Practitioner in Automotive SPICE©

Job Role Skill Set

DOCUMENT TITLE

Report Title:	Practitioner in Automotive SPICE© Job Role Skill Set			
Author(s):	Dr. Richard Messnarz			
Responsible Project Partner:	ISCN	Contributing Project Partners:		ISCN, TU-Graz

Document data:	Status:	(draft/<u>final</u>)		Dissemination level:	Public
Project title:	Development and Research on Innovative Vocational Educational Skills			GA No.:	2017-3295/001-001.
WP title:	WP3 – Skills Framework			Project No.:	591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
				Deliverable No:	D3.1
				Submission date:	30/04/2020
Keywords:	automotive sector, skill card, skill set, job roles, ECTS, ECVET				
Reviewed by:	Damjan Ekert (Formal Review)			Review date:	30/04/2020
				Review date:	
Approved by:	Anke Blume Richard Messnarz			Approval date:	30/04/2020

More information about DRIVES project and contact:

www.project-drives.eu

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

1 / 21

TABLE OF CONTENTS

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement Nº 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

2 / 21

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

3 / 21

INTRODUCTION

1.1 OBJECTIVE

The objective of this deliverable is to provide an introduction to described Job Role within the applied skills definition model.

1.2 PURPOSE OF THE DELIVERABLE

The purpose of this deliverable is to define skills definitions of the Practitioner in Automotive SPICE job role within the ECQA skills definition model.

1.3 SCOPE OF THE DELIVERABLE

The deliverable contains

- Description of the content of the Job Role
- Description of used Skill Sets and skills definitions, coverage of Qualification Schemas

The deliverable does not cover:

- Course development, as this will be done after the skill definitions clearly outlined the set of required courses.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

4 / 21

2 ECQA SKILLS DEFINITION MODEL

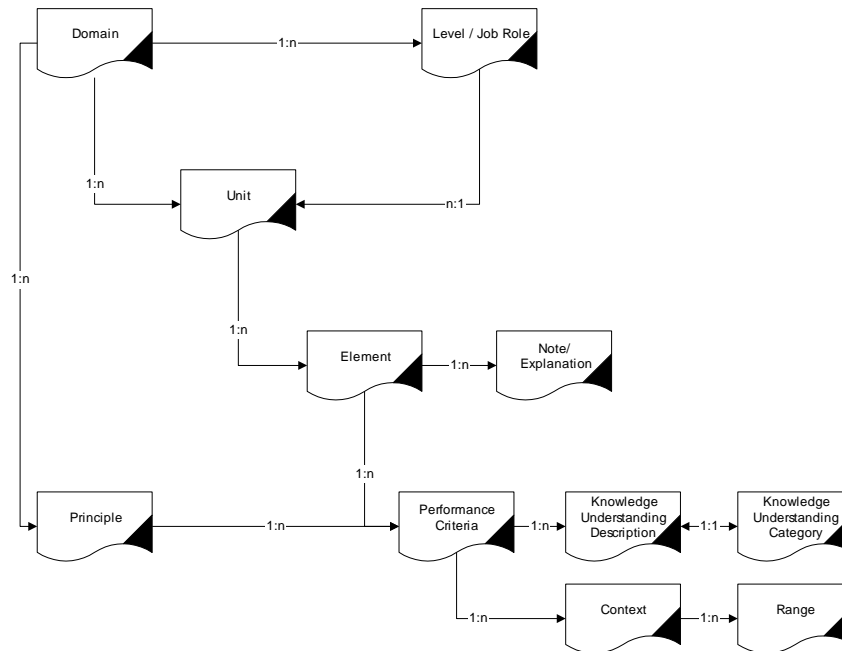A skills definition contains the following items (see Fig. 1):

Figure 1 The Skill Definition Model (1:n = one to many relationship)

Context: A category of ranges; it represents some terminology used in a performance criterion that consists of different context, conditions or circumstances. A participant must be able to prove competence in all the different circumstances covered by the context.

Domain: An occupational category, e.g. childcare, first level management or software engineering.

Element: Description of one distinct aspect of the work performed by a worker, either a specific task that the worker has to do or a specific way of working. Each element consists of a number of performance criteria.

Evidence: Proof of competence.

Knowledge and understanding category: A category of knowledge and understanding descriptions.

