Online Job Advertisements

Landscaping Implementation Report

Francesco Trentini

Web Intelligence Hub

Landscaping OJA Web data sources

Deliverable D3.2 – Final overall OJA landscaping report

Authors: Francesco Trentini

Approved by: Emilio Colombo, Mario Mezzanzanica

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1. Introduction

The project “Towards the European Web Intelligence Hub- European system for collection and analysis of online job advertisement data (WIH-OJA)” takes on the Cedefop’s project “Real-time Labour Market Information on Skill Requirements: Setting up the EU System for Online Vacancy Analysis”, concluded in 2018. The purpose of the project was the extraction of skills and vacancies from Online Job Advertisements, performed on 27 EU countries and UK. The new project inherits components of the methodology and data production system from the former and aims at establishing an accountable system to produce official statistics, extending it to the 32 members of the European Statistical System, adding Iceland, Lichtenstein, Norway and Switzerland to the list of involved countries.

The landscaping activity is a fundamental step in the process. The goal of the activity is to map the existing sources that publish OJA in each country, contextualise their activity in the institutional, sociodemographic and economic context of the country and to integrate this information to establish the register of sources that are most promising for the production of OJV and skills data. The involvement of Individual Country Experts is essential in this stage. Experts have language and context-specific knowledge that inform each stage of the process.

The report develops as follows. Chapter 2 describes the context of OJA and details the developments in the period 2017-2021 along the dimensions of integration of digital technologies in economic activities and changes in the labour market. Chapter 3 details the trends in the of public and private operators (Section 3.1) and the OJA market structure in the involved countries (Section 3.2). Chapter 4 describes how the landscaping activity was operatively conducted, detailing the steps of the construction of the registry of sources (Section 4.1), the editing of the landscaping report (Section 4.3) and the role of the expert internal workshop (Section 4.2). Finally, Chapter 5 provides conclusive remarks and the main findings of the landscaping activity.

2. The context of online job advertisements: developments 2017-2021

The chapter is devoted to the exposition of the changes in the main elements that constitute the context in which the online job advertisement market is embedded. There are two major drivers that change the shape of the context within which OJA operate. First there are the factors that enable the development of the OJA market itself, namely the availability of internet access, the presence of digital skills in the labour force, the digitalisation of processes by employers and the institutional and legislative factors. Second the specialisation of production in the country and the scope of public intervention shape the specific market type and composition of operators.

In the last four years, the use of internet has increasingly become the norm and digitalisation has been one of the drivers of structural change in European countries. These historical trends combined with the responses to the COVID-19 pandemic to determine the current trajectory of European economies.

This section describes the main changes in the context in which the OJA providers operate, highlighting the role played by the enabling factors, leaving the detailed account of the specific market features to Chapter 3.

LM reforms and policies Overall, during the period 2017-2021, reforms that took place in the labour market legislation did not affect OJA directly[1], a similar result holds for labour market policies[2]. Indeed, major policy actions were related to extensive responses to COVID-19 (Eurofound, 2021). Besides income support measures and job retention schemes, including short-time arrangements[3], which were designed to reduce turnover, the remaining intervention largely aimed at accelerating the process of digitalisation to conciliate social distancing policies and the continuation of the production activities. The recovery and resilience plans (RRPs) and the agenda of Europe Digital Decade put large resources in the actual transition to a full integration of digital technology in the operations and interactions of

[1] Structural changes have taken place in Hungary and Slovenia. These reforms will affect the labour market in general and OJA indirectly in terms of composition of demand at the intensive and extensive margin. In Hungary, the Labour Code was modified to allow the increase of the maximum number of overtime hours from 250 to 400 per years and extend the accounting period of work hours from 1 to 3 years for specific work schedules. It entered into force on 1 January 2019.

In Slovenia, several legislative measures were implemented in 2019. A new Labour Market Regulation Act (ZUTD-E) was introduced to increase the number of elderly persons in employment, increasing the minimum age at retirement and introducing schemes to incentivize temporary or occasional work of retired individuals. Moreover, the government introduced incentives to employ low-skill unemployed individuals and created information points to facilitate foreign workers.

