

Pact for Skills – Large Scale Partnership for the Digital Ecosystem – Programme Document

Objective: The objective of this Programme Document is to outline the rationale behind the establishment of the Large Scale Partnership for the Digital Ecosystem (digital-LSP), its activities and to define a Governance structure to meet the ambitions of the partnership.

Within all 14 industrial ecosystems, the digital ecosystem has in fact a twofold importance, which makes it unique in the set-up and design of this partnership. On the one hand, **the digital ecosystem is important in itself**, as it comprises ICT services, ICT manufacturing and telecommunications. On the other hand, **it takes an important role beyond its own remit, as digital technologies (and skills) form an integral part of economic activities at all stages** of value chains in all industrial ecosystems.

Background information:

The outcome of the high-level roundtable on skills for the digital ecosystem that took place on 19th July 2021 set the basis for the establishment of a skills partnership made of enterprises, social partners, chambers of commerce, public authorities, vocational education and training providers, higher education institutions and employment agencies to work together on **a set of clear commitments to upskill and reskill all working age people** across the EU in the form of a large-scale skills partnership.

The partnership has been developed with a bottom-up approach to facilitate the interactions, exchanges and the set-up of concrete actions and initiatives among a diverse range of organisations that have committed to upskill and reskill the European workforce.

By addressing the current situation and challenges, understanding the needs of the ecosystem, and setting ambitious goals, the partnership aims to bridge the European digital skills gap, empower individuals, and contribute to a digitally skilled workforce capable of thriving in the modern world and supporting the Digital Single Market.

The Digital Ecosystem

The digital ecosystem includes three subsectors: information and communication technologies (ICT) manufacturing, ICT services (excluding telecommunications), and telecommunications. ICT services account for the 95% of the total ICT value added. Within the ICT services subsector, telecommunications play a key role, making up around 35% of the value added of the services subsector and 16% of its employment¹.

In 2019, the digital ecosystem, as defined above, registered in Europe an annual turnover of EUR 625 billion, which represented 5.17% of EU value added². Digital industries are prevalent in most EU Member States, employing 6.8 million workers³ in 1.2 million firms, of which more than 99.8 % are SMEs. ¹ SWD(2021) 351, Annual Single Market Report 2021, Annex III, p. 106. [swd-annual-single-market-report2021_en.pdf \(europa.eu\)](#).

¹ SWD(2021) 351, Annual Single Market Report 2021, Annex III, p. 105.

¹ SWD(2021) 351, Annual Single Market Report 2021, Annex III.

¹ SWD(2021) 351, Annual Single Market Report 2021, Annex III, p. 106. [swd-annual-single-market-report2021_en.pdf \(europa.eu\)](#).

² SWD(2021) 351, Annual Single Market Report 2021, Annex III, p. 105.

³ SWD(2021) 351, Annual Single Market Report 2021, Annex III.

Although the digital ecosystem has not been among the most hardly hit by the COVID-19 pandemic,⁴ the aftermath of this crisis and the current global tensions have a negative impact on investments. This risks to slow down the deployment of strategic digital capabilities, such as distributed-ledger technologies (DLT/Blockchain), cybersecurity, supercomputing, HPC, and artificial intelligence (AI). Such technologies present indispensable opportunities for growth, competitiveness and strategic autonomy of the European economy. In particular, the cybersecurity dimension gains importance by the day, not only for large enterprises but also for SMEs and public services.

As highlighted even more during the COVID-19 pandemic, digital technologies and infrastructure play a crucial role in all sectors, including those that have so far been the least digitised, allowing them to remain competitive and making them more resilient. It is thus fair to say that the economic and political developments in recent years have been triggering an unprecedented demand for digital technologies and infrastructures. Connectivity in the EU is steadily improving, businesses are increasingly taking up digital solutions, and citizens are using more digital tools. However, significant variations still exist across sectors, Member States and regions, large businesses and SMEs. More importantly, significant gaps exist in all Member States when it comes to digital skills, which are a key enabler of digitalisation, not only in the digital industries but also for all the other ecosystems⁵.