Knowledge and understanding description: A description of certain knowledge and understanding. To be judged competent in a unit a participant must prove to have and to be able to apply all the knowledge and understanding attached to it.

NVQ (UK based): The National Vocational Qualification standard of England, Wales and N. Ireland.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

5 / 21

Performance criterion: Description of the minimum level of performance a participant must demonstrate in order to be assessed as competent. A performance criterion may have relevant contexts.

Principle: A statement of good intentions; it underpins all competent domain practice.

Range: Description of a specific circumstance and condition of a performance criterion statement.

Qualification: The requirements for an individual to enter, or progress within a certain occupation.

Job Role: A certain profession that covers part of the domain knowledge. E.g. domain = Functional Safety, job role = Functional Safety Manager.

Unit: A list of certain activities that have to be carried out in the workplace. It is the top-level skill in the UK qualification standard hierarchy and each unit consists of a number of elements.

The rationales for developing the ECQA skills definition model is based on the skills definition proposed by the DTI (Department of Trade and Industry) in the UK for the NVQ (National Vocational Qualification) standards. These models have been re-used and slightly modified by other countries when they started employing skill cards [1], [2].

ECQA standards are used to describe the skills sets delivered within the DRIVES project (www.project-drives.eu). Further description and rationales are attached in annexes of this document. The ECQA structure was mapped in DRIVES project to DRIVES Reference and Recognition Framework with the links to ESCO[7], EQF[8], ECTS[9] and ECVET[10]. See more in deliverable DRIVES-D4.1.1 Reference and Recognition Framework – Analysis.pdf (www.project-drives.eu).

3 SKILLS DEFINITION FOR THE JOB ROLE PRACTITIONER IN AUTOMOTIVE SPICE©

3.1 THE SKILLS HIERARCHY

Using the terminology outlined in the skills definition model and including the skills identified during the demand analysis at the beginning of the project, the following skills hierarchy for the job role "Practitioner in Automotive SPICE©" has been designed

Unit ID	Unit Name	Element ID	Element Name
ASPICE.U1	Introduction	ASPICE.U1.E1	Motivation
		ASPICE.U1.E2	Structure and Objectives
		ASPICE.U1.E3	Assessments
ASPICE.U2	Process Assessment Model	ASPICE.U2.E1	Process Reference Framework
		ASPICE.U2.E2	Capability Dimension

Figure 2 The Skills Set

3.2 THE SKILLS DESCRIPTIONS – COMPLETE SKILLS SET PRACTITIONER IN AUTOMOTIVE SPICE©

Domain Acronym: ASPICE

Domain title: Automotive Quality

Domain Description:

Nowadays electronics and software control already about 90% of a modern car's functions. With the increasing complexity of software and systems in car, the car manufacturers started in 2005 to evaluate their supplier's software process capability according to the process assessment model Automotive SPICE®.

The majority of Tier-1 companies developing mechatronic systems have aligned their processes according to the V-Model and the requirements from Automotive SPICE®.

The Practitioner in Automotive SPICE® understands the process reference model and measurement framework of Automotive SPICE® and knows how assessments are performed and how to interpret and understand the requirements from Automotive SPICE® for their projects.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

7 / 21

3.3 UNIT ASPICE.U1: INTRODUCTION

Acronym: ASPICE.U1

Title: Introduction

Description:

This unit gives an overview about the purpose and necessity of each expert domain with respect to quality and safety, as well as the need of an integrated approach. Both a technical and organisational viewpoint are elaborated.

3.3.1 Element ASPICE.U1.E1: Motivation

Acronym: ASPICE.U1.E1

Element Title:

Element Note: In this element the learner will get introduced to Automotive SPICE and rationale behind it.

Performance Criteria:

The student must be able to show evidence of competencies for the following performance criteria (PC):

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U1.E1.PC1	The student understands the goals and purpose of Automotive SPICE
ASPICE.U1.E1.PC2	The students knows what benefits are gained by Automotive SPICE
ASPICE.U1.E1.PC3	The student understands the underlaying V-Model and its processes
ASPICE.U1.E1.PC4	The student understands the concept of traceability

Table 1: Performance Criteria for the Element ASPICE.U1.E1

3.3.2 Element ASPICE.U1.E2: Structure and Objectives

Acronym: ASPICE.U1.E2

Element Title: In the following element the structure and framework of Automotive SPICE will be introduced as well as the key concepts and objectives.

