



## DRIVES Framework

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### Deliverable 4.4.2 Full Definition and Rules of the ERFA



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## EXECUTIVE SUMMARY

This document provides an overall description of the DRIVES Framework and its implementation – the DRIVES Framework platform.

**Section 1** provides an overall description of the main objectives and gives out the background.

**Section 2** discusses the overall framework structure in more detail with its structure and mapping approach for mapping learning outcomes to skills and, on the other side, the mapping of skills/competencies to the job roles.

**Section 3** provides a detailed description of DRIVES Digital badges and their coherency to the Open Badges standard; basic definitions are provided. In addition, DRIVES Digital Badges implementation is described and different types of badges are showcased. Issuing and sharing mechanisms of the badges are outlined as well.

**Section 4** provides insights into the DRIVES Framework ecosystem and describes different types of users, their activities, and permissions. Working groups and work of experts on the platform content and overall change management are drawn as well.

**Section 5** summarizes all major DRIVES Framework features and functionalities; the document ends with **Section 6**, which links to the deliverable D4.5 which talks about the sustainability of the DRIVES project results and the DRIVES Framework.



## INTRODUCTION

During the life of every one of us, we are constantly being faced with new challenges, starting from childhood, where we acquire the most important skills – we learn critical, social, and emotional, skills to interact with others<sup>1</sup>. During adolescence and adulthood, we are constantly being pressured to perform at our best and adapt to changing markets<sup>2</sup>.

Competencies that we acquire in tertiary education are becoming obsolete after seven years on average. This obsolescence is strongly related to rapid changes in the work domain, and shortcomings in education. The importance of a well-trained workforce and the impact of technological and organizational developments on the skills needed in the economy has been one of the most prominent issues on the public policy agenda over the last two decades<sup>3</sup>.

This brings the need for re-skilling (the process of training adults for a different job) and up-skilling (the process of training adults to learn new skills<sup>4</sup>), these processes have long been acknowledged in the literature. Evidence shows that being low-skilled (having low education attainment and/or low cognitive skills) is often associated with a set of negative consequences, both for the individual and society, including lower earnings, civic and social engagement, and a higher probability of involvement in criminal activities<sup>5</sup>.

To facilitate the needs of employers and employees, there is a necessity for the development of proper tools to successfully re-skill and up-skill the workforce, validate employee achievements and match them against targeted job profiles/roles and occupations. Ranging from different frameworks, projects, funds, software, quality rules, and policies, there are multiple options on the market already. The use of artificial intelligence, machine learning, blockchain, and other technologies is being prominent when it comes to these tools.

Project DRIVES consortium has developed a framework that facilitates above mentioned to improve the re-skilling and up-skilling of the workforce. DRIVES Framework as it is called is described further in this document altogether with its implementation in the form of an online platform.

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<sup>1</sup> International Labour Office. (2010). (rep.). A Skilled Workforce for Strong, Sustainable and Balanced Growth: A G20 Training Strategy. Retrieved from <https://www.oecd.org/g20/summits/toronto/G20-Skills-Strategy.pdf>

<sup>2</sup> International Labour Office. (2010). (rep.). A Skilled Workforce for Strong, Sustainable and Balanced Growth: A G20 Training Strategy. Retrieved from <https://www.oecd.org/g20/summits/toronto/G20-Skills-Strategy.pdf>

<sup>3</sup> Allen, J., Velden, R. van. (n.d.). When do skills become obsolete, and when does it matter? Research in Labor Economics, 27–50. [https://doi.org/10.1016/s0147-9121\(02\)21004-3](https://doi.org/10.1016/s0147-9121(02)21004-3)

<sup>4</sup> Reskilling and Upskilling: A Strategic Response to Changing Skill Demands. TalentGuard. (2021, February 15). <https://www.talentguard.com/blog/reskilling-upskilling-strategic-response-changing-skill-demands>

<sup>5</sup> Cedefop(2020). Empowering adults through upskilling and reskilling pathways. Volume 1: adult population with potential for upskilling and reskilling. Luxembourg: Publications Office of the European Union. Cedefop reference series; No 112. <http://data.europa.eu/doi/10.2801/475393>

## LIST OF ABBREVIATIONS/GLOSSARY

<b>ERFA</b>	...	European Recognition Framework for Automotive
<b>EU</b>	...	European Union
<b>ESCO</b>	...	European Skills/Competences, qualifications, and Occupations
<b>EQF</b>	...	European Qualifications Framework
<b>ECTS</b>	...	European Credit Transfer and Accumulation System
<b>ECVET</b>	...	European Credit System for Vocational Education and Training
<b>URL</b>	...	Uniform Resource Locator
<b>IMS</b>	...	Instructional Management Systems
<b>API</b>	...	Application Programming Interface
<b>HTML</b>	...	HyperText Markup Language
<b>APTE</b>	...	Association for Promoting Electronics Technology
<b>SAM</b>	...	Sector Skills Strategy in Additive Manufacturing
<b>ISO</b>	...	International Organization for Standardization
<b>IEC</b>	...	International Electrotechnical Commission
<b>URI</b>	...	Uniform Resource Identifier
<b>DGERT</b>	...	Direcao-Geral do Emprego e das Relacoes de Trabalho
<b>SEPE</b>	...	Public State Employment Service (SPAIN)

# 1 DRIVES FRAMEWORK

This section describes the DRIVES Framework, which serves multiple purposes, developed under DRIVES Project.

## 1.1 MAIN OBJECTIVES

This Framework enables reference recognition and description of job roles and competencies across EU Automotive industry and other associated sectors within the industry. The Framework offers an EU-wide database of training courses for the automotive industry and will act as a “broker” between industry skills/competence/job role needs and training offers through advertisement on the whole EU market. The industry will have a possibility to choose the “right training” and “training path” whereas training providers can see which levels of training and competence are needed and prepare training according to those needs on-demand. Additionally, a harmonized approach to recruitment and mobility of the workforce across the sector will be achieved via the DRIVES Digital Badge, which will be granted based on the achieved skills/competence on a certain level where the quality will be assured by the correct mapping exercise. All the main goals of the DRIVES Framework are depicted in **Figure 1**.



Figure 1: DRIVES Framework - Main Goals

Establishment of DRIVES Framework will fulfill defined DRIVES Key Actions, namely the

- [KA 1: Establish EU Reference Recognition of Skills and Job Roles](#)
- [KA 2: Establish a Harmonized Approach to Education and Training Offer](#)

and will stimulate

- [KA 4: Modular Approach to the Training Provision](#)



## 2 OVERALL FRAMEWORK STRUCTURE

This section describes the overall structure of the DRIVES Framework (**Figure 2**), its key principles, and its components.

