

SUMMARY

OF NATIONAL SURVEYS ON IDENTIFYING GAPS IN DIGITAL SKILLS FOR SERVICE WORKERS IN TOURISM AND RETAIL SECTORS

Project: Digital Skills Evaluation Tool and Support
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Part 1. National strategies for promotion of digital skills of citizens and workers

1.1. Austria

The following documents and concepts were considered:

Digital Austria¹ | Digitale Schule² | AMS New Digital Skills³ | WKO Education Offensive⁴ | Digital Seniors⁵

The items 1. to 7. shown below within the following structure are skill focused. *Other items refer to services, online-platforms, policy-, technology-, or infrastructure-initiatives.* The structure reflects the official order of the Federal Ministry for Digital and Economic Affairs.

Society:

fit4internet

Master plan for digitization in education: Hardware, Software, Educators, Curricula

Digiprof: Digital professionalisation in adult education

Digital Seniors

oesterreich.gv.at

Electronic delivery

Broadband expansion

From e-government to m-government

Handy signature

Economy:

SME digital

WKO Education Offensive

New Digital Skills (Public Employment Service Austria - AMS):

Corporate service portal

Broadband expansion - 5G strategy

Artificial intelligence

Electronic delivery

From e-government to m-government

Administration:

Federal Academy of Administration

The digital authority

oesterreich.gv.at

Electronic delivery

Open Government Data (OGD)

¹ <https://www.bmdw.gv.at/Themen/Digitalisierung/Strategien/Digital-Austria.html>

² <https://digitaleschule.gv.at/>

³ <https://newdigitalskills.at/>

⁴ <https://www.wirbildenzukunft.at/>

⁵ <https://www.digitaleseniorinnen.at/>

fit4internet <https://www.fit4internet.at/view/verein>

fit4internet is a non-partisan and independent association with the objective of qualifying and quantifying digital literacy among the Austrian population. The primary goal is to enable the competent use of digital technologies and ensure a broad participation of the entire society in the digitalisation process.

Competence Framework <https://www.fit4internet.at/view/verstehen-das-modell>

Austria has developed its own competence model for digital skills. It is called "Digital Competence Framework for Austria - DigComp 2.2 AT" and is based on the European Reference Framework for Digital Competences (DigComp 2.1). The Competence Framework serves to classify and compare digital skills and thereby makes a contribution to facilitate the exchange on desirable knowledge and competences in the digital world of life and work.

The Digital Competence Framework for Austria defines digital competences in six areas and eight competence levels. Within these areas of competence, 25 individual competences (PDF) are classified.

Austrian Interdisciplinary Task Force for Digital Competences
<https://www.fit4internet.at/view/taskforce>

The Federal Ministry for Digital and Economic Affairs has established the Austrian Interdisciplinary Task Force that functions as an advisory board for digital competences. Its recommendations are publicly available to all stakeholders in politics, economy and science. fit4internet was entrusted with the task force's establishment and chairmanship. Its permanent members were invited by the Federal Ministry for Digital and Economic Affairs on proposal of the General Secretariat of fit4internet and work free of charge. They come from the fields of adult education, science, research as well as economy, and were chosen due to their professional expertise, interdisciplinarity, independence and non-partisanship.

Objectives, activities and projects of the task force:

Acceptance: The Digital Competence Framework for Austria should become and remain a widely and comprehensively established working base for the development and enhancement of digital literacy among all Austrian citizens.

Updating: The Digital Competence Framework for Austria and the application scenarios derived from this model are continuously updated. If necessary, they are further expanded by the task force in order to keep pace with the dynamics of digitalisation, its opportunities and challenges.

Networking: The task force and its members should ensure a broad and intense exchange and network of initiatives, measures, best practices and new ideas.

Quality Management: By cooperating and participating in projects, the members of the task force ensure the quality and coherence of these measures. The projects include funding programmes, research projects, working groups as well as measures in referencing, evaluation and certification processes.

Check your digital skills <https://www.fit4internet.at/page/assessment>

fit4internet gives you the opportunity to evaluate your digital skills. For this purpose, the so-called fit4internet tools (f4i-tools) CHECK and QUIZ were developed. A CHECK contains self-assessment questions and a QUIZ, on the other hand, employs knowledge-based questions. There is no time limit for answering the questions. Moreover, a registration is not required. The f4i-tools can be used as often as desired. Subject areas: Everyday Life. The workplace. Safety. Artificial Intelligence.

Masterplan for digitization in education: Hardware, Software, Educators, Curricula
<https://www.bmbwf.gv.at/Themen/schule/zrp/dibi.html>

The Masterplan is divided into three major fields of action.

Field of action 1 "Software" - pedagogy, teaching and learning content: In the course of a fundamental revision of existing curricula, new teaching and learning content from the field of digitalisation is to be systematically incorporated into the curricula. The goal is to map a comprehensive basic understanding for dealing with new content in the curricula and to take digitisation into account methodically and didactically in all subjects in the sense of modern teaching.

Field of action 2 "Hardware" - infrastructure, modern IT management, modern school administration: The infrastructural equipment and the availability of mobile devices should be brought to a unified and comparable standard. The prerequisite for the use of digital instruments and tools at schools should be created across the board. School administration is to be simplified through up-to-date applications.

Field of action 3 "Teachers" - initial, further and continuing training: Digitisation, new ways of conveying content and ways of acquiring it should be systematically anchored in the training and further training of teachers.

Compulsory exercise "Digital Literacy" (Secondary Level 1) In this exercise, the pupils acquire competences from the following areas in the scope of two to four lessons per week within four years 1) Social aspects of media change and digitalization 2) Information, data and media competence 3) Operating systems and standard applications 4) Media design 5) Digital communication and social media 6) Security 7) Technical problem solving 8) Computational Thinking.

In addition, a major curriculum reform is underway in primary and secondary 1. Its completion is not foreseeable at present. It is to be expected that digitalisation will be broadly reflected in this curriculum.

Digiprof: Digital professionalisation in adult education
<https://erwachsenenbildung.at/digiprof/>

Digital technologies open up new possibilities for adult education: they influence forms of teaching and learning, educational formats and organisational processes. Continuous learning is necessary at all levels of adult education (professional and organisational development). In the section DigiProf - Digital Professionalisation in Adult Education you will find resources, tools, further training and news on the topic.

Digital Seniors **<https://www.digitaleseniorinnen.at/>**

digitaleSeniorInnen - the service point for digital education for senior citizens in Austria. The goal is to ensure that all people have access to the opportunities of digitalisation. We support you as an educational institution with our experts from the fields of adult education, media education, information technology and organisational development.

The offer of digitaleSeniorInnen is aimed at educational institutions as well as trainers. We support you in planning and implementing educational offers for older people. As a contact for senior-friendly teaching and learning, we help develop and make visible your projects.

SME digital <https://www.kmudigital.at/>

KMU DIGITAL is the digitisation support for small and medium-sized enterprises (SMEs) in Austria. With KMU DIGITAL, the Federal Ministry for Digital and Economic Affairs (BMDW) in cooperation with the Austrian Federal Economic Chamber (WKÖ) supports Austrian companies in using the opportunities of digitalisation and mastering challenges.

WKO Education Offensive <https://www.wirbildenzukunft.at/>

As the largest private education provider, the Austrian Economic Chamber the largest private provider of education, the Austrian Federal Economic Chamber (WKO) has developed a comprehensive education offensive in an open innovation process involving companies, stakeholder institutions and experts, which creates direct benefits for companies and the location. The central concern is to train a sufficient number of digitally and socially competent skilled workers for our entrepreneurs. The education offensive includes both targeted new initiatives by the WKO and proposals for politicians, to create better framework conditions for future-oriented education and further training. The challenge of the shortage of skilled workers is already burdening the economy today, and the situation will become even more acute. Losses in turnover and decline in innovation could be the result.

New Digital Skills (Public Employment Service Austria - AMS)

<https://newdigitalskills.at/>

With the New Digital Skills initiative, the AMS is focusing on the changes brought about by the digital transformation of the economy and the world of work. We are happy to provide you with a summary of the results of the work to date by sector here for you to read and pass on.

Federal Academy of Administration

<https://www.oeffentlicherdienst.gv.at/vab/index.html>

The Federal Academy of Administration (Verwaltungsakademie des Bundes VAB) is the training and further education institute for employees of the Federal Civil Service. It is one of the largest professional development institutes in the country. It is the place where careers begin and careers take off. It is the hub and laboratory for new developments in public administration. The VAB wants to make an important contribution to the motivation and job satisfaction of public service employees through practical and professional offers.

In the near future, the VAB expects extensive orders and action-plans from ministries and CDOs for the digitization of the entire public service.

ESCO | ISCO-08 | ECVET | NQR | EQR | EUROPASS – and the missing „digital diagonal“

It is important to recognise and improve the connections here, but we are only at the beginning. When studying the ESCO descriptors, it becomes apparent that they do not reflect digitisation very much, because digitisation runs "diagonally" through all areas (**digital diagonal**).

More detailed information with focus on retail sector:

Different offers from the chambers of commerce in the different Austrian Regions:
<https://www.wko.at/branchen/vbg/handel/start1.html> – e.g.

Course "Retail with a focus on online retailing" by Update Training

From Retail to Retail Management - WIFI + WAFF

Apprenticeship in Retail

E-commerce expert - WIFI + Digital Austria

Vocational Academy of Retail Management - WIFI and WAFF

Retail Agents

Direct Sales - WIFI

Digital Innovation Hubs & Bootcamps for qualification of personnel - Digital Austria

Online Cash Register - Digital Austria

Digital Roadmap Austria

HANDEldigital <https://www.wko.at/site/handeldigital/start.html#>

Knowledge platform

Digitisation guidebook: [https://www.wko.at/service/WKO_Online-Ratgeber.html#heading_Digitalisierung_Innovation_und IT Sicherheit](https://www.wko.at/service/WKO_Online-Ratgeber.html#heading_Digitalisierung_Innovation_und_IT_Sicherheit)

More detailed information with focus on tourism:

DIGITALISIERUNGSSTRATEGIE FÜR DEN ÖSTERREICHISCHEN
TOURISMUS | DIGITALISATION STRATEGY FOR AUSTRIAN TOURISM (2017)

Link: https://www.bmlrt.gv.at/dam/jcr:41232ac8-a41c-4fd0-bba6-e2bcc3d7c9a6/DIGITALISIERUNGSSTRATEGIE_barrierefrei.pdf

III CREATING COMPETENCES AND PROCESSES FOR DIGITAL TRANSFORMATION

EDUCATION AND LABOR MARKET

Measure 15: Digital competence in apprenticeship position- evaluation of tourism
apprenticeships

Measure 16: Apprenticeship at a glance - development of an electronic training tool

Measure 17: Networking and information - new service offers for apprentices and
trainers

Measure 18: Demands on tourism - ongoing development of school and university
training programs

Measure 19: Train the Trainer - digital fitness and competence for teaching staff at
tourism schools and vocational schools

„Aktionsplan 2019/2020 – Masterplan für Tourismus Plan T“

<https://www.bmlrt.gv.at/tourismus/tourismuspolitische-themen/digitalisierung-und-innovation/digitalisierung.html>

As a measure, the BMLRT established the "Austauschplattform Digitalisierung im
Tourismus" [EN: Exchange Platform for Digitization in Tourism] in December 2019.

Partners from the tourism industry are brought together with representatives from other
sectors such as science, funding institutions or innovation providers.

The goal: regular and institutionalized exchange of knowledge and information in order to identify opportunities and chances for tourism in the field of digitisation at an early stage and to use synergies.

Establishment of a central innovation hub NETA (Next Level Tourism Austria) at Österreich Werbung.

NETA is a networking initiative at the interface between Austria's traditional tourism structures and the global travel & communication tech scene. As part of NETA, the project Learning Platform for Digitization in Tourism was launched. The platform is intended to pick up the industry, which is traditionally structured in micro-enterprises, at its respective level of development and knowledge on the subject of digitization, to provide the companies with new tools for innovation and to support them in the use of new technologies.