Element Note:

Performance Criteria:

The student must be able to show evidence of competencies for the following performance criteria (PC):

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U1.E2.PC1	The student understands the Automotive SPICE reference Model
ASPICE.U1.E2.PC2	The student knows what indicators of process performance are

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U1.E2.PC3	The student understands how processes are described within Automotive SPICE®

Table 2: Performance Criteria for the Element ASPICE.U1.E2

3.3.3   Element ASPICE.U1.E3: Assessments

Acronym: ASPICE.U1.E4

Element Title: Assessments are an essential part of Automotive SPICE. The assessment process, rating scale and results of an assessment are explained in this element.

Element Note:

Performance Criteria:

The student must be able to show evidence of competencies for the following performance criteria (PC):

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U1.E3.PC1	The student understands how assessments are performed
ASPICE.U1.E3.PC2	The student understands how assessments are rated
ASPICE.U1.E3.PC2	The student knows the output of an assessment

Table 3: Performance Criteria for the Element ASPICE.U1.E3

3.4   UNIT ASPICE.U2: PROCESS ASSESSMENT MODEL

Acronym: ASPICE.U2

Title: Process Assessment Model

Description:
This unit gives an overview about the process assessment model and its two dimensions, the process reference framework and the measurement framework (capability dimension). Within the process reference framework, the difference between outcomes and indicators is elaborated. The concept of the capability dimension and its level is elaborated.

3.4.1   Element ASPICE.U2.E1: Process Reference Framework

Acronym: ASPICE.U2.E1

Element Title: Process Reference Framework

Element Note: The element elaborated the process reference framework, including the attributes of each process such as outcomes, indicators and work products.

Performance Criteria:

The student must be able to show evidence of competencies for the following performance criteria (PC):

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

9 / 21

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U2.E1.PC1	The student knows the attributes of the process reference model
ASPICE.U2.E1.PC2	The student knows how process outcomes are linked to base practices
ASPICE.U2.E1.PC3	The student knows the process outcomes for the processes in the VDA scope
ASPICE.U2.E1.PC4	The student can identify the most important work products for the processes in the VDA Scope

Table 4: Performance Criteria for the Element ASPICE.U2.E1

3.4.2 Element ASPICE.U2.E2: Capability Dimension

Acronym: ASPICE.U2.E2

Element Title: Capability Dimension

Element Note: The Measurement Framework defines the process attributes and capability levels. The element describes the concept of generic practices and how to apply them to the processes.

Performance Criteria:

The student must be able to show evidence of competencies for the following performance criteria (PC):

Performance Criterion	Evidence Check: The student can demonstrate -
ASPICE.U2.E2.PC1	The student understands Capability Levels
ASPICE.U2.E2.PC2	The student understands Process Attributes
ASPICE.U2.E2.PC3	The student understands the difference between base and generic practices
ASPICE.U2.E2.PC4	The student understands the difference between the Process and Capability Dimension

Table 5: Performance Criteria for the Element ASPICE.U2.E2

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

10 / 21

ANNEXES

The annex provides overview of used skills set, coverage of Qualification Schemas and Legal background for Certification

ANNEX A ECQA DESCRIPTION

ECQA – EUROPEAN CERTIFICATION AND QUALIFICATION ASSOCIATION

ECQA standards are used to describe the skills sets delivered within the DRIVES project (www.project-drives.eu). ECQA is the pilot Certification body, which structure is mapped to DRIVES Reference and Recognition Framework providing the EU-wide overview of training courses and possible certifications, and micro-credentials. DRIVES Reference and Recognition Framework provides links to ESCO[7], EQF[8], ECTS[9] and ECVET[10]. See more in deliverable DRIVES-D4.1.1 Reference and Recognition Framework – Analysis.pdf (www.project-drives.eu).

Europe Wide Certification

The ECQA is the result of a number of EU supported initiatives in the last ten years where in the European Union Life Long Learning Programme different educational developments decided to follow a joint process for the certification of persons in the industry.

Through the ECQA it becomes possible that you attend courses for a specific profession in e.g. Spain and perform a Europe wide agreed test at the end of the course.

