relating to the Advanced IT Training System

Project Objectives: „Work Process oriented trainings for the IT sector“:

(funded by the Federal Ministry of Education and Research 2000-2004)

- Develop curricular material for the 29 specialist and 6 professional profiles of the system („reference projects“)
- Develop a concept for advanced vocational training that is based on and refers to work processes
- Realize and evaluate the concept in an in-firm setting in cooperation with educational providers and companies
- Support sustainable implementation of the training system

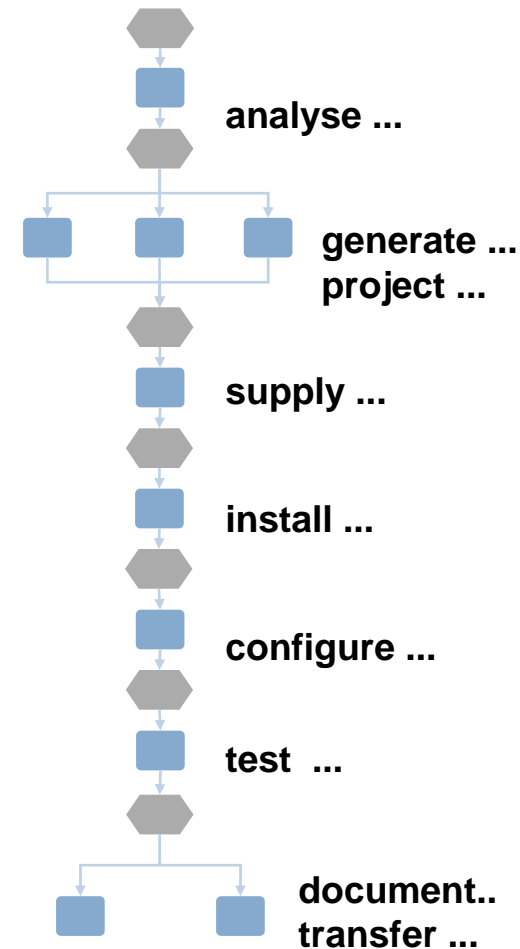


Reference Projects

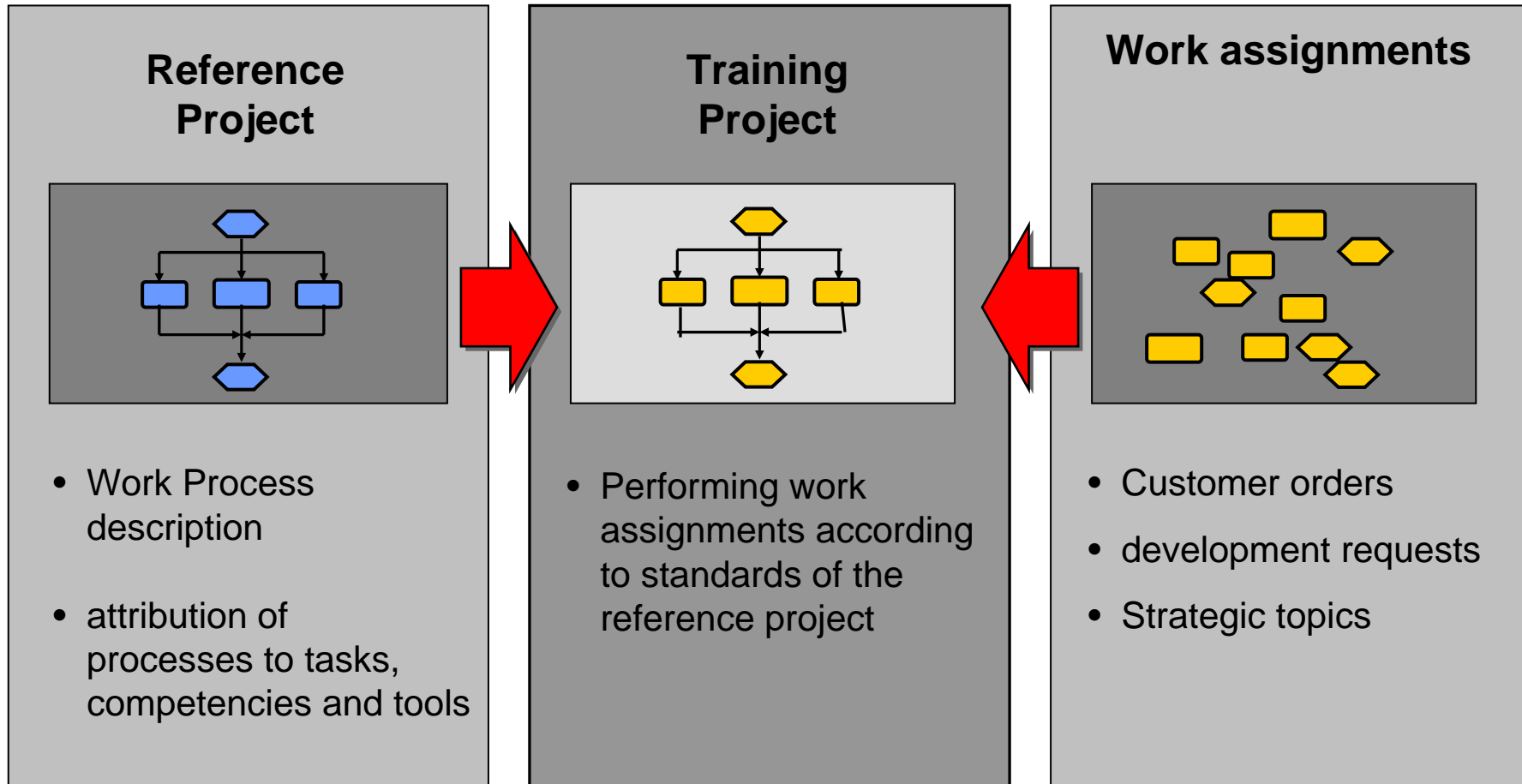
... are a workflow description that is typical for an IT profile (e.g. Network Administrator)

... consist of several sub-processes for which tasks, competencies, knowledge, tools and interfaces are stated.

... were developed in cooperation with partners of the IT industry.