<https://www.austriatourism.com/blog/2019/neta/next-level-tourism-austria/>

In cooperation with the Federal Tourism and Leisure Industry Division of the WKÖ, the brochure "Datenschutz neu - Eine Orientierung für die Tourismus- und Freizeitwirtschaft" [EN: Data Protection New - An Orientation for the Tourism and Leisure Industry] was published in May 2018 on the occasion of the entry into force of the General Data Protection Regulation (GDPR).

<https://www.bmlrt.gv.at/dam/jcr:869de2f3-15ba-4a45-b881-aa408a02a794/datenschutz-im-tourismus.pdf>

In cooperation with the Federal Minister for Digital and Economic Affairs the "Forschungskompetenzen für die Wirtschaft" [EN: Research Skills for Economy] funding program was launched to tourism in 2018. 2 million euros were available for the qualification of employees in tourism concerning of digital competencies.

In 2017, a "Digitisation Strategy for Austrian Tourism" was developed together with the Federal Tourism and Leisure Industry Division of the WKÖ, Österreich Werbung and the entire tourism industry.

Learning-Platform <https://oew.sharepoint.com/sites/eCampus>

Guest Experience

ÖW Knowledge

Marketing & Communication

Business Models of the Future

DSGVO & Cyber Security

1.2. Bulgaria

The National Lifelong Learning Strategy for the period 2014 – 2020 foresees:

3.4.7. Development of opportunities for non-formal and informal learning for personal and professional growth. New opportunities for a good quality of life after the end of one's career

Cultural institutions in Bulgaria (community centers, libraries, museums, etc.) are establishing themselves as centers for non-formal learning and independent learning. Community centers (community libraries) are an example of a sustainable cultural and educational institution with a specific mission to preserve and develop the traditional values of the nation, to provide opportunities for independent learning, to be an active factor in implementing lifelong learning activities in local communities. It is the community centers that traditionally provide the widest network of public libraries in the country. Many public

libraries provide free training to acquire digital skills for different target groups - retirees, children, people with special needs and more.

Objectives:

Targeted measures to promote the networking of public libraries at local and regional level and their establishment as centers for the acquisition of digital competencies

The Strategic Framework for the Development of Education, Training and Learning in The Republic of Bulgaria (2021 - 2030) /Draft/ states that:

The complex of life skills in the 21st century is constantly expanding and changing dynamically. Along with the acquisition of key competencies, the need for social and emotional intelligence is becoming increasingly apparent. Over the next ten years, basic and functional literacy in reading, math, science and technology and digital skills need to be further developed.

The Strategy underlines the following:

Strengths

Introduced training for acquiring digital skills and provided access to free internet and digital resources in schools

Weaknesses

Unsatisfactory level of digital skills of the participants in the educational process;

The Strategy puts the following goals:

Goal 1.1. Training focused on the formation and development of key competencies and skills for living and working in the 21st century

Investing in learning foreign languages and acquiring digital and communication skills

Goal 2.2. Development of competencies in accordance with the changing role of the Master

Raising the qualifications of teachers to develop their competencies to work with digital technologies, with gifted / talented children / students, with children / students with special educational needs and in a multicultural environment

Improving the qualification of teachers for the application of new technologies for cloud ICT services and for innovative digital teaching methods

Especially relevant here is the following Priority Area:

Priority area 4 Educational innovation, digital transformation and sustainable development

Goal 4.4. Development of education in digital environment and through digital resources

Balanced use of digital educational solutions and traditional learning according to the age of the children;

Developing the skills of pedagogical specialists for teaching in an online environment and for developing and using digital learning content;

Formation of competencies in students and teachers for creating, editing, enriching and updating digital content;

Formation of skills for safe use of the Internet, for recognizing risks, threats, fake news, etc .;

Effective and constant control by teachers for compliance with the rules for working in the network of children / students in educational institutions;

Reducing the access to harmful or illegal content on the Internet of children / students in educational institutions by the head of the computer room, together with the Internet provider;

Developing skills for creating, using and modeling artificial intelligence;

Upgrading the cloud environment in the education system, introduction of specialized software solutions for analysis and evaluation of educational outcomes, using computer modeling, algorithms and artificial intelligence;

Creating in each school a high-tech educational environment and conditions for teaching through the use of integrated educational platforms and cloud technologies;

Increasing the number of electronic devices in schools;

Development of internal and external (including international) school networks to provide fast, secure and reliable access to digital resources;

Furnishing classrooms with modern equipment for working with digital learning content and turning them into digital classrooms.

Objective 5.3. Development of vocational education and training based on the transition to a digital and green economy

Support for the introduction of scientific approaches and innovations in vocational education and training, for the promotion of continuing education in order to orient to research and development activities of students and their entrepreneurial skills;

Creating and implementing innovative teaching and learning methods based on digital technologies and open online educational resources;

Establishment and development of centers for excellence in vocational education and training on a territorial and / or sectoral basis;

Construction of new or reconstruction of existing bases for practical training, classrooms and laboratories in vocational high schools;

Establishment of specialized multifunctional centers for professional training / education in several specialties / professions of the type "competence centers"

1.3. Greece

The coronavirus pandemic in Greece acted as an accelerator for the digital transformation of the country as several services got digitalized quickly and efficiently. Greece, as soon as the first lockdown was imposed last spring, launched an online platform offering services such as medical prescriptions, residence certificates, recognition of university degrees etc. At the same time ministerial cabinet meetings were held through online meeting platforms, while distance learning and teleworking was expanding among the student and working communities. During the second lockdown, last November in the country, Greece made an impressive progress in distance learning as all classes, from nursery schools to universities, were held on-line without interruptions or obstacles.

According to available data presented in an extensive report created by Foundation in collaboration with EIT Digital (part of the European Institute of Innovation and Technology) the majority of companies surveyed recognize the importance of digital transformation, as 90.2% have either initiated or intend to activate a digital transformation roadmap immediately. In addition, before the pandemic, 7 out of 10 Greek companies had only 25% of their workforce in remote work whereas after the outbreak of Covid-19, 6 out of 10 companies have more than 50 % of their employees working remotely.

The Greek Ministry of Digital Governance recently presented a Digital Transformation “bible” for the years 2020-2025 outlining a holistic digital strategy that was initially designed before the pandemic outbreak, it had though to move faster due to the urgent situation. The “bible” outlines the guiding principles, the strategic axes and the horizontal and vertical interventions that will lead to the digital transformation of the Greek society and economy. Through collaborations with stakeholders from the public and private sector as well as with the research & academic community and the civil society, the “bible” describes the objectives but also the implementation measures of the digital transformation strategy. It should be noted that the formulation of the Action Plan of the strategy is an open and dynamic process as new actions will be added when needed.

The new national Digital Transformation strategy sets seven objectives as follows:

1. Safe, fast, and reliable access to the Internet for all

The aim is to ensure a favourable regulatory and legislative framework and upgrade fixed network infrastructure for the development of 5th generation (5G) infrastructures. Through the new national cyber security strategy information systems, digital services and infrastructures will be inspected following the proper security procedures. Digital services and websites will be redesigned according to the principle of universal design in order to make them accessible to all population groups.

2. A digital state offering better digital services to the citizens for all life events

The aim is to meet citizen’s needs through the simplification of digital services and the provision of digital solutions. The National Portal for the Provision of Digital Services (gov.gr) has already been created and the aim is to serve as a central point of entrance and reference regarding information and digital of the Public Administration. The interconnection and interoperability among the basic Registries are also described in the “bible”.

3. Development of digital skills for all citizens

The aim is to enhance the teaching of innovation technologies in all education levels, from the secondary level to universities, in order to improve student’s digital abilities, while the creation of a Digital Academy for citizens will ensure that people of all ages will be able to acquire the needed skills through live or online programs whenever needed.

4. Facilitate the transformation to digital enterprise

The aim is to help all Greek enterprises becoming digital ones through training programs, the creation of a central digital invoices system and the support of electronic commerce solutions in order to also enhance the export orientation of enterprises.

5. Support and strengthening of digital innovation

The aim is to ensure the development of the start-up companies active in the domain of ICT while supporting the creation of new innovation ecosystems through the support of Digital Innovation Hubs.

6. Making productive use of public administration data

The aim is to make full use of public data through the creation of a single data governance model at national level with respect for the protection of personal data. The open availability and maximum use of public data contributing to the development of new products, business models and markets is a key factor to the digital transformation.

7. Incorporating digital technologies to all economic sectors

Adopting digital tools in various sectors such as telemedicine, distance learning, remote hearings at courts, teleworking in the public sector, network of sensors to collect data for the Environment etc.

The digital transformation of the country is a great challenge but also a complex and difficult task. The rapid technological changes combined with the low digital maturity of

Greece demand urgent and immediate action on multiple axes through the implementation of a holistic digital approach. Within this direction the Digital Transformation Strategy, according to the “bible”, concerns the implementation of more than 400 projects.

Under the framework of the government’s national strategy for growth and overcoming the financial crisis, a new approach to commissioning the development of digital skills has been set for the Action Plan based on the digital governance priority and the need for a high digitalisation level of Greece’s economy and society.

The scope of the current Action Plan is to establish the main areas of intervention in terms of specific priorities and policy.

In terms of policy areas, the intervention will focus on:

- Public Sector Digital Transformation
- Greek civil servant digital skills capacity
- Formal, vocational and Lifelong Learning education
- Career Counseling and Guidance
- ICT skills accreditation
- Employment
- Entrepreneurship
- ICT and innovation
- Gender dimension: reconciliation of family and working life
- Actions for raising awareness.

Based on the main issues of the Digital Skills and e-Leadership policy, the following priorities have been defined:

Priority 1: Enhance Public Administration capacity towards promotion of e-skills of civil servants as a key enabler for the digital transformation of Public Sector

Priority 2: Development of a learning mechanism that will offer free online courses for civil servant’s digital skills and e-Leadership development

Priority 3: Creating & Fostering Employment Conditions and Structures for Digital Talent within organizations

Priority 4: Up-skilling Small and Medium Enterprises with Digital Skills

Priority 5: Promote Digital Skills in all Educational levels and Life Long Learning.

Priority 6: Up-grading Greek teachers' skills

Priority 7: Promoting e-skills through RTDI activities

Priority 8: Mapping Digital Skills Data on Greek labor market.

Priority 9: Creating & Fostering Employment Conditions and Structures for Digital Talent within organizations

Priority 10: Up-skilling Small and Medium Enterprises with Digital Skills

Priority 11: Empower Women & Girls to Go Digital in Greece.

Priority 12: Better Employment Conditions for Female Talent with Digital Skills

Also, the following Strategic Objectives has been defined:

SO 1: Develop innovative culture and skills in the public administration

SO 2: Promoting data driven decision skills in Public Sector and Industry

SO 3: Administrative Processes Reengineering and Digitization of Public Services

SO 4: Promoting advanced Digital Skills in Public Sector

SO 5: Developing digital skills to enable all citizens to be active in digital society

- SO 6: Developing high-level digital skills for professionals in all industry sectors.
SO 7: Encouraging student's engagement in STEM related fields.
SO 8: Encouraging adults for a Digital Skills engagement.
SO 9: Upgrade of the digital school infrastructure on primary and secondary education level to improve digital skills of their students
SO 10: Supporting Greek Teacher to promote their Digital Skills in classroom.
SO 11: Promoting Digital skills through engagement in RTDI activities
SO 12: Bridging Gap – Creating a National Mechanism for Mapping and Growing Digital Talent
SO 13: Collaboration with businesses and sectoral organizations to identify and address the needs of businesses in digital skills
SO 14: Horizontal Actions of guaranteed employment or training, including digital skills training
SO 15: Digital Skills Labor Force for SME's Digital Transformation.
SO 16: Re-starting for the WGGD Pledge.
SO 17: Up skilling Female labor force with Targeted Training activities SO 18: Innovation Hub for Women in Technology.