[2] In Hungary, in the period 2017-2020 active labour market policies were restructured to reduce public work, increase wage subsidies, reduction of training participants. The main goal was increasing labour supply, with some specific target categories, such as mothers, which were allowed to work while receiving maternity benefits, and incentives to employ retired persons. Another important change is the reform of vocational training which led to the reduction of the recognised vocations from 800 to 175. In the short-term this change may imply difficulties in matching graduates with jobs.

[3] These measures contributed to preserve the level of employment of permanent workers and income support measures were overall implemented for self-employed individuals and business owners.

public and private institutions. Moreover, existing differences in terms of technologies adoption among countries are expected to be reduced to achieve convergence.

Laws on OJA content and obligations of referring to central agencies In term of how job postings are framed from the legal point of view, we observe a common read, which is twofold and in accordance with what was observed in the 2017 landscaping report. On one hand, they are considered ordinary advertisements and subject to general laws on the matter; on the other hand, they are subject to anti-discrimination law, preventing unfair treatment based on subjective characteristics unrelated to the job, such as a person's sex, age, disability, ethnic or racial origin, religion, belief or sexual orientation. Nevertheless, some countries have put in place specific laws to regulate the content of job postings and obligations in reporting to central agencies.

In Lithuania, since the end of 2019 the government forced publishers of job postings to publish the base wage that they offered. Similarly in Slovakia, since January 1, 2019, employers have the legal obligation to report vacancies to the local Office of Labour, Social Affairs and Family[4]. Since 2018 all vacancies in Slovakia must include the basic wage component in job postings. The enforcement of the law was very effective and led to the disclosure of the whole salary amount[5].

In Norway, the PES online job-portal – Arbeidsplassen.no – was established in February 2019. The PES already operated a vacancy database, which included online and offline vacancies, either filed by employers at PES offices or published on offline media. According to the Norwegian labour law, employers are required to notify a vacancy if it is not immediately filled by internal recruitment or replacement hiring.

In Switzerland employers must notify and register job advertisements with the competent regional PES office if the nationwide unemployment rate in its fields exceeds 8%. From 1 January 2020, the unemployment rate threshold has been lowered to 5%. The measure is aimed at supporting employability of unemployed Swiss nationals.

Changes in the regulation of PES The law provisions regulating PES activities has remained stable in most countries. In cases in which new business models have been put in place, legislation was unchanged[6]. One exception is Spain, where public employment services have been reorganised to act as an employment agency and provide services to increase the probability of matching vacancies with jobseekers. On December 3, 2021 the government approved, the draft bill of the Employment Law, which contemplates the transformation of the Spanish Public Employment Service (SEPE) into a Spanish Employment Agency. According to the new Law, the employment agency will have the mandate to operate as a platform for matching jobseekers and vacancies, both from private and public employers. It is expected that the Empleate portal will receive increasing resources in coming years.

[4] Some commercial job portals and newspapers - currently www.profesia.sk, www.kariera.sk, www.job.sk, www.kariera-praca.sk, REGIONPRESS s.r.o. – have a cooperation agreement with the administration which makes the obligation fulfilled for job postings filed to their pages. Jobs in the central public administration system are not subject to such obligation.

[5] On Profesia.sk, 31% of job advertisers disclosed the amount of remuneration before the obligation was introduced, and 92% after the obligation was introduced.

[6] Being the topic concerned with operations rather than legislative changes, this part will be covered thoroughly in Section 3.1.1.