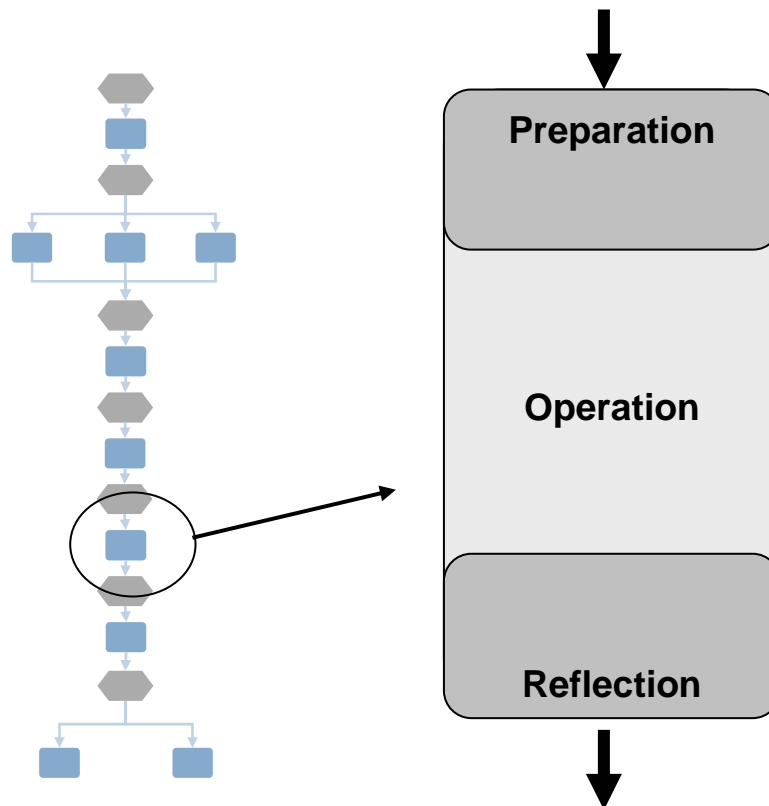


Integration of Working and Learning



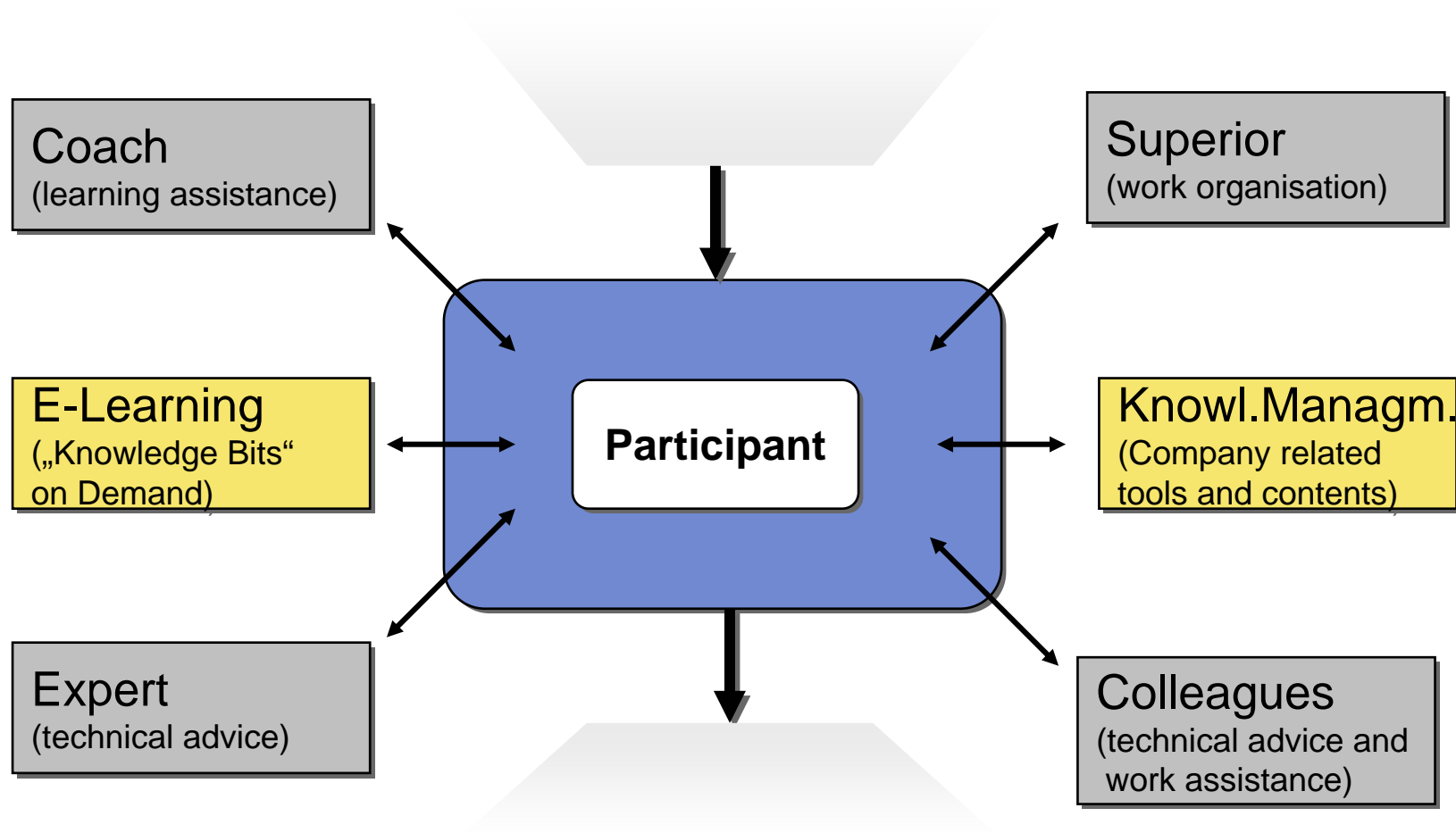
Integration of working and learning

A self-directed process



- overview the task
- reflect own experience / knowledge gaps
- prepare / plan operation
- job completion
- gain experience
- acquire and consolidate knowledge
- Analyse and evaluate own experiences
- document results

Divided Support



Typical sequence of a course

