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Executive summary

This report presents the design, implementation, and strategic relevance of the GRINS Data Dictionary and its integration within the Phygital Platform developed under Spoke 8, WP4. The objective is to provide a scalable, interoperable, and intelligent digital infrastructure capable of acquiring, organizing, and distributing knowledge to support inclusive education, skill development, and employment activation for disadvantaged groups such as NEETs, migrants, and long-term unemployed individuals.

The Data Dictionary serves not only as a structured repository of information, but also as an enabler of knowledge co-creation and decision-making, leveraging advanced Natural Language Processing (NLP) technologies and cloud-based SaaS architecture. It acquires heterogeneous data from diverse sources and formats, semantically structures content, and links it to user profiles to enable personalized, immersive, and collaborative learning experiences. Generative summarization, thematic clustering, semantic enrichment, and multilingual access support rapid and meaningful engagement with complex information.

The Phygital Platform connects physical and digital spaces for training, guidance, and empowerment. It includes tools for skill assessment, AI-based learner profiling, interactive multimedia content, and virtual/augmented reality components for gamified learning and professional simulation. It ensures accessibility, modularity, and compliance with European transparency and quality frameworks (EQF, ECVET, EQAVET, DigComp, EntreComp), making learning paths transferable and certifiable.

The platform supports advanced analytics and knowledge mapping to guide strategic decision-making, optimize services, and foster innovation in territorial ecosystems to enhance stakeholder engagement and data governance. It also enables the creation of secure digital identities for individuals without formal documents.

Overall, GRINS Data Dictionary and Phygital Platform constitute a replicable model for digital social innovation, combining technological robustness with legal and pedagogical coherence. By integrating inclusive design, interoperable infrastructures, evidence-based strategies, the system addresses current gaps in skill recognition and employability, contributing to the EU's goals for sustainable growth and social cohesion.

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Introduction

This deliverable describes the design, structure, and operational deployment of the GRINS Data Dictionary, a new digital infrastructure that supports social inclusion and entrepreneurial education for disadvantaged communities. To help create inclusive business ecosystems, this database changes how it works to focus on skill mapping, competence classification, training paths, and monitoring methods.

The Data Dictionary below is meant to be more than a data repository; it is also meant to be a smart and flexible tool that helps the project achieve its main goal: to promote sustainable and resilient local development through inclusive education and entrepreneurship. It is built into a phygital infrastructure that links local communities, training providers, and policymakers.

This report talks about the structure of the dictionary, its main data types, how it is used for educational purposes, and how it will be used at the Phygital Centre. The goal is to improve the visibility, cooperation, and knowledge sharing inside the business while making sure that decisions are based on reliable data.

1. Data Dictionary Purpose

Innovation has become a complex idea coming from a process that is spread out and expanded. This process combines the value of collective creativity, social interaction, collaboration, learning, and sharing information to create a virtuous flow of knowledge that goes in and out of each organization (Natalicchio et al., 2017).

Digital transformation supports these processes today by making it easier to share information and best practices, which helps an organization learning and sharing knowledge with the outside world and viceversa (Scuotto et al., 2017). It also helps collect, manage, and store digital content for the long term, keep track of processes and resources with more modern and advanced analysis systems, and find out how connected the information is to get a competitive edge (Ferraris et al., 2019).

Innovation is also making its way into governance processes, looking for ways to make knowledge and knowledge management systems more central, promote the development of shared and integrated models, and boost company performance (Del Giudice and Della Peruta, 2016; Santoro et al., 2019).

Combining data in KM systems makes it easier to forecast what will happen by using data association in processing and analysis. This is how businesses and even ecosystems like the GRINS one can change their behavior to follow new and long-lasting models (Intezari and Gressel, 2017). In this situation, knowledge management is one of the most important things for making sure that growth is sustainable, performance is sped up, and growth is inclusive.

Knowledge Management processes are the key to implementing innovation and improving performance in any type of company, including the ecosystemic one of GRINS. This is because the open innovation paradigm is becoming more popular and external knowledge transfer activities are on the rise. In truth, knowledge management isn't only something that happens within an organization; it's also an important way for the business to communicate with its external partners and stakeholders.

Literature has shown how important it is to manage and share knowledge flows, but also how hard it is because the phenomenon is so complex and dynamic. Without organized KM systems based on digital technology, organizations would risk not getting the right advantage to encourage innovation (Cerchione and Esposito, 2017).

The rise of information and communication technologies and the globalization of markets have changed how countries, businesses, and organizations compete with each other. They are now trying out new strategies to boost and share their internal knowledge in a way that is open and transparent (Lichtenthaler, 2011; Appleyard & Chesbrough, 2017).

The idea of open innovation is that knowledge flows in and out of an organization in order to create new knowledge. This is done by combining external and internal knowledge to find new ways to use modern technologies (Chesbrough, 2006).

There are at least two parts of this statement that seem very essential. The idea of open innovation means not only using different ways to get outside knowledge, but also using different ways to combine this knowledge with ideas that come from within the company. The GRINS Data Dictionary is a way to use open innovation, knowledge management, and decision support models in its ecosystem in this way.

According to three basic process archetypes (Gassmann, 2006), the data dictionary helps people use outside knowledge to speed up internal innovation:

1. Outside-in, which opens the innovation process to the needs of acquiring and exploring knowledge from outside sources;

2. Inside-out, which opens the innovation process to the needs of applying and exploiting knowledge for the commercialization of internal knowledge; by outsourcing internal knowledge and innovation, new ideas can be quickly brought to the market;
3. Coupled, which suggests the coupling between the first two, in order to open the process of innovation, exploration, and exploitation of knowledge for the creation of new products (Lichtenthaler, 2011; Bellantuono et al., 2013).

These three separate archetypes show that the KM architecture plays an important role in supporting knowledge exploitation and exploration activities. This is because the use of enabling technology is thought to be linked to achieving growth goals. In this direction, organizational routines and consolidated processes that affect KM strategies are changing in the same way that digital solutions for innovation are changing the way knowledge is acquired, stored, and transferred, as well as the amount of data and information that needs to be managed, thanks to the rise of suitable digital infrastructures.

During the digital revolution, new advanced technologies spread quickly, and the process of creating and exchanging information expands outside the borders of organizations. It happens in an interorganizational environment (Bereznoy et al., 2021). A lot of research has tried to explain the good things that happen when KM systems use open innovation techniques. Nambisan and Sawhney (2007) organized these effects into four main categories: an increase in the ability to come up with new ideas; a decrease in the costs of acquiring and developing those ideas; a decrease in the risk of commercializing those ideas; an increase in the speed at which they become available on the market. In this way, these systems make innovation processes more flexible, but to get the most out of them, organizations need to rethink how they can use knowledge flows and how they can make the most of the use of digital platforms, infrastructures, and artifacts. In fact, looking at innovation from the point of view of interorganizational networking has become a top priority for researchers in recent years. This is because of the most recent trends in digitalization, which uses binary computer languages for all material objects involved in economic activities (Lakhani et al., 2013).

