

Methodology:

At the beginning of the project Metalog, the partners agreed on two relevant aspects for the development of an LQF:

1. The LQF should use the current **European Qualifications Framework (EQF) as a reference-system**. The EQF is designed as a meta-framework: „A European Qualification Framework should help to relate national and sectoral qualifications frameworks and systems. Thus the transfer and the recognition of the qualifications of individual citizens will be facilitated” (Commission of the European Community 2005, p. 4). As the EQF has no validity for concrete sectors, the LQF was meant to link the EQF-descriptors to the qualifications and competencies in the logistics sector.
2. The outcome-orientation of the EQF as a classification of learning outcomes – independent from the way of requiring them – had to be implemented in the LQF as well. The partners agreed on a research approach which was already proven and tested to develop an SQF for the Automotive Sector in the project CarEasyVET: the **work process based approach**. In addition, the results from this approach should be amended by results from previous projects in the logistics sector.

This means, that the development of the LQF was started from a workplace demand perspective that focusses on skills and qualification levels required at the workplace – in contrast to a training supply perspective, that considers skills and levels offered by the trainings system (cf. Spöttl & Ruth, 2011b). The work process based approach allows to access technology and work not only at the level of general structures but also to identify the knowledge incorporated in practical work and to get a deep insight into the internal structure of work (cf. Spöttl, 2007).

The most important category of this approach is the **work process**. The term is defined as a highly complex description of a series of processes which, taken as a whole, describe the individual (work) tasks of vocation(ally) oriented professional work. There is no such a thing as a single definition of “the” (perfect) work process since every professional occupation has a different number of and (even more important) a completely different structure of work processes. Some people refer to work processes as business processes which are wider in range because they may include processes/ tasks which are not to be found in a work process of a certain profession/ trade but rather lie within work processes of other, professional occupations/ trades. A work process may be viewed as those means to fulfil a certain order. But underneath the surface of a rather simple order lays a much more complex structure of work than one might think of in the first place. That implies that the worker has more to cope with than just the fulfilment of the order. He/she needs to know what happens as a consequence of all his tasks and duties.



The whole approach of work process studies to define core work processes as a basis for a sectoral qualifications framework has been described in the documentation of the CarEasyVET project (cf. Spöttl & Ruth, 2011a). For the Metalog project, the method was condensed to five phases: Selection of companies / sector studies (PHASE A), exploration of company (PHASE B), work process analysis (PHASE C), design of a draft version of core work processes and LQF (PHASE D) and validation and re-design (PHASE E). The results – core work processes and LQF – are based on work processes and therefore very close to the industry’s needs.

As the Metalog partners were experts of the logistics sector, PHASE A could be shortened in the way that no deep sector studies were necessary: sector structures and “best practice companies” were known. Instead, another initial phase was necessary: Given the fact that none of the partners had carried out work process analyses before, a PHASE 0 was added, in which the partners could become acquainted with the research method and the corresponding documents. Figure 1 below gives an overview of the sequence of phases, Figure 2 shows the five main phases in detail.

Phases	Tasks
0	Providing the research documents and a workshop on work process studies
A	Selection of companies.
B	Exploration of company.
C	Work process analysis.
D	Design of core work processes and LQF (draft)
E	Evaluation an re-design
Product: Design of core work processes and LQF	

Figure 1: Overview of work process studies



	PREPARATION	EXECUTION		TRANSFER PERFORMANCE	
	PHASE A SELECTION OF COMPANIES	PHASE B EXPLORATION OF COMPANY	PHASE C WORK PROCESS ANALYSIS	PHASE D DESIGN OF CORE WORK PROCESSES AND LQF (DRAFT)	PHASE E EVALUATION AND RE-DESIGN
AIM	Overview of sector structures	Overview on dominating work and business processes	Analysis of work processes at shop-floor-level	Usage of all findings from company visits	Refinement of core work processes draft with the help of shop-floor-experts
PURPOSE, or INTENTION	Selection of appropriate companies	Selection of appropriate work processes	Finding of work processes and underlying structures	Draft version of core work processes	Validation and refinement to create final core work process design
METHOD(S)	<ul style="list-style-type: none"> • observation of sector/ trade • look for relevant companies with “best practice” 	<ul style="list-style-type: none"> • tour of comp. • talks with exp. • observation of work structure • talks with worker. 	<ul style="list-style-type: none"> • observation of work at shop-floor-level • talks with workers • analysis of work 	<ul style="list-style-type: none"> • presentation of outcome • discussion of outcome • 1st structuring • 2nd structuring • comprehensive draft 	<ul style="list-style-type: none"> • presentation of comprehensive draft • discussion of comprehensive draft • restructuring • questionnaire
HELP TOOL(S)	<ul style="list-style-type: none"> • internet, books • data bases 	<ul style="list-style-type: none"> • semi-structured questionnaire 	<ul style="list-style-type: none"> • semi-structured questionnaire 	<ul style="list-style-type: none"> • flipcharts • brainstorming 	<ul style="list-style-type: none"> • flipcharts • brainstorming