On top, despite the ever more strategic role of digital technologies, many parts of the digital ecosystem observe a net outflow of skilled workers. This places up- and reskilling in a particularly intense spotlight.

Policy Framework:

In June 2020, the European Commission announced the new European Skills Agenda⁶, organised around four building blocks:

1. a Call to join forces in a collective action through the Pact for Skills;
2. Ensuring the right skills for jobs;
3. Initiatives to support people in their lifelong learning pathways; and
4. a Framework to unlock investments in skills.

The European Skills Agenda complements the European Digital Strategy⁷ and the Strategy for SMEs⁸ (small and medium-sized enterprises). It is also embedded in the framework of the Recovery Plan for Europe.

Subsequently, the European Commission launched the EU Pact for Skills on 10 November 2020⁹. It is the first of the 12 flagship actions under the European Skills Agenda and is firmly anchored in the

⁴ The digital ecosystem is heterogeneous; the magnitude and nature of the economic impact of COVID-19 vary depending on the market area. Some technology segments (such as PCs, tablets, and PC monitors) and infrastructure as a service (IaaS) are expected to experience continued growth. However, mid-term, a general decline in ICT spending, as companies put non-mission-critical investments on hold, might be expected (IDC, August 2020).

⁵ Only 54% of individuals possess at least basic digital skills and only about one third of Europeans possess above basic digital skills (26%). In parallel, there remains a shortage of ICT specialists on the labour market: In 2022, ICT specialists in employment were 9.4 million, which corresponds to 4.6% of the total employment. Both rates are far away from the Digital Decade targets, respectively of 20 million ICT specialists and 10% of total employment. (Report on the state of the Digital Decade 2023 and accompanying documents).

⁶ <https://ec.europa.eu/social/main.jsp?catId=1223&langId=en>.

⁷ https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/shaping-europe-digital-future_en.

⁸ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0103>.

⁹ <https://ec.europa.eu/social/main.jsp?catId=1517&langId=en>

European Pillar of Social Rights. A Charter, which outlines a shared vision on quality training from industry, social partners, vocational education and training (VET) providers as well as national, regional and local authorities, forms the basis of the Pact for Skills. Signatories agree to respect and uphold the Charter's four key principles:

1. Promoting a culture of lifelong learning for all;
2. Building strong skills partnerships;
3. Monitoring skills supply/demand and anticipating skills needs; and
4. Working against discrimination and for gender equality and equal opportunities.

Based on this vision, the digital LSP implements the 2nd principle of the Pact at European level and by doing so, it aligns with and supports the implementation of all the other principles, including building partnerships at regional and local level. The partnership shares the Pact for Skills vision, aiming to mobilise resources to make investments in skills and set up a collaboration model to collectively take action to upskill and reskill the workforce in all 14 industrial ecosystems identified in the Industrial Strategy¹⁰.

As the partnership refers to the digital ecosystem specifically, it is also worth considering the European Commission communication on the Digital Decade, which sets concrete targets and objectives to drive Europe's digital transformation by 2030¹¹. The partnership will help achieving the policy objectives related to skills, namely more than 20 million ICT specialists considering gender convergence, and the 80% of the population with at least basic digital skills. This will enable the realisation of the whole Digital Decade strategy, as it will support the other objectives, namely the digital transformation of businesses and public administrations, and to keep secure and sustainable digital infrastructures.

Challenges for the digital sector

The current digital landscape presents several challenges in terms of skills development. Many individuals, in fact, lack the necessary digital literacy and technical skills required to thrive in the digital era. Digital adoption and advanced digital skills are needed to embrace the transformation, thus asking more secure, in-demand tech careers. Digital skills are also essential to the survival and growth of businesses. As routine tasks are becoming increasingly automated, there is a risk of job loss for workers performing mainly such tasks. A growing number of workers will need to gain new skills to work in tandem with (digital) technologies. Furthermore, the rapid pace of technological advancements necessitates continuous learning and upskilling to keep pace with evolving job requirements.