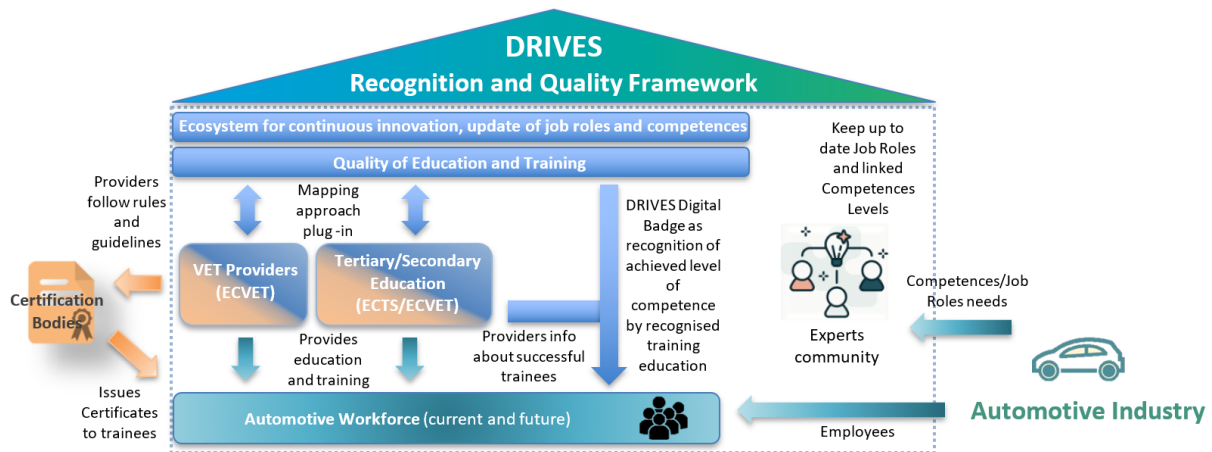


Figure 2: Depiction of DRIVES Framework

### 2.1 FRAMEWORK BASIC STRUCTURE OVERVIEW

Overall DRIVES Framework revolves around the database of skills/competence and knowledge, which will, throughout the years, expand as the DRIVES Framework will accommodate more and more training providers and other types of users described in **section 4** in more detail.

As mentioned, DRIVES Framework will ensure recognition of job roles, as well as skills, competences, and knowledge, based on the reference concepts on desired levels in the system. These elements are and will be compliant with ESCO and EQF levels, as seen in **Figure 3**.

All of this will enable mapping to existing training and education with the provision of ECTS/ECVET credits.

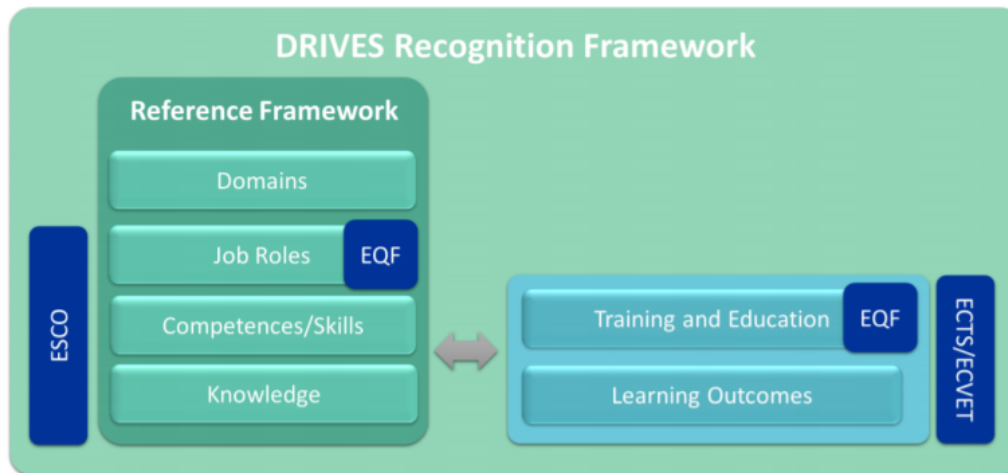


Figure 3: Mapping of Learning Outcomes to Reference Job Roles and Skills/Competence on Certain Level

Additionally, three levels of maturity are defined<sup>6</sup>.

- **Awareness:** Understand the background knowledge, competence/skill, and its practical implications in the practical environment.
- **Practitioner:** strong understanding of the knowledge, experience in the competence/skill. Able to apply knowledge, the experience of the competence/skill, and share with others including the use of the most appropriate tools and techniques for the solution.
- **Expert:** an expert knowledge or competence/skill ability to develop and apply procedures and activities as an individual and/or provide a qualified opinion to a team. Recognized specialist and advisor in the generation of solutions and ideas, including methods, tools, techniques, guiding or leading others in best practice use of the specific knowledge and skill.

These three skills/competence and knowledge levels will express the expertise needed to obtain a particular job role. The very same levels are applied to the mapping of training and education to skills/competence and knowledge provided by the training or education, as seen in **Figure 4**.

<sup>6</sup> Development and Research on Innovative Vocational Educational Skills. (2020). (rep.). Deliverable 4.2.1 European Recognition Framework for Automotive. Retrieved from [https://www.project-drives.eu/Media/Publications/22/Publications\\_22\\_20200522\\_101015.pdf](https://www.project-drives.eu/Media/Publications/22/Publications_22_20200522_101015.pdf)

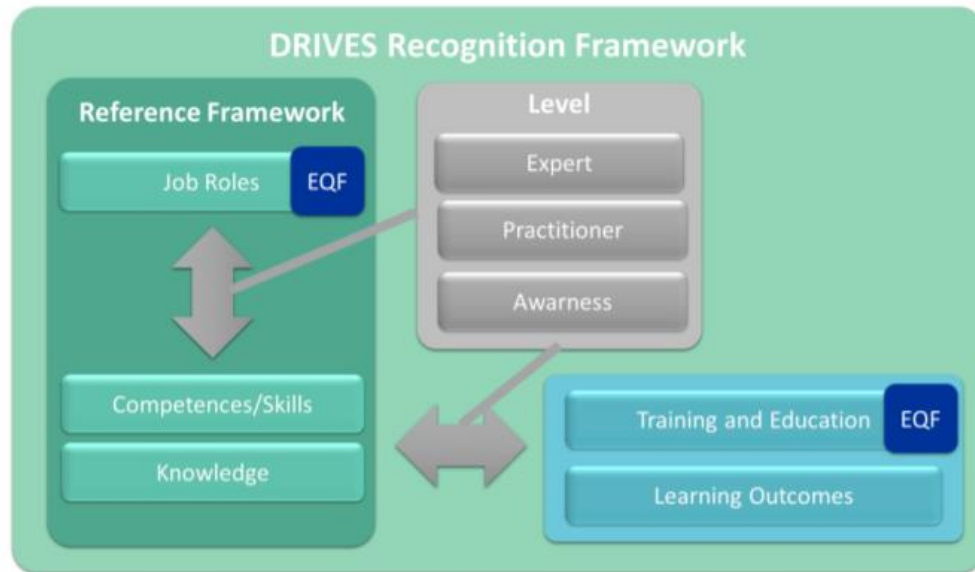


Figure 4: Relation of the Job Roles and Training and Education Concepts

## 2.2 MAPPING APPROACH

This section describes the mapping of learning outcomes of training and education to skills/competence and knowledge elements on a certain level and thus to the reference job roles. Mapping is performed as seen in **Figure 5** below.

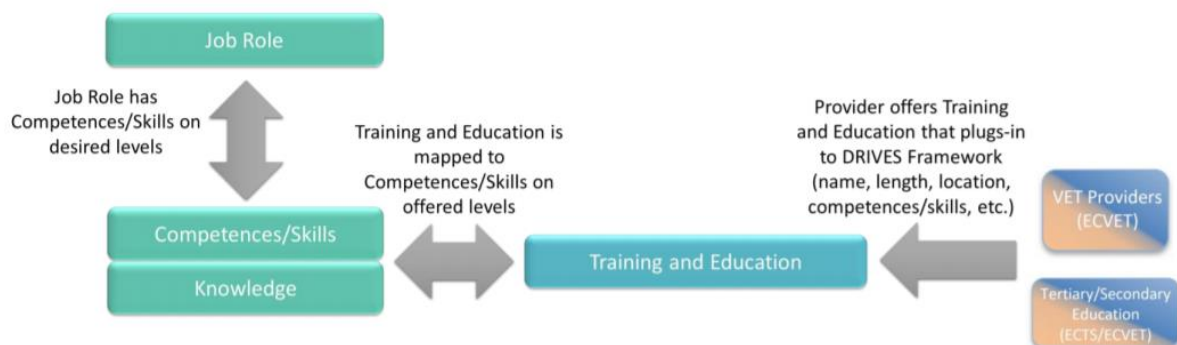


Figure 5: Learning Outcomes Mapping

This mapping of learning outcomes to the reference skills/competence and knowledge and ultimately job roles ensures the EU-wide recognition of the mapped training and education and further enables the DRIVES Digital Badge to be awarded upon course completion in the DRIVES Framework platform. Since the course is taken outside the platform, the provider must additionally register/verify the participants in the system.