PILLAR 2: TRANSITIONING TO A DIGITAL ECONOMY TO PROMOTE GROWTH

PILLAR COORDINATOR: Ministry of Digital Policy, Telecommunications and Media

<u>FIELD</u>	<u>OBJECTIVES</u>
<i>Priority 3: Creating & Fostering Employment Conditions and Structures for Digital Talent within organizations</i>	<p>SO 5: Developing digital skills to enable all citizens to be active in digital society</p> <ul style="list-style-type: none"> Promote Digital skills as a key enabler of transformational improvements that generate greater productivity. Overcoming the obstacles and/or limitations some people face to obtaining digital skills - including lack of interest, awareness, resources and/or knowledge, as well as fear of technology and importantly disability
<i>Priority 4: Up-skilling Small and Medium Enterprises with Digital Skills</i>	SO 6: Developing high-level digital skills for professionals in all industry sectors.

Priority 3: Creating & Fostering Employment Conditions and Structures for Digital Talent within organizations

SO 5: Developing digital skills to enable all citizens to be active in digital society

One of the most important goals of the National Digital Strategy 2016 - 2021 is skills development aiming to unlock leapfrogging opportunities for a digital Greece. The relevant section for human capital improvement with Digital Skills focuses on research, the Greek school system and the Life-Long Learning actions advocating: “The human factor is the driving force for the development of the digital economy and the incorporation and diffusion of its benefits into Greek society and economy. In addition to the field of the economy, digital skills are the tool for participation on equal terms by all citizens, in all areas of human activity that are constantly enriched through ICT. The reinforcement of the digital skills of human resources must be continuous and should monitor technological developments, since:

- It creates the appropriate platform for the development of entrepreneurship in the digital economy,
- It is a driving force for the digitization of traditional business and economic activities,
- It supports research and innovation in ICT and is the basis for the creation of start-ups,
- It transfers the benefits of growth to the rest of the economy,
- It creates the conditions for equal participation in the new environment that is shaped by the constant evolution of ICT and the diffusion of benefits across society.”

Proposed Actions

Action 9: “Digital Technology Week”

A series of events that enhance interplay between digital technologies and the public through a learning platform by offering e-classes, workshops, oral presentations, teleconference sessions and round table Q&A sessions. It is held in remote/rural locations, where the “Rural Broadband” project has already enabled broadband connections.

The events aim to inform participants about the benefits of broadband connectivity and digital skills. It actively involves local communities and includes several components:

- Highlighting effective uses of broadband, the educational sessions address various audiences, i.e. pupils/students, adults, e-entrepreneurship, and they provide people with basic digital skills used in everyday life and the workplace.
- For the hybrid e-learning sessions, students use an e-learning system with the assistance of an on-site tutor.
- Teleconference sessions include conferences with doctors and physicians, displaying applications of tele-medicine and e-health.
- Teleconferences set up communication among different communities.
- Round tables offer Q&A sessions, which are held in public places, with the participation of experts who present digital technologies with the public.

Action 10: “Get digital skills for all”

Short Learning Programmes (SLPs) developing digital skills to encourage people to be active in our digital society.

The “Get digital skills” e-learning classes are available in the form of enhanced video tutorials combined with certified digital, multimodal and interactive educational material, utilizing Learning Management Systems and/or MOOCs, designed by the Hellenic Open University.

Priority 4: Up-skilling Small and Medium Enterprises with Digital Skills

SO 6 : Developing high-level digital skills for professionals in all industry sectors.

Data Ready Programme

The Data Ready funding policy is a larger set of policies that form Greece's National Data Policy.

Within the wider designed framework, the Ministry will launch the “Data Ready Programme” targeting industry workforce to make sure that everyone can participate and learn new skills, promoting inclusive labor markets and to spur innovation, productivity and growth. Courses that lead to certification will be introduced, ensuring easy access and availability.

Proposed Actions

Action 12 : “Get digital skills for all”.

Short Learning Programmes (SLPs) developing high level digital skills for ICT professionals in all industry sectors. The “Get digital skills” for professionals consist of e-learning classes available in the form of enhanced video tutorials combined with certified digital, multimodal and interactive educational material, utilizing Learning Management Systems and/or MOOCs, designed by the Hellenic Open University. Digital skills classes include digital skills required by the generic workplace (communication, email, digital work ethics, basic SW/HW settings etc.).

Action 13: Blockchain technologies evaluation

The Ministry is ambitiously looking into the setting up of a new regulatory function with the primary objective of harnessing the technology with a legal operational framework, serving as a bold initiative leading to the formation of an ideal ecosystem for those willing to invest in blockchain technology. A “Blockchain Taskforce” will take steps to establish a national strategy to develop the disruptive technology as a catalyst for growth. The taskforce will foster an open dialogue to develop innovative and disruptive projects.

Applications envisaged at this point include digital payment systems, fraud detection, smart contracts, smart ID systems and even micro-certifications for skills.

PILLAR 3: ENHANCING DIGITAL SKILLS THROUGH EDUCATION

PILLAR COORDINATOR: Ministry of Education, Research and Religious Affairs

FIELD	OBJECTIVES
Priority 5: Promote Digital Skills in all Educational levels and Life Long	SO 7: Encouraging student’s engagement in STEM related fields. <ul style="list-style-type: none"> Support innovative STEM teaching and to try to find a way to have a cross-curricular activities as well as hands-on and project-based activities which could then integrate these innovative activities in the curriculum. Early age development and support of the primary school level students with digital skills.
	SO 8: Encouraging adults for a Digital Skills engagement. <ul style="list-style-type: none"> Targeted Programmes for the Lifelong Learning Centres aiming to the improvement of adult’s digital skills. Upgrade of the digital school infrastructure on primary and secondary education level to improve digital skills of their students

FIELD	OBLECTIVES
Learning.	<ul style="list-style-type: none"> Support the learning process for the acquisition of digital skills and self-assessment of the students.
Priority 6: Up-grading Greek teachers' skills	<p>SO 10: Supporting Greek Teacher to promote their Digital Skills in classroom.</p> <ul style="list-style-type: none"> Training of Teachers for the utilization and application of ICT in the teaching practice.
Priority 7: Promoting e-skills through RTDI activities	<p>SO 11: Promoting Digital skills through engagement in Research, Technology Development and Innovation (RTDI) activities</p> <ul style="list-style-type: none"> Support collaborative RTDI projects between enterprises and Public Research Centers (PRC) as well as Higher Education Institutions (HEI) Establish specialized competence centers, Digital Innovation Hubs and clusters Promote recruitment of highly qualified personnel in enterprises to conduct research for the development of innovative products/services Enhance extroversion of enterprises through participation in bilateral and transnational RTDI co-operation

Priority 5 : Promote Digital Skills in all Educational levels and Life Long Learning.

SO 7: Encourage student's engagement in STEM related fields.

Action 14: STEM – Labs in Greek Schools: Program that concerns the development of innovative technology laboratories in schools of primary and secondary education level across the country.

The main purposes of the digital open standards equipment are:
improving basic skills in science, technology and digital competence of students of primary and secondary education

- the use of ICT in primary and secondary education
- create the conditions for learning motivation and initiative
- the acquisition of basic life skills enhancing self-esteem, confidence and sociability through group-collaborative actions
- improving basic knowledge and life skills needed in a rapidly changing socioeconomic environment

Action 15: "Certification of secondary school students in ICT": Student's Training Program in order to acquire Digital skills by the completion of compulsory education assessment.

SO 8 : Encouraging adults for a Digital Skills engagement

Action 16: Programs for the Lifelong Learning aiming to the improvement of adult's digital skills: Student's Training Program in order to acquire certified Digital skills by the completion of compulsory education assessment.

SO 9 : Upgrade of the digital school infrastructure on primary and secondary educational level to improve digital skills of their students

Action 17: Development of a National Digital Educational Platform.

Development of the National Digital Educational Platform, which includes digital Educational materials that support the learning process for the acquisition of digital skills and self-assessment of the students. Support the learning process for the acquisition of digital skills and self-assessment of the students.

Action 18 : Upgrade of the digital school infrastructure on primary and secondary schools

Implementation of a project in order to upgrade the digital infrastructure on primary and secondary education level schools.

SO 10 : Supporting Greek Teacher to promote their Digital Skills in classroom.

Action 19 : In-Service Training of Teachers for the utilization and application of ICT in the teaching practice

A certification action of (A- level) basic ICT skills and of (B- level) advance ICT skills is provided with Training of Teachers for the utilization and application of ICT in the teaching practice.

SO 11 : Promoting Digital skills through engagement in RTDI activities

Action 20: Promoting Digital skills through engagement in RTDI activities

- Support collaborative RTDI projects between enterprises and Public Research Centers (PRC) as well as Higher Education Institutions (HEI)
- Establish specialized competence centers, Digital Innovation Hubs and clusters
- Promote recruitment of highly qualified personnel in enterprises to conduct research for the development of innovative products/services
- Enhance extroversion of enterprises through participation in bilateral and transnational RTDI cooperation.

1.4. Spain

Over the last two decades, successive Spanish governments have adopted programs for digital advancement, aligned with the European digital agendas, which have served as a framework to promote the development of a business ecosystem and technology in a key area for economic productivity, territorial structuring and social progress. Thus, the **Info XXI Plan**, the **España.es Program**, the **Avanza Plan** and, finally, the **Digital Agenda for Spain** of February 2013 have allowed a strategic approach that has guided a significant public and private investment effort in this field.

Most of these strategies and digital agendas have been articulated around four lines of action:

- ✓ the deployment of networks and services for digital connectivity;
- ✓ the digitization of the economy;

- ✓ the improvement of electronic Administration, and
- ✓ **training in digital skills.**

Although progress has been important in all areas, the public and private investment emphasis has been clearly focused on the extension of physical telecommunications networks.

As a result of these programs, Spain has a very favourable position to tackle the next phase of the country's Digital Transformation process, with a network of digital infrastructures of the best in the world, leading companies in tractor sectors (health, agri-food, mobility, tourism, financial), modern cities and a diverse, dynamic and agile society to adapt to changes. Our country is also relatively well positioned in the digitization of the Administration and has a formidable potential in the application of new technologies to the management of information and the execution of public policies.

However, progress has been more **limited in the field of digitization of industry and business** - especially SMEs -, in the field of **R & D & I and digital training of the population**. These are three key levers for the future so that the Digital Transformation results in an increase in productivity, an **improvement in working conditions**, connectivity and opportunities for development and inclusion of society as a whole throughout the national territory. In addition, there are still areas that do not have reliable and quality digital connectivity, both in rural areas and in certain industrial areas, which generates social and territorial gaps, puts a brake on the digitization of the industry, or conditions the quality of experience in tourist destinations.

The exceptional situation derived from **the COVID-19 pandemic** has accelerated the digitization process, **highlighting the strengths and also the shortcomings both from an economic, social and territorial point of view**. Teleworking has also increased significantly, and the digitization of education has been promoted, with a radical change in methods and content.

These processes have put on the table the need to **urgently address the pending challenges to reinforce the social, territorial and ecological structure of our country**, guaranteeing the **accessibility of the whole of society** to the opportunities provided by the new digital economy. This requires a particularly important investment effort in the coming years to guarantee the **availability of adequate tools and equipment for the population** as a whole, promote **digital training for workers, entrepreneurs, students, teachers, and the entire educational community for the future**, and support the digitization of companies, reorienting the production model towards a more resilient and sustainable economy, increasing productivity, but also improving well-being and inclusion.

This represents a great challenge, in a **business fabric dominated by small and medium-sized companies**, with capacities for modernization and production chains that are still limited, and **most of them do not have the resources or skills necessary to invest in digital technologies and organizational changes** that allow assimilating its use in the production, distribution, and management processes. Hence, the relevance of the public policies defined by *Digital Spain 2025* can be deduced to promote growth through productivity supported by digital technologies, such as: (1) stimuli for modernization; (2) incentives for inter-business cooperation; and (3) promoting entrepreneurship to unleash the potential for technological and organizational innovation currently latent.