Also, there are the main effects of digitalization. On one hand, the costs of communication and coordinating innovation activities have gone down a lot, and these costs don't depend on how many people are involved or where they are located. On the other hand, the number of people who can potentially help creating knowledge has gone up a lot, which makes it possible for new methods and

formats of innovation to happen. As a result, the new logic of innovation is more focused on ways for organizations to work together like GRINS.

What stands out is that the GRINS Data Dictionary sets up a new way for people to communicate that is made possible by technology. This new way of interacting provides value by making it easier for groups of people who depend on each other to work together. Using the GRINS Data Dictionary requires people with different skills and resources to work together in a way that is both traceable and synergistic. This is necessary to automate procedural processes and to use new enabling technologies like Artificial Intelligence or Machine Learning to make more complicated decisions. This helps actors make better decisions by finding patterns in the data that they may use to make predictions or decisions. Organizations will be able to improve their internal workflows by using algorithms to manage the information in the data. This will help them define their investment agenda and make decisions that are more strategic and based on real facts.

They will also be able to optimize the efficiency-effectiveness ratio of their decisions by extracting large amounts of data, which will strengthen their ability to predict and monitor information in a systemic and systematic way.

So, it is necessary to rethink how we categorize and store data to be more open and shared, which can help operations run more smoothly and make the most of the ever-changing data environment.

Furthermore, being able to use and make the most of data is becoming an important way for businesses in all industries to stand out from their competitors. In this case, the GRINS Data Dictionary is a great way for stakeholders to talk to each other. Because of this, organizations have a hard time figuring out what processes need to be put in place and what resources need to be made available to make engagement successful, especially as new technologies that make things easier are used more and more. Indeed, tools like these and the most modern and advanced ways of getting stakeholders involved have become very popular because they can quickly spread information and encourage communication and cooperation between stakeholders all over the world. They can also look at processes and progress over time and help interested parties take part in even the most complicated decision-making processes (Anning-Dorson, 2018).

The literature has been interested in techniques and methods of stakeholder involvement because they are an important incentive for innovation management (Loureiro et al., 2020). This is because they raise awareness and decision-making capacity through better processes that are connected to

opportunities for input and participation, which are linked to the use of digital platforms (Kujala et al., 2022). This is why businesses should create digital capacity building programs and buy solutions that make it easy to collect and share data securely across the firm. So, the stakeholder engagement process goes hand in hand with the possible collaborative efforts between the organization and its internal and external stakeholders to share knowledge and other resources for managing innovation. These efforts could use network skills to plan, carry out, and evaluate proactive innovation strategies that are good for the whole ecosystem (Shams et al., 2020). Knowledge sharing and exchange platforms let individuals learn more by integrating outside knowledge and turning it into expertise. When this knowledge is merged or changed, it could have a big impact on innovation. This shows that technology has a big effect on the GRINS project.

In this case, cyberattacks could cause vital services to stop working, which could have very bad effects on the ecosystem. The Internet is now used by a lot of people, which makes them more vulnerable to cyber risks. This makes it even more important to achieve an

A good level of cybersecurity can be achieved by combining the technological solutions that are currently available for IT security, such as antivirus software, firewalls, access control systems, and content filters. This will allow for more advanced and collaborative approaches to be developed, which will set up the infrastructure for protecting the information collected, including different interested parties such as suppliers of cybersecurity solutions, suppliers of information on cybersecurity, end users, government organizations, and standards bodies (Rashid et al., 2021).

The market for cybersecurity information has grown as more people have become involved in the process of getting and sharing information. This has led to a complicated structure of value creation and distribution that tries to better align the needs and profits of all parties involved in order to keep costs as low as possible. Researchers in security have learned over the past 20 years that technological solutions alone are not enough to fix cybersecurity issues. As a result, they have started to look at these issues from an economic point of view (Huang & Behara, 2013). This includes looking at the economics of sharing information, how to decide how much to invest in cybersecurity, how to set the right budget for cybersecurity, the network effects of security investments, how to figure out the economic effects of cyber-attacks, cybersecurity risk modelling, and cybersecurity policy. Putting money into cybersecurity initiatives is an important way for firms to deal with cybersecurity problems like higher cyber risks,

economic costs from incidents, lower social well-being, and lower levels of individual and national security.

2. Architecture of the Data Dictionary and collection methods

Based on what was said earlier about the objective of the Data Dictionary, it should be set up to perform the following tasks:

1. *Data Ingestion*: the data dictionary finds and collects information on the innovation and knowledge management activities in GRINS from a variety of sources, including databases, logs, streaming data, social media, external APIs, and more. We can think about both importing data in bulk from different sources on a regular basis and taking in data streams in real time.
2. *Data Storage*: GRINS Data Dictionary can show you several areas where data can be stored. A raw zone is where raw, unfiltered data is first kept. It has data in its original form, with no changes made to it. An improved area where raw data is cleaned up, changed, and put in order so that it is easier to find. For better management, metadata is also added. A carefully chosen area where processed and cleaned data is further structured and readied for certain use cases. This zone might have data that has been changed and combined in more complicated ways.
3. *Metadata Management*: it should have a strong metadata catalog that lists details about the data, like where it came from, what format it is in, what changes were made to it, and who owns it. This is really important for finding and understanding the knowledge assets that are out there.
4. *Data Catalog*: it should list all of the data assets that are available in one place. There should be metadata, data lineage, and information on data quality.
5. *Access Control*: strong access control systems must be put in place to make sure that only authorized people may see certain data. This is vital for keeping data safe and following the rules. Tools and frameworks are needed to process and analyze data in the GRINS Data Dictionary. This is also connected to putting in place a search and discovery tool that makes it easy for users to find useful information and data.

6. *Data Governance and Quality*: Set up data governance rules to make sure that data is of good quality, accurate, and follows the rules. This covers processes for profiling, cleaning, and validating data.
7. *Monitoring and Maintenance*: GRINS Data Dictionary has capabilities for monitoring how the dictionary is being used, how well it works, and how healthy it is overall.
8. *Backup and Recovery*: use strong backup and recovery systems to make sure your data is safe in event of a breakdown or disaster.

The way to get data for the GRINS Data Dictionary will be the following:

- *Ecosystem Surveys* that are specifically created for ecosystem partners to learn more about their innovation efforts and how they manage their knowledge. You can also talk to or survey employees of partner organizations to find out how involved they are in managing knowledge and coming up with new ideas. Existing Partner Collaboration Platforms are places where partners can store and share information for joint projects and efforts. This implies taking in data from project management systems, collaborative spaces, or innovation platforms that partners use to work on joint projects.
- *Conference and Events Data*, including hackathons or collaborative workshops, as well as meetings, forums, or roundtable talks that are planned with partners. Putting together information from event websites, speaker sessions, and presentations on new ideas and how to make them work.
- *Research initiatives* that GRINS partners do (using research data, publications, and results).
- *Partner systems and the organization's internal innovation portal*, where we can gather information like idea submissions, feedback, and implementation status. This could include performance metrics, R&D activities, or updates on innovation projects.
- *Reports* on partnership agreements or collaborative business plans.
- *Partner Social Media Channels*, to keep up with partners' innovation projects by following their posts, announcements, and conversations.
- *Reports and databases* that are available to the public and collect information from reports, publications, and white papers. For example, the Patent Databases let you get information

about patents that were granted or filed by companies, including the inventors and technical areas involved.