As learning outcomes are mapped to the skills/competence and knowledge, it is necessary to specify one of three DRIVES maturity levels described in **section 2.1**. Since these maturity levels were defined solely in DRIVES Project<sup>7</sup> and have never been used elsewhere, it is important to provide guidance on how to map them to different, more widely used frameworks. This could be BLOOMs taxonomy for example, as seen in **Figure 6: Pilot Mapping of BLOOMs Taxonomy To DRIVES Levels of Maturity**. This pilot mapping will help providers to understand the DRIVES Levels of Maturity, especially in the case of providers' familiarity with the BLOOMs taxonomy.

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<sup>7</sup> To provide more variability in terms of concept definition.

DRIVES Levels		Awareness		Practitioner		Expert	
BLOOMs Taxonomy	Remember	Understand	Apply	Analyze	Evaluate	Create	
	Recall	Describe	Apply	Analyze	-	-	
		Follow	Assess	Compose			
		Identify	Assure	Construct			
		Interpret	Calculate	Deploy			
		Participate	Convert	Design			
		Understand	Define	Develop			
			Demonstrate	Distinguish			
			Differentiate	Empower			
			Divide	Evaluate			
			Eliminate	Lead			
			Encourage	Manage			
			Facilitate	Prioritize			
			Implement	Translate			
			Motivate				
			Organize				
			Plan				
			Prepare				
			Present				
			Promote				
			Propagate				
			Review				
			Select				
			Standardize				
			Support				
			Use				

Figure 6: Pilot Mapping of BLOOMs Taxonomy To DRIVES Levels of Maturity

### 3 DRIVES DIGITAL BADGE

This section describes the DRIVES Digital Badges, their usage, and enrolment in the DRIVES Framework. This is covered by the area which is seen in **Figure 7**.

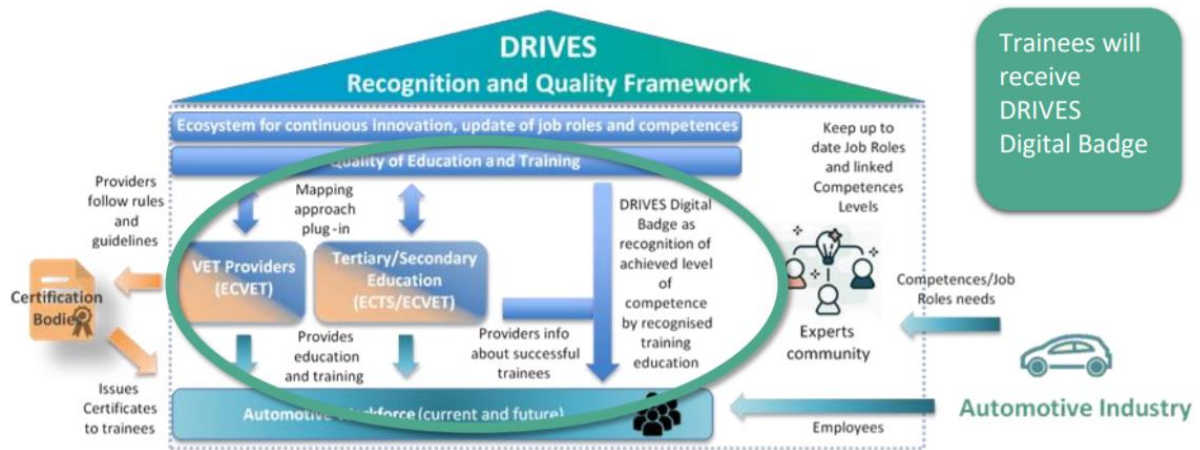


Figure 7: DRIVES Digital Badges Area

#### 3.1 MICRO-CREDENTIALS DIGITAL BADGES

Digital Badge in recognition for learning outside the traditional academic records. Digital badges validate the accomplishment, skill, or competence earned in learning environments, typically online. It includes higher education, certification, internships, apprenticeships, volunteer work, continuing education, etc.

A digital badge is a complement to conventional degrees, certificates, and diplomas. Badges help participants translate their learning experiences into skills that employers seek.

Badges show the earner of the badge, issuer, and evidence of work that lead to the badge. Additionally, it contains details such as badge name, criteria, URL, issue date, and issuer. The badges can be awarded based on memberships, competence, internships, or achievements accomplished by the learner.

#### 3.2 DRIVES FRAMEWORK DIGITAL BADGES IMPLEMENTATION

In the case of the DRIVES Framework, the DRIVES Digital Badge will be awarded based on the achieved skills/competence and knowledge on a certain level. It will be parallel to existing certificates that might be awarded additionally on training/course completion.

After the training provider verifies certain trainees in the system that they have completed their courses, they are awarded the DRIVES Digital Badges for achieved skills/competence or knowledge on

certain levels. DRIVES Digital Badges are shown on the trainee dashboard and they can share them on social media and use them in their further careers.

### 3.2.1 Mapping to Open Badges Standard

The Open Badges standard<sup>8</sup> is a technical specification describing how to create, issue, endorse, verify, and exchange interoperable Open Badges. The standard is publicly available and free for anyone to use. IMS Global Learning Consortium manages the Open Badges standard; the Mozilla Foundation originally released it.

Issuing Open Badges requires constructing and publishing a set of interconnected resources that follow the structure and guidelines set out in the Open Badges standard. More information on the Open Badges standard and its terms can be found in the **ANNEX A: Open Badges Specification Terms**.

