Automotive Skills Alliance—From Idea to Example of Sys/SW International Standards Group Implementation

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Abstract. This paper introduces the initiative, in the form of a working group led by Valeo, under the Automotive Skills Alliance (ASA) [1] the EU and stakeholder wide partnership which focuses the skills development and re-up-skilling within the automotive-mobility sector. The focus, mission, and objectives of the ASA and the group are outlined as a follow-up to the project DRIVES [2] results and how the group will further elaborate on the development of job role and skills definitions in a field of System and Software international standards.

Keywords: Skills · Job roles · Automotive · Sw/sys international standards · Process improvement · Skills needs · Collaboration · Networking

1 Introduction of ASA

Automotive Skills Alliance (ASA) is a European and stakeholder-wide partnership focused on the collaboration on the skills agenda within the Automotive-Mobility Ecosystem and all linked sectors. ASA launched in November 2020 (see [3]) and became a legal entity (non-profit organization) in January 2022.

1.1 Focus, Mission, and Objectives

ASA is focused on the re-up-skilling of employees in the automotive sector, developing/gathering intelligence and fostering dialogue among all relevant partners and stakeholders within the ecosystem whilst supporting the elaboration of specific plans for re-up-skilling and training of those who work in the sector.

The ASA mission is to contribute to a better coordination of relationships at the European level of all the relevant national or regional stakeholders in the ecosystem to ensure and develop a common platform for collaboration and sharing best practices. ASA intends to ensure continuous, pragmatic, and sustainable cooperation on the skills agenda in the ecosystem. A more detailed description of the objectives can be seen in Fig. 1.
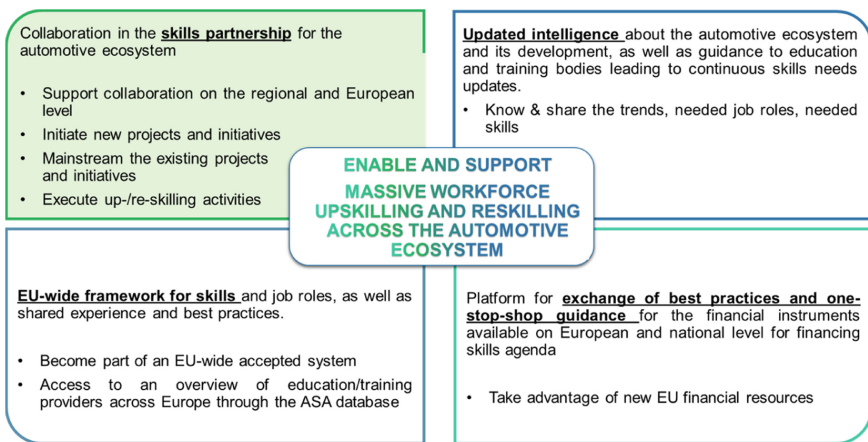

Collaboration in the **skills partnership** for the automotive ecosystem

- Support collaboration on the regional and European level
- Initiate new projects and initiatives
- Mainstream the existing projects and initiatives
- Execute up-/re-skilling activities

Updated intelligence about the automotive ecosystem and its development, as well as guidance to education and training bodies leading to continuous skills needs updates.

- Know & share the trends, needed job roles, needed skills

ENABLE AND SUPPORT MASSIVE WORKFORCE UPSKILLING AND RESKILLING ACROSS THE AUTOMOTIVE ECOSYSTEM

EU-wide framework for skills and job roles, as well as shared experience and best practices.

- Become part of an EU-wide accepted system
- Access to an overview of education/training providers across Europe through the ASA database

Platform for **exchange of best practices and one-stop-shop guidance** for the financial instruments available on European and national level for financing skills agenda

- Take advantage of new EU financial resources

Fig. 1. Objectives of the ASA

1.2 Ambition and Commitments

The overall ambition of the ASA is to:

1) upskill 5% of the workforce each year (resulting in 700 000 employees re-upskilled) through the regional implementation and ongoing projects;
2) to start implementation of pilot projects in selected regions.

Additionally, the first set of KPIs include:

- number of workers to be reoriented and upskilled;
- number and skills profiles of new jobs created;
- number of agreed personal development plans;
- number of successful trainings certifications;
- number of workers entering a new or revised job position;

– number of involved stakeholders and coverage of the ecosystem, countries, and regions.

1.3   Partnership and Collaboration

As of now, the ASA brings together over 80 organizations consisting of: training and education providers, social partners, consultancy, technology centers, as well as regions and municipalities. The full list of partners can be found on the project's website [1].

