

D.1.1.1 Synoptic Overview of the Skills of the Precision Farming Specialist

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1. PRECISION AGRICULTURE IN CENTRAL EUROPE

Precision Agriculture (PA) represents an epochal change in how agricultural activities are managed, integrating advanced technologies for optimized monitoring and resource management. Key PA technologies, such as IoT sensors, drones, autonomous driving systems, and Big Data, allow real-time data to be captured on soil, crops, climate, and machinery [1][2]. These technologies enable practices such as irrigation and fertilization to be optimized, reducing water use by up to 30% and improving fertilizer efficiency [3]. The use of drones and satellite imagery makes it possible to identify water stress, pests, and diseases early, enabling targeted interventions before problems escalate [4]. Autonomous driving systems simplify operations like planting and harvesting, minimizing waste and reducing operating costs through Global Positioning Systems (GPS) combined with yield maps [5].

One of the pillars of PA is advanced data analytics through Big Data and Artificial Intelligence (AI). Predictive models accurately forecast crop needs, improving planning and enabling proactive responses to climate change [6]. AI, through machine learning algorithms, can analyse historical farm data and suggest improvements to reduce losses and maximize profits [7]. PA thus offers an innovative response to global challenges, including population growth and climate change, by enhancing the resilience of the agricultural sector [8].

From an economic perspective, PA reduces operating costs, with productivity gains of 10–15% and cost reductions of 20–25% [9]. However, the economic impact varies by firms’ scale. Large farms benefit more due to their ability to spread implementation costs over larger areas, optimizing returns and operational efficiency. SMEs, while potentially gaining the same productivity and sustainability benefits, face higher relative costs during adoption [1]. This disparity highlights the importance of European tools such as the Common Agricultural Policy (CAP) and European Agricultural Fund for Rural Development (EAFRD) and other national funding programs like the National Recovery and Resilience Plan (NRRP) , which reduce entry barriers for SMEs, enable access to advanced technologies and favour the upskilling and reskilling of the employees [10].

At the European level, legislative frameworks and supporting policies are crucial to support the creation of new standards. The CAP integrates funds for transitioning to sustainable, digital farming, while Horizon Europe and EIP-Agri funds research on cutting-edge technologies [2][11]. In Central Europe, the NRRP has allocated substantial resources for digitizing agriculture, particularly to support SMEs in adopting technological tools for better resource management [12]. Regional policies have further driven adoption through innovation-focused initiatives.

Looking forward, technological innovations in PA are expected to evolve rapidly. Edge computing will process data on-site, improving real-time decision-making, while blockchain could enhance supply chain traceability and transparency [4]. Emerging technologies, such as autonomous machinery, will reduce labour requirements and improve efficiency, while AI-based predictive models will ensure greater resilience against climate change [6].

The versatility of PA allows its application to a wide range of crops and practices. For example, in viticulture, sensors monitor grape ripening and detect early diseases, enabling targeted interventions. In cereal farming, site-specific planting and fertilization technologies improve yield and reduce waste [1]. This flexibility makes PA suitable for both intensive and organic farming, promoting sustainable practices [5].

Adoption levels vary across Central Europe, as seen among AGRI-DIGITAL GROWTH project partners. Italy’s northern regions, like Veneto and Emilia-Romagna, have seen a 15% increase in digital technology use due to regional support, while Austria has a 12% adoption rate, focusing on organic farming [13]. Other countries, like the Czech Republic, Slovenia, Hungary, and Poland, are catching up with government and European initiatives and CAP funding [11].

Despite these advancements, challenges remain. Only 21% of European agricultural SMEs employ ICT specialists, compared to 77% of large enterprises, highlighting a skills gap [13]. Initial costs and a lack of technical expertise in rural areas further hinder adoption [7].