Access to a Vast Pool of Knowledge

ECQA currently supports 27 professions in Europe and with the continuous support until 2012 by the European Commission the pool is growing to 30 certified professions in Europe. ECQA offers certification for professions like IT Security Manager, Innovation Manager, EU project manager, E-security Manager, E-Business Manager, E-Strategy Manager, SW Architect, SW Project Manager, IT Consultant for COTS selection, Internal Financial Control Assessor (COSO/COBIT based), Interpersonal Skills, Scope Manager (Estimation Processes), Configuration Manager, Safety Manager, and so forth.

The ECQA guide can be downloaded at www.ecqa.org -> Guidelines.

Defined procedures are applied for:

DRIVES
Development and Research on Innovative
Vocational Education Skills

Co-funded by the
Erasmus+ Programme
of the European Union

- Self assessment and learning
- http://www.ecqa.org/fileadmin/documents/Self_Assessment/eucert-users-self-assessment-learning-guide-v5-doc.pdf
- Exam performance
- http://www.ecqa.org/fileadmin/documents/ECQA_Exam_Guide_Participant_v2.pdf

ECQA SKILLS DEFINITION MODEL

The ECQA skills definition model, used for Job Role definition, is described in section 2 of this document.

ECQA SKILL SET STRATEGY

Imagine that in the future Europeans will have a skill set like a card with a chip which stores your skill profile to fulfil specific professions, job roles, and tasks. It's working like an ID card. This future scenario requires -

- A standard way to describe a skill set for a profession, job, or specific task.
- A standard procedure to assess the skill and to calculate and display skill profiles.

Such a common set of skill sets in Europe is needed due to the free mobility of workers. European countries such as UK, The Netherlands, and France already have well established open universities which support APL (Accreditation of Prior Learning). In APL the skills of students are assessed, already gained skills are recognised, and only for the skill gaps a learning plan is established. The skill assessment bases on defined skill units and a skill profile displaying how much of the skill units are covered.

In a previous project CREDIT (Accreditation of Skills via the Internet) [1] in which some of the project partners were involved such an Internet based skills assessment system has been built. Therefore another possible scenario of the future is that representative educational bodies per country in Europe maintain skill profiles in databases which can be accessed via defined ID codes for people.

ECQA SKILLS ASSESSMENT MODEL

Step 1 – Browse a Skills Set: You select a set of skills or competencies, which are required by your profession or job using national standards or your company standards. You browse different skills cards and select a job role you would like to achieve.

Step 2 – Register for Self Assessment with a Service Unit : This can be a service unit inside your own company (e.g. a personnel development department) or a skills card and assessment provider outside

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

12 / 21

DRIVES
Development and Research on Innovative
Vocational Education Skills

Co-funded by the
Erasmus+ Programme
of the European Union

your company which offers skills assessment services. In case of the Safety Manager Project the registration will automatically assign a predefined service unit.

Step 3 – Receive an Account for Self-Assessment and Evidence Collection : With the registration you automatically received an account to login to the working space in which you can go through the steps of online self assessment and the collection of evidences to prove that you are capable of certain performance criteria.
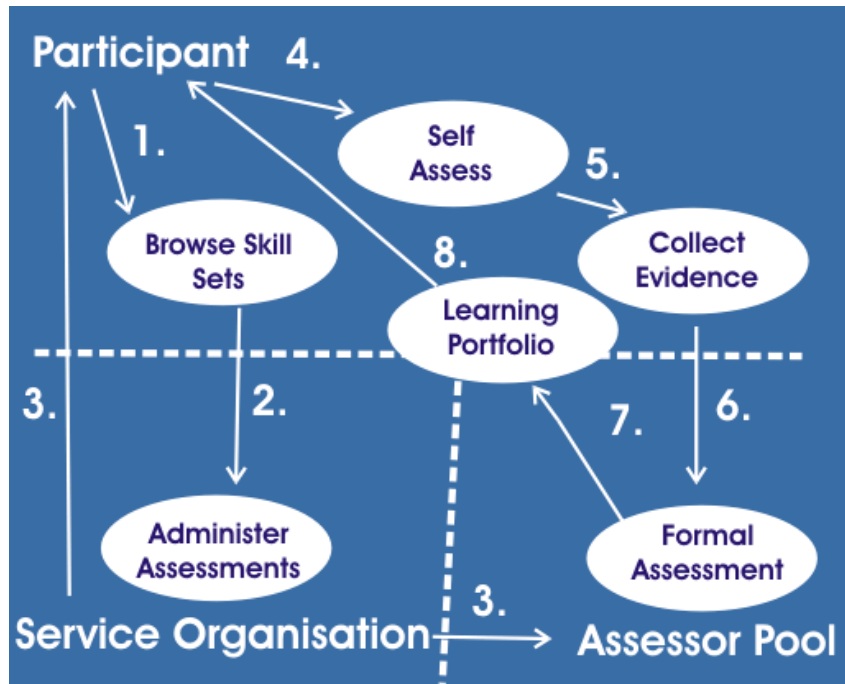
Picture 1: Basic steps of the skills assessment model