The variety of partners enables networking and collaboration on important issues to form several project partnerships under the ASA. which is one of the main cornerstones, as it is built upon the skills agenda for the ecosystem, namely:

– The Blueprint project on Strategic Sectoral Skills Collaboration in Automotive Sector. Focused on skills needs & offer, recognition of training and development in the automotive sector [2].
– The Blueprint project on Strategic Sectoral Collaboration in Batteries for Electromobility Sector. Focused on skills needs & offer, support of training developments in the battery sector [4].

1.4   Onboarding for the ASA

It is possible to join this group by joining the ASA (JOIN—AUTOMOTIVE SKILLS ALLIANCE), either as a natural person or a legal entity and specifying the interest in WG3.6 Sys/SW International standards or to fill in the dedicate Google form (ASA WG 3.6 [International Sys/SW Standards] Registration Form) and then to register as ASA member.

1.5   Project DRIVES

As mentioned before, ASA is built on the work done in the project DRIVES which ran from 2018 until March 2022 with 24 full partners from 11 EU countries. The main objectives of DRIVES Project can be divided into three streams:

1) **Sectoral Intelligence**—analysis of key trends; definition of the skills and job roles needs; analysis of the existing training offer; identification of skills gaps within the industry [5].
2) **Recognition**—to ensure mutual recognition of the skills and job roles across the EU and to create the EU-wide framework that can be used throughout the EU and implemented in the EU Regions [6].
3) **Training Offer**—create training courses for selected skills and job roles in the automotive sector; provide 1100 training courses as a pilot project across the EU and across the education and training institutions; and provide a clear guide for the education and training providers on skills needs of the Automotive Industry [7].

All streams can be found further explored in the ASA, where further work on sectoral intelligence continues to take place as part of specific working groups and sub working groups that focused on different topics, providing recognition tools and an EU-wide framework piloted and implemented via the EU-wide DB [8], having a training offer publicly available within the ASA Learning Platform [9].

1.6 Overview of ASA Working Groups

Members of ASA participate in Working Groups, each with a different topic and approach, with the purpose to involve as many stakeholders as possible. The Working Groups are depictured in Fig. 2, which also includes an indication of the leaders of the sub-working groups.

The structure of the Working Groups combines both a horizontal and a vertical approach. Working Groups are of a vertical nature and ASA member type groups represent a horizontal perspective. Each working group has clearly assigned inputs and outputs to ASA member type groups.
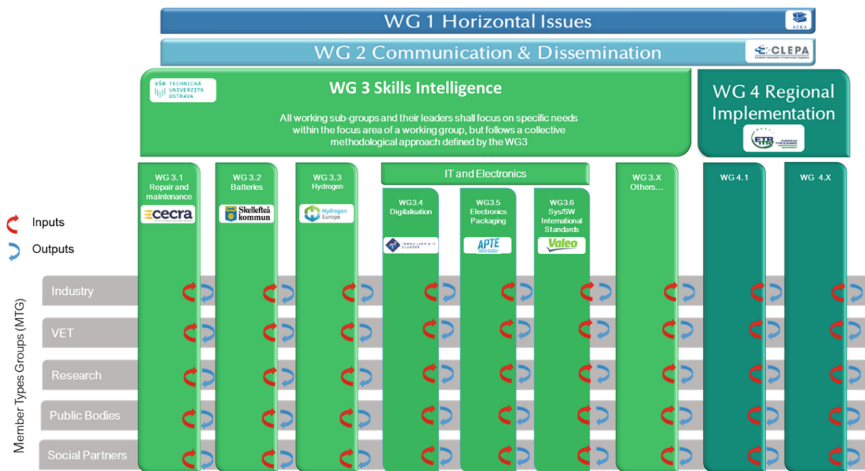
Fig. 2. Structure of working groups

2   Mission of Process Improvement Working Group 3.6

The future homologation of vehicles requires an increasing coverage of standards to fulfil the state of the art in electronic and software. The ASA IT Processes Improvement working group plans to support and disseminate best practices, job roles and training related to those new and constantly increasing IT standards.

International automotive standards represent a big portion of the OEM specific quality requirements for tier 1 suppliers to work in the automotive industry, so there is a need to focus on those related skills/job roles to empower the automotive suppliers in those standards which became very critical for the ecosystem.

Figure 3 depicts some examples of related norms:

Fig. 3. Example related norms

2.1 Organisation

The community is supported by EuroSPI & EG-SPICE communities under the ASA WG3.6 Group for International Automotive Standards for System & SW Development.