Precision Agriculture aligns with the European Green Deal by reducing chemical inputs by up to 40% and enhancing sustainable farming practices [14]. Furthermore, the role and collaboration between specialists is crucial. Precision Agriculture Specialists integrate technologies like agronomics, IoT sensors, drones, and GIS systems to optimize resource use and ensure sustainability [7] and the application these competences requires a hybrid profile that mixes technological and agronomy competences.PA has a transformative potential for agriculture if driven by technological innovation and policy support. Through collaboration, training, and targeted investments, PA can stimulate competitiveness and sustainability in European agriculture [2].

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15. EUROPEAN AND NATIONAL QUALIFICATION NETWORK

The European Qualifications Framework (EQF) was conceived in the early 2000s as a response to the need for greater transparency and comparability of qualifications across Europe. Following the 2004 Maastricht Communiqué, which emphasized enhancing mutual trust in education and training systems [1], the EQF was formally adopted in 2008 by the European Parliament and Council [2]. Its initial phase focused on referencing National Qualifications Frameworks (NQFs) to the EQF's eight levels, laying the groundwork for aligning diverse national systems under a shared framework. This facilitated cross-border recognition of qualifications, promoting mobility and collaboration in education, training, and employment. Over time, the EQF expanded beyond the EU, influencing global qualification systems and adapting to emerging challenges like digital transformation and green transitions [3].

The EQF's key features include its eight reference levels, ranging from basic skills (Level 1) to advanced, research-based competencies (Level 8), defined by learning outcomes in terms of knowledge, skills, and responsibility/autonomy [4]. It is inclusive of all education and training sectors, encompassing formal, non-formal, and informal learning. By linking national systems through the NQFs, it ensures the comparability and transparency of qualifications, fostering lifelong learning and mobility for learners and workers [5]. The EQF prioritizes the recognition of diverse learning experiences and supports adaptability to evolving educational and labour market needs, making it a cornerstone for the modernization of European education and training [6].

The eleven partners involved in the project represent 9 Central Europe regions and 7 countries, in each country EQF has been integrated into a National Qualifications Framework as listed below. The Precision farming specialist profile developed within the Interreg AGRI-DIGITAL GROWTH project will be designed according EQF and NQF principles allowing its recognition across Central Europe.

* 1. Italy

NQF Name: Quadro Nazionale delle Qualifiche (QNQ)

Structure: The Italian NQF includes eight levels, aligned with EQF levels.

Implementation: Covers general education, vocational education and training (VET), and higher education

Reference: Italy's NQF was referenced to the EQF in 2012 [7-8-10].

* 1. Austria

NQF Name: National Qualifications Framework Austria (NQF-AT)

Structure: Austria’s NQF includes eight levels aligned with the EQF.

Implementation: Covers general education, VET, and higher education.

Reference: Austria completed its referencing to the EQF in 2012 [7-9-10].

* 1. Slovenia

NQF Name: Slovensko ogrodje kvalifikacij (SOK)

Structure: The Slovenian NQF consists of ten levels, with eight levels aligned with the EQF.

Implementation: Includes all types of qualifications, formal and non-formal education.

Reference: Slovenia referenced its NQF to the EQF in 2013 [10].

* 1. Hungary

NQF Name: Magyar Képesítési Keretrendszer (MKKR)

Structure: Hungary’s NQF includes eight levels matching EQF levels.

Implementation: Includes qualifications from general education, VET, and higher education.

Reference: Hungary completed its referencing to the EQF in 2015 [10].

* 1. Poland

NQF Name: Polska Rama Kwalifikacji (PRK)

Structure: The Polish NQF includes eight levels aligned with the EQF.

Implementation: Covers qualifications from formal education, non-formal learning, and informal learning.

Reference: Poland referenced its NQF to the EQF in 2013 [10].

* 1. Croatia

NQF Name: Hrvatski kvalifikacijski okvir (HKO)

Structure: Croatia's NQF includes eight levels aligned with the EQF.

Implementation: Covers general education, VET, and higher education.

Reference: Croatia completed its referencing to the EQF in 2012 [10].

* 1. Czech Republic

NQF Name: Národní soustava kvalifikací (NSK)

Structure: The Czech NQF includes eight levels aligned with the EQF.