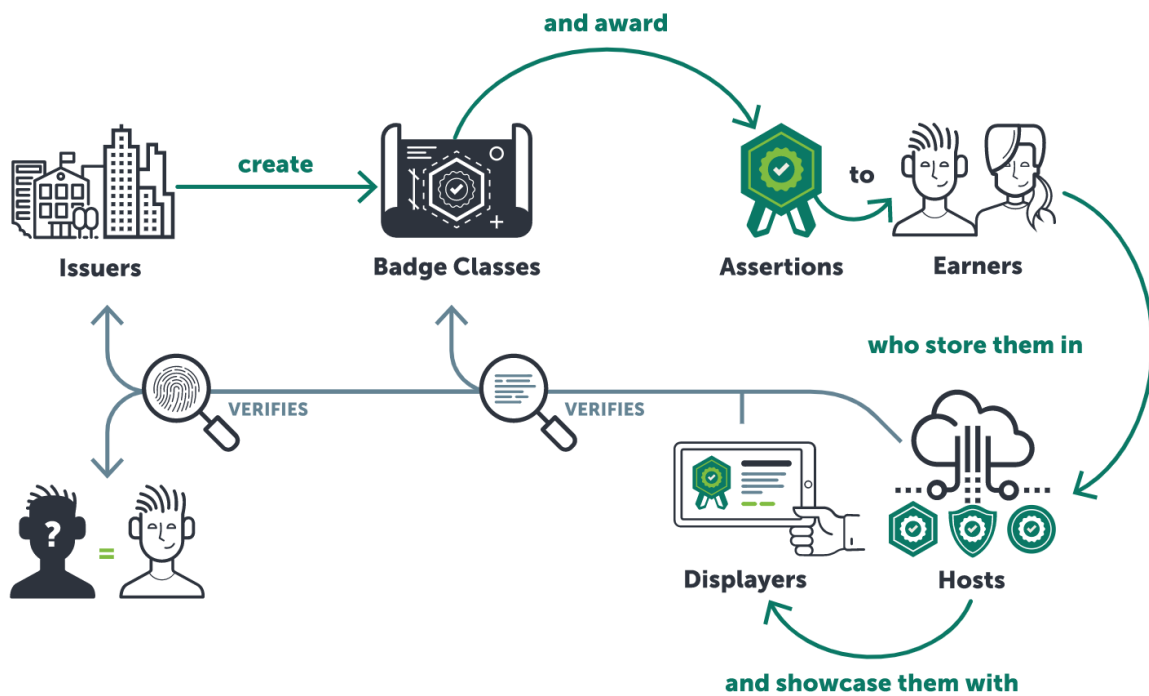


Figure 8 Open Badges Ecosystem

<sup>8</sup> Digital Badges. Digital Badges | IMS Global Learning Consortium. (1970, January 1). Retrieved November 29, 2021, from <https://www.imsglobal.org/activity/digital-badges>.

### 3.2.2 Types of DRIVES Digital Badge

Based on the progression or completion of the training/course, multiple types of DRIVES Digital Badges are issued. The type of badge comes with a set of rules and criteria that must be fulfilled to issue the badge. There are two basic types of badges:

- **Grey DRIVES Digital Badge**

- Grey DRIVES Digital Badge is awarded for a certain amount of time spent studying the course and the number of topics of modules finished or finishing the course exam, which does not fulfill the recognition criteria. There is a grey badge for each skill/competence or knowledge on a certain DRIVES Level of Maturity mapped to the training.

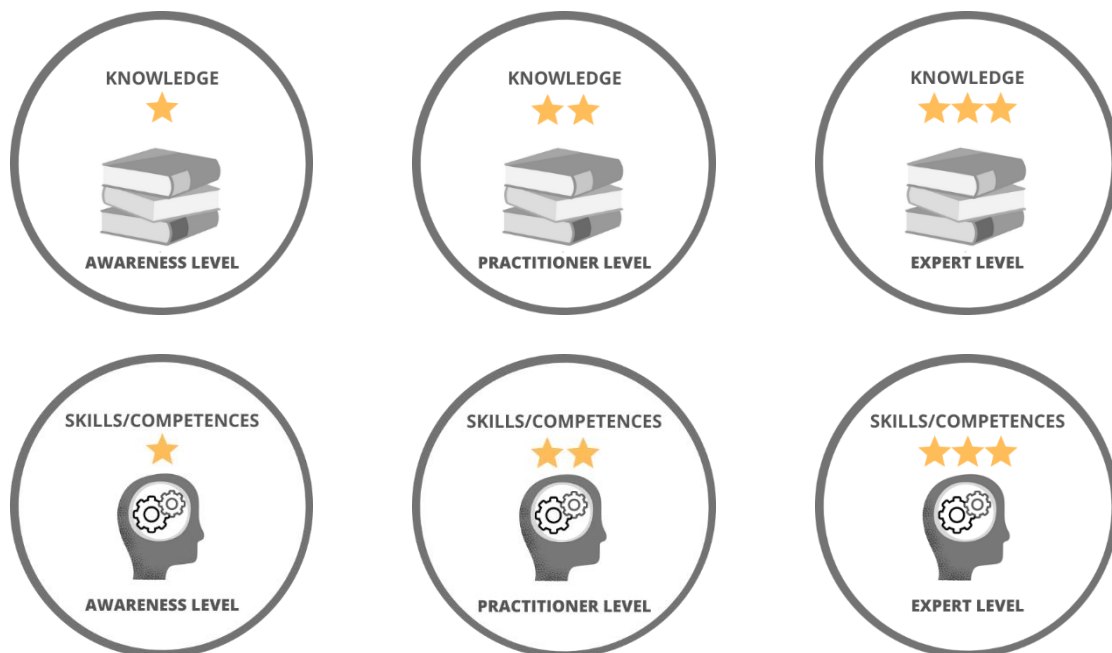


Figure 9 Grey DRIVES Digital Badge Design

- **DRIVES Digital Badge Recognized (Golden Badges)**

- Recognized digital badges are automatically awarded for the courses – meaning that the golden badges will be awarded. These badges are awarded when fulfilling one of the following criteria:
  - **Conformity Assessment ISO:17024** – when the training is created within the system and certification information is specified, when certification is in line with ISO:17024, golden badges are awarded.
  - **ECTS Credits** - when the training is created within the system and information on ECTS credits awarded is specified, golden badges are awarded.



- **ECVET Credits** - when the training is created within the system and information on ECVET credits awarded is specified, golden badges are awarded.



Figure 10 Recognized Golden DRIVES Digital Badge Design



### 3.2.3 Issuing of DRIVES Digital Badge

DRIVES Digital Badge is issued on training completion, as described in the previous section. The training provider verifies the training for a certain trainee and the badge is issued for the specific set of skills/competence and knowledge on corresponding levels of maturity. Badges are visible on a trainee's profile and all the features are available. DRIVES Digital Badge can be issued by following methods

- (1) The automatic – API - training provider fills in the information needed to verify successful training completion through the API interface that is implemented on the provider's side. The trainee receives the DRIVES Digital Badge.**
- (2) In the case of manual verification, the process is executed manually in the DRIVES Framework online platform itself by a registered training provider. Further API descriptions and examples of training plugins are provided within deliverable 4.4.1<sup>9</sup>.**

### 3.2.4 Sharing

DRIVES Digital Badges can be managed by trainees in the DRIVES Framework. It is possible to share the badge outside the DRIVES Framework. It is also possible to embed the badge on different websites and social media. Sharing of the digital badge is important for simple and effective trainee recognition by the industry, guide is accessible on the DRIVES Framework.

- (1) Link provision** - due to the nature of the DRIVES badges and its assertion (achievement information) being available for public sharing, it is possible to share the achievement URL link.
- (2) Social media** – public achievement link is possible to share on social media.
  - a. LinkedIn** – LinkedIn provides a possibility to create certification or achievement information on user profiles. It is possible to create a badge certification under the official project DRIVES LinkedIn profile to embed and link the badge on the user profile.
- (3) Website embedding** – HTML snippet is provided for the user who would like to embed the achievement on his website.

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<sup>9</sup> Development and Research on Innovative Vocational Educational Skills. (2021). (rep.). Deliverable 4.4.1 DRIVES Framework API and Pilot Plug-in of Existing Courses.



## 4 DRIVES FRAMEWORK ECOSYSTEM

This section describes the DRIVES Framework Ecosystem. As mentioned before, the DRIVES Framework revolves around job roles and skills/competence and knowledge reference definition, which must be updated frequently and continuously. The continuous update is achieved by the DRIVES Framework Ecosystem which is described in the following section.

### 4.1 MAIN ENTITIES IN THE DRIVES FRAMEWORK

DRIVES Framework considers multiple users in the system who have different types of permissions. There are three main types of entities that are active in the system.