What is more, the major disruptions happening on a global scale are exacerbating the disparities between sectors and regions, thus creating polarisation within Europe and a country itself. Among the multiple challenges that the digital ecosystem needs to tackle, the digital skills partnership identified the following as being of utmost relevance:

4.1. Shortage of ICT specialists and other technology experts

Demand for skills has significantly increased in the past years, raising the need for digital skills and competences at different levels and across all ecosystems. In particular, ICT specialist jobs have been among the fastest growing occupations since 2010. However, all Member States, including the front

¹⁰ In its updated version of the New Industrial Strategy (2021), the Commission has identified 14 industrial 'ecosystems', one of them being digital: EUR-Lex - 52021DC0350 - EN - EUR-Lex (europa.eu)

¹¹ https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

runners, currently face a critical shortage of digital experts¹², which hampers the development, uptake and use of emerging key digital technologies and exposes them increasingly to cyber risks. There remains a general shortage of ICT specialists on the EU labour market, and the number of vacancies keeps growing as new jobs emerge. During 2020, 55% of enterprises that recruited or tried to recruit ICT specialists reported difficulties in filling such vacancies¹³. ICT occupations are expected to grow at four to five times the average rate over the course of this decade, as jobs requiring programming are growing 50% faster than the job market overall. The [Cardinal points - Digital Decade report 2023](#), published at the end of September 2023, showed that only few countries, the Netherlands and Finland on top, are set to meet the digital skills goal provided by the Digital Decade. Similarly, the proportion of the general workforce employed in ICT roles remains low in most countries (in 2022 it was still below 4% in Italy, Bulgaria, Croatia, Poland, Romania and Greece). Given the current situation, a systemic lack of ICT experts could be a significant risk that could significantly slow down the digital transformation of all European industrial ecosystems.

4.2. Shortage of digital experts in traditional companies of all sizes and in all ecosystems

The shortage reported above does not only relate to ICT specialists and dedicated experts e.g. in breakthrough technologies. It includes the uptake of digital technologies and related digital skills in all types of enterprises, notably SMEs, in all 14 ecosystems. This endangers the ambition to foster digitalisation, competitiveness, and innovation everywhere in the EU. In recent years, a steady growth in the demand for professionals combining sectoral knowledge with digital skills emerged, with the view to enable the use of digital solutions for specific business cases.

It also clearly comes out from various sectorial blueprints (other than the ones in the ICT ecosystem), that ICT skills become an integral part of all other, more traditional, sectors. As such, it is important to understand the skills needs identified in the blueprints and suggest activities, look up for the good practices and ways to support their upskilling.

Having a skilled workforce that is able to understand new technological trends and how to implement and make savvy use of them in a company strategy and operations is an indispensable condition to move forward with the digital and green transition. It is at the same time a prerequisite to allow traditional industries to remain globally competitive.

Recent developments exacerbate these problems, including cyberattacks that exploit weaknesses and lack of digital skills in all types of enterprises. They underline the need to not only focus on advanced digital skills but – at least equally importantly – basic digital skills that every citizen (and worker) should possess. These basic digital skills range beyond cybersecurity and include data skills (awareness of the GDPR and its implications, knowledge on where to store and how to move data), insights into how digital clouds function and can be managed, in contrast to analogue ways of doing business, as well as many other basic skills.

4.3. Fast pace of transformation of the industry and effect on jobs and skills

There is a coherent view among stakeholders that a key factor – if not the most important one – in exploiting digital opportunities (and addressing risks) is speed, which in many instances is more important than e.g. access to finance. The fast pace of technological development and the challenges created by accelerating interaction between and recombination of innovation render traditional ways to do business increasingly obsolete. This requires updated and more flexible approaches to learning, both in terms of structure and content.

An additional consequence of the ever-faster speed of innovation is accelerating automation. Jobs are increasingly subject to substitution by automation, while at the same time new jobs are constantly being created. This implies on the one hand an increasing demand for advanced skills to address skills

¹² Between 260.000 and 500.000 cybersecurity experts are currently needed in Europe (Cardinal points - Digital Decade report 2023)

¹³ Cardinal points - Digital Decade report 2023

shortages and, on the other hand, the risk for some types of skills to become obsolete because of automation, especially in low and medium-skilled jobs.