3. Data Categories and attribute

The aim of this part is to identify specific attributes or features that need to be taken into account and then to construct a taxonomy that describes the categories, relationships, and traits that will be used for mapping projects, initiatives, and knowledge transfer objects.

Data for GRINS Dictionary can be classified into these groups: projects, initiatives, and knowledge transfer activities.

As regard the first category, data can be described as follow:

- *Strategic Projects*, done to reach long-term goals and help the organization as a whole succeed. Examples include digital transformation initiatives and business model innovation.
- *Operational Projects* which are about the daily tasks and processes that are necessary for the organization to keep running (for example, quality management efforts and process optimization projects).
- *Research and Development Projects*, done to find and improve new products, services, technology, or processes. They are focused on coming up with new ideas and making the organization better at what it does so that it can grow in the future (new product development, technical innovation projects, scientific research initiatives).
- *Infrastructure Projects*, focused on creating or improving the basic parts that an organization needs to run. This could be things like physical infrastructure, technology infrastructure, or the skills of the company.

Attributes for each project are: *Project Name, Objective, Timeline, Budget, Key Stakeholders, Keywords or Tags; Status of the initiative (for example, not started, in progress, or completed) and the project's success metrics.*

For the second category, data related to organizational initiatives can be described as:

- *Change Management Initiatives* are planned and organized ways to help people, teams, and organizations go from where they are now to where they want to be in the future. It means

using processes, tools, and approaches in a planned way to handle the people side of change and get the business results you want.

- *Efficiency Improvement Initiatives* are intentional attempts to make processes more efficient, cut down on waste, and boost overall productivity in a company. The objective of these programs is to get better results with the same or less resources, which will save money, enhance quality, and boost output. You can use efficiency improvement projects in many parts of a firm, such as operations, workflows, and business processes.
- *Innovation Initiatives* are efforts to encourage and put into action new ideas, processes, products, or services that will bring about good and useful changes. The purpose of an innovation project is to come up with new ideas, make things more efficient, open up new prospects, and make the business more competitive in the market. Innovation isn't only about making new products; it may also mean making things better, like procedures, business models, and customer experiences.
- *Initiatives for training and development* which are planned efforts to improve the knowledge, skills, talents, and capabilities of workers. The goal is to increase both individual and group performance, make employees happier, and help the organization succeed.

Attributes for each initiatives are: *Name of the initiative, purpose and scope, expected results, keywords or tags; status of the initiative (for example, not started, in progress, or completed); metrics for the effects of initiatives.*

Finally, Knowledge transfer activities are specific processes that people or groups apply to help share knowledge, skills, expertise, and insights with each other inside an organization. These steps are necessary to make sure that knowledge is effectively communicated, retained, and applied by those who need it. There are many ways to transfer knowledge, both formal and informal. The best way to do this depends on the type of knowledge being transmitted and the organization's situation.

Attributes for each Knowledge Transfer are: *Title, Description (Documents, Training Modules, Best Practices, Guidelines, and Manuals); Author; Date Created; Last Updated; Related Projects/Initiatives; Keywords or Tags; Initiative Status (e.g., Not Started, In Progress, Completed); Knowledge Transfer Status (e.g., Draft, Published, Archived); Knowledge Transfer Effectiveness Metrics.*

4. Data processing and analysis to support decision making process

Tools and frameworks are necessary to work with and look at the data inside GRINS Data Dictionary. This is also connected to realize a search and discovery system that makes it easy for people to find useful information and data.

Users should be able to see the following relationships in the data:

1. *Between Projects and Initiatives of different organizations*

In this section, we can consider: 'Dependency Relationships' which refer to the reliance for successful completion or achievement of goals. Dependencies are important because they can change deadlines, how resources are used, and how well things go overall. 'Supporting Relationships' which mean that programs or activities are linked or aligned in a way that helps, improves, or adds to another. In supporting relationships, the initiatives work together and help each other out. 'Synergy relationships' between projects or initiatives refer to collaborative and mutually beneficial interaction in a way that is good for all members, and the results are better than what each project could have done on its own.

2. *Between Projects/Initiatives and Knowledge Transfer activities among different organizations*

'Relationships of Use' represent a usage link between projects and knowledge transfer actions to combine knowledge transfer tactics in the best way possible to improve the results and performance of different projects. The idea is to use what it's already known to make future endeavours more efficient, effective, and successful. 'Update Relationships' mean that information, skills, and insights are constantly shared and updated between current or future initiatives. In this case, knowledge transfer is an ongoing process in which projects share and update lessons learned, best practices, and new information on a regular basis.

3. *Among Knowledge Transfer activities*

'Reference Connections' are connections or links between distinct instances of information transfer. In this case, acts that transfer knowledge operate as sources of information or references for each other. In this relationship, one transfer action can be used as a reference, citation, or justification for another. 'Complementary Relationships' represent connections or links between diverse examples of knowledge

transfer. Acts that transfer knowledge operate as sources of information or references for each other. In this relationship, one transfer action's information can be used as a reference, citation, or basis for another.

5. Phygital Platform design

GRINS Phygital Centre in Catania was intentionally designed as a scalable, replicable model that can be applied to other territorial contexts, especially those in which it is necessary to improve the entrepreneurial approach to accelerate socio-economic development. The available modules make the project highly adaptable to varied societal and economic settings, presenting a national strategy to tactics addressing social and educational issues. By partnering with local governments, NGOs, and private enterprises, this Phygital Centre aims to expand its reach and impact, creating a network of Phygital centres that serve disadvantaged groups across the country.

Going into more detail, to effectively structure personalized learning paths based on the needs of the target categories, that is disadvantaged groups as NEETs, migrants, inmates, the Phygital Centre will equip itself with a software platform that will fulfill the functions of Data Dictionary with structured data from relational databases, semi-structured data from web pages, social media feeds, raw feed directly from a sensor source, geospatial, e-mail, etc., or unstructured data from video, images, audio, clicks. Data dictionary, in fact, is defined as a centralized repository containing details about the data, including its meaning, links to other data, origin, usage, and format. Data dictionaries are vital for various data management activities, such as facilitating data conversion, testing data generation, validating data, and documenting data usage criteria (Rashid et al., 2020).

The required software platform is a deep tech knowledge management system capable of acquiring, delivering, and distributing knowledge in a SaaS (Software as a Service) cloud-based mode. The system will be delivered in compliance with the requirements of scalability, security, and interoperability across various devices such as PCs, smartphones, and tablets. It employs advanced Natural Language Processing (NLP) technologies to perform a range of sophisticated knowledge management functions.

The platform will be able to acquire textual documents in different formats and from multiple sources in order to construct a comprehensive "data dictionary." Using NLP algorithms, it will automatically identify and structure key concepts, entities, relationships, and topics. It will also automatically group documents based on semantic similarity, enrich content by adding metadata and semantic links to

increase the informational value, and transform complex content into more comprehensible versions while preserving its semantic integrity. Moreover, it will support advanced information extraction, thematic clustering, semantic enrichment, content simplification, and indexing to enable fast and relevant searches.