Step 4 – Perform Self Assessment: You log into the system , browse through the skills required and self assess performance criteria, whole elements or whole units with a standard evaluation scale of non-applicable, not adequate, partially adequate, largely adequate, and fully adequate. A skills gaps profile can be generated and printed illustrating in which areas your self assessment shows improvement potentials.

Testing of Skills (Addition to Step 4) – The system provides a multiple-choice test for each performance criteria so that you can check your capabilities as realistically as possible.

Step 5 – Collect Evidences: Before you want to enter any formal assessment you need to prove your skills by evidences. Evidences can be any electronic files (sample documents, sample graphics, results of some analysis, etc.) or any references with details (e.g. a certificate received from a certain

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

13 / 21

institution). Evidences you can then link to specific performance criteria or whole elements of skills units.

Testing of Skills (Addition to Step 5) – In traditional learning schemes people have always needed to go to a learning institution (university, accreditation body, professional body, etc.) to take exams and they received a certificate if they pass. This traditional approach however is insufficient when it comes to measuring experience and (soft) skills learned on the job and fails to give recognition to skills gathered on the job. The APL (Accreditation of Prior Learning) approach, by contrast, collects so called evidences. Evidences can be certificates obtained in the traditional way, but also references from previous employers, materials from previous projects in which the person took ownership of results (e.g. a test plan) to prove their capability, as well as any kind of proof of competence gathered on the job. The assessors will then evaluate the evidences provided and not only rely on certificates and exams.

Step 6 – Receive Formal Assessment: Formal assessors are assigned by the service unit to the skills assessment. Once formal assessors log into the system they automatically see all assigned assessments. They select the corresponding one and can see the uploaded evidences. They then formally assess the evidences and assess the formal fulfilment of performance criteria, whole elements or whole units with a standard evaluation scale of non-applicable, not adequate, partially adequate, largely adequate, and fully adequate. In case of missing competencies they enter improvement recommendations, a well as learning options.

Step 7 – Receive Advise on Learning / Improvement Options: After the formal assessment the participants log into the system and can see the formal assessment results from the assessors, can print skills gaps profiles based on the assessor results, and can receive and print the improvement recommendations and learning options. If required, the generation of learning options can also be automated through the system (independent from assessor advises).

ECQA CERTIFICATE TYPES

In the standard test and examination procedures for levels of certificates are offered:

- Course Attendance Certificate
    - Received after course attendance
    - Modular per Element
- Course / Test Certificate
    - Test in a test system (European pool of test questions)
    - 67% satisfaction per element

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

14 / 21

- Summary Certificate
    - o Overview of covered elements where the student passed the test, all elements shall be covered
    - o Generation of certificate
- Professional Certificate
    - o Uploading applied experiences for review by assessors
    - o Rating by assessors
    - o Observation of 2 years

The certificates show credited elements in comparison to all required.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

15 / 21

ANNEX B ECQA COVERAGE OF QUALIFICATION SCHEMAS

MAPPING BASED ON NVQ QUALIFICATION LEVELS

Qualification / training levels: Five levels of qualification / training are defined by European legislation and this structure can be used for comparability of vocational qualifications from the different European countries.

- Level 1: semi-skilled assistant performing simple work
- Level 2: basic employee performing complex routines and standard procedures
- Level 3: skilled professional with responsibility for others and performing independent implementation of procedures
- Level 4: middle management & specialist performing tactical an strategic thinking
- Level 5: professional / university level

In most cases the same job role can be offered on different levels. e.g. IT Security Manager Basic Level (NVQ level 2), IT Security Manager Advanced level (NVQ Level 3), and IT Security Manager Expert Level (NVQ Levels 4 and 5).