Digitalisation[7] The development of the OJA market depends on enabling factors on both demand and supply side of the labour market. Considering the infrastructural endowment, there has been a steady improvement in connectivity in Europe in the last years. In 2021 basic broadband infrastructure fully covers Europe, while 59% of households have access to fixed high-capacity networks. Rural regions are still suffering divides in access to very high-capacity networks (the overall incidence is 28% but some countries, such as Malta, Luxembourg, Denmark and Spain can cover more than 90% of homes). The specific geographic conformation of the ground determines the type of technology that is used, as it is the case of Ireland – which has the highest share of one-off households in Europe – and France, where wireless connections are important to provide internet access. Differences persist also among countries, with Bulgaria and Greece having the lowest connectivity performance.

Considering human capital, 84% of individuals used the internet regularly in 2019, while the share of those possessing at least basic digital skills was 56%, a 2% increase over the 2015 figures. Large gaps are still present among countries, the Netherland and Finland leading the ranking and Bulgaria and Romania scoring lowest. The growth rate is expected to increase due to the impact of the COVID-19 pandemic on the use of digital tools and on the investment in training in digital skills planned by EU states following the Recovery and Resilience Plans. In Cyprus, the government introduced significant investments in the digital infrastructure (5G and optic fibre network) and further development of digital skills in the population. In Denmark two strategies have been implemented since 2018, a digitalisation within the public sector and the digital growth strategy for the entire economy. In Hungary, the "Re-programming" policy was put in place in 2020. It offered a free eight-week basic course in IT skills for registered jobseekers. However, the success of this initiative was limited: of the 47,000 people who finished the course, only 9,000 graduated successfully.

The use of digital technologies in private companies substantially differs by their size, both in advanced and basic digital solutions, such as enterprise resource planning and e-commerce. The use of digital tools in the recruitment process has increased with very high incidence in its early stages. Online interviews became the norm during the pandemic and are expected to be widely used henceforth. Another trend is the integration of HR management with external providers. In Liechtenstein, job portals offer services to automate the collection of job advertisements by scraping the employers' website automatically for an extra fee. In UK, the rise of programmatic agencies as new intermediaries indicates the availability of employers to automate activities concerning needs assessment and recruitment with external providers.

The availability of digital public services increased significantly over the last years and the online access to public administration services has become the norm since the 2020 outburst of the pandemic (64% of internet users in 2020 compared to 58% in 2015). Estonia, Denmark, Finland, and Malta have been leader in the process, while Romania and Greece lag behind. An important strand of digital public services are Public Employment Services job portals. Since 2017, most PES job portals have been redesigned and improvements have taken place in Austria, Belgium, Bulgaria, Cyprus, Czech Republic,

[7] The section draws on the Digital Economy and Society Index 2021 report (European Commission, 2022), integrated with the evidence emerging from national landscaping reports. See Appendix, Figure 3 and Appendix, Figure 4 for a comprehensive picture along the human capital, connectivity, integration of digital technology and digital public services as well as a representation of the 2016-2021 progresses.

Denmark, Lithuania, Portugal, Sweden, Slovenia, and UK, while they are under restructuring in Greece, Finland, Romania and Spain and expected to start being operative by the end of 2022.

In some cases, new portals started to operate. In Austria a new platform, called Allejobs, started to operate in 2021 with the mission to gather OJA from private as well as public providers, including the ads for neighbouring regions collected from the German Federal Employment Agency. In UK, the PES job-portal Universal Job Match, designed and operated by Monster, has been replaced by a redesigned system, Find-a-job, developed and run by Adzuna. The new job-portal is a customised version of its proprietary platform. In Sweden, in 2021 the PES has developed a new business model for collaboration between public and private job portals. the SPES Platsbanken developed a new ecosystem for job advertisements, in which private portals were invited to participate – in February 2021, 20 external websites participated. The collaboration includes the optimisation of the format and content of all job offers, coordinated through the Jobtechdev.se platform.