The system will be also capable of generating automatic document summaries (generative summarization), with the ability to customize the level of detail and to produce tailored textual content based on specific user requests. It will include a multimedia presentation layer and offer a user experience that aligns the acquired knowledge within the “data dictionary” with user profiles, thereby providing an active, immersive, and collaborative learning environment.

Additionally, the platform will deliver the digital interface of the “Phygital” centre for training and empowerment, ensuring the personalized delivery of information contained in the "data dictionary" according to the characteristics of the target audience and consistent with both physical and digital usage contexts. It will analyze user behaviour and data to identify target audiences and perform context-aware clustering. This capability will allow for the personalization of services offered by the platform, including recognition of professional skills, the creation of occupational profiles, and orientation toward employment through specific training and career pathways.

An administrative frontend (admin console) will be available to support the editorial management of platform content, enabling the uploading and integration of textual information such as captions, alt text, and labels, as well as the management of multimedia content production including videos, animated presentations, podcasts, and webinars. All content and data will also be accessible via API services, supported by a dedicated storage cluster and external console management capabilities.

Furthermore, the platform will provide a simultaneous translation tool to overcome language barriers and a chatbot-based interface for querying the data dictionary. The user experience will be enhanced through the integration of Virtual Reality (VR) and Augmented Reality (AR) technologies for the delivery of interactive content and gamification, the simulation of technical and manual tasks, the creation of virtual and metaverse-based experiences, and the organization of virtual tutoring and emotional support activities. It will also enable virtual assessments of learning progress through interactive quizzes and the issuance of certifications of achieved learning outcomes.

Finally, the platform will support the provision of secure digital identities for individuals without official documents, such as migrants and homeless persons.

6. Transversal Skills for the Phyigital Centre

The very rapid digital and green transition, coupled with widening socio-economic gaps, is widening the mismatch in Europe between skills possessed and skills required by the labor market. To address this, the EU has, since the Recommendation on Key Competences for Lifelong Learning (European Parliament and Council, Recommendation 2006/962/EC, OJ L 394, Dec. 30, 2006), placed the systematic development of transversal competencies—from literacy to digital citizenship—at the center of lifelong learning policies. The 2018 update expanded the framework, strengthening digital competence and introducing critical thinking as a metacompetence (Council of the EU, Council Recommendation of May 22, 2018 on Key Competences for Lifelong Learning, OJ C 189, June 4, 2018).

Ensuring that these skills are recognized uniformly in different countries requires anchoring any training design in European transparency and quality arrangements: the European Qualifications Framework (EQF) (European Parliament and Council, Recommendation 2008/C 111/01, OJ C 111, May 6, 2008) and the ECVET credit system (European Parliament and Council, Recommendation 2009/C 155/02, OJ C 155, July 8, 2009) make learning units modular and transferable, while the EQAVET quality assurance framework (European Parliament and Council, Recommendation 2009/C 155/01, OJ C 155, July 8, 2009) requires all providers to have a Plan-Do-Check-Act cycle and shared indicators.

Within this normative perimeter, the Commission has published two content frameworks that are indispensable today—DigComp 2.2—which details more than 250 examples of digital knowledge, skills, and attitudes (Carretero S. et al., DigComp 2.2: The Digital Competence Framework for Citizens, JRC Science for Policy Report, Pub. Office EU, 2021)—and EntreComp, which articulates entrepreneurship into 15 competencies across eight levels of mastery (Bacigalupo M. et al., EntreComp: The Entrepreneurship Competence Framework, JRC Science for Policy Report, Pub. Office EU, 2016).

The inclusive dimension is prescribed by the Recommendation “Upskilling Pathways: New Opportunities for Adults” (Council of the EU, Recommendation 2016/C 484/01, OJ C 484, Dec. 24, 2016), which calls on member states to provide flexible, individualized and supported pathways for low-skilled adults—typically the disadvantaged individuals targeted by the GRINS project.

Building on these references, this paper-developed under Spoke 8 of the GRINS project-presents a phygital model of propaedeutic training that:

1. Normatively hooks each module to EU devices (EQF, ECVET, EQAVET, DigComp, EntreComp);
2. Implements blended and data-driven teaching, capable of collecting evidence of learning and profiling learners through AI;
3. Integrates measures of accessibility and support for different categories of disadvantage, ensuring equal opportunities for completion and recognition.

After this introduction, the paper describes: the normative and methodological frame of reference; the operational design of the modules, with learning outcomes, workloads and credits; the integrated assessment system, including final verification based on realistic scenarios; and the inclusion strategies and expected impacts. This provides the GRINS Phygital Hub with a legally sound, transferable training framework centered on the real needs of the most fragile students, contributing to the achievement of the European goals of sustainable growth and social cohesion.

6.1. Regulatory and methodological framework

This section describes the regulatory framework and methodological choices that ground the legal validity, transferability, and quality of the Phygital Hub's cross-skills propaedeutic pathway in GRINS.

European normative landscape architecture

1. Key Competencies for Lifelong Learning.

They constitute the content matrix. The eight competencies were introduced by Recommendation 2006/962/EC (European Parliament and Council, OJ L 394, December 30, 2006) and updated by Council Recommendation of May 22, 2018 on Key Competences for Lifelong Learning (Council of the EU, OJ C 189, June 4, 2018).

2. European Qualifications Framework (EQF).

Provides the “lingua franca” of learning outcomes: eight levels described in terms of knowledge, skills and responsibility/autonomy (Recommendation 2008/C 111/01, European Parliament and Council, OJ C 111, May 6, 2008).

3. European Credit System for VET (ECVET) 3.

Makes learning units modular and transferable by awarding “ECVET points” proportionate to workload and learning outcomes (Recommendation 2009/C 155/02, European Parliament and Council, OJ C 155, July 8, 2009).

4. *European Quality Assurance Reference Framework (EQAVET).*

Imposes on all VET providers the Plan → Do → Check → Act cycle with shared indicators to ensure process consistency (Recommendation 2009/C 155/01, European Parliament and Council, OJ C 155, July 8, 2009).

5. *Validation of non-formal and informal learning.*

Establishes requirements for identifying, documenting, assessing and certifying competencies gained outside formal settings (Council Recommendation 2012/C 398/01, Council of the EU, OJ C 398, December 22, 2012).

6. *Upskilling Pathways - New Opportunities for Adults.*

Ensures access to flexible and personalized pathways for disadvantaged learners (Council Recommendation 2016/C 484/01, Council of the EU, OJ C 484, December 24, 2016).

Transparency and mobility devices

1. Europass (Decision 2241/2004/EC, European Parliament and Council, OJ L 390, Dec. 31, 2004) provides the standard format for CV, Certificate Supplement and Europass Mobility, ensuring international readability of certificates issued.
2. All pathway certificates will indicate: EQF level, ECVET credits, learning outcomes and correspondence to Key Competences.

Content frameworks and operational taxonomies

Scope	Framework	Key Features
Digital skills	DigComp 2.2 (Carretero S. et al., JRC, 2021)	5 areas, 21 skills, 8 mastery levels, over 250 examples of knowledge/skills/attitudes.
Entrepreneurship	EntreComp (Bacigalupo M. et al., JRC, 2016; update 2020)	3 macro areas, 15 competencies, 442 learning outcomes on 8 levels.