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

16 / 21

MAPPING BASED ON EUROPEAN QUALIFICATION FRAMEWORK (EQF) LEARNING LEVELS

- Six level taxonomy:

  Level 0: I never heard of it
  1. Knowledge (I can define it):
  2. Comprehension (I can explain how it works)
  3. Application (I have limited experience using it in simple situations)
  4. Analysis (I have extensive experience using it in complex situations)
  5. Synthesis (I can adapt it to other uses)
  6. Evaluation (I am recognized as an expert by my peers)
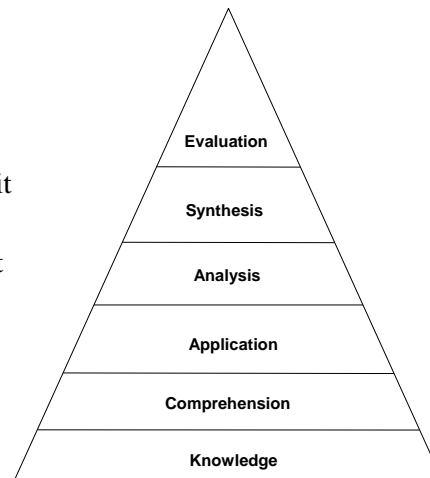
Picture 3: Blooms Learning levels

Level	Knowledge	Example
Level 1	Basic general knowledge	
Level 2	Basic factual knowledge of a field of work or study	
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	Six Sigma Yellow Belt
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	
Level 5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Six Sigma Green Belt
Level 7	• Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research • Critical awareness of knowledge issues in a field and at the interface between different fields	Six Sigma Black Belt

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

17 / 21

![DRIVES logo] Development and Research on Innovative Vocational Education Skills

Co-funded by the
Erasmus+ Programme
of the European Union

Level	Knowledge	Example
Level 8	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	Six Sigma Master Black Belt

Picture 4 : EQF Learning levels

MAPPING BASED ON ECTS AND ECVET SCHEMA

ECQA has established a procedure to map ECQA skills sets onto the ECTS (European Credit Transfer System) and the ECVET framework n the European Union.

A job role is assigned ECTS and ECVET points using a defined framework.

ECTS Mapping

Each element of the skills set is assigned hours of lecturing and exercises. These hours determine the ECTS points which are then agreed among a cluster on different universities in Europe.

Level	Knowledge	AQUA	ECTS	Safety Manager	ECTS
Level 1	Basic general knowledge	-		-	
Level 2	Basic factual knowledge of a field of work or study	-		-	
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study				
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study				
Level 5	Comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge				
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	AQUA - Automotive Quality Integrated Skills - presentations / theory	3	AQUA - Automotive Quality Integrated Skills - presentations / theory	3
Level 7	- Highly specialized knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research - Critical awareness of knowledge issues in a field and at the interface between different fields	AQUA - Automotive Quality Integrated Skills - with exercises to apply on nan example (e.g. ESCL)	4	AQUA - Automotive Quality Integrated Skills - with exercises to apply on nan example (e.g. ESCL)	4
Level 8	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	AQUA - Automotive Quality Integrated Skills - implementation in a research at PhD level / with link to a real project	5	AQUA - Automotive Quality Integrated Skills - implementation in a research at PhD level / with link to a real project	5

Picture 5 : Example Automotive Quality Engineer and Safety Manager

The 2 job roles illustrated in the picture above have been assigned to ECTS and are taught using the same skills set at industry and also universities.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

18 / 21

![DRIVES - Development and Research on Innovative Vocational Education Skills](logo)

Co-funded by the
Erasmus+ Programme
of the European Union

ECVET Mapping

Also ECQA provides a framework to assign ECVET points onto elements of the skills set. The ECQA guidance recommends to offer the ECQA course (which is offered as a lecture at university) as a short course (2 weeks with exercises) in industry to retrain for a job role in industry. The recommended size is 30 ECVET points in total. The lecturing time and exercise per element determine how many ECVET points ae assigned to an element of the skills set.