Estimates suggest that around 9 to 14 % of jobs in the EU face an elevated risk of automation and that a further 32 to 40 % of jobs are likely to be transformed by automation, entailing corresponding changes in skill requirements¹⁴. There is yet no sufficient investment in reskilling and upskilling, although this would be important to accompany and mitigate the transition in skill sets required for workers affected by technological skills obsolescence¹⁵.

4.4. Lack of lifetime and gender balance

In the light of all the above, it is essential to activate resources across Europe wherever they exist. As noted, the digital ecosystem is currently characterised by a net outflow of digital experts, *i.e.* more experts leave their jobs than start new ones. A considerable part of this stems from the lack of a lifetime perspective, in particular for older employees that at times face discrimination in the job market purely because of their age, which are often a consequence of (perceived) lack of modern digital skills. Initiatives to rebalance up- and reskilling and to foster a lifetime learning perspective are therefore particularly welcome.

The lack of women in the ICT sector and more broadly among graduates in science, technology, engineering and mathematics (STEM) constitutes a further challenge that the digital ecosystem needs to address. Less than one in five employees in the ICT sector (around 19%) and among ICT graduates (0.9% out of 4.2% of all the graduates in the EU in 2021) is female¹⁶. These figures have registered a very slight increase for several years, demonstrating the lack of progress in addressing the issue. In 2022, women accounted for more than 25% of workers in the ICT field only in Bulgaria, Greece and Romania¹⁷. Beyond creating labour and skills shortages, this gender imbalance also has an impact on the way digital solutions are devised and deployed, especially in terms of prompt biases for AI and machine learning.

4.5. Cybersecurity

The reflections so far indicate that cybersecurity skills should play a central role in the work of the digital skills partnership, the more so as the partnership will be “cross-ecosystem”, since digital and cybersecurity issues are transversal and relevant to all sectors. It is illustrated also by the Capgemini report, which finds that 68% of the surveyed companies (within different sectors) in Europe report a high demand for cybersecurity skills, comparably more than other highly-demanded skills, such as big data skills (61%)¹⁸. Furthermore, topics like cybersecurity continue to fail to attract women, with only 20% of cybersecurity graduates being women¹⁹.

Numerous EU initiatives address cybersecurity. In May 2023, the Cyber Skills Academy²⁰ has been launched, with the aim to put a coherent focus on the required skills in the sector. The digital LSP will engage with the Academy to ensure easy access to and high take-up of high-quality cybersecurity skills trainings which match the needs of the labour market.

¹⁴ Pouliakas (2018), [Automation risk in the EU labour market: a skill-needs approach](#); Nedelkoska, L. and G. Quintini (2018), “[Automation, skills use and training](#)”, OECD Social, Employment and Migration Working Papers

¹⁵ Cedefop (2020), Assessing the employment impact of technological change and automation: the role of employers’ practices. Luxembourg: Publications Office of the European Union. Cedefop research paper; No 79. <http://data.europa.eu/doi/10.2801/173340>.

¹⁶ Cardinal points - Digital Decade report 2023

¹⁷ Women in Digital Scoreboard (Digital Economy and Society Index 2022).

¹⁸ <https://www.capgemini.com/news/press-releases/business-leaders-report-urgent-need-for-cybersecurity-skills-as-digital-talent-gap-widens/>

¹⁹ Cardinal points - Digital Decade report 2023

²⁰ <https://digital-skills-jobs.europa.eu/en/cybersecurity-skills-academy>

Cybersecurity for SMEs deserves then special attention. Awareness raising goes beyond regular up- and reskilling; it requires a culture that enables and rewards a joint effort, as an enterprise is only as strong as its weakest link in the face of ever more elaborated cyber-attacks. Moreover, cyber threats are often linked to privacy related issues, questions of data storage and access etc., which necessitates a coherent approach including for workers that – often wrongly – consider themselves as not exposed to such risks.