	Mai	Juni	Juli	Aug	Sept	Okt	Nov	Dez	Jan
Appropriate project identified	■	■							
Qualification individ.planned		■							
Kick-Off-Meeting		■							
Work and learn in projekt		■	■	■	■	■	■	■	■
Learning materials provided		■	■	■	■	■	■	■	■
Coaching meetings			■		■		■	■	
Collateral Workshops			■		■		■		
Project documentation		■	■	■	■	■	■	■	■
Final Meeting								■	
Certification process								■	■
Delivery of certificates									■

Source: Bildungswerk der Thüringer Wirtschaft e.V.



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Certification in the Advanced IT Training System

Professional level

Public certification pursuant to federal regulations

„IT-Fortbildungsverordnung“ (May 2002) regulates content and modalities of assessment

Assessment by chamber of commerce and industry

Specialist level

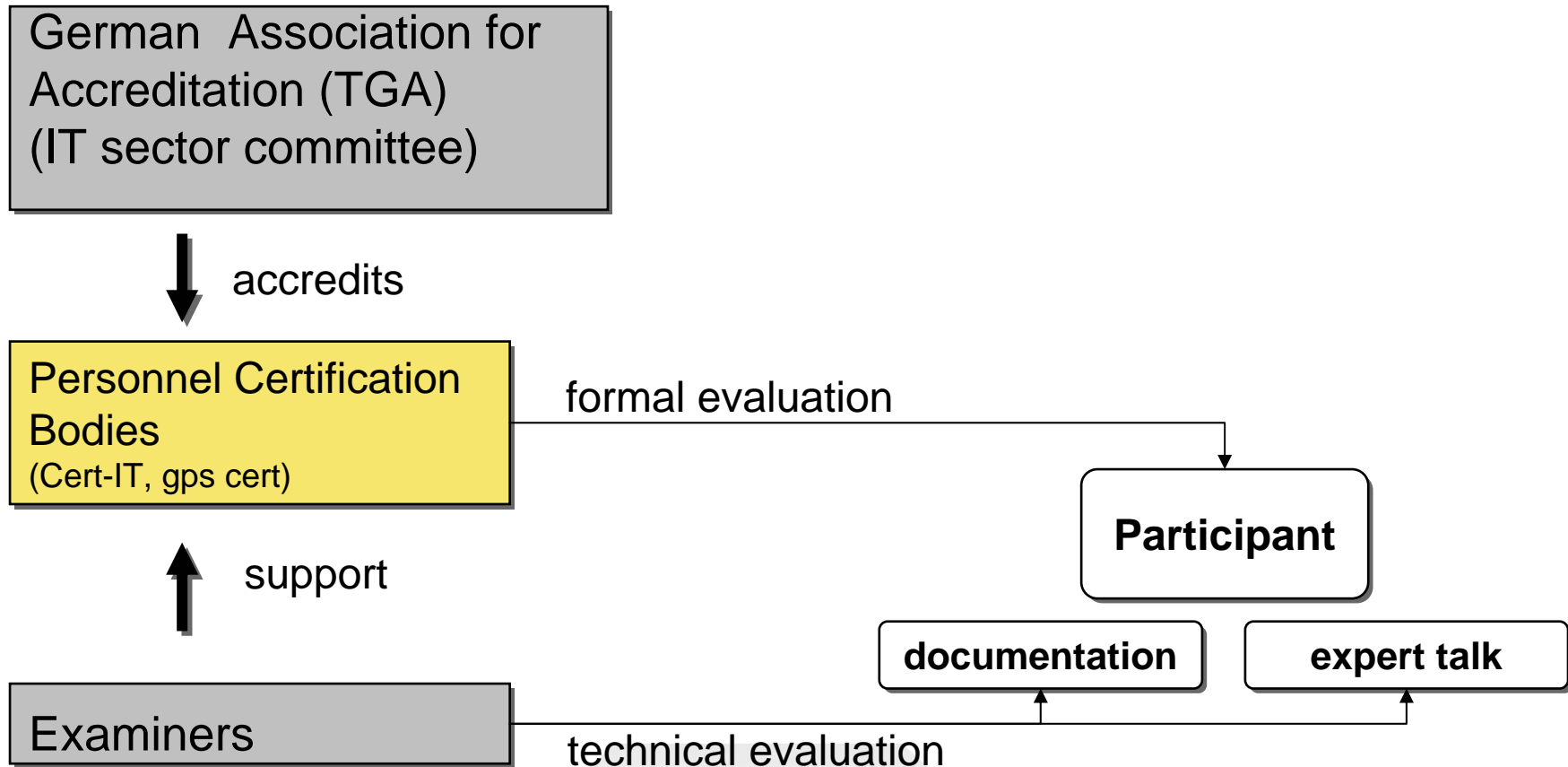
Private Certification due to ISO/IEC 17024 (Personnel Certification)