Implementation: Covers general education, VET, and higher education.

Reference: The Czech Republic referenced its NQF to the EQF in 2011 [10].

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11. METHODOLOGY

THE CREATION OF THE PRECISION FARMING SPECIALIST PROFILE

The development of the Precision Farming Specialist profile was done through a collaborative effort among project partners from Central Europe, starting from the European Qualifications Framework (EQF) and the National Qualifications Frameworks (NQFs) of participating countries. This cross-border collaboration allowed partners to share expertise, ensuring the profile’s relevance to diverse agricultural systems and digitalization demands across Central Europe and engage dialogue with regional stakeholders. Three main principles have been used to structure the definition of the profile:

* 1. ****De-contextualization****

The proposed descriptive model for the occupational profile operates at a higher level of abstraction, freed from the constraints of national contexts. With the removing of contextual constraints, the model allows for adaptability and recognisability in a wide range of professional scenarios, without losing its authority as it is developed on the principles of EQF and NQF.

Key aspects include:

1. The description aligns with national legislative frameworks, serving as a reference for qualifications and competencies systems. It expands upon existing norms to provide detailed guidance to all labour market stakeholders.
2. The logical structure of the model, organized by macro-processes, transcends specific national contexts and economic sectors. It holds validity across all sectors and work contexts within the EU, promoting flexibility and facilitating human resource mobility within both national and European competency markets.
3. Based on this virtual framework (a process map oriented towards the market), competencies are concretized through subsequent work tailored to the relevant sector.
4. The system is neutral to personal elements (e.g., attitudes, values, motivations) of individual citizens or workers. It focuses objectively on processes and outputs, ensuring the profile’s universal validity across all citizens and production structures.
   1. ****The Professional Area of Practice****

Within this customized representative structure, the specific processes and activities defining the professional profile are selected. A process and activity map serves as the foundational source for identifying the technical-professional competencies required for the sector.

The professional area is defined through three elements:

1. **Processes** associated with the profile.
2. **Activities** required by the profile.
3. **Outputs or expected results.**

The professional area is designed to ensure *flexibility, communicability*, and *recognition* across stakeholders at regional, national, and European levels:

* The professional area is activity-based rather than focused on job titles or academic qualifications, avoiding conflicts with existing frameworks (e.g., educational degrees or labour contracts).
* Each activity can be updated independently to respond technical advancements and organizational innovations without affecting the overall profile.
* Activities, even in simulated training environments, produce outputs recognizable by the labour market and activate aggregated competencies assessed uniformly in both educational and professional contexts.
* Aggregating the profile’s specific activities (non-delegable and defining its mission) enables the identification of the "core competencies" essential for role access.
  1. ****Competencies Defined by Outputs****

The third principle is based on the premise that professional competencies are defined by their outputs (i.e., the final, significant, and recognizable results of work activities). This definition aligns with the EQF system, where competence is defined as “the set of knowledge and skills enabling a person to perform a task and achieve a corresponding output.”

The output becomes the central anchor of the model, guiding the definition of required competencies in the labour market. To avoid impractical detail, the model treats competencies as aggregates of knowledge and skills necessary to produce significant and recognizable outputs across education, training, and labour systems.

Competencies required for optimal output production are categorized as:

1. **Technical-professional competencies**: Directly related to work processes and the technical quality of the output.
2. **Transversal (soft) skills**: Independent of specific processes but crucial to interpersonal and professional effectiveness, indirectly impacting output quality.
3. **Green and cultural competencies**: Underpinning the quality of output through indirect contributions during production, encompassing communication, methodologies, rules, and norms.