	<ul style="list-style-type: none"> • sector experts 			<ul style="list-style-type: none"> • mind maps 	<ul style="list-style-type: none"> • mind maps • online-questionnaire
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Figure 2: Phases of work process studies



Phase 0: Providing the research documents and a workshop on work process studies (ITB)

The necessary documents for conducting work process studies in the partner countries were provided by ITB. These were

- a short information on work process studies for companies that might take part in the studies,
- a semi-structured questionnaire in German and English to be used in the PHASE B and PHASE C and
- a form for the description of core work processes.

Moreover, ITB developed a workshop on work process studies in written form. It consists of

- an introduction into basic terms as work process and core work process as well as a glossary,
- an overview of the steps of the method,
- detailed information on the most relevant parts of a work process analysis,
- guidelines for the selection of companies,
- guidelines for selection of experts for carrying through the work-process analyses, and
- background information.

At the partner meeting in Piacenza, this written workshop could be continued in a face-to-face context. In this way, it was possible to go deeper into some aspects of the research method, especially into the combination of observation and interview at shop-floor level. Another point of discussion was the best way to convince the companies' managers to take part.

Phase A: Selection of companies (partners)

Initially, it was planned to select about three companies of different sizes from the sector in each country. The partners were advised to choose "best practice companies".

For the work process study, the companies should ensure that the following persons were available:

- a person from the management for a 30 min presentation of the company,
- other persons from the middle management for a round tour in the company and the same person to help establish contacts at shop-floor-level, and
- some persons at shop-floor-level to carry through the analyses at the work place .

As it proved to be the most difficult part of the Metalog project to convince companies to take part in the study, these criteria didn't play a relevant role. At least, the project partners managed to conduct work process studies in ten companies in four of the partner countries and had the chance to carry through 23 work process analyses on shop floor level.



Phase B: Exploration of company (partners)

The studies in the companies are divided into two parts: the interviews with the management and the middle management on the one hand and the work process analyses on shop-floor level on the other hand.

For the interviews with the management, the partners used the semi-structured questionnaire. It covers five areas:

- company
- development of the company, innovations
- qualification
- conditions of work
- special details.

The documentation took place directly in the form of the questionnaire which was then passed to ITB for further examination.

Phase C: Work Process Analysis (partners)

The work process analyses were guided by the semi-structured questionnaire as well. It mainly covered the area of work places and core work tasks and special details. As the observation of work is a main source of information which has to be related to the work process of the employee, a documentation within the questionnaire would not have been sufficient. Therefore, the partners were asked to fulfil a special form for each (core) work process they observed. This form has a three-part structure:

- The first part is a brief description of *the core work process*, presented as a narrative, comprehensive portrait.
- Then, a definition of the *core competencies* for carrying out the core work process is required, to be assigned to EQF descriptors in the course of WPA evaluation.
- The third part is a link to the EQF related *reference objective*, showing the *context* of the core work process which includes a detailed description of the *objects* related to skilled work (as tools, methods, organisation of skilled work).

Figure 3 shows the form, ITB provided to the partners. Not all of them used this way of documentation, some structured these contents in an Excel-sheet, others preferred to write down the gathered information in free text.



[Name of Core work Process]		
<p>CORE WORK PROCESS [short description of Core Work Process]</p> <ol style="list-style-type: none"> 1. What has to be done? – Main task 2. The overall and detailed tasks to be coped with. 3. What are the requirements? 4. How can the requirements be complied with? 5. How are requirements interlinked? 6. Solutions of problems 		
CORE COMPETENCIES		
<ul style="list-style-type: none"> • [Occupational Core Competency 1] • [Occupational Core Competency 2] • [Occupational Core Competency n] • [...] <p>Place work tasks related to the core work processes above as well as the verb defining the competency level.</p>		
DETAILING THE CORE WORK PROCESS		
Objects of skilled work	Tools, methods used, organisation of skilled work	Requirements in terms of skilled work and technology in use
<ul style="list-style-type: none"> • [...] • Write down activities relevant to carry through the core work processes • relevant steps • relevant products, • relevant technology, • relevant phenomena (such as customers, hidden tasks ...) 	<p>Tools</p> <ul style="list-style-type: none"> • [...] • Write down the tools relevant to carry through the activities under “objects” <hr/> <p>Methods</p> <ul style="list-style-type: none"> • [...] • Write down the methods to carry through the activities named under “objects” <hr/> <p>Organisation</p> <ul style="list-style-type: none"> • [...] <p>organisation necessary / relevant to carry through the activities named under “objects”</p>	<ul style="list-style-type: none"> • [...] • Write down the requirements defined by the • customer, • company, • government, • skilled worker himself/herself.