Use of internet for job search Overall, in EU-27, the share of individuals that used internet to search for a job or send an application has been stable in the period 2015-2021, with almost one person in nine that has used the internet to look for a job. This evidence can be used as an indicator of the potential extent of the market for OJA, relative to the population. This trend was quite heterogenous among countries (Appendix, Table 4) and depends on the demographic composition as well as in the degree of digitalisation of the population and the above-mentioned enabling factors. The main divides in the former domain can be traced along the age of jobseekers and their education level. The results are consistent throughout Europe and show that one out of four individuals aged 15-34 used internet for job search while the share decreases to almost one out of seven in the 35-44 age class in 2021 (Appendix, Table 5). Nevertheless, the pandemic reportedly increased the use of the internet channel for job-search among all age classes.

The incidence in the use of the internet channel for job search among unemployed individuals is a good indicator of the adoption of the technology and the importance of the instrument in the portfolio of jobseekers' strategies. On average in Europe almost half of unemployed individuals declare to use the internet channel for job-search, a share which has been stable over the period 2019-2021 (Appendix, Table 4). Considering the features of the occupations, skills-related differences are also present – although in a less pronounced manner – and homogenous throughout the countries. ICT professionals display a higher incidence in use of the internet to search for a job (Appendix, Table 7), while non-manual workers[8] are more likely to use the online channel to search for a job compared to manual workers (Appendix, Table 6).

Other channels It is important to note that recruitment strategies are targeted to the prospective employee occupational level. Top management positions are usually not advertised as the public job posting can be interpreted as a signal of changing marketing strategies to competitors. The informal channel and direct hiring after referrals are also widely used among all occupational levels, with a higher incidence among professionals and managers and elementary occupations. In Denmark, in 2018, the most used recruitment channels were publicly advertised jobs (76%), while the informal channel was

[8] We use the classification provided by Eurostat. Non-manual workers are those belonging to ISCO08 Major groups 0-5, while manual workers belong to ISCO08 Major groups 6-9.

also widely used (52%), hinting to the fact that at least a fourth of vacancies are not even advertised. In 2020 the former grew to 82% while the latter decreased to 36%.

The size of the employer is also relevant, being small and medium enterprises more prone to rely on personal contact and informal networks rather than large enterprises.

The dimension of the country and, more in general, the dimension of the local labour market, partly determines the use of the informal channel over other channels. In Iceland, job search mainly leverages on the informal channel through job fairs, word-of-mouth, and direct inquiries to prospective employers. In Liechtenstein, newspaper postings are still very common and play a role in enlarging the talent pool of potential job applicants by targeting experts and management professionals, that may not be actively looking for a job.

Online social networks A recent trend that has gained momentum in the years of the pandemic is the growth of the use of online social networks for job seeking activities and recruitment. The main social networks used for this purpose are LinkedIn and Facebook. In all countries, the use is reportedly differentiated, LinkedIn being used to address the segment of high-skill workers while Facebook is more used by and for low-skill workers.

In Finland, experts agree that OJAs are the second most used channel to recruit after informal channel, while they also state that social networks are increasing their importance. In 2020, 31% of firms declare to use social networks as a means of acquiring labour – a figure doubled since 2015. In the Netherlands, social media are increasingly important in job search. In 2018, the most used channels for advertising vacancies have been own websites and social media. Indeed, 71% of all vacancies is published on social media with Facebook targeting middle and low educated job seekers and LinkedIn targeting high educated job seekers. About 50% of all vacancies are published through OJA. In Poland, albeit traditional channels include private recommendations, internal recruitment through personal channels, press advertisements or PES, in December 2021 the coverage of OJV market in the number of job announcement is reportedly almost 100 per cent.

In UK, albeit Facebook and Google Jobs have been growing in use, social networks are perceived as a threat by a minority of players.

Conclusions of the chapter The main finding of the section is that the shock induced by COVID-19 accelerated phenomena that were already in place, namely the integration of digital technologies in private businesses' and public agencies' operations. Some countries such as Bulgaria, Romania and Greece lack the infrastructural endowment that allow the development of digital services, including OJA. The Recovery and Resilience plan is expected to lead to large improvements in these respects.