Digital Spain 2025 includes a set of measures, reforms and investments, articulated in ten strategic axes, aligned with the digital policies established by the European Commission for the new period. The actions of the Agenda are aimed at promoting more sustainable and inclusive growth, driven by the synergies of digital and ecological transitions, which reaches

the whole of society and reconciles the new opportunities offered by the digital world with respect for values constitutional laws and the protection of individual and collective rights:

1. Guarantee adequate digital connectivity for 100% of the population, promoting the disappearance of the digital divide between rural and urban areas.
2. Continue to lead the deployment of 5G technology in Europe, encouraging its contribution to increasing economic productivity, social progress and territorial structuring.
3. **Strengthen the digital skills of workers and citizens as a whole (2025 goal: 80% of people with basic digital skills, of which 50% will be women).**
4. Strengthen the Spanish capacity in cybersecurity, consolidating its position as one of the European poles of business capacity (2025 goal: 20,000 new specialists in cybersecurity, AI and Data).
5. Promote the digitization of Public Administrations.
6. Accelerate the digitization of companies, with special attention to micro-SMEs and start-ups (2025 goal: 25% contribution of e-commerce to SME turnover).
7. Accelerate the digitization of the production model through sectoral transformation projects that generate structural effects.
8. Improve the attractiveness of Spain as a European platform for business, work, and investment in the audiovisual field.
9. Promote the transition to a data economy, guaranteeing security and privacy and taking advantage of the opportunities offered by Artificial Intelligence.
10. Guarantee the rights of citizens in the new digital environment (goal 2025: a national charter on digital rights).

In order to reinforce the existing governance architecture, which integrates all public and private agents, the previous Telecommunications and Information Society Advisory Council (CATSI) will be reactivated, making it the Consultative Council for the Digital Transformation of Spain. In addition, the potential of the recently constituted Artificial Intelligence Advisory Council will be available, which brings together experts from different fields in the field of Artificial Intelligence.

These mechanisms of dialogue and participation between the different Public Administrations, the private sector, the academic and research world, and civil society, will allow a better articulation of public-private collaboration. Something that will be channelled through a set of instruments, such as funds, pilot programs, tractor projects, and innovative purchasing, among others.

1.1 Strengthen the digital skills of workers and citizens as a whole (2025 goal: 80% of people with basic digital skills, of which 50% will be women).

The Digital Transformation of the economy and society offers enormous possibilities to improve people's lives and increase the productivity, competitiveness and sustainability of the Spanish economy. But this requires, in addition to the deployment of infrastructures, the **capacity of people and organizations to be able to use them with confidence and security**. In this sense, it is essential to have the **necessary digital skills** to guarantee an efficient and responsible use of available digital tools. The measures developed in this area seek to provide digital skills to three large target groups, coinciding with those identified by the "Coalition for Digital Skills and Jobs": (1) **citizens**, in general; (2) the active population, which includes **working and unemployed people**; and (3) **technology professionals from all sectors of the economy**.

In the first place, citizens need basic digital skills to operate with confidence when communicating, informing themselves or carrying out transactions, such as shopping, interacting with Public Administrations, or booking a medical appointment. However, the

current diagnosis indicates that the **percentage of people without basic digital skills** in the European Union is 42% and in **Spain 43%**. Although this percentage decreases year by year, there are still groups where the lack of skills hits with special intensity, producing new phenomena of **digital exclusion**.

Secondly, advanced skills are required to be able to carry out a more elaborate activity, such as publishing content, doing sophisticated searches or programming and configuring simple digital systems. In the case of the workforce, specific digital skills related to the work performed are also necessary, such as the use of complex digital tools. In this area, according to estimates by the European Commission, **at least 90% of jobs already require basic digital skills**. However, in Spain, in 2019, **36% of the workforce lacked these skills**, the situation being worse among the unemployed population (55%) than that of the employed (32%). Furthermore, employees with limited or no digital skills are at higher risk of losing their job, further accentuating this gap.

Third, there are specialists who work directly in the maintenance and operation of digital systems or in the design and implementation of the digital tools themselves. This group also includes people who work in cutting-edge technological areas such as data analytics, Artificial Intelligence, cybersecurity, supercomputing, quantum computing or blockchain. In this sense, the demand for specialists in digital technologies, whether they are generalists or advanced, increases continuously year after year, without it being possible to cover this demand neither in Spain nor in the European Union. Although it is difficult to make homogeneous comparisons between all the countries of the Union, the Commission estimates the percentage of digital specialists in total employment at 3.9% for the EU and 3.2% for Spain.

Based on the previous diagnosis, the current gap in digital skills for citizens, the workforce, and specialists is notable, and requires joint actions between the public and private sectors to close it.

To achieve this, the education system and lifelong training play a key role, as stated in the Action Plan for Digital Education of the European Commission:

1. students currently in their **primary or secondary studies** or **vocational training studies** must have guarantees that they will acquire in the educational system the digital skills demanded by society to develop a full life, personally and professionally;
2. **Vocational Training and the University, together with companies**, must make the necessary adaptations to ensure that current and future workers have the required skills; and
3. **social agents and organizations, and Public Administrations** must act to incorporate digital skills in lifelong learning.

In addition, the situation generated by the COVID-19 pandemic has further evidenced the digital divide in education, a matter that deserves extraordinary action, focused on ensuring accessibility to technological resources and the development of relevant digital skills. It is difficult to develop actions aimed at improving digital skills if you do not previously have access to the necessary technological resources.

Thus, the Recovery Plan presented by the European Commission on May 27, recognizes initiatives aimed at acquiring digital skills, such as the Skills Agenda for Europe and the aforementioned Digital Education Action Plan, as key elements for promote a fair and inclusive recovery.

For all these reasons, *Digital Spain 2025* establishes as a third axis that of strengthening the digital skills of citizens and the workforce, with the specific objectives detailed below.

Improve citizens' basic digital skills and close gaps between groups

Digital Spain 2025 will promote the universalization of basic digital skills so that citizens can fully live in the digital age (communicate, learn, buy, carry out transactions, interact with Administrations, etc.).

For this, special emphasis should be placed on training those groups that find it more difficult to acquire these skills (elderly, retired people, people with low income levels, people living in non-urban areas, among others). The goal is to train 15 million people in basic skills.

Provide advanced digital skills to students and promote digital vocations

One of the missions of the educational system is to provide the students with the skills required to live in the society. Today digital skills are part of the core of these skills and their demand increases year after year.

In the case of Universities, these should be a conducive space for training and attracting students in cutting-edge fields, and innovation and technology transfer. For this, it is essential to create open ecosystems, through university innovation projects, where these profiles can be formed. This will require that Universities develop new, more participatory and collaborative educational spaces, designing interuniversity programs for training, innovation, research and programming and promoting contexts that facilitate new collective ways of thinking, learning and collaborating, based on experimentation aimed at achieving objectives, through more creative and open processes.

Consequently, *Digital Spain 2025* will seek, together with the educational system, to set itself the objective that all its students acquire the required skills, and the ability to keep them updated. In addition, the educational system must promote scientific and technological vocations, without abandoning the arts, which involve a sufficient volume of people who study Science, Technology, Engineering, Arts and Mathematics (STEAM) in the most equal way possible. The goal is to train 7 million people in advanced digital skills.

Provide workers with the digital skills required in the workplace

For the Digital Transformation of companies to contribute to increasing their productivity and competitiveness, work must be done so that **workers have the appropriate digital skills** to have greater and better employment opportunities. For this reason, *Digital Spain 2025* will prioritize closing the digital skills gap between employed and unemployed people to mitigate the chronification of unemployment situations and allow **continuous requalification** throughout the working life, paying special attention to the existing digital gap in areas with low population density and in the rural world. The goal is to train 8 million people in digital skills for the world of work.

Meet the demand for specialists in digital technologies

Digital Spain 2025 will promote meeting the demand for specialists in digital technologies, which will include experts in cutting-edge technologies, such as data analytics, Artificial Intelligence or cybersecurity. Special attention will be paid to the gender composition of these specialists. The goal is to train 250,000 people in digital skills to design, develop or operate digital systems.

Reduce the gender gap in digital skills

The gender gap in Internet access, which fortunately managed to be reduced notably in the past years, has been transferred in recent years to a gender gap in digital skills. Given this situation, *Digital Spain 2025* will seek to reduce it both among the general population, as well as in the workforce and digital specialists.

1.2 Measures***Educate in digital skills***

The COVID-19 pandemic has brought with it a severe disruption of educational activity.

Face-to-face teaching in the centres has been suspended, and teaching has been transferred to the virtual plane, thus accelerating the process of Digital Transformation of education, through the generalization of the use of online resources, telematic communication and collaboration tools, and devices and Internet connections by both teachers and students.

However, as a result of this transfer of teaching activity from schools to homes, the COVID-19 pandemic has generated a new digital divide, which has had a greater impact on those students with difficulties in accessing devices and connectivity in their homes, which are deprived and have greater obstacles to continue the school year with their teachers and their classmates.

The "Educa en Digital" program consists of a set of actions to support the Digital Transformation of the educational system through the provision of devices, digital educational resources, adaptation of the digital skills of teachers, and actions that involve the application of Artificial Intelligence to personalized education. In short, a program that allows us to continue advancing by following the steps already taken in this area, such as the Connected Schools program that contributes to providing educational centres with reliable and quality connectivity.

National plan for digital competences

It is a comprehensive plan that aims to: (1) substantially increase the level of basic digital skills of the currently worst-off groups (elderly, people with low income and education, non-urban areas, women); (2) guarantee the advanced digital skills of students at the end of secondary education; (3) train the workforce with the digital skills necessary for their jobs and for future employability, increasing their productivity and also promoting remote work; and (4) meet the demand for general and advanced digital specialists in the Spanish economy, paying special attention to reducing the existing gender gaps in all of them.

The plan includes the actions of all ministerial departments in this area, favoring the development of synergies with other Public Administrations, Universities and with the private sector. This strategy will include, at least, the following programs: (1) Digital training program for citizens; (2) Program of digitization and development of digital skills in education (primary, secondary and university) and VET; (3) Digital skills program for employed and unemployed; and (4) Program of specialists in basic and advanced digital technologies, such as data analytics, Artificial Intelligence or cybersecurity, among others.

Uni-digital Plan

This plan aims to print, in the Spanish university system, a boost in the digitization processes in Higher Education. To this end, a series of actions are planned to reinforce and improve the university digital infrastructure, promote the digital competences of the teaching staff or stimulate the creation of inter-university training innovation poles taught digitally.

Likewise, actions will be developed to promote the dynamics of innovation and inter-university cooperation around collaborative work and collective intelligence in the digital context, as well as the promotion and support for the development of open access tools.