- **Trainee:** is a user who is seeking the up-skilling or re-skilling and searches in the platform to find useful and interesting training/courses that he can attend. His progress is being tracked and DRIVES Digital Badges are being collected by him. The trainee can do a self-assessment where he can set up his goals and envision his training/career path through the DRIVES Framework.
- **Training Provider:** is a user who is providing the courses in the system. Provider plugs the courses or training into the system, manages the trainees that are attending, and verifies the training completion for them to earn the DRIVES Digital Badges. In simple words, providers are advertising their courses on the DRIVES Framework platform.
- **Experts Community**
  - **Working Group:** is a group of Experts. This group contains certain reference job roles, skills/competence, and knowledge managed and updated by the group of experts. Working Group is led by Leader.
  - **Expert:** is a user that is associated with a certain Working Group. Expert is a part of the Working Group and can propose changes implemented by Working Group Leaders. The leader manages the pending users that are waiting to be approved as a Leader or Expert.
  - **Leader:** is the user implementing the changes to the reference job roles, skills/competence, and knowledge in the domain group and manages other experts in the group.
- **Corporation Admin**
  - A corporation admin is an entity that has access to and can manage the company in the system. A company is a set of linked users. Company admin case the overview of the user in a term of achieved skills and job roles, other users and their promotion to admins within the company can be managed as well.



## 4.2 WORKING GROUPS

Domain Groups must be established before the experts are assigned. The following set of Domain Groups is active in the DRIVES Framework:

- Engineering
- Materials Planning and Logistics
- Purchasing
- Quality
- Manufacturing
- *DRIVES Project*
- *Electronics Packaging (APTE – ASA Electronics Packaging Group)*
- *Additive Manufacturing (SAM Project Concept Repository)*

\* bullet points in *italics* are specific working groups of different projects.

Working groups are adjusted based on the needs of the experts and the industry. Working groups can also serve as a repository of knowledge of different blueprint projects and other initiatives. As visible above, project DRIVES members to have a working group for the job roles developed within the project. Another example is an electronics packaging (group around APTE and their electronics packaging consortium) or an additive manufacturing group (group around the SAM project).

## 4.3 CHANGE MANAGEMENT

The DRIVES Framework enables all users to flexibly propose changes to the system via change requests. This means that the user fills in the change request template based on the change request type and it is further processed by the expert community on the domain groups level or by the developers of the platform. These requests for changes will be periodically reviewed and implemented by the community and the requestors will be updated about the status.

### 4.3.1 Domain Group Change Management

Domain group is a set of reference job roles, skills/competence and knowledge, and a set of experts and leaders. Based on the discussion, leaders implement the changes within the domain group. This could mean editing existing ones, creating new ones, or deleting those already in the system.



## 4.4 PROVIDER VERIFICATION

To ensure correct mapping of the learning outcomes of the training/education, it is necessary to verify the provider during the registration process. Set of requirements, to be met by the provider during the registration, consists of:

- Affiliation to the Organization or Company
  - Private entities that provide training/courses also accepted
- Website
- One of the following certifications or standards to be uploaded (optionally):
  - ISO/IEC 17024 Standard for Personnel Certification Programmes
  - ISO/IEC 17021 Conformity Assessment – Requirements for Bodies Providing Audit and Certification of Management Systems
  - Other examples of certifications can be found in the **ANNEX B: Examples of Relevant Certification per Country**
- Provision of the provider description (*optionally*)

After all, fields are filled in, the provider is registered and is active in the system, but provided material can be reviewed and audited at any time, this could lead to canceling providers registration if the provided material does not meet defined requirements or other rules (general terms of use are being showcased during the first log-in to the platform) are violated.



## 5 DRIVES PLATFORM FEATURES

This section describes the main features of the DRIVES Framework:

- **Feature 1 (F1)** – Search;
- **Feature 2 (F2)** – Progress Tracking and Achievements;
- **Feature 3 (F3)** – Expert Community;
- **Feature 4 (F4)** – Training Plug-in;
- **Feature 5 (F5)** – Training Management;
- **Feature 6 (F6)** – Training Completion Verification;
- **Feature 7 (F7)** – Good Practice Resource Tool;
- **Feature 8 (F8)** – Apprenticeship Comparison Tool;
- **Feature 9 (F9)** – API
- **Feature 10 (F10)** – Company Overview
- **Feature 10 (F11)** – Apprenticeship Toolkit

## 5.1 SEARCH

DRIVES framework enables one to search for training offers. Users can choose from a wide variety of search criteria from full-text search to specific queries. The training course can be searched for by (1) multiple skills/competence or knowledge that are mapped to the course and its levels of maturity; (2) multiple job roles that match with the mapped skills/competence and knowledge; (3) multiple training providers; (4) delivery method – online or onsite; (5) multiple countries in a case that courses are provided onsite; (6) language; (6) certificate; (7) domain group (working group); (8) organization areas within the organization value chain; (9) EQF levels; (10) price range; (11) attendee limit; (12) ECTS and ECVET points; and (13) date.

Resulting training courses can be viewed in more detail – general information, mapped skills/competence and knowledge, and related job roles that are covered by the course by a certain percentage, users can traverse from the detailed view of the training course to the mapped skills/competence and knowledge elements or job roles – each element has its detailed view.

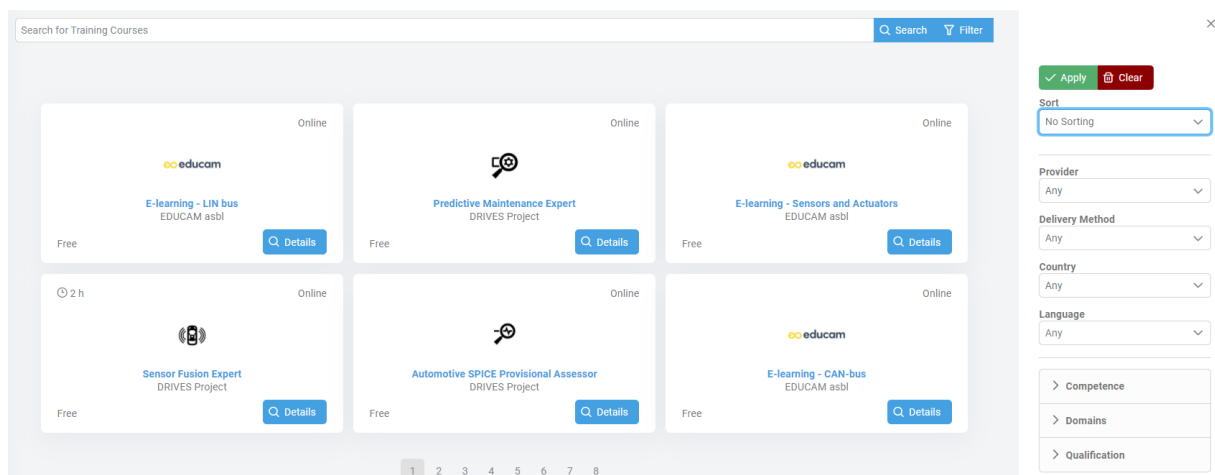


Figure 11: DRIVES Search



## 5.2 PROGRESS TRACKING AND ACHIEVEMENTS

Each user can track progress and see achievements. DRIVES Framework stores information about completed training courses and skills/competence and knowledge achieved by completed training. Additionally, it is possible to see the progress when it comes to the job roles, this progress is calculated based on the obtained skills/competence and knowledge on a certain level. As mentioned in section 4.2.3, users can see and manage issued digital badges – the possibility to share individual badges or a summary overview is provided.