Digital public services have also experienced a wide development in the majority of countries and public employment services have undergone improvements to job portals. In all considered countries the use of the internet channel for job search has been increasing in the period 2017-2021. Online job vacancies are a subsample of public vacancies, namely those that are not filled by direct hiring, either internal or external. Despite the diversification of recruitment channels, which leads to the overlapping of public and private channels, a part of vacancies, concentrated in top management, management, professionals and in elementary occupations are not visible in public spaces, albeit there are no available estimates of the incidence of this phenomenon on the aggregate of vacancies.

The use of online social networks such as Facebook and LinkedIn is a phenomenon that gained importance in the pandemic period. The relevance is in general quite low but it differs by countries, with higher importance perceived in The Netherlands and Ireland, where these players are expected to induce large changes in the market in coming years.

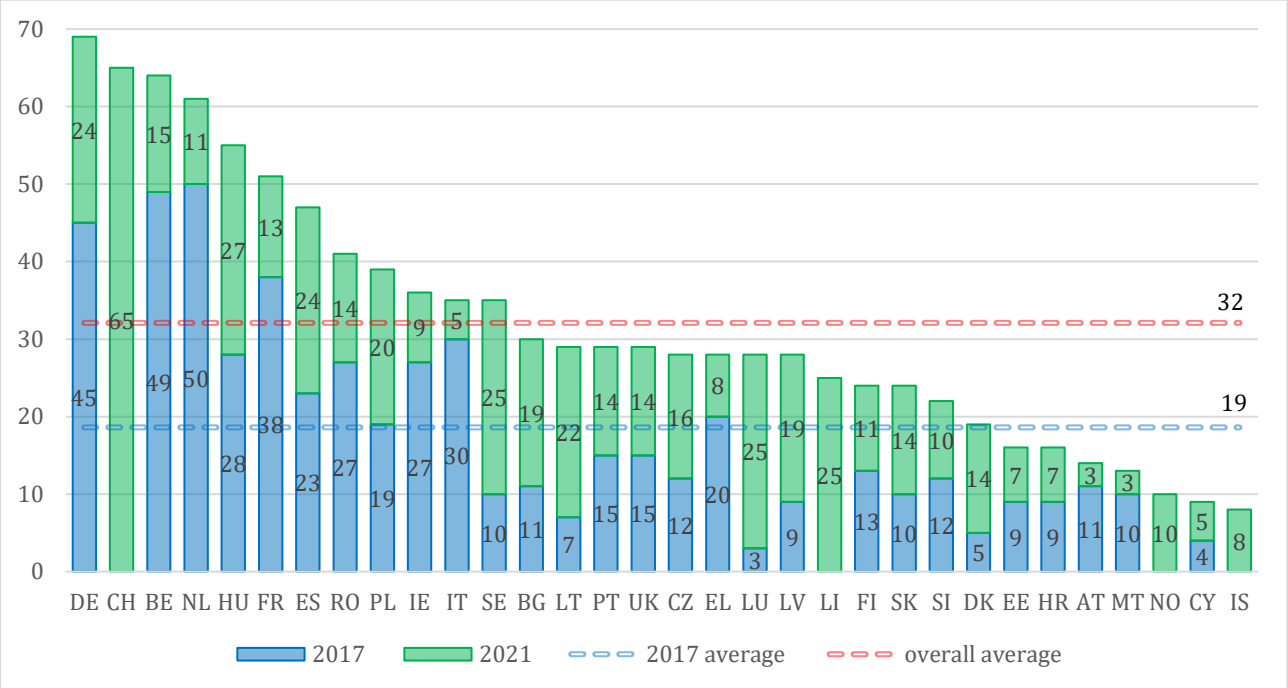
3. The Online Job-portals Landscape in the EU: changes 2017-2021

In this section we develop the analyses of the OJA market in the light of the trends that are presented in Chapter 2. Our analysis pivots on the outcomes of the two main landscaping activities – the register of new potential sources for the collection of advertisements and the updated national reports – to give a comprehensive read of the structure of OJA market in the involved countries. The Chapter is organised as follows. Section 3.1 gives an overview on the number of new sources and the volume of job advertisement, while a separate analysis on public and for-profit operators is presented in Sections 3.1.1 and 3.1.2 respectively.