Linguistics	CEFR – Common European Framework of Reference for Languages (Council of Europe, 2001; Companion Volume 2020)	“Can-do” A1-C2 grid, qualitative scales for reception, production, interaction, mediation.
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Methodological process

1. Plan

- Defining learning outcomes with EQF syntax.
- Allocating workload in hours and converting to ECVET points (1 point = ~30 hours of guided learning).

2. Do

- Blended modes: asynchronous e-learning, synchronous webinars, phygital workshops.
- Materials accessible according to Universal Design for Learning principles.

3. Check

- Quiz, project work, peer-review, situational judgment tests; raccolta dati LMS in tempo reale.
- Quality dashboard con indicatori EQAVET (tasso di completamento, successo, soddisfazione).

4. Act

- Issuance of digital badges and Europass Certificate Supplement.
- Annual quality audit; review of forms based on analytics and empirical evidence.

Inclusion measures for disadvantaged people

- Preliminary Scaffolding (“level 0” literacy modules): 1:1 tutorship, mobile-friendly micro-learning.
- Continuous orientation and peer-coaching funded through ESF+ in line with Upskilling Pathways 2016.
- Differentiated assessments (oral tests, graded rubrics) in line with EQAVET equity principles.

This architecture ensures that each stage-from design to certification-is consistent with European arrangements for quality, transparency and inclusion, providing the legal and methodological basis for the application sections that follow.

6.2. Operational design of the preparatory modules

The design takes outcome-based coherence (EQF descriptors), transferable modularity (ECVET credits) and evaluative transparency (EQAVET indicators) as guiding principles. Each module is described in terms of content, learning outcomes, workload, credits and assessment methods, with constant reference to the DigComp, EntreComp and CEFR frameworks where relevant.

Key:

- LO: Learning Outcome
- EQF-L: EQF reference level
- Wload: estimated workload (total hours guided + individual study)
- ECVET: credits awarded (1 credit \approx 30 h)

Module 1 - Data Literacy & Information Management

	Operational description
Key contents	Searching and filtering sources, structuring datasets, visual analytics, principles of data privacy and digital ethics (DigComp 2.2 - Area 1)
LO	Mapping, filtering and representing real datasets explaining quality and protection criteria (EQF-L 4)
Wload / ECVET	60 h (40 h guided + 20 h study) \rightarrow 2 credits
Evaluation methods	- DigCompSat Adaptive Quiz - Case studies on open datasets (DigComp 'information & data literacy' rubric) - Progress/post self-assessment (Likert scale)
Institutional Sources	DigComp 2.2 (Carretero S. et al., JRC, 2021); Recommendation 2008/C 111/01 (EQF); Recommendation 2009/C 155/02 (ECVET)

Module 2 - Communication in the mother tongue

	Operational description
Key contents	Argumentative writing techniques, storytelling, public speaking, critical listening (Key Competence 1)
LO	Produce cohesive oral and written texts for professional purposes, demonstrating B2 CEFR mastery and rhetorical strategies (EQF-L 4)

Wload / ECVET	45 h (30 h guided + 15 h study) → 1.5 credits
Evaluation methods	- Technical essay (CEFR Companion Volume 2020) - Role-play and 360° feedback - Portfolio with subsequent reworking (process-writing)
Institutional Sources	Recommendation 2006/962/EC; CEFR (Council of Europe, 2001; CV 2020); EQF 2008/C 111/01

Module 3 – Digital Content Creation & ICT Safety

	Operational description
Key contents	Multimedia editing, use of collaborative CMSs, versioning, basic cybersecurity (DigComp - Areas 3 & 4)
LO	Designing and publishing multimedia content respecting WCAG 2.1 accessibility standards and security protocols (EQF-L 4)
Wload / ECVET	75 h (45 h guided + 30 h study/project) → 2.5 credits
Evaluation methods	- Digital portfolio (DigComp 'creation' & 'safety' criteria) - Scenario-based test on phishing and data breach - Cross-group peer review
Institutional Sources	DigComp 2.2; DigComp-at-Work Guide (Ikanos, 2020); Recommendation 2009/C 155/02 (ECVET)

Module 4 – Learning to Learn & Metacognition

	Operational description
Key contents	SMART goal-setting, self-monitoring, time-boxing, structured reflection techniques, group work
LO	Develop a personal study plan, monitor progress with digital tools and reformulate strategies critically (EQF-L 4)
Wload / ECVET	60 h (35 h guided + 25 h diary/peer-coaching) → 2 credits
Evaluation methods	- Digital logbook (PDCA EQAVET rubric) - Metacognitive Awareness Inventory pre/post questionnaire - Peer coaching logs

Institutional Sources	Council Recommendation 2018/C 467/01 (“Learning to learn”); EQAVET 2009/C 155/01; Upskilling Pathways 2016/C 484/01
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Module 5 – Entrepreneurial Mindset (Hackathon)

	Operational description
Key contents	Opportunity recognition, business-model canvas, teamwork, pitching, iterative feedback (EntreComp - Areas ‘Ideas & opportunities’, ‘Into action’)
LO	Define a value proposition, design a simplified BMC and present the pitch to simulated stakeholders, negotiating feedback (EQF-L 4)
Wload / ECVET	90 h (50 h guided + 40 h hackathon/teamwork) → 3 credits
Evaluation methods	<ul style="list-style-type: none"> - Tutor assessment on BMC (EntreComp rubric) - Pitch assessed by mixed panel (peer, mentor, experts) - EntreCompSAT self-assessment
Institutional Sources	EntreComp Framework (Bacigalupo M. et al., JRC, 2016/2020); Recommendation 2009/C 155/02 (ECVET)

Final integrated check

	Operational description
Key contents	Situational Judgment Test phygital: managing a mini-project in which issues of data breach, tight deadlines and cross-cultural negotiation arise.
LO	Independently mobilise the competences of Modules 1-5 in a complex scenario, emphasising responsibility and autonomy (full EQF-L 4).
Wload / ECVET	<ul style="list-style-type: none"> - SJT with 8 branching scenarios (analytics of choice + reflection) - Tutor debriefing and peer-review on teamwork - EQF-DigComp-EntreComp integrated
Evaluation methods	Badge ‘Advanced Phygital Problem Solver’, Europass Supplement with credit detail (tot. 11 ECVET) and EQF level 4.
Institutional Sources	EQF 2008/C 111/01; DigComp 2.2; EntreComp 2020; EQAVET 2009/C 155/01; Council Recommendation 2012/C 398/01 (NF/IF validation)

Overall mapping of levels and credits

Section	EQF-L	ECVET	Main Framework
1. Data Literacy	4	2,0	DigComp
2. Communication L1	4	1,5	CEFR / Key Comp.
3. Digital Creation & Safety	4	2,5	DigComp
4. Learning to Learn	4	2,0	Key Comp. / EQAVET
5. Entrepreneurial Mindset	4	3,0	EntreComp
Total	4	11,0	–

The total of 11 ECVET credits constitutes the “common propaedeutic block” that every Phygital Hub learner must complete before accessing specialised VET pathways. The correspondence to EQF Level 4 guarantees spendability in both advanced VET pathways and entry-level employment.