Part 2. Main skills set demanded by the employers in the tourism and retail sectors (digital skills shortfall)

2.1. Austria

General research results: FOSTER LEARNING AT THE WORKSPACE and CO-CREATE digital transformation

„A central area of workplace learning is learning at the workplace and in the process of work. In the process of work. All in-company CET provision is based on this, that what is taught is used, internalised and consolidated in the work activity. This also applies to introductions that take place directly at the workplace. This process takes time, during which employees, in comparison to experienced colleagues, are slow and uncertain. And insecure compared to experienced colleagues, have questions with which they can to those very same experienced colleagues, and benefit from a culture of and benefit from a culture of error that allows them this uncertainty.”⁶

Comprehensive and participatory co-creation of the digital digital transformation

“The cross-border analysis of the online survey and the qualitative interviews make it clear that employees and employee representatives are only occasionally involved in shaping the digital transformation. In the case of a monopoly of employers on the design of the use of technology in the context of digitization, it can happen that the objective in the implementation of digital technologies is not primarily an improvement of working conditions, but an increase in efficiency and the associated profit maximization. It is seen here as the task of the employee representatives to pose the question of how the everyday work of employees can be improved through the use of technology in order to shape the digital change in the world of work in the interests of employees. The experts for what such an improvement can look like in practice can usually be found directly in the companies. The employees must therefore also be given the opportunity to contribute creatively to the digitization processes at their workplaces.”⁷

General digital literacy (Digital Common Sense) is paramount⁸

Competence area(s) 0. to 5. according to DigComp 2.2 AT
Typical digital tasks in everyday work:

- 0. ... understands the concept of different accounts, roles and passwords in systems
- 0. ... can communicate with different devices (mobile phone; Tetra mobile phone; computer etc.): Phone. Chat. Email

⁶ Umbach, S., Haberzeth, E., Böving, H., & Glaß, E. (2020). Kompetenzverschiebungen im Digitalisierungsprozess. wbv Media. <https://doi.org/10.3278/6004593w>, p. 196

⁷ Bergmann, N., Pretterhofer, N., & L&R, B. W. (2019). Digitalisierung der Arbeitswelt–Auswirkungen auf ausgewählte Branchen in den Staaten Bulgarien, Rumänien, Serbien und Österreich. Wien: L&R Sozialforschung. p. 124

⁸ Nárosy, T., & Szalai, E. (2020, November). Digitaler Hausverstand?! Digitale Anschlussfähigkeit im beruflichen Kontext und eine notwendige Antwort der Schule. In Bildung und Digitalisierung (pp. 217-236). Nomos Verlagsgesellschaft mbH & Co. KG. p. 228

0. ... can operate equipment (tools, scanners, etc.) and understand and follow procedures (including the benefits of digitalisation).
- 0.-5. ... trains employees on the digital applications in the organisation.
- 0., 2. ... can write texts on the computer and is proficient in keyboard, mouse, word processing and browser-based programmes.
- 1., 2. ... can carry out online research, recognise the (in)value of the information found and can process/provide the information further
2. ... writes e-mails and deals with digital correspondence
2. ... manages orders, incoming and outgoing goods, distribution to clients or patients or clients (logistics)
2. ... recognises the limitations of digital communication and seeks analogue opportunities accordingly.
2. ... can carry out handovers between work steps and work partners digitally
- 3., 1. ... creates documents digitally, files them, finds them again
4. ... can create, manage and keep secret secure passwords and has a basic understanding of IT security
4. ... is aware of the stressful aspects (posture problems; eye strain; loss of job; stress due to continuous workload etc.) and tries to deal with them in the best way possible
5. ... has an overview of an entire business process, follows it digitally (e.g. time recording, diary management, SAP, ticket system, ERP ...) and can model, support and handle it digitally with the right programmes, if necessary.
5. ... understands what digitalisation means for their own business and learns continuously - also through the (analogue) exchange in the network of acquaintances and colleagues
- 5., 3. ... understands human-machine cooperation (machine tools, agricultural machines, robots, etc.), can cooperate with them or organise/program them

Based on job level and responsibility, skills vary broadly
Manual skills (reasonably well described by DigComp 2.2 at)
Strategic skills (business models, strategic partnerships)
Policy skills (legal concerns and regulations)

More exemplary results

Retail:

Main skills demanded are MS-Office, Excel and SAP still.

Basic further education/training is then made on-the-job.

Online Job Applications - filling out forms, saving, uploading documents and sending.

For online shop jobs:

Database

Photoshop

Understanding of the process

Workers needed for sales and cash register etc. sometimes do need any additional experience or qualifications. If a worker desires to climb the corporate ladder, most companies offers in-house training via their own academies. Willingness to offer more data on these academies is quite limited.

Tourism:

Research of existing job advertisements in the tourism sector:

MS-Office (Word, Excel, Outlook)

Knowledge of hotel and reservation software

Experience with digital booking systems or ordering in the hotel industry

Detailed information – focus tourism

Anforderungen an die Digitalisierung in der Tourismus- und Freizeitwirtschaft für Mitgliedsbetriebe der Sparte Tourismus- und Freizeitwirtschaft der WKO | Requirements for digitalisation in the tourism and for member businesses of the Tourism and Leisure Industry of the WKO

<https://www.wko.at/branchen/tourismus-freizeitwirtschaft/anforderungen-an-die-digitalisierung.pdf>

WHAT ARE THE PREREQUISITES FOR SUCCESS CONCERNING DIGITISATION?

Development of a digital strategy (Digitization Customer Journey)

The development of digital skills (among employees and entrepreneurs)

Because routines that "machines" can take over in order to free up more time for the core task of personal contact with guests.

A digital coach

Particularly for SMEs in the tourism industry, it is important to have a professional online presence →

Email inquiries and email contacts with guests or potential guests.

Website, which must function intuitively from the guest's point of view

Social media presence that is tailored to the target group

The following measures can be derived from the benchmark analysis in this regard:

Email:

Reply to all questions asked in the mail

Answer mails within a certain period of time (max. one day)

List offers in the mail and do not attach numerous offers as pdf files, in which the total offer must first be laboriously "worked out" by themselves.

Send a follow-up mail, e.g. whether there are still questions to be answered.

Do not use text modules that do not answer the questions asked

Spelling and personal salutation (write names correctly!)

Website:

Timeliness of content and images

Quality of images

Avoid complex structure of too many subpages

Clarity in the start page and avoid much different content

Create possibility of interaction (email address, telephone and address easily findable).

Direct booking ability on the homepage
Listing of results of guest evaluations (do not leave negative reports uncommented)
Linking with social media presence
Set measures to increase the findability in search engines

Social media presence:

Develop a social media strategy; do not use all possible channels, but targeted and specially selected, tailored to the target group

Pay attention to the measure of too much and too little, because several messages daily or even very infrequent "posting" does not appear very professional

Create a link to the company's website

Create targeted networking and cooperation

Contact and exchange with bloggers

Select social media channel in coordination with the defined target group (personas)

Most companies across Europe are still struggling with their digitisation strategies:

Deal with data protection issues

incompatible IT solutions

incomplete customer data

lack of analysis tools

frustrated and unmotivated employees, who need to be convinced and inspired to use digitisation.

2.2. Bulgaria

These skills are framed in the following document:

NATIONAL STRATEGY FOR SUSTAINABLE TOURISM DEVELOPMENT IN
THE REPUBLIC OF BULGARIA, 2014-2030

It states that:

The dynamics of competition on the international tourist markets and the priority nature of tourism for the Bulgarian economy require compliance with the evolution of the information society and the mass application of digital distribution technologies. The tourism management bodies in Bulgaria should support the tourism business in the process of adaptation to changes in the behavior of tourists through regular provision of information and consulting assistance.

However, this also requires the development of relevant digital skills both among those employed in the sector and among students at all levels of education. Innovative behavioral algorithms are needed in the field of tourism. The future of tourism enterprises is inconceivable without the development of a corporate website with a user-friendly interface, implementation of multifunctional reservation systems, integration and compatibility with information systems of tourism-related sectors (hotels, restaurants, carriers, tour operators, intermediaries, etc.), cooperation and cooperation between travel companies to facilitate interaction with customers and business partners, the use of social media, connecting to web search engines for travel and tourism, advertising promotional offers and package tours in a

digital environment. Despite the benefits that ICT provides for the tourism industry, it is necessary to take into account the risks of their use.

It is necessary to introduce and comply with the principles of secure data exchange between the parties, protection of enterprise systems from external interference, constant updating of available software and training of personnel for safe behavior in the online environment.

According to data provided by the Ministry of Education and Science, only 25% of Tourism graduates find employment in the specialty. When it comes to assessing labor market requirements, you should keep in mind that the tourism sector is over 90% private, and the provision of staff especially with higher education is dominated by state universities. This is extremely necessary a close link between HEIs and practice with a view to achieving dialogue and cooperation. At the same time, SMEs in tourism represent almost 98%, as a significant part of them micro enterprises (family business). It does not take into account the fact that a significant part of the workers in tourism they have no education in the professional field.

In terms of competences, a report from February 2016 on Bulgaria states that that up to 80% of the so-called general competencies and only 20% specific to tourism business competencies, which in most cases accumulate as experience and knowledge of practice. The same document states that emerging professions and competencies in the country will be those directly related to tourism management destination, clusters, networks (congress bureaus, etc.) and related specific marketing activities, information activity including through the new ones ICT.

According to the sectoral competence model developed by the Bulgarian Business chamber 8 technical competencies (language and digital) are part of the three main ones subsector in tourism - hotel, restaurant, tour operator and agency activity.

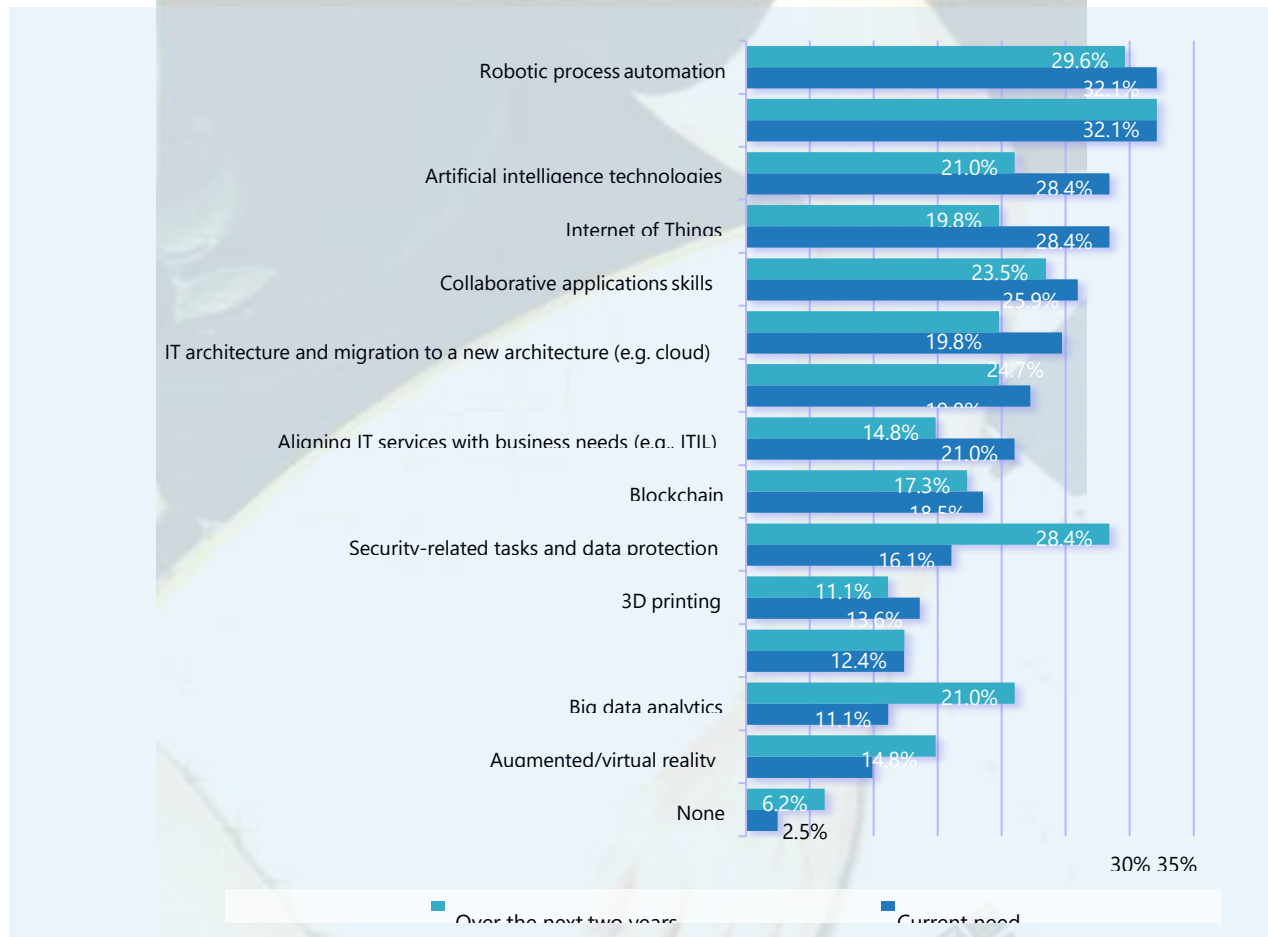
In practice, however, as the review of the training and preparation of staff in the professional field of tourism, a significant part of these digital competencies are not acquired through formal training and education. Modern requirements of the labor market in terms of digital competencies are related to such areas as digital marketing strategies, online reputation and use of social media, m-tourism (mobile) - related to the use of smart phones and user experiences. The specific digital competencies are related to skills to work and service the changing demand - in terms way of planning, reflection, review (visibility) in multiple digital platforms example EU Directive 2015/2302).