**My Progress**

Completed Trainings **My Skills/knowledge** My Job Roles Wishlist

« 1 2 »







Name	Type	Obtained	Most recent best training	Badge Achievement
Homologation	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Awareness (29-11-2021)	
Functional Safety	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Practitioner (29-11-2021)	
Product Lifecycle Management	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Expert (29-11-2021)	
Embedded Automotive Systems	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Awareness (29-11-2021)	
cyber security	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Awareness (29-11-2021)	
hybrid control systems	knowledge	1x	ECQA Certified Electric Powertrain Engineer, Practitioner (29-11-2021)	

Figure 12: User Progress



### 5.3 EXPERT COMMUNITY

This feature was already described as a part of section 4.3. Users are provided with the interface that allows them to apply for a certain working group, be accepted, and become experts or leaders. After the application is accepted, experts can observe the working group content and leaders can manage the definitions – addition, update, or deletion of the elements. Leaders can manage the users in the working groups in which they are in charge.

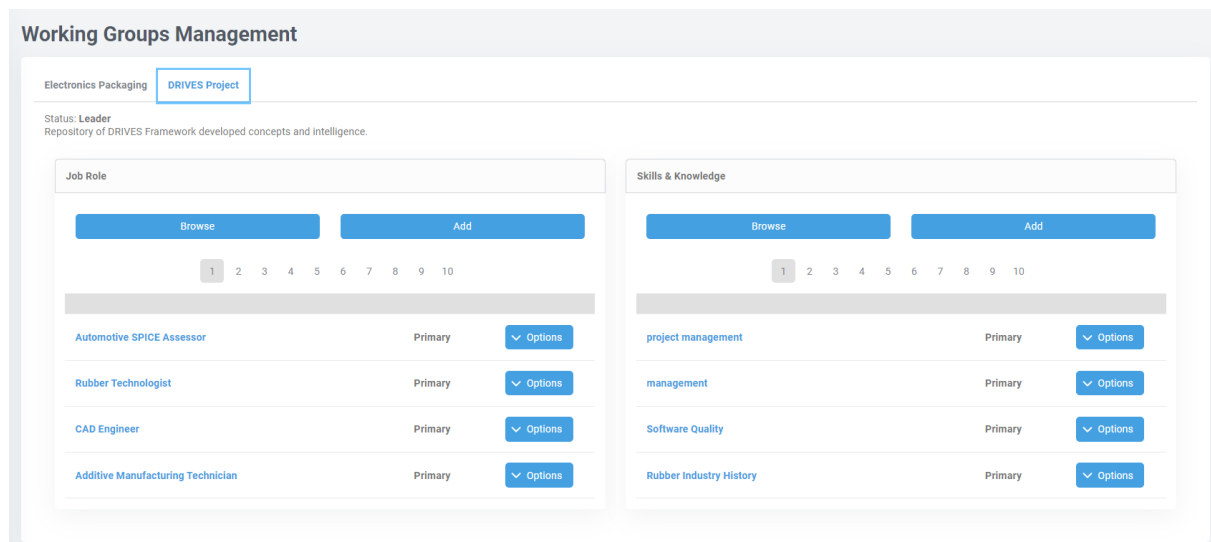


Figure 13: Expert Community - Content Management

### 5.4 TRAINING PLUG-IN

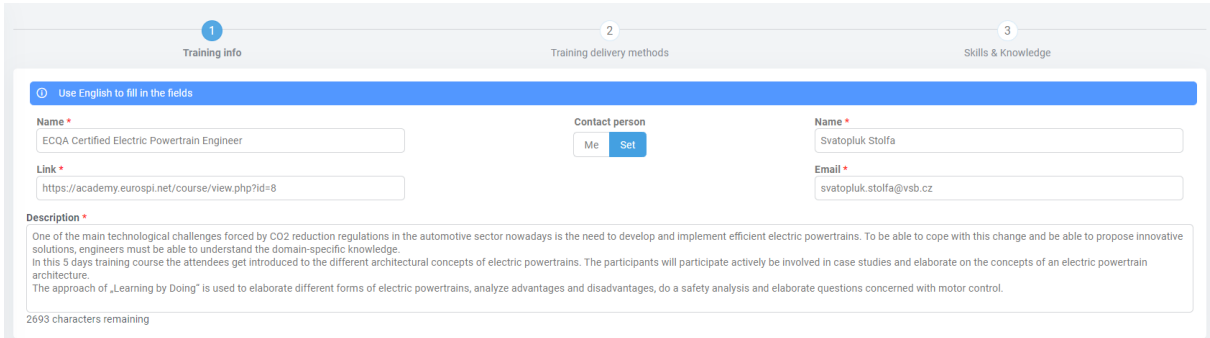
This feature is used by training providers when creating a new course. The following information is filled: (1) mandatory – name, description, link to the actual training course and contact person; (2) optional – length in hours/days/weeks, prerequisites, organization area – value chain (Porter), training proof, ESCTS and/or ECVET points, and EQF levels. As a second step, the delivery method is specified, this could be either (1) online delivery method – description, language, date, and attendee limit can be specified; or (2) onsite delivery method with the addition of country, city, and address information that must be specified. The training course can be delivered by multiple methods.

As a third and final step, the skills/competence and knowledge are mapped to the training offer – one of the three levels of maturity is chosen for each of them. The training provider chooses the elements from the database that contain ESCO definitions and the concepts created by the Expert Community or by the providers themselves when creating a new course – this feature is available to ensure that the training can be mapped according to reality. Elements created by the training providers during this process are not associated with any working group and can be associated by the Expert community in the future.

After the training course is created and saved, it can be instantly found on the platform by the trainees.

## 5.5 TRAINING MANAGEMENT

As soon as the training provider has created several pieces of training in the platform, they can be managed – edit the course, edit the delivery methods of the course, and set the training as deactivated (not visible to the public) or activated (visible to the public) depending on the status.

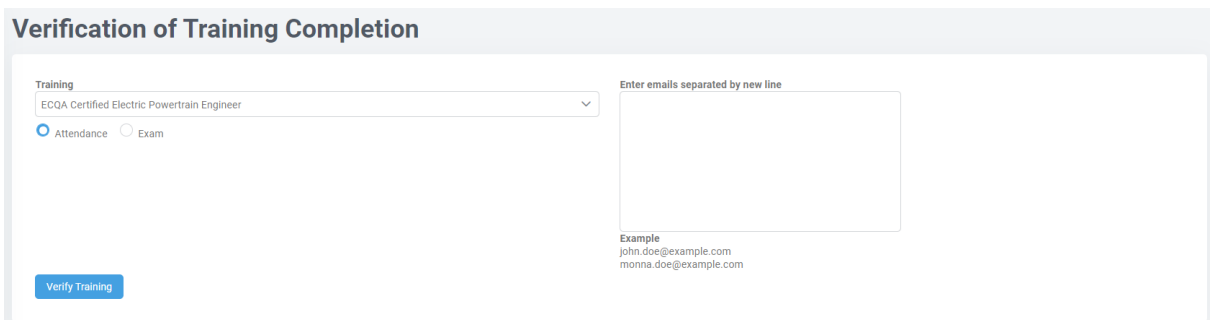


The screenshot shows a web form titled "Training Plug-in" with three tabs: "1 Training info", "2 Training delivery methods", and "3 Skills & Knowledge". The "Training info" tab is active. At the top, there is a blue bar with the text "Use English to fill in the fields". Below this, there are several input fields: "Name" (containing "ECQA Certified Electric Powertrain Engineer"), "Link" (containing "https://academy.eurospi.net/course/view.php?id=8"), "Contact person" (with "Me" and "Set" buttons), "Name" (containing "Svatopluk Stolfa"), and "Email" (containing "svatopluk.stolfa@vsb.cz"). A "Description" field contains text about CO2 reduction regulations and electric powertrains. At the bottom left, it says "2693 characters remaining".