Adaptations for disadvantaged learners:

- Fractioned micro-learning: each module is divided into ‘micro-units’ of 15-20 min usable via mobile devices.
- Tutor one-to-one: assigned to participants with low ISCED (< 2) for language and digital scaffolding.
- Accessibility: WCAG 2.1 AA-compliant materials, subtitles, simplified texts and audio-reading.
- Alternative assessment: possibility to replace written tests with video clips or podcasts when specific literacy difficulties emerge.

These measures apply the guidelines of Upskilling Pathways (2016/C 484/01) and ensure equal opportunities for completion.

This section provides the detailed matrix on which the monitoring-quality system (EQAVET) and the impact analysis on the disadvantaged target group will be grafted in the following sections, completing the training framework of the Phygital Centre.

6.3. Application of the model to disadvantaged people

The GRINS project operates in territorial contexts marked by a high presence of NEETs, first generation migrants, long-term unemployed, people with low educational qualifications (ISCED ≤ 2) and learners with disabilities. In these audiences, the distance from the formal education system and the skills required by the labour market is not only technical, but also economic, linguistic, motivational and - often - emotional. The propaedeutic model presented in § 3 must therefore be declined according to a 'universal design' principle that makes the modules usable, certifiable and truly transformative even for the most fragile profiles.

Political framework for inclusion

The starting point is the Recommendation 'Upskilling Pathways - New Opportunities for Adults' (Council of the EU, Recommendation 2016/C 484/01, OJ C 484, 24 December 2016), which obliges Member States to provide low-skilled adults with a three-stage circuit - initial assessment, personalised training offer, validation and recognition - and recommends continuous mentoring, socio-emotional supports and logistical flexibility. Principle 1 of the European Pillar of Social Rights (Inter-institutional Proclamation, 17 November 2017) then enshrines the right to "inclusive and quality lifelong learning", while Regulation (EU) 2021/1057 establishing ESF Plus allocates targeted resources to NEETs, migrants and persons with disabilities. On the digital side, the European Accessibility Act (Directive (EU) 2019/882, OJ L 151, 7 June 2019) imposes accessibility requirements for online platforms and content, fully relevant for phygital delivery.

Initial profiling and facilitated entry

Before the start of the modules, each candidate will undergo an Initial Skills Assessment on three axes - linguistic, digital, entrepreneurial - through adaptive testing (DigCompSat, EntreCompSAT) and motivational interview. This diagnosis, aligned to phase 1 of Upskilling Pathways (2016/C 484/01), produces a preliminary EQF profile and identifies specific barriers (e.g. access to devices, emotional fragility). The results flow into a Personal Learning Agreement, drawn up on an ESF Plus template, which specifies objectives, timeframe and support (loaned devices, transport vouchers, childcare, 1:1 tutor).

Adaptive teaching and scaffolding devices

To bridge basic gaps, the course integrates “Level 0” modules of language and digital literacy in 15-20 min micro-pills, which can also be used via smartphone, with shadow tutors accompanying the less autonomous learner in real time. The multimedia materials are designed according to WCAG 2.1 level AA required by Directive 2019/882, with subtitles, audio-descriptions and easy-to-read versions. Learners with language barriers are offered the opportunity to take oral tests - provided by the CEFR Companion Volume (Council of Europe, 2020) - and to access simplified glossaries in L1. For those without devices, a device-loan scheme funded by ESF Plus (Art. 7 Reg. 2021/1057) is available and coworking spaces are provided in the Phygital Hub.

Motivational and socio-professional support

The learning of frail adults suffers from the “cognitive scarcity” induced by economic insecurity and low self-esteem. The model therefore integrates:

- Peer-coaching circles of 6-8 participants who meet weekly with a mentor counsellor, strengthening belongingness and resilience (recommended by the Digital Education Action Plan 2021-2027, COM/2020/624 final).
- Vertical mentoring with employed alumni, to make successful paths visible and increase self-efficacy.
- Continuous career guidance in cooperation with the EURES network, including Europass CV compilation and interview simulation.

Financial incentives - attendance allowance for transport, meals or assistive technology - further reduce the risk of dropout.

Inclusive assessment and recognition

The assessment phase adopts adaptive tests: DigComp quizzes branch out according to answers, adjusting the level of difficulty; timers can be extended for learners with specific learning disorders. Project work rubrics apply three-level graded criteria (entry, progress, mastery) in line with EQAVET indicator 5 “success rate” (European Parliament and Council, Recommendation 2009/C 155/01, OJ C

155, 8 July 2009). Prior competences, perhaps acquired in informal working contexts, are validated according to Recommendation 2012/C 398/01 on the recognition of non-formal and informal learning, by means of a validation interview and evidence portfolio analysis.

Disaggregated quality monitoring

All EQAVET indicators - completion rate, success, satisfaction, placement - are disaggregated by gender, age, migratory status and disability, making it possible to identify any “outcome gaps” at an early stage and to activate a rapid-feedback loop that adapts micro-content or tutoring intensity. Finally, compliance with EQF/ECVET/EQAVET standards and accessibility requirements is verified annually by an accredited third party (e.g. Accredia according to UNI ISO 29993).

Economic sustainability and replicability

The model is financed by a mix of ESF Plus (Priority 4 “Promoting Social Inclusion”) and React-EU funds for the digitisation of spaces. Partnerships with NGOs and social enterprises guarantee work placements and enhance digital badges on Europass blockchain, making the results “portable” into further EQF level 5 VET pathways.

Ultimately, the integration of Upskilling Pathways, Social Pillar, Accessibility Act and DigComp/EntreComp tools makes it possible to transform the preparatory block into a truly inclusive experience. The combination of didactic scaffolding, social-emotional support, flexible assessment and disaggregated monitoring ensures that even the most fragile learners can complete the pathway, obtain a recognised EQF 4 certification and successfully embark on the subsequent technical-professional pathways provided by GRINS.

7. Scoring Evaluation System

This section provides a detailed description of the evaluation system applied to the users' intake questionnaire, in order to assign one of the following pathways:

- Job placement
- Upskilling
- Reskilling
- Referral to other public services

Areas A and B include scoring for each question. Area C activates conditions to be verified.

Area A – Employment Status (Max 14 points)

A-1 Educational Qualification (Max 2 points):

- No qualification: 0
- Primary school certificate: 0.5
- Lower secondary school certificate: 1
- Vocational qualification (IeFP): 1.2
- Upper secondary school diploma: 1.5
- Bachelor's or Master's degree: 2

A-2 Training/Internships (Max 1 point):

- No training or internship experience: 0
- At least one activity: 1

A-3 Time since last employment (Max 4 points):

- Never worked or more than 3 years: 0
- Between 2 and 3 years: 1
- Between 1 and 2 years: 2
- Between 7 and 12 months: 3
- Less than 6 months: 4

A-4 Total work experience in the last 3 years (Max 5 points):

- Less than 6 months total: 0
- Between 6 and 12 months: 2
- Between 13 and 24 months: 3.5
- More than 24 months: 5

A-5 Job preferences and skills (Max 2 points):

- No job preference: 0
- Has preferences but lacks required skills: 1
- Has preferences and is competent: 2

Passing threshold for Area A: at least 8 out of 14.