3.1. Online Job-portals

During the 2021 landscaping 505 new potential sources have been identified, 397 in EU27+UK countries, a 74% increase over the 2017 landscaping. EFTA countries, that ran the activity for the first time in 2021, accounts for 108 sources: the list is led by Switzerland (65 sources), followed by Liechtenstein (25), Norway (10) and Iceland (8). The two leading countries have a high number of sources compared to the small dimension of the labour market due to the linguistic diversity and high integration with neighbouring countries. Overall, the sum of potential and new sources amounts to 1027 sources. The distribution of the sources is presented in Figure 1.

Figure 1 Number of sources by country and year of landscaping survey: 2017 and 2021.



The changes during the period 2017-2021 are very heterogenous among countries, providing an indicator of the degree of transformation of the market, as seen through the lenses of the landscaping methodology[9]. The markets in which we observe the highest increase in the absolute number of sources are Hungary (+27), Sweden (+25), Luxembourg (+25), Spain (+24) and Germany (+23). Considering the initial size, the largest relative changes are observed in Luxemburg (+25, compared to 3 know sources), Lithuania (+22 compared to 7 known sources), Denmark (+14 compared to 5), Sweden (+25 compared to 10) and Latvia (+19 compared to 9). On the other side, countries which displayed the smallest relative increase are Austria (+3), Malta (+3), Cyprus (+5), Italy (+5) and Estonia (+7). In order to fully understand the changes in the markets we separate the analysis of public employment services job-portals, in Section 3.1.1, and private for-profit job portals in Section 3.1.2.

3.1.1. Public employment services

As a general rule, all European and EFTA countries have one national public employment service online job-portal. Croatia, Finland, Greece, Hungary, Iceland, Ireland, Latvia, Lithuania, Norway, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, Switzerland and UK have a single national public online job-portal (see Appendix, Table 8). In the remaining countries public portals are more fragmented for various reasons.

Generally countries with regional autonomies have specific portals that are specialised on linguistic and regional bases. In Belgium there are 4 public portals, all surveyed in 2017, that are segmented by language (Flemish, French, German) and region. In Spain, alongside to the national portal, Empleate, surveyed in the first landscaping report, new regional portals were found for the regions of Navarra, Valencia, Andalucía and Cantabria. In Italy the centralised portal Cliclavoro has been dismantled and only regional portals can now be found, with increased fragmentation of the service and its consequent marginal role for jobseekers and prospective employers.

Moreover, recently some countries have developed specialised portals to target specific groups of interest. For example, in France the portal 1jeune1solution is catered to persons under 30 years of age. The portal selects specific advertisements drawn from Pôle Emploi. In Liechtenstein, next to the public employment service platform, the Arbeitsmarkt Service (AMSFL), there is an apprenticeship platform that is run by the local trade association in collaboration with the government. In Denmark the portal workindenmark.dk targets foreign workers that want to find a job in the country with a selection of EURES job postings for Denmark. Finally, in Ireland there is a portal- PublicJobs- dedicated to jobs in the public administration.

PES have undergone several developments in the past years. Since 2017, improvements have taken place in Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Hungary, Lithuania, Portugal,

[9] The argument is valid for sources that are visible according to the procedure that we designed and explained in the Methodological guide and that were either not surveyed in 2017 or started to operate after the first landscaping. More precisely the results are a combination of the effectiveness of the new procedure compared to the first landscaping and the actual degree of transformation of the market as measured comparing the two points in time and without accounting for sources that ceased to operate between the first and second landscaping. Finally, the avoidance of highly descriptive keywords for the search of job portals may have resulted in an underestimation of niche or specialised primary portals – which are less relevant in terms of contribution to the volume of vacancies and are likely to be scraped by larger secondary operators.