Figure 3: Documentation form for description of (core) work processes

Phase D: Design of Core Work Processes and LQF (draft) based on the results of WPA and on previous projects' results (ITB)

The results of the work process studies done by the partners were the main source for designing a first draft of core work process as well as an LQF. This phase was carried out at



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ITB. It included several steps: e.g. a first reading of the documentations, a clarification of technical terms, the sorting and clustering of similar work process et cetera.

In addition, the results from previous projects were used to amend the results from the work process analyses. The results of WP 2 were very helpful to get an overview over the different projects. Finally, it were most of all the results from the projects PROLOG and CENTRAL that could be used to define and describe core work processes.

Phase D led to three different products in a draft version:

(1) List of core work processes

The results were clustered into ten different core work processes for the logistics sector.

Figure 4 gives an overview of these ten processes and shows, how many work process analyses were related to each process.

		1 Pick and pack orders	2 Receive and transfer goods and document it	3 Transload, repack, store and retrieve goods	4 Ship orders	5 Control and administrate goods and shipment	6 Draw up offers and prepare contracts, supervise customer-relations	7 Organize and implement the shipment and storage of goods	8 Deal with insurances and customs procedures	9 Enhance the efficiency and range of services offered by company	10 Plan and schedule resources
KS = Kaufm. Sachbearbeiter FL = Fachlagerist GM = Gewerblicher Mitarbeiter SB = Sachbearbeitung											
AuL, U1	KS Eingang					x		x	x		
	KS Ausgang					x		x			
	FL Eingang		x	(x)							
	GM Ausgang	x			(x)						
AuL, U2	FL Eingang		x	x							
	FL Ausgang	x									
	SB Ausgang					x		x	(x)		
AuL, U3 (trainees)	SB Seefahrt					x	(x)	(x)	(x)		
	SB Luftfracht					(x)		(x)	(x)		
AuL, U4	FL Warenausgang	x									
	FL Versand	x			x						
	FL Eingang		x	x							
UniP	Loading Leader	x			x	(x)					
	Storage Leader					(x)	(x)			x	x
	Logistics Assistant				x	x	x	x			
	Picker	x									
3s	SB Customer-Service					x		x		(x)	x
	Logistikleiter									x	x
	SB Logistik					x	(x)	x			
	Shift Manager		(x)			x					x
	Team Manager						x				x
ITL	Transport Technician					x		x	x	x	
	Warehouse Technician					x		x			x
4 Countries, 10 Companies		6	4	3	4	13	5	10	5	4	6

Figure 4: Draft of core work processes and related work process analyses



Matrix with fields of competency

This matrix displays a detailed description of the core work processes. It contains all the work place demands of a working process that were found in the research process.

As an aid for assigning the core work processes to the EQF levels and as a first step towards a VQTS matrix, the matrix differentiates each work process into three degrees of difficulty during the coping with work requirements. The less complex work place demands are shown on the left side of the matrix, the more complex ones on the right side. All demands cover the dimensions of knowledge, skills and competence. The tripartition regarding the degree of difficulty may not be misunderstood as a classification of the EQF dimensions of knowledge, skills and competence.

The matrix is the basis for the assignment of the core work processes to the levels of the EQF. Figure 5 shows an excerpt of it for the first core work process.

Work Processes		Fields of competency	
	He/she...		
1. Receive and transfer goods and document it	<ul style="list-style-type: none"> – knows documentation procedures for incoming goods – re-labels incoming goods – handles scanners 	<ul style="list-style-type: none"> – checks delivery against documentation, e.g. using the information on master labels and packing lists – checks if delivery is undamaged and free from vermin – accepts goods and documents it using tally sheets and/or software – notes special characteristics for storage, e.g. “non-stackable” – transports goods to company-internal destination, knowing the warehouse system and proper storage areas 	<ul style="list-style-type: none"> – performs quality conformity inspection – records damaged packages and takes pictures – detects anomalies / faults in goods received – uses floor-borne vehicles – uses in-house software

Figure 5: Part of the matrix with the fields of competencies (draft)

(3) Level structure

The assignment of the core work processes to the EQF levels constitutes the draft for the **Logistics Qualification Framework (LQF)**. Based on the detailed description of the core work processes, these could be related to the EQF descriptors in the dimensions of knowledge, skills and competence for the eight levels.