Area B – Skills (Max 15 points)

B-1 Italian language proficiency (Max 3 points):

- Level A1–A2: 0
- Level B1: 1
- Level B2: 2
- Level C1–C2: 3

B-4 Foreign languages known (Max 2 points):

- No foreign language: 0
- At least one language at A2–B1 level: 1
- One or more languages at \geq B2 level: 2

B-5 Digital skills (Max 3 points):

- 0–2 activities performed independently: 0
- 3–5 activities: 1
- 6–7 activities: 2
- 8–9 activities: 3

B-6 Extracurricular training and certifications (Max 4 points):

- No activity: 0
- Non-certified training: 1
- Training with certified competencies: 2
- License or professional certification (e.g., permits): 3
- Recognized qualification: 4

B-7 Quality of work performed (Max 3 points):

- All aspects rated low: 0
- At least one aspect rated intermediate: 1
- Two out of three aspects rated high: 2
- All three aspects rated high (complete tasks, autonomy, use of tools): 3

Passing threshold for Area B: at least 9 out of 15.

Area C – Personal Conditions

This area is not scored but triggers closer review in the following cases:

- Mobility constraints (C-1)
- Serious personal/family constraints (C-2)
- Health problems limiting work ability (C-6.1)
- No family support combined with high care burdens (C-4 + C-5)
- Uncertified limitations (C-6.3)

Final Classification

The total score determines the type of pathway to be assigned to the user of the phygital center, and thus defines the type of service. A minimum threshold of 60% of the maximum score for each area has been established:

- If Area A ≥ 8 and Area B ≥ 9 → Job Placement – the user is already trained and ready
- If Area A ≥ 8 or Area B ≤ 9 , or Area A ≤ 8 or Area B ≥ 9 → Upskilling (enhancement of existing skills)
- If Area A < 8 and Area B < 9 → Reskilling (acquisition of new skills)
- If there are limitations flagged in Area C → Careful assessment required

Conclusions

The creation and use of the GRINS Data Dictionary and its connection to the Phygital Platform are big steps forward in the areas of digital transformation, knowledge management, and inclusive education. The platform improves the ability of territorial ecosystems to make smart, data-driven decisions by organizing and structuring the collection, classification, and use of a wide range of data sources, from structured to unstructured formats. It also encourages multiple stakeholders to work together to build knowledge.

The system's ability to dynamically map abilities, trace learning routes, and make it easier for people to find training and job opportunities that are related to their needs shows that it is a scalable and replicable model for social innovation. The focus on semantic enrichment, enhanced indexing, and AI-

powered analytics turns raw data into useful information, which strengthens the idea that data is a strategic asset in the quest for equitable and sustainable development.

In addition, the platform's architectural design, which includes SaaS infrastructure, powerful NLP capabilities, VR/AR integration, and support for several languages, makes it adaptable to different social and technical settings. This makes it especially good at helping vulnerable groups like NEETs, migrants, and people who don't have easy access to formal credentials or documents with their educational and job-related problems.

The GRINS Phygital Centre approach is even more credible, portable, and likely to have an impact because it fits with EU rules like EQF, ECVET, EQAVET, DigComp, EntreComp, and the Accessibility Act. Using proven methods, flexible assessment systems, and inclusive lesson plans all help make the classroom a fair place to learn and one that focuses on verifiable results.

Finally, the GRINS Data Dictionary is more than just a technological tool; it's a key part of a larger plan for local development. It encourages the sharing of knowledge, the valuing of people's skills, and the establishment of collaborative innovation methods in organizations helping to build ecosystems that are strong, data-driven, and sensitive to societal needs.

Appendix

Personal Data Collection Form

Name	
Surname	
Date of birth	
Place of birth	
Nationality	
Phone number	
E-mail	

Residence	
Household Composition	
Current Employment Status	Unemployed (specify duration), seeking first employment, currently employed, etc.
Income Support Measures	NASpI (Unemployment Benefit), Wage Subsidy Scheme, Social Inclusion Income, others (specify)...
Current Educational Status	Attending or not attending training courses, school, university, etc.
Technological Availability (select multiple options)	<input type="checkbox"/> Smartphone <input type="checkbox"/> Tablet <input type="checkbox"/> Computer <input type="checkbox"/> Printer <input type="checkbox"/> Other (specify) _____
Availability of Internet Access	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially <input type="checkbox"/> Other (specify) _____
Interest or hobby	

Complex Data Collection Form for Processing

This form is divided into 3 sections: A) Employment Status, B) Skills, C) Personal Conditions

Area A	EMPLOYMENT STATUS
A-1 Highest Level of Education	<input type="checkbox"/> No educational qualification <input type="checkbox"/> Primary school certificate <input type="checkbox"/> Lower secondary school certificate <input type="checkbox"/> High school diploma _____ <input type="checkbox"/> Vocational qualification/diploma (IeFP) (IeFP) <hr/> <input type="checkbox"/> University degree <hr/> <input type="checkbox"/> Other <hr/>
A-2 Training courses, Internships/Work placements Other training or	<hr/> <hr/> <hr/>

<p>work-based learning experiences</p>	
<p>A-3 Time elapsed since last employment</p>	<p><input type="checkbox"/> I have never worked <input type="checkbox"/> From 0 to 6 months <input type="checkbox"/> From 7 to 12 months <input type="checkbox"/> From 1 to 2 years <input type="checkbox"/> From 2 to 3 years <input type="checkbox"/> More than 3 years</p>
<p>A-4 The 3 most relevant professional experiences carried out in the last three years (to be completed unless you answered 'I have never worked' in the previous question) – Link each to the professional profiles from ISTAT (https://professioni.istat.it/sistemainformativoprofession/cp/). Given that the classification is not always straightforward, AI should match the data provided with the closest corresponding professions.</p>	<p>1. _____ Experience in years: _____ _____ 2. _____ Experience in years: _____ _____ 3. _____ Experience in years: _____ _____</p>
<p>A-5.1 Taking into account your previous work experience, what type of job are you looking for?</p>	<p><input type="checkbox"/> I have no preferences <input type="checkbox"/> Yes, I have preferences</p>
<p>A-5.2 If you have preferences, indicate at least one type of job (maximum 3 choices). Specify whether you have the skills/competences to perform it (refer to the CPI classification mentioned above).</p>	<p>1. _____ <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially 2. _____ <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially 3. _____ <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partially</p>