4.6. Other challenges

There are important other challenges worth mentioning in the digital ecosystem, many of which relate to issues above but also go beyond and/or complement them. They include the following:

- There is a clear global dimension in the supply of and demand for digital skills. The difficulty to attract and maintain experts in European companies is magnified though strong competition by global tech companies or emerging countries investing in IT outsourcing, e.g. Nigeria, India.
- A similar challenge applies to universities, especially small and medium-sized European universities that face global competition in educational services. Attracting good students in a reliable and predictable manner is a difficulty.
- The integration of digital technologies (e.g. AI, blockchain, data management, cybersecurity) into the curricula of higher education courses outside of ICT programmes is not well developed. Reasons are lack of resources, notably teachers, as well as missing understanding of the demands of industrial ecosystems and the digital society we live in as a whole.
- There is a lack of a common nomenclature to assess and evaluate digital skills, which leads to a fragmented situation in Europe as well as to the difficulty of evaluating skills and profiles for recruiters and companies.
- It would be desirable to have shorter courses with flexible modes of study (e.g. part-time, distance) in key digital technologies to facilitate implementation in small businesses who often lack resources to send employees for a 6 months in person training.

Needs for the digital sector

To boost the uptake of digital technologies and solutions across the economy, it is necessary to increase advanced digital skills levels of the workforce and to attract and train people also from non-ICT-sectors. Moreover, it is important to use the full potential of the EU workforce and provide accessible and relevant upskilling and reskilling opportunities to satisfy the needs of more ICT specialists, advanced digital technology users and lower skilled employees with basic digital skills needs.

The activities of the digital LSP will try to address the above-mentioned needs by organising activities following the interconnected priorities:

- **Identifying skills needs and foresee skills requirements:** identifying the specific set of digital competences required by individuals across various sectors, job profiles and industries. This involves assessing the existing skill gaps, determining the most in-demand digital competencies, and anticipate future trend by working closely with the private sector. (Blueprints specific outputs);

- **Creating a nurturing collaboration environment among Academia, Training Institutions, Businesses and public bodies in the form of Public-Private Partnerships (PPP):** collaborating with educational institutions to incorporate digital skills into their curricula, ensuring that students are equipped with the necessary knowledge and capabilities to succeed in a digital world. Understanding the digital skills needs of businesses and employers will help align curricula with the requirements of the job market, fostering a skilled workforce that meets industry needs. At the same time, Government and policy makers should allow a fostering policy environment allowing collaboration to thrive easily and supporting with targeted investments and financing.
- **Setting good practice examples** and providing support that can assist all European industrial ecosystems and respective enterprises in digital up- and reskilling, building upon already available resources and initiatives. The content of up- and reskilling measures will be as important as their quantitative amount, and even the smallest initiative can serve as a blueprint for others and help digital training scale in Europe.

Ambitions

The ambitions of the digital-LSP under the *Pact for Skills* include:

- The partnership will contribute to reach the targets of the Digital Decade policy programme, especially those of **equipping 80 % of people with basic digital skills, of achieving gender convergence and of having 20 million ICT specialists employed in the EU by 2030**. The partnership will also work to achieve the objectives of the EU Skills Agenda and the European Pillar of Social Rights Action Plan calling for collective action to support the development of digital skills in the adult population and to **reach the 2030 targets of 60 % of adults participating in learning every year**, as per Digital Decade communication.
- **Favouring, fostering and supporting a collaboration environment** where all stakeholders can share and exchange knowledge, learn from peers, leverage on and aligning with existing and successful initiatives at European and national level, rather than reinventing the wheel. The partnership will become a central point for networking and a pool for examples of actions and scaling up best practices to encourage other actors and stakeholders in the digital ecosystems and beyond to take up similar actions and thus to develop solutions that contribute to the up-skilling and re-skilling challenge that Europe needs to face.