Sweden, Slovenia, and UK. While in most of the cases improvements were related with renovated websites and improved information sections, some portals have been completely overhauled.

In Austria the PES's eJob-Room online portal used to advertise vacancies from the PES database. On April 2021 a new platform, Allejobs, became active. Allejobs includes OJAs that are registered at the Austrian PES or posted by companies on eJob-Room, while also including postings from private online job-portals, with an ambition to cover the whole market. The portal cooperates with the German Federal Employment Agency to post vacancies for neighbouring regions in Germany. In UK, the Universal JobMatch portal, developed and run by Monster, was substituted by a new portal, Find-a-job, designed and developed by Adzuna, as a customised version of its proprietary platform. In Hungary a new public portal provides competence-based matching. The service is currently separated from the PES job portal but it is expected to replace the existing one in the future.

In Greece, Finland, Romania and Spain PES job portals are under renovation. In Romania the national PES online job portal, www.card-profesional.ro, has suspended the service in 2021 while a new portal is not available yet. In Greece a new portal is under development and expected to open under the OAED portal by the end of 2022, while in Finland a new portal Työmarkkinatori will replace the one currently in use, TE-palvelut.fi. In Spain the new Empleate service will run a platform for matching jobseekers and vacancies, drawn both from private and public employers, and is expected to start its operations at the end of 2022.

Coverage of public sectors job. Only in a minority of countries public sector jobs are posted on online job portals, being more common to have specialised pages on public institutions websites, often due to specific recruitment procedures for public employment jobs. While the practice is in line with the one observed in the previous landscaping, some exceptions can be identified. The new Empleate portal in Spain and the new Työmarkkinatori in Finland will post public sector jobs. In Lichtenstein and Norway, the PES portal includes them as well. In Iceland, while the PES portal lists jobs from the public sector, the government and municipalities usually advertise vacancies on their own portals. In Switzerland, Cantons have dedicated websites for this purpose.

Focus of PES portals Public online job portals can be grouped depending on the user that they target. On the one side there are PES operating as secondary job-portals, with the goal of gathering public and private job postings and behave as a marketplace for all advertised vacancies in the country. In this case, the target group are all job seekers. The cases of Austria and Lichtenstein are the most clearcut in this sense, with a complete coverage of all public and private vacancies. Spain is also converging to this model, albeit it is not clear whether the PES portal Empleate will proceed via agreements to include advertisements from private sources as it did before the reform. Similarly, the Norwegian PES has an agreement with the largest job-portal, Finn.no, to repost its job advertisements on its own platform. In Sweden the new business model of Platsbanken provides an ecosystem of for job advertisements that optimize and standardise format and content of all job offers from both private and public actors. Moreover public portal has agreements with private ones to post vacancies on its own platform.

On the other side, PES may operate with a complementary approach to private portals to support categories of workers neglected by the latter. It is the case of Ireland, where JobsIreland advertises vacancies that are not found on private job sites. In fact, it posts vacancies of Community Employment, apprentices and it acts as the State's recruiter to various schemes (such as Youth Employment Support Scheme). In Iceland the PES has the specific mission to activate non-employed individuals to whom the

services of the job portals are catered. France is a stand-alone case, as it has specialised PES portals by level of qualification. Pôle Emploi is particularly active for intermediate or low level of qualifications, whereas APEC focuses on intermediate and higher level of qualifications. Both portals, as reported above, partner with private portals. In Switzerland, employers posting jobs for high-unemployment professions are obliged to notify the regional PES offices before publishing the vacancy so that registered jobseekers have a priority access to apply for these jobs. In Belgium, the regional PES office, VDAB, has agreements with private portals to acquire vacancies to target disadvantaged groups, such as migrants, disabled people and people over 50 years of age.