#### ****Centrality of Output****

The output's role in the model is critical because:

* It is easily recognizable, codifiable, and measurable via indicators and quality specifications.
* It evolves with improvements in standards or new quality benchmarks driven by innovations.
* It enables precise identification of required competencies (knowledge, skills, behaviours), where the output determines the competence, not vice versa.
* It serves as a convergence point for education, training, and labour systems, continuously aligning educational offerings with societal and labour market changes.
* It provides a rigorous basis for evaluating individual workers’ competency levels against predefined quality standards.
* It acts as a primary reference for companies in terms of efficiency, quality, and market alignment.
  1. Implementation phases

The methodology ensures a practical framework for professional profile development, emphasizing flexibility, recognition, and alignment with labour market dynamics. The creation of the Precision Farming Specialist profile has been structured into phases to ensure clarity and homogeneity in its development. The five steps advance in parallel with the other project activities and reinforce the validation process through a continuous feedback loop and validation of the profile. In Phase 1, partners conducted in-depth research and benchmarking to align the Precision Farming Specialist profile with the European Qualifications Framework (EQF) and National Qualifications Frameworks (NQFs). This phase included analysing EQF descriptors and mapping national qualifications to identify gaps and opportunities within digital and agricultural competencies. In Phase 2, the team started the engagement of diverse stakeholders, including SMEs, universities, VET providers, policymakers, and research centres, to identify sectoral needs and assess skills gaps in precision farming and digital agriculture through workshops and surveys. This collaboration helped uncover emerging trends and technologies such as IoT, AI, and GIS, which are reshaping the sector and design pilot courses as foreseen in the next steps of the project. Phase 3 transitioned these findings into action developing a comprehensive competence framework that categorized skills, abilities, results, and performance indicators as presented in the chapter results. The framework will be used to design an actionable profile aligned with EQF levels 4–7, integrating core and optional competencies tailored to national and sectoral contexts. In Phase 4, the profile will be validated through cross-country workshops, ensuring its adaptability across regional contexts, and will piloted in vocational training and higher education institution to gather feedback from trainers, students, and industry representatives. The results will refine the profile and enhance its alignment with labour market demands. Finally, Phase 5 will focus on integrating the Precision Farming Specialist profile into national frameworks by collaborating with national qualification authorities and developing equivalency guidelines to ensure portability across borders. Dissemination efforts targeted policymakers, educators, and industry stakeholders, promoting widespread adoption.

* + 1. Phase 1: Framework Alignment and Benchmarking

**1.1 Research and Analysis**

**Objective**: Align with EQF levels and assess NQF structures in partner countries.

**Activities**: Analyse the EQF descriptors (knowledge, skills, responsibility, and autonomy) to determine the most suitable levels for the PRECISION FARMING SPECIALIST profile. Conduct a comparative analysis of the NQFs of participating countries (e.g., Italy, Austria, Slovenia, Hungary, Poland, Croatia, and the Czech Republic). Identify gaps and opportunities in the existing qualification frameworks for digital and agricultural competencies.

**Output:** Mapping linking relevant qualifications in each NQF to the EQF levels.

* + 1. Phase 2: Needs Assessment and Stakeholder Engagement

**2.1 Identifying Sectoral Needs**

**Objective:** Understand the skills and competencies required for the digital transformation of agriculture.

**Activities:** Engaged stakeholders such as SMEs, universities, VET providers, policymakers, and research centres in surveys and workshops.Collect feedback on the skills gap in precision farming and digital agriculture across the value chain.Identify emerging technologies (e.g., IoT, AI, GIS) shaping the Precision Farming Specialist role.

**Output:** Identification of sectoral needs highlighting key competencies required for the Precision Farming Specialist.

* + 1. Phase 3: From Competence Mapping to Profile Design

**3.1 Competence Mapping**

**Objective:** Define the competence profile using EQF and NQF descriptors.

**Activities:** Developed a matrix mapping competences to EQF descriptors (skills, indicators and responsibility / autonomy).Integrated feedback from stakeholders to ensure the profile meets practical and academic needs.

**Output:** Competence map categorized into: skills, abilities, results and indicators.

**3.2 Profile Design**

**Objective:** Translate competencies into a clear and actionable profile.

**Activities:** Drafted the Precision Farming Specialist profile aligned with EQF levels (suggested Level 4–7, depending on the educational and professional pathway).