These relations were discussed in a workshop at ITB very thoroughly. The discussion led to a first draft of the LQF, in which each of the core work processes is assigned to an EQF level. In some cases, a core work process covers more than one qualification level because there are different ways to carry out the process: a simpler and a more complex one.

Phase E: Evaluation (partners)

The results of phase D were evaluated in the partner countries in national workshops, expert interviews and a web survey (WP 4). The feedback from this evaluation was the basis for a re-design of the core work process and the LQF.

In a first step, all the feedback statements were clustered in an Excel sheet. A total of 110 feedback statements was collected. For each statement, it was specified, if it was related to a single core work process or the general results, and which kind of change was desired (e.g. title of work process, a change in the matrix, a change of EQF level). Moreover, the source of the feedback was indicated (country, where appropriate: size of the company, web survey).

Figure 6 shows an excerpt of the resulting table.



	Desired changes				
	Country /	Title of Work Process	Matrix	Level-structure	Work Processes
2. Receive and transfer goods and document it (Level 3)	Italy	Specific words to be added in the WPA titles: Inventory (level 3 and 4) 1			Merge work processes 1,2,3, and 4 into one main work process. 2
2.	Italy	New Title: Handle incoming goods and information			
2.	Austria		were accepted by the interviewed experts as being 'okay' and 'fine'		
2.	Web-Survey	New Title: „Accept, identify and store goods“. 1	Reports defective goods to the customer. Asks for instructions from the customer before accepting defective goods (fehlerhafte Ware). 2		
3. Transload, repack, store and retrieve goods (Level 3)	Italy	Specific words to be added in the WPA titles: Inventory (level 3 and 4) 1			Merge work processes 1,2,3, and 4 into one main work process. 2
3.	Austria		the third paragraph of the second column ('keeps track of goods' movements'...) is not a competence required from a warehouse logistician (Lagerlogistiker)		
3.	Germany		Column 1: A __ handles scanners (belongs to mid- dle column) B __ knows functionality of a scanner (add this competence)		

Figure 6: Feedback sheet

In the next step, for every single feedback statement a decision had to be taken, whether the desired change should be carried out or not. In many cases, this decision required to discuss some aspects with the national partners or a sector expert, to go back into the results of the work process analyses or the documentation of previous projects. At least, the criteria were:

- Was it a single feedback or were there similar ones?
- Was there conflicting feedback from another source?
- From a theoretical view: were the pros or cons?
- Were the results of the work process analyses conflicting with the feedback?

This decision process led to a lot of minor changes in wording or in the assignment of some work place demands in the matrix. Major changes were the following:



- 9 instead of 10 core work processes: The core work process No. 8 of the draft version (Deal with insurances and customs procedures) was integrated in the core work process “Organize and implement the shipment and storage of goods”.
- Some core work processes were assigned to higher EQF levels than in the draft version. The EQF-levels 1 and 2 are no longer used.

Literature

Commission of the European Community (2005): Commission Staff Working Document towards a European Qualifications Framework for Lifelong Learning. Brussels, SEC(2005) 957.

Spöttl, G. (2007): Work-Process-Analysis in VET-Research. ITB-Forschungsberichte 22/2007. Institut Technik und Bildung, Universität Bremen.

Spöttl, G. & Ruth, K. (Hrsg.) (2011): ECVET – Kompatibilität von Kompetenzen im Kfz-Sektor. Impuls 42 – Schriftenreihe der Nationalen Agentur Bildung für Europa beim Bundesinstitut für Berufsbildung, Bremen.

Spöttl, G. & Ruth, K. (2011): Entwicklung eines sektorbezogenen Qualifikationsrahmens (SRQF) – am Beispiel des Kfz-Service- und Reparatur. In: G. Spöttl & K. Ruth (Hrsg.): ECVET – Kompatibilität von Kompetenzen im Kfz-Sektor. Impuls 42 – Schriftenreihe der Nationalen Agentur Bildung für Europa beim Bundesinstitut für Berufsbildung, Bremen, p. 8-60.