Suggested activities to be implemented by the Secretariat are divided into macro categories, depending on the final outcome:

Awareness and Outreach: the more organisations are involved in the partnership, the better it is to create impact. To onboard new members, the Secretariat will implement the following activities: launching social media campaigns, organizing events where the partnership is promoted, leveraging members' communication channels to reach a wider audience, speaking as a digital LSP Ambassador in external events at national and EU level.

Cross contamination and knowledge exchange: Facilitating collaboration between various stakeholders, including businesses, educational institutions, and government agencies, to share best practices, resources, and expertise in digital skills development, pitching events for LSP members, validation workshops, infodays on EU funded calls, matchmaking events to create consortia and foster collective learning and cooperation.

Monitoring and Evaluation: Implementing mechanisms to assess the effectiveness of the partnership's initiatives and make data-driven adjustments as needed. This includes gathering feedback from participants to continuously target the activities and ensure their long-term impact, as well monitoring the commitments of Members and support those having difficulties in meeting them.

Scaling and Sustainability: Working towards the scalability and sustainability of the partnership's efforts. This may involve securing long-term funding, developing business models that allow to sustain the partnership and its effort.

Governance of the digital-LSP

The digital-LSP has defined its own governance to reflect the multiple layers of the Partnership and its Ambitions. It is composed by the following bodies:

1. **Digital LSP Secretariat at EU level:** this body is composed of the European DIGITAL SME Alliance and the University of Applied Technology of Amsterdam. The two organizations are performing their tasks without any form of compensation.

The Secretariat manages and coordinates members and activities, and communicates directly with the support service if needed.

Among its main duties, the Secretariat performs the following **activities**:

- Overall partnership management: defining responsibilities, tasks, monitoring and organizing activities, managing and supporting members.
- Scouting and onboarding new partnership members.
- First line of communication with the other LSPs.
- Promoting the partnership as an ambassador in internal and external events, both at local and European level.
- Overseeing national, regional, local digital LSPs and other initiatives in the framework of the digital LSP – such as ad hoc blueprints Working Groups / Alliances.

2. **Blueprints / Alliances / Verticals Working Groups:** these entities are composed of the partnerships established within a Blueprint / EU project framework delivering digital skills training, intelligence and curricula.

As the digital ecosystem is comprised of several verticals (technologies), most of which are being covered by Erasmus+ blueprints projects, an appointed organisation from the project consortium can create and manage a “Vertical” Working Group under the umbrella of the digital-LSP.

A Working Group can be opened to tackle specific and identified sectoral or regional issues, e.g., women in STEM.

Coordinators of the “Vertical” Working Groups can choose their own Group’s governance, members, and activities, provided they comply with the overall governance and branding of the digital-LSP. All organisations wishing to be part of a specific WG need, in fact, to have signed the Pact for Skills and to be included in the digital-LSP. WGs coordinators are responsible to share with the Secretariat their WGs planned activities as well KPIs in advance, so to have a general overview and create possible synergies with other activities happening at ecosystems level. Working Groups can be opened by any organisation member of the digital-LSP wishing to steer the activities, upon agreement with the Secretariat.

Alliances Working Groups can leverage on the outreach of the digital-LSP umbrella to perform the following **activities**:

- Survey for industry needs and market trends.
 - Workshops to validate findings with relevant stakeholders.
 - Events / Webinars to disseminate project results, such as: new curricula, new job profiles, training opportunities, relevant sectoral findings.
 - Any project task that might benefit from the engagement of the digital-LSP (hence required the approval of the Secretariat).
 - Exchange of best practices on methodologies and lessons learnt from the project's implementation.
3. **National and Regional partnerships:** As education remains a competence of Member States, regional and local partnerships will be encouraged and supported with guidelines and sharing of best practices. As National partnerships have been established already under the "National Coalitions for Digital Skills and Jobs" initiative, the Secretariat of the digital LSP will focus on the regional and local dimension, thus keeping the connection with the National Coalitions and supporting their establishment. The partnership will engage with EDIHs and Clusters as they are one of the key instruments to provide training to the European businesses and their workforce.