Structured the profile into core and optional competencies to accommodate national differences.

**Output:** Finalized Precision Farming Specialist Competence Profile, including:

* General description of the role.
* Required knowledge, skills, and responsibilities.
* Recommendations for educational pathways and training programs.
  + 1. Phase 4: Validation and Piloting

**4.1 Cross-Country Validation**

**Objective:** Validate findings with a wide range of experts and ensure the profile is relevant and applicable across partner countries.

**Activities:** Organize workshops with sectoral representatives to review draft findings.Incorporate regional and national priorities to ensure inclusivity.

**Output:**

Incorporate adjustments to align with local labour market demands and NQF specifications.

Output: Consensus on the core competencies needed for the Precision Farming Specialist profile.

**4.2 Piloting and Feedback**

**Objective:** Test the applicability of the competence profile in real-world settings.

**Activities:** Pilot the profile in vocational training programs and higher education courses.Gather feedback from trainers, students, and industry representatives.

**Output:** Recommendations for refining the Precision Farming Specialist profile and integrating it into existing qualification frameworks.

* + 1. Phase 5: Integration and Dissemination

**5.1 Integration into NQFs**

**Objective:** Align the Precision Farming Specialist profile with national systems.

**Activities:** Collaborate with national qualification authorities to integrate the profile into NQFs.Developed equivalency guidelines to ensure portability of qualifications across borders.

**Output:** Recognition of the Precision Farming Specialist as a formal qualification within NQFs.

**5.2 Dissemination and Advocacy**

**Objective:** Promote the Precision Farming Specialist profile to stakeholders.

**Activities:** Publish the profile and methodology in an open-access format.Organized dissemination events targeting policymakers, educators, and industry stakeholders.

**Output:** Increased awareness and adoption of the Precision Farming Specialist profile across Europe

1. RESULTS

The partners, coordinated by Fondazione Fenice and JR, conducted an initial analysis of the European Qualifications Framework (EQF) and its adaptations within national contexts. This first phase highlighted harmonies and differences across various national regulations, leading to the decision to develop a model, as described in the methodology, that would be transversal and adaptable to different regional contexts.

Once the working framework was established, a preliminary needs analysis was carried out, targeting key stakeholders across the agricultural value chain. This included professionals such as agronomists, agricultural technicians, and farmers, as well as industrial actors, such machinery manufacturers and their representative’s organisations. The focus was on creating a coherent approach as described in section 2:

* The methodology aims to ensure macro-regional applicability within Central Europe, emphasizing de-contextualization from specific local regulations or practical case studies that might fragment or invalidate results.
* The scope was deliberately selected to address current market needs while maintaining flexibility, communicability, and output recognition by involved institutions.
* The competencies of the Precision Farming Specialist were identified based on labour market needs, ensuring that the resulting profile is not only formally correct but also applicable and marketable.

This initial analysis and definition phase was followed by a needs assessment and stakeholder engagement process. The second phase integrated the expertise and experiences of project partners and included a comprehensive bibliographic review. The results of these efforts led to the creation of a competency framework and the definition of the Precision Farming Specialist profile. Recent studies, such as Marinoudi et al. (2024) *Adapting to the Agricultural Labor Market Shaped by Robotization*, highlight the rapid evolution of the labour market. They stress the urgent need to renew and maintain skills in response to technological advances. Repetitive and manual jobs are increasingly being replaced by automation, while intellectual and non-repetitive tasks are expected to remain in demand. In this perspective, operational agricultural roles are likely to be automated, with robots replacing human workers. Consequently, it is crucial to foster professional growth by updating skills in key emerging sectors.

These sectors include:

* Knowledge of new technologies for agriculture, particularly in precision farming, with a focus on sensors, electronics, and data science.
* Maintenance and services related to new digital and electronic equipment.
* Training in these innovative fields, development of new products, commercialization of technologies, and knowledge transfer to businesses adopting them.