Agreement (March 2002 between employer's federations and labor unions)

The private structure facilitates a fast adaption of relevant content in accordance with the current IT industries needs.



3 Levels of Quality Assurance (specialist level)



IT sector committee

- Founded in 2001 as part of German Association for Accreditation (TGA)
- developed the vertices of personal certification in IT (“normative document”)
- Perceives itself as an independent authority to protect the quality of the Advanced IT Training System
- ensures a high grade of quality of the personnel certification bodies
- Keeps the Training Structure up to date



Personnel Certification Bodies

- organize the process of certification
- verify the requirements of candidates
- provide and qualify examiners
- provide rating scales to make sure assessments are impartial
- Issue certificates, monitors and recertifies IT specialists



cert:it



- Germany's first personnel certification body in the IT sector, accredited in 2003
- A corporation of social partners (BITKOM, ZVEI, IG Metall, ver.di) and scientific associations (Fraunhofer Gesellschaft, Society of Computer Science)
- Certificates the whole spectrum of specialist profiles of the Advanced IT Training System
- Presently: about 70 IT specialists have been certificated



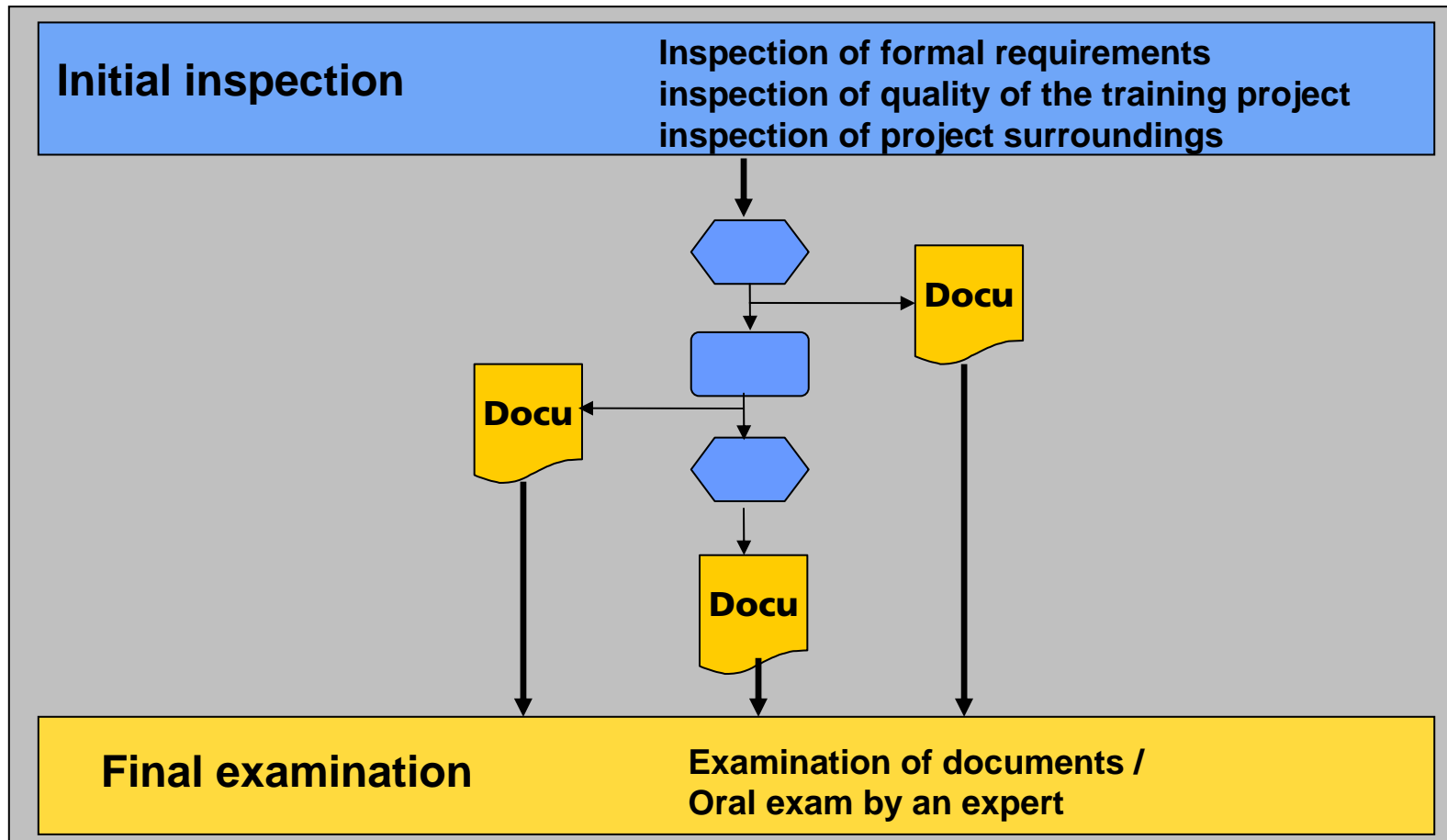
Requirements for certification

- qualificatory educational achievement in IT sector or
- qualificatory educational achievement in any other sector plus at least 1 year work experience in IT-sector or
- at least 4 year work experience in IT sector
- any other proof that would justify a permission to participate (exceptional decision)

Examiners

- are at least 25 yrs. old
- know concepts and practice of work process oriented IT training
- have professional competence in reference to the relevant norms and profiles in their responsibility
- master techniques of oral exams
- are able to review and evaluate procedures and the spectrum of competencies of participants