Automotive Quality Engineer				ECVET L7&8
U1		4	U1.E1: Introduction	2
			U1.E2: Organisational Readiness	2
U2		32	U2.E1 Life Cycle	8
			U2.E2 Requirements	8
			U2.E3 Design	8
			U2.E4 Test and Integration	8
U3		12	U3.E1: Capability	2
			U3.E2: Hazard and Risk Management	8
			U3.E3 Assessment and Audit	2
U4		12	U4.E1: Measurement	6
			U4.E2: Reliability	6
			ECVET Points Total	60

Picture 6 : ECVET Mapping example - Automotive Quality Engineer

Functional Safety Manager / Engineer				ECVET L7&8
U1		2	U1.E1 International Standards	1
			U1.E2 Product Life Cycle	1
			U1.E3 Terminology	
U2		4	Safety management on organisational	1
			Safety Case Definition	1
			Overview of Required Engineering an	1
			Establish and Maintain Safety Planning	1
U3		16	System Hazard Analysis and Safety Co	4
			Integrating Safety in System Design &	4
			Integrating Safety in Hardware Design	4
			Integrating Safety in Software Design	4
U4		4	Integration of Reliability in Design to	2
			Safety in the Production,Operation an	2
U5		4	Legal aspects and Liabilities	2
			Regulatory & Qualification Requireme	2
			ECVET Points Total	30

Picture 7 : ECVET Mapping example – Functional Safety Manager / Engineer

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

19 / 21

ISO/IEC 17024 STANDARD FOR PERSONNEL CERTIFICATION PROGRAMMES

The ISO/IEC 17024 standard describes standard processes for the examination and certification of people. Some of the basic principles described include:

- Standard exam procedure

- Standard certification procedure

- Identification of persons receiving the certificate

- Independence of examiner and trainer

- Certification system that allows to log the exam to keep a record/proof that the examinee passed the exam

- Mapping of processes towards ISO 17024

ECQA AND ISO/IEC 17024 STANDARD

- ECQA defined standard exam processes

- ECQA defined standard certification processes

- ECQA developed an exam system that generates random exams and corrects exams.

- ECQA developed a certification database to identify persons and map them to exam results

- ECQA established a mapping onto the ISO 17024 norm and published that in form of a self declaration.

LIASION WITH NATIONAL UNIVERSITIES

ECQA established cooperation with national universities who teach job roles with ECTS. The same job roles are offered with ECVET on the market by training bodies.

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

20 / 21

[1]   *CREDIT Project*, **Accreditation Model Definition, MM 1032 Project CREDIT**, Version 2.0, University of Amsterdam, 15.2.99

[2]   DTI - Department of Trade and Industry UK, **British Standards for Occupational Qualification**, *National Vocational Qualification Standards and Levels*

[3]   R. Messnarz, et. al, *Assessment Based Learning centers*, in : Proceedings of the EuroSPI 2006 Conference, Joensuu, Finland, Oct 2006, also published in Wiley SPIP Proceeding in June 2007

[4]   Richard Messnarz, Damjan Ekert, Michael Reiner, Gearoid O'Suilleabhain, *Human resources based improvement strategies - the learning factor* **(p 355-362)**, Volume 13 Issue 4 , Pages 297 - 382 (July/August 2008), Wiley SPIP Journal, 2008

[5]   European Certification and Qualification Association, *ECQA Guide*, Version 3, 2009, www.ecqa.org, Guidelines

[6]   Richard Messnarz, Damjan Ekert, Michael Reiner, **Europe wide Industry Certification Using Standard Procedures based on ISO 17024**, in: Proceedings of the TAEE 2012 Conference, IEEE Computer Society Press, June 2012

[7]   The European Skills/Competences, qualifications and Occupations (ESCO), https://ec.europa.eu/esco/portal/home

[8]   The European Qualifications Framework (EQF), https://www.cedefop.europa.eu/en/events-and-projects/projects/european-qualifications-framework-eqf

[9]   European Credit Transfer and Accumulation System (ECTS), https://ec.europa.eu/education/resources-and-tools/european-credit-transfer-and-accumulation-system-ects_en

[10]   The European Credit system for Vocational Education and Training (ECVET), https://ec.europa.eu/education/resources-and-tools/the-european-credit-system-for-vocational-education-and-training-ecvet_en

Development and Research on Innovative Vocational Skills -DRIVES – Project number 591988-EPP-1-2017-1-CZ-EPPKA2-SSA-B
The European Commission support for the production of this publication under the Grant Agreement № 2017-3295/001-001 does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

21 / 21