2.3. Greece

Greek organizations' approach to digital skills is largely dictated by the skill sets of existing employees. The bulk of organizations report that their employees generally meet their requirements in terms of digital skills; very few indicate that employees do not meet their requirements at all. However, only 3.7% of organizations believe that their employees fully meet their digital skills requirements, suggesting that there is room for improvement across the board.

More businesses in Greece report a lack of specific digital skills (i.e., the skills highlighted in Figure 1). The businesses are also more likely to highlight that they expect their demand for these digital skills to increase in the future. This further underscores the importance of reskilling for Greek organizations.

Main Digital Skills Lacking in Greek enterprises



Most companies in Greece reported certain digital skills deficits. These companies report several obstacles to filling posts with the right people, while finding the right skills for particular technologies was highlighted as the most significant challenge. This result suggests that, while potential employees are generally widely available (unemployment in Greece is significantly above the regional average), there is a mismatch between demand for skills and supply. In other words, potential employees currently available in the market do not possess the skills that are in demand.

Moreover, the companies face problems in the areas of employees' ability to learn and in soft skills. This is an indication that, while the system of formal education is delivering graduates, there are gaps in soft skills such as adaptability (ability to learn) and, in particular, technical skills. The education sector in Greece will thus likely face higher pressure to offer courses that reflect the situation on the labor market (demand for skills).

2.4. Spain

The third study of the Digital Economy Institute was published in 2017 and it aims at understanding the development of digital competencies inside the Spanish enterprises. The study was based on 247 interviews conducted to collect data from Spanish firms in the sectors of tourism, services, industry, retail and transport.

The study classifies 23 fundamental digital disciplines:

1. E-commerce
2. Digital talent (methodologies and processes for recruitment, motivation, training and evaluation of performance)
3. Social media management
4. Cybersecurity
5. Analytics (analysis of the interactions with and investments in the clients: branding, digital advertisement, engagement, leads generation)
6. Internet of things (take advantage of the connectivity in the value chain: production, logistics, commercial efficiency)
7. Customer experience
8. Customer service
9. Blockchain (Decentralised processes of business models)
10. Artificial and cognitive intelligence (machine learning)
11. Web positioning (SEO and SEM)
12. Digital innovation
13. Augmented and virtual reality (customer experience and new business models)
14. Advertisement programming (planning of the digital and marketing tools)
15. Compliance (preparing the campaigns in compliance with the privacy and security rules)
16. Web and mobile marketing
17. Inbound marketing (inbound strategies for the selling processes)
18. Cloud and virtualisation (integration of cloud technology in the business processes)
19. Ethical hacking (prevention and defence protocols against cyber-attacks through ethical hacking)
20. Display marketing (performance and branding strategies applied to the web and mobile screens)
21. Big data (the capacity to obtain relevant information and process data and to exploit this knowledge)
22. Digital project management (Agile and Lean methodologies)
23. Branded content management (strategy to create, produce and spread digital content).

The two disciplines that are being complied with the most by companies are **customer service through social and digital media** as well as **cybersecurity**.

The retail sector companies comply with e-commerce (65%), social media management (38%), web positioning (35%), web and mobile marketing (20%) and big data (6%). Respondents then expressed that their companies **do not comply** with the rest of the disciplines (digital innovation, customer experience, analytics, display marketing, branded content management, inbound marketing among others), testifying the need of training in these lacking disciplines.

The tourism sector focusses majorly in customer service. But it complies with web positioning (64%), social media management (35%), big data (16%), e-commerce (10%), customer experience (10%), web and mobile marketing (4%) and digital innovation (1%). It does not comply with the disciplines of compliance, cloud and virtualisation, analytics etc. This gives a clear picture of the need of the tourism sector to set a strategy to train its workers on the digital disciplines.

The different application of the disciplines does not depend on the scale of the companies, in fact both SMEs and large companies behave quite the same giving more importance to customer service and cybersecurity.

Employers were then asked to select the 3 disciplines that, in their opinion, are most important in the digital transformation of a company. In line with the disciplines in which companies are investing the most, Cybersecurity and Customer Service occupy the first positions. Digital Innovation and E-Commerce share the third place. They are then followed by Big data and Cloud and Virtualization. The least selected disciplines were Compliance, Inbound marketing and Blockchain.

In general, just over a quarter of **managers** consider that they receive training on a regular basis. This differs by sector, thus in retail it reaches 30% while in tourism it remains at 24%. 57% of managers in the retail sector affirm that they receive training at times, 54% in the tourism sector. The highest share of managers who never receives training is in the tourism sector (21%), while it stays at 12% in the retail one.

Large corporations provide regular training to a greater extent than SMEs. Likewise, CEOs say they receive periodic training to a much greater extent than other managers, where there are also variations from one profile to another. 34% of the respondents in the retail sector are very much satisfied with the training they received, only 24% in the tourism sector.

When asked to what extent they consider that they have the education and training necessary to take advantage of the equipment and technological tools available in the performance of their professional work, respondents from the retail sector where the most satisfied (from a scale to 1 to 5, 4 was the average response), while it was not the same for the tourism sector (3.76 was the average punctuation).

Part 3. Field of ICT concerned by the skill shortage

3.1. Austria

Almost every field of ICT is concerned by the lack of certain digital skills as shown on the diagram below:

1.1.2 Die digitale Wirtschaft

Die **Digitale Wirtschaft** mit dem zugehörigen **E-Business** hat sich zu einem inzwischen etablierten und anerkannten Bereich entwickelt. Basis hierfür waren technologische Innovationen in den Bereichen Telekommunikation, Informationstechnik, Medientechnologie und Entertainment (sog. TIME-Märkte). Diese Innovationen hatten und haben einen nicht unerheblichen Einfluss auf die Möglichkeiten der Informations-, Kommunikations- und Transaktionsabwicklung (Kollmann 2001, S. 5 ff.). Dabei lässt sich wiederum eine Vielzahl verwandter Begriffe (z. B. E-Business, E-Commerce, Informationsökonomie, Netzwerkökonomie) identifizieren, die zum Teil synonym verwendet werden (Wirtz 2018, S. 17 ff.). Für eine Strukturierung und Klärung von Begriffen, Bereichen und Anwendungsgebieten bietet sich ein **Schalenmodell der Digitalen Wirtschaft** an (Kollmann 2019a, S. 95 ff.; s. Abb. 1).

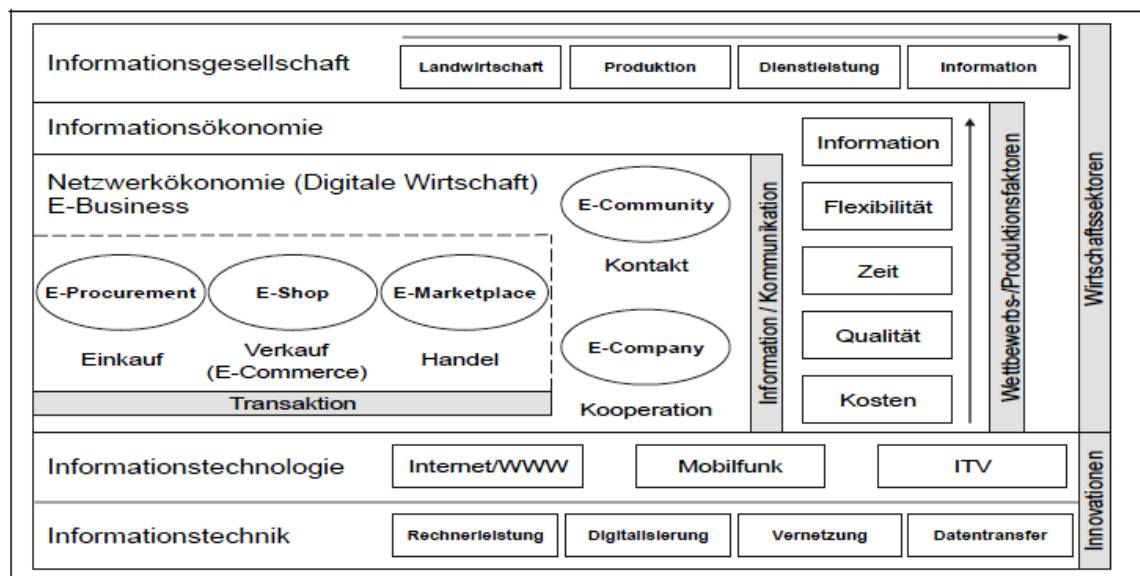


Abb. 1: Das Schalenmodell der Digitalen Wirtschaft

Quelle: Kollmann 2019a, S. 96.

Retail:

SPAR Information & Communication Services (ICS) GmbH developed shorter Time-to-Market concept (Axians ICT Austria – Smart Store)

Imtech Austria – taking over entire SAP programmes in Retail in days to come

CRM (Customer Relations Management) Tools are being further developed and enhanced with the use of AI.

AI is also being used in Planning & Forecasting (screening of clients, determining and predicting rush hour, staff needed etc.)

MS Office – still dominant, especially for new staff

Tourism:

MS-Office (Word, Excel, Outlook)

Social Media ...

3.2. Bulgaria

The main directions for increasing digital competencies with key important for those trained in the professional field of "Tourism" in the future will be linked to:

- Management of the processes of sharing, awareness and commitment, incl. in social networks;
- Maintaining, creating and managing an information database, transparency and awareness on the Internet and on the ground in tourist sites
- Personalization of the service, care and experience of the tourists, incl. use, development and application of mobile applications, the so-called SMART (or smart) travel and tourism; user engagement (network), sharing - location, social networks, experience and experience. Creating and maintaining interactivity through augmented reality, inclusion of games elements (gamefication) to attract interest, attention and generate added value to the experience
- Internet marketing in its two main directions: at the destination level and the activities of destination management organizations (linking to destination, GIS and other positioning systems) and application of marketing tools in different communication environment (digital), change in distribution, sales and advertising channels
- Competencies for business intelligence (Business Intelligence), which by definition includes "the ability of an organization to take competitive strategic solutions based on the analytical processing of large sets of information"

Business analysis solutions are aimed primarily at sales management, customer base and not at last place with financial management, through such analytical tools such as operational analytical processing (OLAP) tools; funds for intelligent data mining; instrument panels; means for generating reports

The real needs of the labor market are related to changes in the consumer behavior - such as planning, mobility, awareness and willingness to share in social media. On the supply side, new ICTs help marketer's efforts, reaching the user, personalizing the communication. The last two directions - solutions for business analysis (Business Intelligence) and the issue

of preparation of staff with adequate digital competencies are part of the conditions and factors responsible for the competitiveness of tourism enterprises.