The certification process: a two-step quality check



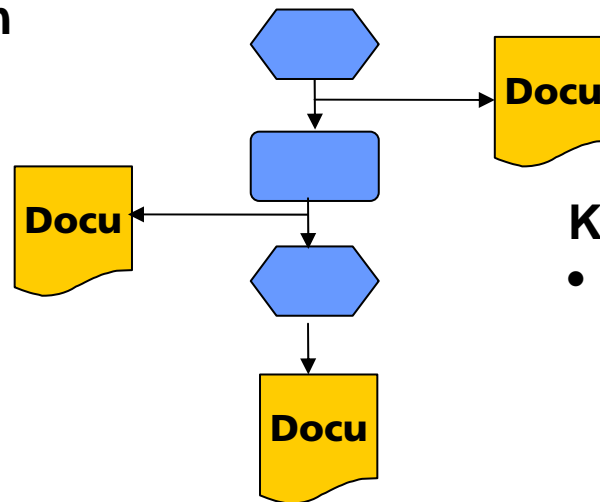
Structure of Documentation

Introduction

- short overview of the whole project

Process Documentation

- descriptions of activities / performance within all sub-processes



Key Situations

- Decision and communication processes in challenging situations

Oral Exam

Point System

Name, Vorname Prüfling: _____
 Prüfprotokoll Fachgespräch



Bewertungskriterien der Präsentation der Projektarbeit (minimal 25, maximal 30 Minuten)

Einleitend muss der Kandidat eine kurze Gesamtvorstellung des Projektes präsentieren. Der Fokus der Präsentation liegt auf der Darstellung ausgewählter Teilprozesse, die vom Kandidaten absolviert wurden. Besonders erwähnenswerte Schlüsselsituationen müssen in der Präsentation dargestellt werden.

Aufbau und inhaltliche Struktur der Präsentation

Roter Faden, Sachliche Gliederung, Zeitliche Gliederung, Logik,
 Konnte das Projekt und seine Vorteile vom Plenum verstanden werden?
 Wurde durch die Präsentation geführt und die Gliederung eingehalten?
 Wurden die wesentlichen Themen und Schwerpunkte angesprochen?
 Wurden die Ziele des Projektes verdeutlicht?

Insgesamt überzeugende Darstellung Ablauf klar und Übersichtlich	Im Wesentlichen überzeugende Darstellung Ablauf übersichtlich	In wesentlichen Teilen ansprechend Ablauf erkennbar	Noch akzeptabel Ablauf erschließbar	Nicht ansprechend Ablauf bedingt erschließbar	Nicht annehmbar Ablauf nicht erschließbar	Faktor 1,5
15-13	12-10	9-7	6-4	3-1	0	

Präsentationstechnik/Fachgerechter Medieneinsatz

Wie war der Umgang und das Handling mit Material, Geräten? Wie wurde Visualisiert?

Einsatz ist voll angemessen und zeitgemäß	Einsatz ist angemessen und zeitgemäß	Einsatz ist weitgehend angemessen und zeitgemäß	Einsatz ist in Ansätzen angemessen und zeitgemäß	Einsatz weist deutliche Defizite auf	Einsatz ist nicht hinnehmbar	Faktor 1,5
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Experiences

- increasing requests (Cert-IT: 500 current registrations)
- IT specialists need the coaches' support in order to produce a documentation
- Some companies set value on work process oriented training methods, however, they regard the value of certificates low (that concerns not only the Advanced IT Training System)
- in individual cases, even experienced IT specialists have failed the examination at first attempt

Pro's

- The process of certification is an efficient facility to acknowledge competencies akquired on the job (not just a person's knowledge).
- The process of certification is a correlating concept of assessment to the work process oriented training
- The process of certification offers certainty to superiors and HR departments on the actual competencies of an employee
- The process of certification sets standards for the training of IT specialists.



Con's

- Documentation is a time-consuming and unfamiliar task for participants: To meet the requirements often dominates over individual learning targets
- Companies are reluctant in terms of training measures, especially when they are broadly based.
- Requests for certificates are increasing, however, noticeably slower than expected.



How to improve validation of competencies for the Advanced Training System

- Design documentation forms that are more flexible and easier to use
- Implement examination tools to improve objectivity (e.g. point rationing schemes)
- Continue to make it popular



Further Information



www.apo-it.de

www.it-sektorkomitee.de

www.cert-it.org

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