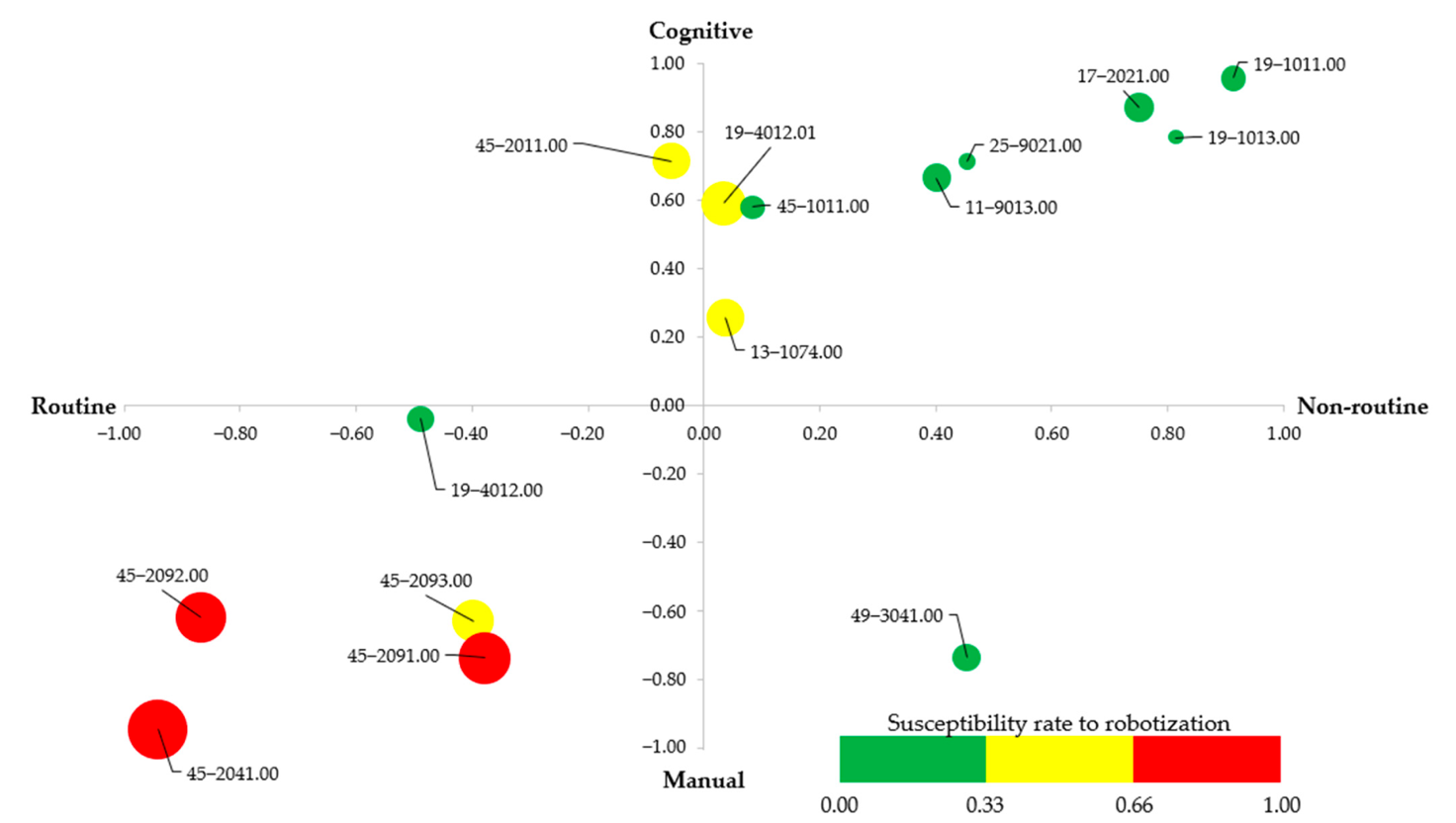


Figure 1 Mapping of the estimated cognitive/manual versus routine/non-routine levels along with the susceptibility rate to robotization of the reviewed occupations. Marinoudi et al. 2024