The following topics are covered within the most common training in tourism:

= **DIGITALIZATION IN THE HOTEL AND RESTAURANT**

- Essences of the role of digitalization for the development of tourism
- Trends in digitalization in tourism
- Successful practices

= **PROCESS AUTOMATION**

- Automatic check-in and check-out in hotels and airports
- Automatic answers via reservation system, website or email
- Automatic real-time update

= **DIGITAL SIGNAGE & AUDIO SIGNAGE**

- Nature and application in tourism
- New trends

= **VIRTUAL REALITY AND ADDED REALITY**

- Nature and key features
- Application in hotel and restaurant business

- Trends and successful practices

= **B2B reservation systems**

- Nature of B2B reservation systems
- Application of B2B reservation systems
- Successful practices
- Online chats with consultants and employees in real time - in fact, integration into

websites, support

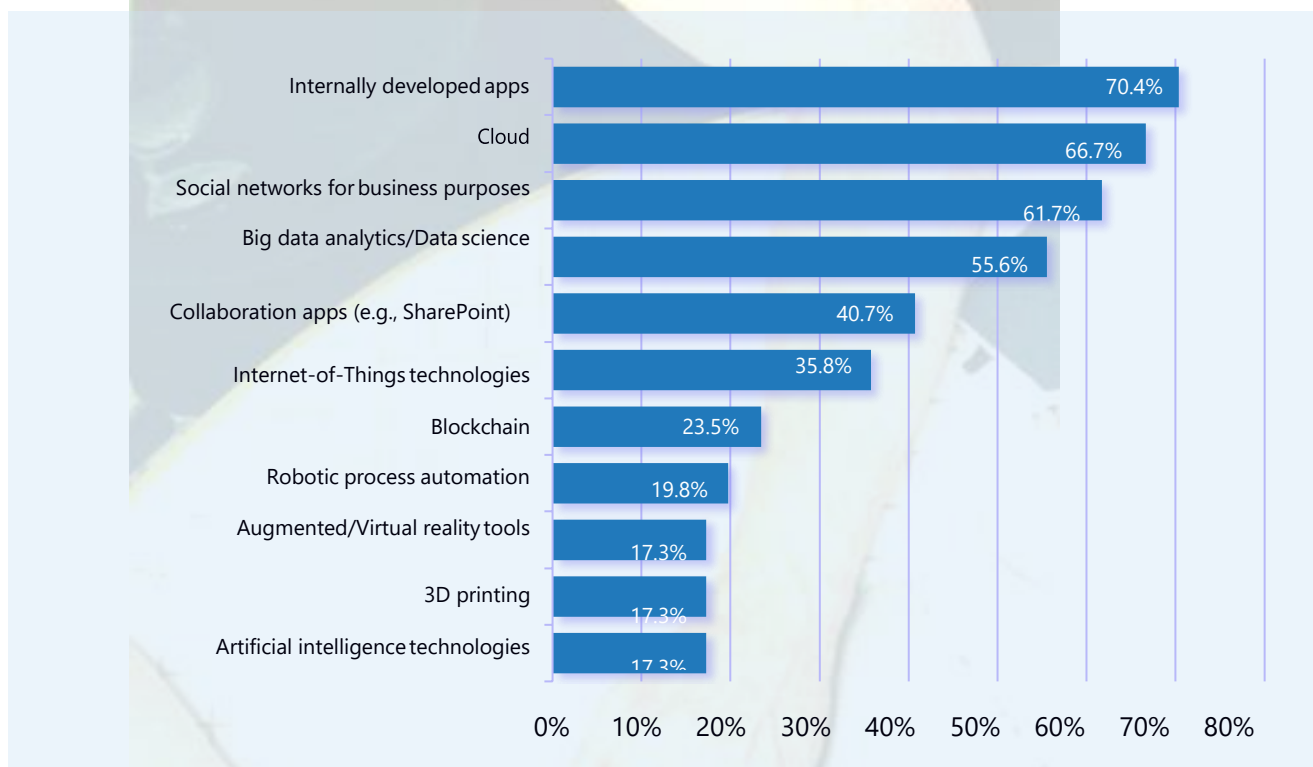
= Hotel and restaurant reservation management systems 6.1. Nature and key features and functions

- Successful practices
- Creating and managing reservations, storing customer data
- Contracts, accounting documents and document flow

3.3. Greece

Digital Skills Accelerators in Greece

The following solutions / technologies are currently mostly used in Greek **enterprises**



3.4. Spain

According to the Third study of digital competencies in Spanish enterprises (ICEMD – ESIC, 2017), the majority of the respondents use cloud-based systems and tools to undertake their daily tasks at workplace. In fact, 74% of the respondents use e-mails on multiple devices, 49% use online search engines, 47% work remotely using cloud-based tools (53% for the retail sector workers while 44% for the tourism ones), 41% make online operations (banking and administrative) but the percentage is higher in the case of the retail sector in which 60% of the respondents makes online banking operations, 40% use web conferencing tools, 39% use cloud based systems for e-commerce reasons (58% of the retail firms), 37% use web chats to talk with their team. It is worth noticing that more than 50% the tourism and retail enterprises use professional social media accounts, while only 30% of the other sectors do so.

Regarding the digital means integrated into the firms, the majority of the interviewed tourism and retail enterprises has a web page (94% and 90% respectively), 93% of tourism

firms and 84% of the retail ones has a corporative Facebook page, more than 70% of the firms use an internal communication system. Twitter is widely used in the retail (71%) and tourism sectors (63%) as well. The vast majority (81%) of the retail firm uses an online shop, while only 54% of the interviewed tourism enterprises does so. Half of the firms has a mobile app and a blog.

The Digital Competence Index (DCI) is an indicator that determines the level of implementation of digital competences in Spanish companies. This index helps us to understand and quantify the relationship of Spanish companies with the Digital Economy based on a “self-assessment” (declared) on different digital skills.

The total DCI serves as a reference for the implementation of digital competences of Spanish companies in general and as a reference for the differences between the sectors analysed. Therefore, it allows a specific company to compare its DCI with respect to its sector and the market.

We encounter a high index in 16% of the retail companies and in 25% of the tourism ones. 41% of retail companies have a medium index against 26% of the tourism firms. 43% of the retail companies and 49% of the tourism ones have a low index.

Part 4. Main training schemes available at the workplace

4.1. Austria

1. Vocational Schools and Curriculae
Types of vocational schools in Austria:
<https://www.bmbwf.gv.at/Themen/schule/schulsystem/sa/bmhs.html>

Curriculae: <https://www.abc.berufsbildendeschulen.at/downloads/>
Dual education – vocational schools:
<https://www.bmbwf.gv.at/Themen/schule/schulsystem/sa/bs.html>

Curriculae: <https://www.abc.berufsbildendeschulen.at/downloads/?kategorie=7> und
<https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20009625>

<https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20009625>

Very little evidence for specific digital competences

Teaching principle Digital competences
critically deal with analogue and digital media offers and use them according to the situation,

can describe digital reading devices and associated formats and recommend them to target groups.

Product groups. Digital reading devices. E-commerce.

know the importance of digital sales as well as different sales channels in the retail trade and can point out possible uses of mobile devices in sales and advisory talks

Exception: E-COMMERCE Salesperson

can name advantages and disadvantages, especially of digital payment methods, and explain their economic effects,

Competence area Internet presence of companies

Competence area web shop operation and support

2. Competency model: DigComp 2.2 at <https://www.fit4internet.at/view/verstehen-das-modell>

3. VET: Designing a model of digital competences for VET⁹

Retail:

Most bigger companies have in-house training (facilities and trainers) where their personnel can further educate themselves, especially if there has been a promotion or the desire for one (REWE, IKEA, Media Markt, Hofer, DM, H&M, ZARA, NIKE etc).

4.2. Bulgaria

⁹ Schmoelz, A., Erler, I., Proinger, J., Löffler, R., & Lachmayr, N. (2018). Entwurf eines Modells digitaler Kompetenzen für die Berufsbildung. Medienimpulse, 56(4).

The existing trainings are primarily within the following funding sources:

- = National Action Plan for Employment and financed from the state budget
- = Operational Program "Human Resources Development" (co-financed by the European Social Fund)

In practice, these trainings are provided within the network of vocational training centers in the country in the following directions:

- = For unemployed persons within the framework of the Two-Year Training Plan financed under the NAP (National Employment Action Plan)
- = Training for acquiring professional qualification in professions and specialties in the professional field "Tourism" according to the license of BGCPD
- = Vocational guidance
- = Training in 5 key competencies related to mandatory skills in the field of services: Learning skills, Public and civic competencies, Digital competencies, Initiative and entrepreneurship, Mathematical competence and basic knowledge in the field of science and technology

4.3. Greece

The National Coalition Action plan contains 54 actions ranging from the design and development of accessible digital educational material, upgrading education infrastructures, subsidising job positions in ICT enterprises, training in digital marketing for SMEs in the tourism industry, launching vocational training programmes in the field of ICT etc. Some of the most emblematic actions included in the action plan are:

- Training in digital marketing for SMEs to enhance the extension of tourist season in regions of Greece (with the support of GOOGLE).
- Creation of job positions in ICT enterprises for 12 months. The total number of beneficiaries were 500 young unemployed aged 25 to 29 years old. The budget for the programme will be EUR 7,000,000.
- Measures regarding training, certification and up-skilling in the field of ICT at Regional Level, for 3000 unemployed for the 18-24 age cohort and 1250 already employed.
- Digital Skills for All initiative: Short Learning Programmes (SLPs) developing digital skills to encourage people to be active in the context of the digital society. The initiative is launched in Cooperation with the Ministry of Digital Policy, with the support of the Hellenic Open University (HOU), targeting 150,000 people.
- Boosting Digital Skills on job – “Digital Opportunity Traineeship” Programme
- Training program for small and medium-sized tourism businesses on digital skills through the “Grow Greek Tourism Online” initiative. The aim of the program is to enhance the online presence of these businesses in order to attract more visitors, making the city of Thessaloniki an attractive destination for the whole year. The training will take place with the help of Google Greece specialists, Online Advisors, who have received special and extensive training on Internet tools for tourism.

4.4. Spain

The respondents to the interviews conducted for the study of digital competencies in Spanish enterprises (ICEMD – ESIC, 2017), were asked to indicate the investment they make

in training their staff. Also in this area, we notice that the main resources are allocated to the disciplines of customer service and cybersecurity. Those two disciplines are then followed by

- e-commerce,
- digital innovations,
- cloud and virtualization,
- web and mobile marketing,
- social media management,
- customer experience,
- big data.

In terms of sectorial investment, we see that the retail sector mainly invests in training their workers in:

1. Analytics
2. Cloud and virtualisation
3. E-commerce
4. Social media management
5. Customer experience
6. Web and mobile marketing
7. Digital project management
8. Advertisement programming.

Regarding the tourism sector, the main training investment has been in the areas of:

1. Web positioning
2. Customer service
3. Advertisement programming
4. Customer experience
5. Display marketing
6. Compliance
7. Digital innovation
8. Social media management.

Also when it comes to training, the size of the company influences the dedication of resources to each discipline, being greater in large corporations. The two main disciplines are assigned a person in charge with specific training in approximately two thirds of the cases.

Part 5. Available digital skills evaluation methods and tools

5.1. Austria

Currently, the following tools are available in the country:

CRM (Customer Relations Management) Tools

DigComp 2.2 AT <https://www.fit4internet.at/page/assessment>

Fit4internet <https://www.fit4internet.at/page/assessment>

5.2. Bulgaria

Currently, there is only one instrument for such evaluation:

Project system: "Expansion of the capacity and scope of the National Competence Assessment System MyCompetence"

The project is implemented by the Bulgarian Chamber of Commerce - Union of Bulgarian Business, cooperation with the Ministry of Labor and Social Policy under OP "Human Resources Development". The project builds on the achievements of the project "Development and implementation of an information system for assessing the competencies of the workforce by industry and region" (ISOK), implemented by BIA, with the financial support of the European Social Fund of the European Union.

Funding program: OP "Human Resources Development" 2014-2020

Scope of the project: National

Website : tourism.competencemap.bg

Assessment of workforce competencies - status, problems, analytical systems and tools

The document summarizes the main conclusions and recommendations of the labor market analyzes, the qualification and educational structure, the foreign experience, the conducted surveys, as well as the key elements of the tools for competence assessment and staff selection.

5.3. Greece

There are different tools developed under various programs and initiatives

5.4. Spain

Within the national scope, between the autonomous communities there are differences in the application of the European DigComp framework. We could find two best practices.

In the case of the Junta de Andalucía, they have focused more on the environment of SMEs and the self-employed in the face of digital transformation. Andalusia has a public project called the Digital Company Program in order to evaluate both the weaknesses and the strengths of the technical team of the Junta de Andalucía (Public Body).

While the Basque Government with its Ikanos Project focused on the professional profile of the people that make up the company to improve the digital transformation. They are currently working in collaboration with Ibermática consulting firm with the purpose of evaluating weaknesses and strengths.

Digital Company Program of the Junta de Andalucía:

The digital transformation as a driver of the economy was revealed in Andalusia through the “Agenda for Employment, Andalusian Economic Plan 2014-2020. Strategy for Competitiveness” which wants to achieve a more competitive economy thanks to the development of the digital economy.

This strategy establishes the specific challenge of favouring the renewal of the productive model by increasing the productivity and competitiveness of companies and entrepreneurs through ICTs, increasing their incorporation into the digital market. The 2020 Digital Company Action Plan (PAED) constitutes the operational framework of reference to promote the digital transformation of small and medium-sized Andalusian companies until 2020.