Figure 14: Training Plug-in

## 5.6 TRAINING COMPLETION VERIFICATION

This feature is available to the training providers who have active training in the platform, and they want the badges to be issued to the trainees who completed the course. Training providers need to possess the information about the trainee (email address) and the training completion type needs to be chosen. Verification is successful if the user with a specified email exists in the system and did not previously complete the training with the same type of completion type – the user will receive an email saying that they completed the course and that the badges were issued as an achievement.



The screenshot shows a form titled "Verification of Training Completion". It has a "Training" dropdown menu set to "ECQA Certified Electric Powertrain Engineer". Below the dropdown are two radio buttons: "Attendance" (selected) and "Exam". To the right, there is a large text area labeled "Enter emails separated by new line". Below this area, there is an "Example" section with the text "john.doe@example.com" and "monna.doe@example.com". At the bottom left, there is a blue button labeled "Verify Training".

Figure 15: Training Completion Verification

## 5.7 GOOD PRACTICE RESOURCE TOOL

The Good Practice Resource is a searchable tool that currently comprises a wide range of case studies highlighting innovative practices concerning different aspects of apprenticeship development, design, and delivery, of particular relevance to the automotive sector. It is planned that the scope of the Good Practice Resource is widened beyond a focus on apprenticeships to include innovative practices with all training and skills development issues of relevance to the automotive sector, with a particular focus on re-skilling and up-skilling in companies and other institutions. Each case study has a defined structure – name, summary, background, product definition, implementation, challenges, outcomes, benefits, lessons learned, practical tips, and further resources. This information provides an overview of particular innovative practices that could be replicated to enhance re-skilling, up-skilling, and other skills development of the workforce. The example case study can be found in [10].

Each case study is mapped to keywords and themes that help create a search hierarchy and linkage to similar case studies. The Good Practice Resource case studies can be searched by themes, keywords, or full-text. Contents of the case study can be viewed on the platform or downloaded in PDF format. A detailed description of each detailed theme is also available on the platform.

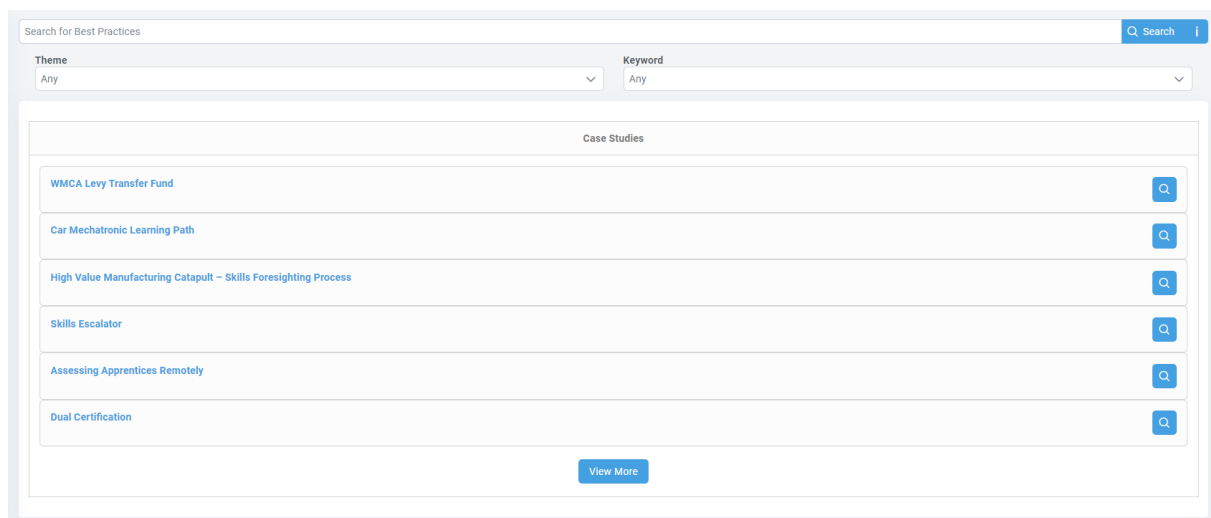


Figure 16: Good Practice Resource

## 5.8 APPRENTICESHIP COMPARISON TOOL

The Apprenticeship Comparison Tool is a tool for searching and comparing automotive-related apprenticeships across different countries based on multiple criteria including (1) job roles and occupations; (2) age range; and (3) EQF Levels. As is the case with other training courses, Apprenticeships are mapped to skills/competence and knowledge and thus job roles – Apprenticeships also have an additional linkage to job roles which are predefined for each apprenticeship and not based on the mapped skills/competence or knowledge. Other specific fields are: (1) age range; (2) wider occupation links; (3) progression; (4) professional recognition information; (5) funding information.

### 5.8.1 Apprenticeship Toolkit

The Apprenticeship Toolkit is a set of resources created for companies that will help them to attract and enroll more apprentices within their companies. A guide in the style of the booklet is provided in the form of a roadmap or step-by-step guide, which also includes links to further resources.



Figure 17: Apprenticeship Toolkit Frontpage



## 5.9 API

An Application Programming Interface (API) is provided mainly for the training providers interested in integrating the DRIVES Framework and having easier workflow. API provides an interface for operations on training courses that are provided within the system by the specific provider, it also facilitates the behavior that can be done by the provider in the system, such as training management, training creation, or verification of completion. API also provides the possibility to register users if the necessary information is provided, this enables the easy platform to platform migration of the users if needed. It is also possible to use the API for fetching the information of the user achievements<sup>10</sup>.

## 5.10 COMPANY OVERVIEW

DRIVES Framework platform provides a possibility to register as a company that can oversee their employees' progress.

A simple company profile is created during the registration, or after through the user profile, this enables to see an interface that enables the manager of the company profile (one or many) to invite their employees. The manager of the profile will have a possibility to see the achievements of all assigned users in the company (gained skills/competencies + gained badges, or progression on job roles).

It is also possible to promote assigned users to managers of the company.

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<sup>10</sup> Development and Research on Innovative Vocational Educational Skills. (2021). (rep.). Deliverable 4.4.1 DRIVES Framework API and Pilot Plug-in of Existing Courses.



## 6 STEPS FORWARD AND SUSTAINABILITY

DRIVES Framework as a concept will be further enhanced and adjusted based on the pilot and full run of the DRIVES Framework platform, the first implementation of the DRIVES Framework (this also means that this document may be updated in the future to assure the up-to-date information provision to the potential users of the platform).

DRIVES Framework platform will be further used after the project DRIVES ends and will further serve in the Automotive Skills Alliance as a support tool used as a re-skilling and up-skilling database (training, reference skills/competence, or job roles concepts defined by experts).

Further sustainability topics are discussed in the designated deliverable D4.5.