Main missions of the community:

1) Study the impact of those emerging standards on the existing Job Roles & Skills, propose necessary updates or new Job Roles & Skills.
2) Network and harness possible training courses in this area, initiate or create new training courses (the group is composed of industry, but also training and education providers, etc.).
3) Support the recognition of the Job Roles & Skills and training courses achievements by using ASA EU-wide DB, related and relevant tools (e.g. EuroSPI Academy).
4) Support of the good practice sharing.

2.2 Challenges

Another important aspect to be taken into consideration is represented by the challenges encountered by the Working Group 3.6 of the Automotive Skills Alliance focusing on Sys/SW International standards and Process Improvement initiatives. The challenges members of the Working Group come across can be categorized as organizational, technical, and strategic. As Working Group 3.6 consisting of multiple members, part of different organizations, difficulties in planning common meetings can even arise from simple topics such as choosing a meeting platform that is accepted by all involved parties. The technical challenges come as a result of the constantly evolving automotive industry. With standards being continuously updated and published their impact on the job roles can only be determined by a laborious analysis. On the other hand, internal ASA factors can also be regarded as challenges, as every Working Group must align to the globally defined eight ASA objectives.

Organizational challenges: This working group consists of members coming from different backgrounds, companies, as well as universities and research institutes. One challenge on this part is to depict how the management structure of the respective institutes is offering support regarding the activities of Working Group 3.6 of the Automotive Skills Alliance. A possible solution to this challenge is organizing workshops focusing on the overall aim of ASA and the benefits that each company could obtain from its employees' involvement in the activities of ASA. Furthermore, exploring the needs in terms of networking, exchanging support for bridging partnerships and exchange best practices is of utmost importance in order to ensure participation of stakeholders.

Technical challenges: As different standards are emerging in the continuously changing market, a real challenge is merging these standards with the job roles. A continuous process of studying the impact of the standards on these job roles is needed in order to create and implement an efficient structure. This way, new directions are to be found in current jobs or else, new jobs need to be created as new standards and trends are emerging within the industry.

Strategic challenges: Working Group 3.6 of the Automotive Skills Alliance focusing on Sys/SW International standards and Process Improvement initiatives and its goal is to support Objective 2—Ensuring systematic and harmonized EU-wide definitions of skills and job roles used in Automotive Ecosystems, as well as Objective 4, by Establishing a EU-wide umbrella framework based on commonly agreed definitions of skills, job roles and system of digital-badges ("micro-credentials") for individual workers across the Ecosystem. Therefore, the management of WG 3.6, as well as its strategy, should be continuously checked for the fulfilment of ASA objectives.

2.3   What Was Accomplished in 2021

During 2021, we started our close discussion with the ASA leaders in order to take some robust actions to support the idea of injecting the spirit of the Sys/SW Development into the different ASA working groups.

A EuroSPI & Valeo (represented in EG-SPICE) working group for IT and software in automotive has been formed and a EuroSPI chair for ASA has been appointed.

In Q4 2021, the initial milestone had been achieved which is forming the Sys/SW processes improvement working group under the IT working group (initially it had the name of WG 3.4.x which was changed to WG 3.6 after that).

With the support of EuroSPI, EG-SPICE, industry and academic partners, the initial set of members in this working group is 5 members by end of 2021.

3   Plan for 2022

The working has 3 main missions for 2022:

a. Increase number of members
One main mission for this year of 2022 is to increase popularity and credibility of the Automotive Skills Alliance among the stakeholders within the automotive industry. The

membership is free, there is the possibility that more than one representative for one organization to join.

The goal is to increase the number of members with the aim to have a broad range of experience and know-how that will be reflected in the different working groups.

b. Study current job roles in DRIVES project

As previously mentioned, one of the goals of the working group is to identify currently active job roles within the scope, update them according to the current trends (see the DRIVES paper [11]), standards, and needs and to further develop re-up-skilling opportunities. This goes along with making these job roles widely available as reference job roles via the EU-wide Database which was developed in DRIVES project and will be further maintained and used under the ASA.

This is connected to the training opportunities which can be plugged-in to the EU-wide DB with the linkage to the ASA Learning Platform which was developed under the DRIVES Project as well, where the training in form of MOOCs can be available to the potential trainees.