Area B	SKILLS
B-1 Communication skills in the Italian language – What is your level of proficiency in Italian? (CEFR)	A1 – Breakthrough or beginner level A2 – Waystage or elementary level B1 – Threshold or intermediate level B2 – Vantage or upper-intermediate level C1 – Effective operational proficiency or advanced level C2 – Mastery or proficient level
B-2 [If non-Italian user] Do you have a certificate attesting your level of proficiency in the Italian language?	<input type="checkbox"/> CILS <input type="checkbox"/> CELI <input type="checkbox"/> PLIDA <input type="checkbox"/> CERTIT <input type="checkbox"/> AIL <input type="checkbox"/> Other
B-3 What is your mother tongue?	
B-4 Which languages do you know other than Italian, and at what level?	
B-5 Digital skills – Which of the following activities are you able to perform independently, and at what level?	<ul style="list-style-type: none"> - <u>Conduct internet searches</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Send and receive emails</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Use social networks (Facebook, Instagram, TikTok, etc.)</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Take photos and/or videos and send/share them across devices (PC, smartphone, tablet, etc.)</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Make online purchases (Amazon, eBay, Shein, Temu, Zalando, etc.)</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Use SPID (Public Digital Identity System)</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Search for, download, and update apps on your phone</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Use word processing software such as Word</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can - <u>Use spreadsheet software such as Excel</u> <input type="checkbox"/> I can't <input type="checkbox"/> Only with support <input type="checkbox"/> I can

<p>B-6 Have you participated in extracurricular training activities that improved your professional skills?</p>	<p><input type="checkbox"/> No, I have not participated in any extracurricular training activities</p> <p><input type="checkbox"/> Yes, I attended training courses without obtaining any qualification or certification, including continuing education</p> <p><input type="checkbox"/> Yes, I completed training courses that led to the acquisition of certified skills and/or competencies and/or knowledge</p> <p><input type="checkbox"/> Yes, I completed training courses and obtained a legally required certification (e.g., license, permit – e.g., forklift license) necessary for performing a specific job. If yes, which one? _____</p> <p><input type="checkbox"/> Yes, I completed training courses and obtained a qualification. If yes, which one? _____</p>
<p>B-7 CONNECTED TO QUESTION A-4 IF FILLED IN, TAKE THE ACTIVITY WITH THE MOST EXPERIENCE AND ASK: With reference to the activity of indicated in the previous question, please answer the following questions:</p>	<p>Job content:</p> <p><input type="checkbox"/> I performed all tasks related to my profession</p> <p><input type="checkbox"/> Only some tasks</p> <p><input type="checkbox"/> Only simple/unskilled tasks</p> <p>Autonomy and responsibility:</p> <p><input type="checkbox"/> I worked completely independently</p> <p><input type="checkbox"/> With partial autonomy</p> <p><input type="checkbox"/> Without autonomy</p> <p>Use of tools:</p> <p><input type="checkbox"/> I used all necessary tools</p> <p><input type="checkbox"/> Only partially</p> <p><input type="checkbox"/> I was not able to use them or did not know how to use them</p>

Area C	Personal Conditions
<p>C- 1.1 Mobility and transportation – Do you have your own vehicle?</p>	<p><input type="checkbox"/> No, and I do not have a driver’s license</p> <p><input type="checkbox"/> No, but I have a driver’s license</p> <p><input type="checkbox"/> Yes, I have a car, but I am not in a condition to drive it (specify whether this is temporary or permanent and the reason: no valid license, health/mental issues)</p> <p><input type="checkbox"/> Yes, I have a car and use it frequently</p>
<p>C- 1.2 Mobility and transportation – Do you use or are you able to use public transportation?</p>	<p><input type="checkbox"/> No, I am not autonomous; I travel only with support/assistance</p> <p><input type="checkbox"/> Yes, but I use them with difficulty (poor knowledge of the transport system or routes, or other personal difficulties)</p> <p><input type="checkbox"/> I do not use them but I am able to</p> <p><input type="checkbox"/> Yes, and I use them frequently</p>

<p>C 2 - Are there any personal (health, advanced age, etc.) or family-related (care responsibilities) constraints that may limit your ability to work or search for a job?</p>	<p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes, there are personal/family constraints, but they are compensated and have no impact on work or job search activities</p> <p><input type="checkbox"/> Yes, there are personal/family constraints that may partially limit work or job search activities</p> <p><input type="checkbox"/> Yes, there are personal/family constraints that limit the ability to work or search for a job</p>
<p>C3.1 - If you answered yes to the previous question, can you specify the nature of the constraints? (multiple answers allowed)</p>	<p>[1] Caring for children/teenagers</p> <p>[2] Assisting elderly family members</p> <p>[3] Assisting family members with disabilities or who are not self-sufficient</p> <p>[4] Study/training commitments</p> <p>[5] Personal health issues</p> <p>[6] Other (please specify) _____</p>
<p><i>If you selected answers [1] to [4]</i> C3.2 – How many hours per day do you dedicate to these commitments?</p>	<p><input type="checkbox"/> Less than 1 hour</p> <p><input type="checkbox"/> From 1 to 3 hours</p> <p><input type="checkbox"/> More than 3 hours</p>
<p>C4 - Are there family members or relatives who can provide you with material or non-material support in case of need (e.g., financial help, assistance with child or family care, help with shopping, transportation, household tasks, etc.)?</p>	<p><input type="checkbox"/> Yes, and they provide adequate support</p> <p><input type="checkbox"/> Yes, but they provide only limited support</p> <p><input type="checkbox"/> Yes, but they are not able to provide support that meets actual needs</p>
<p>C5.1 - Do you have any dependent family members?</p>	<p><input type="checkbox"/> 0</p> <p><input type="checkbox"/> 1 person</p> <p><input type="checkbox"/> 2 people</p> <p><input type="checkbox"/> More than 2 people</p>

<p>C5.2 - Indicate the dependent family member(s) (multiple answers allowed)</p>	<p><input type="checkbox"/> Spouse (not legally and effectively separated)</p> <p><input type="checkbox"/> Children (including adopted and foster children)</p> <p><input type="checkbox"/> Other cohabiting family members (parents, sons/daughters-in-law, parents-in-law, brothers and sisters)</p>
<p>C6.1 - Do you have any health problems that affect your work or daily life?</p>	<p><input type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> Partially</p>
<p>If the previous question was answered with Yes or Partially: C6.2 – What type of limitations are they?</p>	<p>_____</p>
<p>C6.3 - Do you have a certification that attests to these limitations?</p>	<p><input type="checkbox"/> Yes, _____</p> <p><input type="checkbox"/> No, _____</p> <p><input type="checkbox"/> Awaiting certification</p> <p><input type="checkbox"/> Other (please specify) _____</p>

Legend on user types (to be defined for use in the assessment):

<p>User types</p>	<ul style="list-style-type: none"> ▪ NEET under 30 (Not in Education, Employment or Training) <input type="checkbox"/> ▪ Young people under 30 <input type="checkbox"/> ▪ Unemployed with no previous work experience <input type="checkbox"/> ▪ Unemployed <input type="checkbox"/> for: 6 months <input type="checkbox"/>; 12 months <input type="checkbox"/>; 18 months <input type="checkbox"/>; 24 months <input type="checkbox"/>; over 36 months <input type="checkbox"/> ▪ Unemployed receiving wage guarantee fund or in mobility schemes <input type="checkbox"/> ▪ Over 50 and unemployed for more than 12 months <input type="checkbox"/> ▪ Women unemployed for at least 6 months residing in disadvantaged regions <input type="checkbox"/> ▪ Women victims of violence <input type="checkbox"/> ▪ Former prisoners <input type="checkbox"/>
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