## REFERENCES

Footnote	Reference
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3	Allen, J., Velden, R. van. (n.d.). When do skills become obsolete, and when does it matter? Research in Labor Economics, 27–50. <a href="https://doi.org/10.1016/s0147-9121(02)21004-3">https://doi.org/10.1016/s0147-9121(02)21004-3</a>
4	Reskilling and Upskilling: A Strategic Response to Changing Skill Demands. TalentGuard. (2021, February 15). <a href="https://www.talentguard.com/blog/reskilling-upskilling-strategic-response-changing-skill-demands">https://www.talentguard.com/blog/reskilling-upskilling-strategic-response-changing-skill-demands</a>
5	Cedefop(2020). Empowering adults through upskilling and reskilling pathways. Volume 1: adult population with potential for upskilling and reskilling. Luxembourg: Publications Office of the European Union. Cedefop reference series; No 112. <a href="http://data.europa.eu/doi/10.2801/475393">http://data.europa.eu/doi/10.2801/475393</a>
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8	Digital Badges. Digital Badges   IMS Global Learning Consortium. (1970, January 1). Retrieved November 29, 2021, from <a href="https://www.imsglobal.org/activity/digital-badges">https://www.imsglobal.org/activity/digital-badges</a> .
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## 7 ANNEX

### 7.1 ANNEX A: OPEN BADGES SPECIFICATION TERMS

**Issuer Profile** describes the individual or organization awarding badges. Information about the organization appears in the metadata for all badges, including name, description, contact email address, and website URI.

**BadgeClass** is the formal description of a single achievement the issuer recognizes. This includes all the necessary information on name, description graphic image, links to detailed criteria for how the badge may be earned, and the issuer's profile. BadgeClass also contains information on how to access the human-readable criteria page and the image file must be published at a stable URL. Many assertions may be issued from a single BadgeClass.

**Assertion** is the record of an individual's achievement of the badge. The assertion links to one BadgeClass and contains the information specific to one recipient's achievement of the badge's criteria, like the date it was awarded, encoded recipient identifier, and optional links to evidence and expiration date.

**Issuer** is an application that enables the creation of BadgeClasses and the issuing of assertions to earners.

**Displayer** is an (external) application that displays Open Badges with their associated metadata and offers verification functionality.

**Host** is an application that can import, aggregate, and publicly host Open Badges for earners while also supporting the export of badges at the recipient's request.

Open Badges support a variety of powerful features:

- **Alignment:** Open Badges may include URLs that point to the official description of the target of the alignment. For example, a badge may be aligned to competency or academic standards published in an external framework.
- **Criteria:** Open Badges can contain detailed information about the requirements needed to earn the badge.
- **Endorsements:** Open Badges can contain endorsements (claims of support made by third parties) regarding BadgeClasses, Assertions, or Issuers. For example, a professional association might endorse an educational institution's badge offering (BadgeClass), or an internship supervisor might endorse an Assertion issued to an intern related to workplace professionalism.
- **Multi-lingual:** Open Badges can use tags to declare the language in which the badge object is written. There is a possibility to have multiple language versions of the badge.





- **Revocation:** Open Badges may be revoked by issuers, if necessary.
- **Verification:** Metadata about the badge, recipient, and issuer are verifiable using one of two available verification methods. Verification simply checks if the metadata of the badge (mainly the stable URI of the assertion and BadgeClass) exists. Verification of digitally signed assertions is available as well.



## 7.2 ANNEX B: EXAMPLES OF RELEVANT CERTIFICATION PER COUNTRY

### General Standards

- EN ISO/IEC 17024 standard for personnel certification programmes
- ISO/IEC 17021 Conformity assessment - Requirements for Bodies Providing audit and certification of management systems (<https://isoupdate.com/standards/iso17021/>)

### National Certifying Bodies/Documents for training

#### 1. Austria

- European Organization for Quality <https://www.eoq.org/>, Europe wide standard for the certification of quality professionals

#### 2. Portugal

- Legal requirements from DGERT (Direcção Geral do Emprego e das Relações de Trabalho) is the body responsible for the certification of training providers in Portugal. (<https://www.refernet.pt/en/news/certification-of-training-providers.html>)
- A declaration that belongs to a university system by the Ministry of Higher Education.

#### 3. Spain

- Legal requirements from SEPE (Servicio Público de Empleo Estatal) + Competent bodies of the Autonomous Communities are the bodies responsible for the issue of certificates of professionalism. (<https://sepe.es/HomeSepe/>)

### Recognized Certification Bodies

- **Austria**
  - TÜV AUSTRIA
  - Akkreditierung Austria, the Austrian National Accreditation Body <https://www.bmdw.gv.at/en/Services/Akkreditierung/Akkreditierung-Austria.html>
  - Quality Austria <https://www.qualityaustria.com/en/company/akkreditierung/>
  - Austrian Standards <https://www.austrian-standards.at/en/products-solutions/certification/personal-certification>



- Ö-Cert <https://oe-cert.at/ueber-uns/>, (only in German), e.g. Mobility Cluster AC Styria Academy certified via Ö-Cert
- Wien-cert <https://wiencert.oeibf.at/> (only in German)
- WIFI Zertifizierungsstelle (EN ISO/IEC 17024)  
[https://zertifizierung.wifi.at/zertifizierungwifiat/personenzertifikate/dienstleistung/trainee-rin-erwachsenenbildung/zertifizierung\\_trainerin\\_erwachsenenbildung](https://zertifizierung.wifi.at/zertifizierungwifiat/personenzertifikate/dienstleistung/trainee-rin-erwachsenenbildung/zertifizierung_trainerin_erwachsenenbildung) (only in German),  
personal certification for adult education
- **Denmark**
  - [Bureau Veritas Denmark](#)
  - DNV GL
- **Finland**
  - Kiwa Inspecta
  - Inspecta Sertifointy Oy
- **France**
  - BSI
  - AFNOR
- **Germany**
  - DEKRA Certification GmbH
  - DNV GL Renewables Certification
  - Bureau Veritas Certification
  - AssZert Zertifizierungsgesellschaft mbH
  - TÜV Technische Überwachung Hessen GmbH
  - DQS Holding GmbH
- **Greece**
  - TÜV AUSTRIA HELLAS
  - TÜV Hellas (TV Nord) S.A
  - MIRTEC S.A.
- **Italy**
  - Bureau Veritas Italy
  - BSI
  - CISQ – Federazione Certificazione Italiana dei Sistemi
- **Lithuania**



- LLYOD'S REGISTER EMEA Klaipeda branch
- **Netherlands**
  - TÜV Nederlad
  - Bureau Veritas Inspection and Certification B.V. the Netherlands
- **Poland**
  - Lloyd's Register Polska Sp. Z o.o.
  - DNV GL Poland
  - Bureau Verritas Polska SP Z O. O.
  - PCBC – Polish Centre for Testing and Certification
- **Portugal**
  - Bureau Veritas Certification
  - SGS ICS, Lda
  - APCER
  - TUV RHEINLAND PORTUGAL
  - LLOYD'S REGISTER PORTUGAL
- **Romania**
  - Bureau Veritas Romania
  - INTERTEK INDUSTRY SERVICES ROMANIA SRL
  - SRAC CERT
- **Spain**
  - SGS International Certification Services Ibérica, S.A.U.
  - Bureau Veritas Iberia
  - AENOR INTERNATIONAL S.A.U.
  - Lloyd's Register Quality Assurance Espana
  - TÜV RHEINLAND IBERICA CERTIFICATION & TESTING S.A.
  - BSI
- **Turkey**
  - Bureau Veritas Turkey
  - TSE – Turkish Standards Institution
- **United Kingdom**
  - AFNOR UK



- BSI
- SGS UK
- Bureau Veritas Certification UK Limited