As an initial step, it is important to analyse already developed job roles within the DRIVES Project, all definitions can be found here [7]. More than 30 definitions of automotive job roles are provided via skills cards and via the skills browsing on the ISCN skills and Exam portal, furthermore the job roles are already mapped in the EU-wide DB and can be explored here [10]. The following DRIVES job roles were identified as relevant for the scope of the working group (as seen in Table 1):

Table 1. Selected job roles from project DRIVES

Job roles titles	Leaflet	Skills cards	Portal
Artificial Intelligence Technician	pdf	pdf	Browser
Machine Learning Engineer	pdf	pdf	Browser
Practitioner in Automotive Spice®	pdf	pdf	Browser
Automotive Cybersecurity Engineer	pdf	pdf	Browser
Automotive Cybersecurity Tester	pdf	pdf	Browser
Automotive Cybersecurity Manager	pdf	pdf	Browser
Functional Safety Manager Strategy Level	pdf	pdf	Browser
Functional Safety Project Manager	pdf	pdf	Browser
Functional Safety Engineer	pdf	pdf	Browser
Automotive Mechatronics Manager Awareness Level	pdf	pdf	Browser
Automotive Mechatronics Manager Basic Level	pdf	pdf	Browser
Automotive Mechatronics Expert	pdf	pdf	Browser
Automotive Mechatronics Developer	pdf	pdf	Browser
Automotive Engineer in Quality and Metrology	pdf	pdf	Browser

(*continued*)

Table 1. (*continued*)

Job roles titles	Leaflet	Skills cards	Portal
Lean Six Sigma Yellow Belt	pdf	pdf	Browser
Lean Six Sigma Green Belt	pdf	pdf	Browser
Lean Six Sigma Black Belt	pdf	pdf	Browser
Automotive Engineer in Tool and Die Production and Maintenance	pdf	pdf	Browser
Automotive Quality Engineer	pdf	pdf	Browser
Innovation Agent—Basic Level	pdf	pdf	Browser
Innovation Agent—Product Innovation	pdf	pdf	Browser
Innovation Agent—Organisation Innovation	pdf	pdf	Browser
Innovation Agent—Business Model Innovation	pdf	pdf	Browser

c. Improvement and update of the existing job roles

It is important that these job roles are further analysed, and the need for improvement or update is assessed accordingly. Additionally, other sources of information and reference job roles should be investigated in order to cover the full scope.

With the action steps taken, it is also important that the linked training material that was developed is synchronized with any changes made to the job roles definitions or that the new training material is developed with/considering the new job roles definitions.

Planning for the group activities in 2022 and 2023 can be seen in Fig. 4.
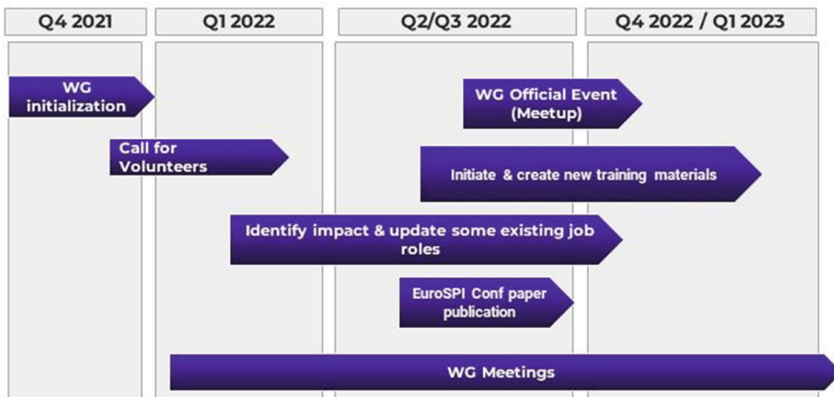
Fig. 4. WG3.6 roadmap for 2022/23

4   Summary and Conclusions

In this paper, we are sharing the experience about how the automotive industry & Academic partners can reach a milestone to mainly enrich the whole automotive ecosystem. WG 3.6 is a concrete example where the concerned parties related to Sys/SW development in the automotive industry are welcomed to sit together, study the impact of the different world changes, and assess the impact of these changers on the existing job roles.

Once the gaps were identified, some advanced training materials will be created & injected into the ecosystem to improve these identified skills gaps (Fig. 5).

Fig. 5. ASA benefits summary

5   Relation to SPI Manifesto

EuroSPI has the mission to discuss, share and exchange gathered knowledge concerning Software Process Improvement (SPI) among Europe [12]. To analyse and enrich existing project DRIVES job roles according to the current automotive needs. The defined SPI manifesto contains required principles for a most efficient SPI work.

The link from our paper and mission to the EuroSPI can be done to the principle "**Base improvement on experience and measurements**". This means that the job roles shall be improved based on experience and the current needs of the automotive industry to be able to improve the candidates search and ensuring that the candidates have the required skills as necessary.

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