The Digital Business Action Plan aims to promote the digital transformation of Andalusian SMEs, fostering the incorporation of information and communication technologies in business processes as a means to improve the competitiveness and productivity of companies. In order to design a plan adapted to its characteristics, the first step is to know how the Andalusian business fabric is and what its degree of digitization is (Junta de Andalucía, 2019).

To evaluate the compliance with the PAED 2020, it is necessary to define a monitoring and evaluation plan that allows knowing the degree of development of each of the lines of action and evaluating whether the set objectives are being met. The incorporation of this monitoring and evaluation process in the implementation of the Action Plan constitutes an important source of value insofar as:

- Provides information that facilitates decision-making to redefine the objectives set based on the deviations detected and carry out strategic planning for future actions.
- It is an important dissemination tool about the results obtained.
- Provides transparency to public actions, reinforcing the link between public administration, citizens and companies.
- It legitimizes the actions generating a greater perception of the value contributed to society.

This program has been developed with a self-diagnosis plan in which companies have access, this tool will have a series of questions so that the employer can characterize himself in relation to the digital transformation model and know if s/he is at an optimal level of digitization and if the objectives are being met.

Ikanos Project of the Basque Government:

In the Basque Government, the Department of Economic Development and Infrastructures, in collaboration with the consulting firm Ibermática S.A., they have been

applying a project since 2016 called Ikanos Project. With this tool, the Basque territory has positioned itself among the most digitally developed areas within the European Union, from internet connectivity to people's digital skills. These are data supported by the study on the Digital Society in Spain and that the Telefónica Foundation has made public. The study highlights that the Indicator for the Digital Economy and Society for the Basque Country grew by 4.8% in 2008, ranking fifth when compared to other territories in the European Union. In human capital, it has increased to 4.5% to be in seventh place in the ranking, making people with advanced digital skills grow and also ICT specialists, making the use of the internet in the territory also notable (The World, 2019). 5 areas and 21 digital skills are established:

1. Information
2. Communication
3. Content creation
4. Security
5. Problem solution.

The project consists of the following:

- Promote society to information and knowledge.
- Collaborate, share and disseminate what digital skills are and how they are acquired.
- Lead economic development and competitiveness.
- Entrust entrepreneurship, innovation and the information society for development.

With this project, it is intended to:

- Contribute to the development of a competent, highly participatory and co-responsible society, user of advanced and high-impact digital services.
- Increase through ICT its competitiveness and improve people's quality of life and collective well-being.

The Ikanos project consists of these evaluative elements: the citizen performs a self-diagnostic survey that will lead to the creation of an initial digital profile. The Project will take you to an orientation through an established guide to strengthen the weak points.

The digital profile proposes a series of objectives, to meet them, a series of training itineraries would be recommended in order to obtain a series of certificates that the administration will provide.

This project also consists of a series of self-assessment tests for companies and organizations to open the possibility of carrying out the diagnosis of the digital competences of integrated human capital. Companies are aware that they must adapt their productive capacity through digitalization techniques of their processes, from design to production and organization of work centers, applying solutions in cybersecurity, paperless, integration of processes, traceability, systems IOT, etc. With all this, it allows a self-diagnosis of the digital capabilities of an organization to be carried out, taking as a reference the aforementioned by the European DigComp framework for the definition of digital competences.

Access to the survey is usually without a password for individual users, but users who take the survey in an organized manner through a company or organization are given a password to recognize them as members.

During the test, the possibility is offered to save the answers and continue further through the options to choose from. A form is displayed where the users must indicate their name, a password and their email address where they will receive the email with the link that will allow them to return later to the survey.

The test consists of 32 items and answering all the questions takes between 20 or 25 minutes.

The questions are based on the digital competences of the European DigComp framework and are structured in the same sections, thus generating results organized into 5 areas that facilitate subsequent actions.

There are three types of interaction in questions:

- o Single or multiple selection.
- o Assessment scale.
- o Affirmative / negative - true / false.

When finished, the user can put his name in the report in PDF format that will be downloaded below and have a personalized report with the results obtained.

Also the same project can define the Professional Digital Profile: it defines the behaviors, skills and attitudes that determine the job performance in a given occupation. The profile can be used to assess the potential and suitability of a professional for a job and identify training needs and define training plans.

Part 6. Clustered skills list based on national mapping

Basic Digital Skills

- Use & Navigate Digital Devices like Computer & Smartphone
- Use Basic Web Services like Search Engines, Digital Payment & Online Banking
- Use Software to write Texts, make Spreadsheet Calculations and Presentations
- Use E-Government Services

Digital Awareness

- Understand Online Risks & Threats
- Communicate according to Netiquette & Net-Cultures
- Act according to GDPR & Media Law
- Be conscious about Data Use & Data Traces

Content Production

- Produce Structured Documents including Photos & Images
- Produce Photo, Audio & Video Content
- Produce Contributions for Websites or Social Media Pages
- Produce Targeted Digital Ads
- Apply Corporate Identity Principles

Communication & Collaboration

- Use Personal Text & Messaging Tools e.g. E-Mail, Messenger
- Use Video Conferencing Tools
- Use Cloud and Collaboration Tools
- Use Project Management Tools
- Organize Digital Collaboration
- Organize and Carry Out Digital Events
- Act according to Corporate Identity & Social Media Guidelines

Content & Customer Management

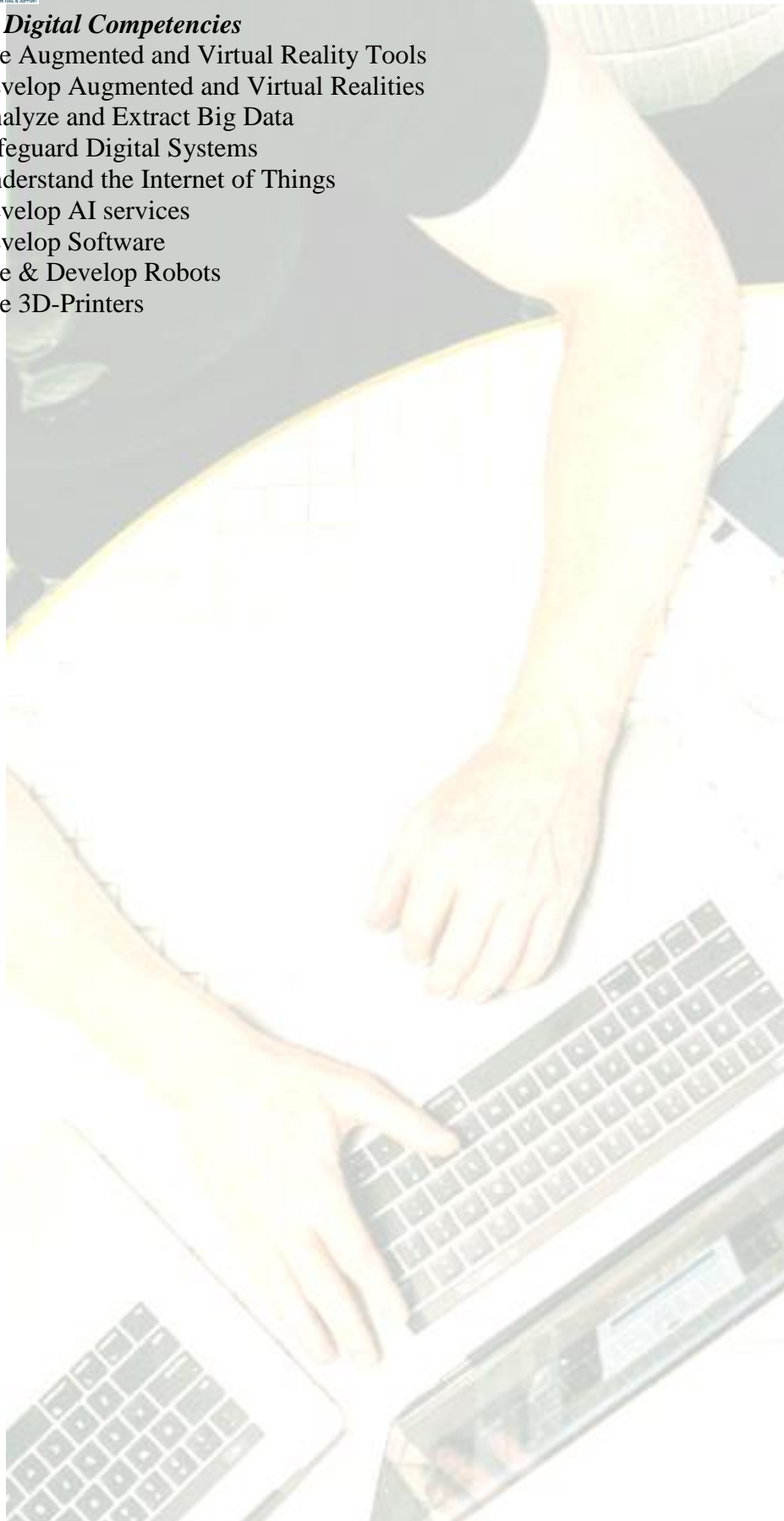
- Use Online Content Management Systems
- Maintain & Organize Social Media Channels (Content Production)
- Interact virtually with Customers & Community
- Develop Digital Marketing & Communication Strategies
- Apply Gamification & Digital Storytelling Principles
- Communicate according to target audiences
- Apply SEO Principles
- Structure & Analyze Data
- Filling out and digitally signing online forms (customer database etc.)
- Operating with (Automated) Customer Answering Tools (chatbots etc.)

Branch-Specific Skills

- Mastering specific tourism management software
- Providing destination management (GIS, GPS)
- Working with digital guest check-in
- Working with Computer Reservation Systems
- Working with logistics and warehousing software (databases)
- Online stock management
- Implementing Display Marketing, in showrooms and online
- Use and Maintain Digital Pricing Systems (Stickers)

Advanced Digital Competencies

- Use Augmented and Virtual Reality Tools
- Develop Augmented and Virtual Realities
- Analyze and Extract Big Data
- Safeguard Digital Systems
- Understand the Internet of Things
- Develop AI services
- Develop Software
- Use & Develop Robots
- Use 3D-Printers



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Part 7. Further findings

Tourism

Hotellerie 4.1 – Studie zur Digitalisierung in der Hotellerie / Hotel industry 4.1 - Study on digitisation in the hotel industry

In April 2019, ÖHV (Österreichische Hoteliervereinigung) & German Hotel Association (IHA) presented a cross-national study on the current state of digitisation in the hotel industry. A total of 587 hoteliers in Germany and Austria were surveyed as part of the study.

The majority of hoteliers do not feel fit for digitalization yet

What do they need to get fitter in regard to digitisation?



In Austria, a high percentage of between 70 and 80% demand more knowledge about digital solutions. In particular, the desire to not only follow the trends, but to develop digital solutions independently in order to take on a pioneering role can be recognized. For this purpose, more training and better information strategies are primarily required.

In addition to the general opportunities, the following factors are assessed as positive in detail:

- Comfort & efficiency for guests
- Simplification of processes
- Automatic and efficient bundling of work steps
- Networking the system landscape for Golden Data Set
- Be able to get faster on the market

In contrast, the following factors are considered to be risks of digitisation:

- Longer reaction times
- No optimal availability of the public infrastructure of the Internet - rural areas
- Too slow implementation by the software partner - this can lead to competitive disadvantage

High training requirements
More work in maintaining the system
Fake reviews or spiteful reviews of individual dissatisfied guests

<https://www.oehv.at/themen-recht/digitalisierung/hotellerie-41-update-zur-grossen-digitalisierungsstudie/>
https://media.hotellerie.de/media/docs/oehv-iha-rb_update_digitalisierungsstudie_umfrageergebnisse_2019_oesterreich.pdf
PowerPoint Presentation (hotellerie.de)

Retail

<https://www.moving-forward.com/round-table/>
an online panel about influences of digitalisation in retail.

WIFI Wien offers Digital Check for IT- Digitale Kompetenzen | WIFI Österreich
All of these competences are required when applying for a job in retail.

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