The Precision Farming Specialist is a multidisciplinary profile requiring foundational knowledge across various fields, tailored to the operational context. To design this profile, partners identified the economic activities involved in the sector and defined the emerging skills required. Two main profiles emerged:

1. **Agronomic Profile**: Professionals with agronomic expertise who must acquire new skills in precision agriculture (e.g., IT, electronics, data science) to support farms in their digital transformation.
2. **Technical/Mechanical Profile**: Technicians or engineers with mechanical, mechatronic, computer science, electronic or similar backgrounds who must integrate agronomic knowledge to design products that meet the needs of the agricultural sector.

After defining the scope of action for these two profiles, the partners established the structure of **market-oriented macro-processes**, specific processes and activities, and the required competencies. These competencies were categorized into **knowledge, skills, behaviours, technologies, and performance indicators**.

From a process perspective, the Precision Farming Specialist must:

1. Analyse the regulatory framework, market trends, and emerging technologies.
2. Design and deliver a service or product for the final client (farmers and cooperatives) or the manufacturer.
3. Evaluate the effectiveness and impact of their work.

This logical framework applies to both the **Precision Farming Specialist Farm** and the **Precision Farming Specialist Manufacturer** profiles, though their specific activities and competencies differ:

* The **Precision Farming Specialist Farm** acts as a consultant, integrating agronomic expertise with the skills needed to adopt new technologies and precision agriculture techniques.
* The **Precision Farming Specialist Manufacturer** is a technician or engineer specializing in automation and IoT that improves mechanical and electronic devices, who integrates agronomic knowledge to understand sector needs and develop new products accordingly.

**PRECISION FARMING SPECIALIST (FARM)**

**Indicators**

* + Interpretation of plant diagrams and layouts
  + Selection of IoT components
  + Knowledge of communication protocols (BUS)
  + Verification of the functionality of automated devices and equipment
  + Setting up the work plan for product automation

**Results**

* + Development and automation of machinery, equipment, and services for the agricultural sector, adequately prepared according to project technical documentation and prescribed procedural standards

**Skills**

* + Analysis of the regulatory framework of the target market
  + Analysis of the supply chain and its requirements
  + Examination of the main IT and statistical tools essential for managing
  + organizational structures and implementing innovative management models (precision farming, DSS - Decision Support System).
  + Creation of a service for knowledge transfer
  + Design of studies and research
  + Development of a management system for precision farming
  + Creation of a supply chain plan for precision farming
  + Management of technical and operational documentation for equipment, machinery, and raw materials
  + Implementation of a corporate Big Data system and indicators for data analysis

**Competencies**

* + Apply procedures and techniques to gather contextual information and legislation
  + Assess contextual factors influencing the demand for precision farming
  + Apply techniques for analyzing demand and market trends
  + Basic knowledge of chemistry, physics, and biology
  + Basic knowledge of botany and sector-specific features, etc.
  + Familiarity with machinery, equipment, professional profiles, and technologies in the sector
  + Understanding of business and work organization within agricultural enterprises
  + Techniques for planning production processes
  + Basic knowledge of cost accounting
  + Basic computer literacy

**PRECISION FARMING SPECIALIST (MANUFACTURER)**

**Competencies**

* + Develop project diagrams and layouts, bill of materials, and technical documentation for automated systems with IoT, Bus, GPS, and electro-electronic control and power components for machinery and/or plants
  + Identify technologies, communication protocols, equipment, timelines, and work sequences based on the system's characteristics and the type of automation work to be performed

**Results**

* + Development and automation of machinery, equipment, and services for the agricultural sector, properly prepared according to project technical documentation and prescribed procedural standards

**Indicators**

* + Reading of plant diagrams and layouts
  + Selection of IoT components
  + Knowledge of communication protocols (BUS)
  + Verification of the functionality of automated devices and equipment
  + Setting up the work plan for product automation

**Skills**

* + Development and automation of materials, equipment, and tools for assembling mechanical and electronic systems
  + Knowledge
  + Elements of design and development for the automation of mechanical parts: components and assemblies, signs, symbols, scales, and representation methods
  + Main tools, equipment, and digital work instruments, along with their methods of use

1. CONCLUSION AND NEXT STEPS
   1. Presentation of the Precision Farming Specialist Profile at EIMA International 2024

During EIMA International 2024, project partners presented the newly developed Precision Farming Specialist (PRECISION FARMING SPECIALIST) profile to key stakeholders. The hybrid event, featuring both in-person and online participation, facilitated broad discussions among industry actors and regional stakeholders (see report D.3.1.1). A key theme that emerged was the urgent need for the agricultural sector to modernize and integrate digital technologies across the value chain. The exhibition space dedicated to digital and robotic technologies had expanded significantly compared to the 2022 edition, highlighting the growing momentum toward technological innovation in agriculture. In addition to workshops with regional stakeholders, project partners engaged with innovative companies at the **EIMA desk stand**, gaining insights into the sector's ongoing transformation:

* **Argo Tractors**: The company has revamped its R&D department by including new profiles alongside mechanical engineers to integrate digital tools within its tractors. This shift underscores the increasing importance of multidisciplinary teams in agricultural innovation. In addition, eng. Giovanni Esposito highlighted how the new tractors are produced more and more by default with GPS and IoT sensors. Argo tractors is developing a new line of hybrid and e-tractors to reduce emissions.
* **Forigo RoterItalia**: Awarded at EIMA2024 for its **ENERG electric multipurpose tool carrier**, the company started developing this product a decade ago. Engineer Francesco, the first electronic engineer with a background in automation to join the team over five years ago, shared insights into how his expertise catalyzed the company’s transformation toward digital and electronic solutions.
* **Agricolus**: A provider of digital services for farmers, Agricolus requires agronomists to collaborate closely with IT specialists to develop forecasting models, IoT sensors, and digital tools. Agronomist Enrique De Angelis introduced the company’s **AI4FARM network**, emphasizing the critical role of **collaboration and cross-contamination of knowledge** in fostering innovation. He drew parallels with the **AGRI-DIGITAL GROWTH Ecosystem**, which similarly aims to connect knowledge centres to promote innovation and knowledge transfer.

These discussions confirmed that the **planned activities for Phases 4 and 5** of the present methodology and the overall project are well-aligned with market trends and demands. They also highlighted the necessity of ensuring that training and qualifications keep pace with technological advancements.

* 1. Next Steps: Precision Farming Specialist Validation, Pilot Course Development and Dissemination

In the coming months, the project partners will refine and present the **qualification framework** to regional authorities to obtain feedback and evaluate its relevance. In parallel, a **comprehensive survey** will be designed and distributed to businesses within the agricultural value chain. This survey will aim to:

* Identify **training gaps** in companies.
* Understand specific needs for adopting new technologies.

The survey results will support the development of **pilot training courses,** designed to bridge the identified competency gaps and better equip businesses and professionals for the digital transformation in agriculture.

After the validation process, the partners will develop **guidelines (D.3.2.2)** to support the implementation of the Precision Farming Specialist profile. These guidelines will:

* Define the required competencies.
* Outline pathways for training and certification.
* Align with both industry demands and educational frameworks.

To ensure widespread adoption, a series of **dissemination initiatives** will be rolled out, targeting:

* **Educational institutions**: Collaborating with schools to incorporate precision agriculture and digital technologies into their curricula.
* **Training providers**: Aligning vocational training programs with the new profile.
* **Industry stakeholders**: Raising awareness and encouraging the adoption of the profile within the agricultural and technological sectors.

From now on the PPs will enhance dialogue among stakeholders and favour the **transformation of agricultural education and workforce development,** upskilling young generation and reskilling professionals with the competences needed to thrive in a sector increasingly shaped by the **digital and robotic revolution**.