Structure of the content. PES job portals tend to have a higher degree of structured information and adherence to national and international standards compared to private job-portals, as presented in Table 1. This evidence emerges similarly from all the reports – with the exception of Greece, Romania and Italy where public portals are not active. On average public job-portals are more informative, with a lower share of missing information on all the dimensions of interest in OJA pages, except for the economic activity and education, for which the performance is similar to private job-portals. Considering the degree of structured information, on average the presence of such type of information in public job-portals is higher.

Table 1 Content availability and structure in private and public portals. All known sources 2017 and 2021.

	Missing information, % of all categories		Structured field, % of valid	
	Private portals	Public portals	Private portals	Public portals
Occupation	8%	6%	65%	80%
Contract	22%	17%	60%	83%
Working time	26%	20%	55%	80%
Economic activity	29%	30%	63%	73%
City	14%	9%	76%	83%
District	57%	50%	66%	81%
Region	44%	36%	72%	83%
Education	22%	23%	34%	59%
Salary	48%	41%	55%	71%

Public portals are also having important spillover effects on the rest of the market in countries where they tend to be more active. Indeed, in recent years the trend has evolved toward greater standardisation, especially in Scadinavian countries. In Finland the Työmarkkinatori portal is defined as an ecosystem that promotes an information which is common, standardised and available to all actors. The new Jobtechdev.se platform in Sweden provides open-access tools – including standards, datasets and code – for the analysis of job advertisements and the labour market to the public via API. In Norway the collaboration between the PES job portal and the largest private portal is contributing to standardise the content and structure of all the other portals. According to experts, similar results are achieved in

countries with high competition, while countries in which the OJA market tends to the oligopoly private portals try to impose proprietary classifications and standard.

Use of EURES According to the EU regulation, vacancies posted to the national public employment service job-portals can be automatically transferred to EURES. In the original intentions the EURES portal was expected to play a pivotal role in European OJAs not only by providing an aggregator of national PES but also by providing a common standard in terms of information and coverage, to national PES and private portals. Overall, so far EURES failed to emerge as the pivotal driver in the market of OJA. In fact the increasing relevance and centrality of national PES described in the previous paragraphs is more the outcome of national strategies and policies than the outcome of a process led by EURES. The EURES service seems to be rarely used in all countries, despite the increased trend in the transmission of job postings in the period 2017-2021. Following Brexit, UK is no longer part of the EURES network. Some exceptions apply. In Greece, the quality of EURES vacancies is reportedly insufficient to characterise jobs. Italy and Romania have a low number of vacancies posted on EURES due to the fact that the national PES job-portals are not active.

An important issue emerging from national reports is selection and quality of vacancies transmitted from national PES to EURES. Reportedly in Ireland, PES send to EURES a subset of their vacancies, selecting only paid employment and excluding apprentices. In Greece, while there is no evidence of ex-post selection, quality of transmitted vacancies is very low.

3.1.2. Private operators

For-profit operators increased in number in all countries, with some general trends that can be observed in Europe. Primary job portals are the most represented type of job portals. Secondary job portals grew the most in the period 2017-2021 and are more prevalent than portals combining primary and secondary functions in the comprehensive list of websites (Appendix, Table 9). Job portals[10] are the majority of known sources, followed by recruitment agencies (Appendix, **Error! Reference source not found.**). Between 2017 and 2021, job portals, company websites and recruitment agencies have grown most. Three out of four job portals have a national scope (Appendix, Table 13). New sources induced a doubling in the prevalence of regional portals, while the incidence of international portals remains stable. Common language and geographic proximity make foreign portals appear among national potential sources. Liechtenstein, Luxembourg and Switzerland are countries with small labour markets, integrated with neighbouring regions in Austria, Germany or France and portals registered in the latter are found in searches in the former[11]. An exception is Lithuania, where two new portals, CV Vilnius and CV Klaipedia focus on cities. The vast majority of potential sources are reported to post OJAs for all sectors (Appendix, Table 15). The share of portals that post for a single industry has been growing in the period 2017-2021, doubling their incidence. This evidence, read together with the reported increased

[10] We aggregate the two categories “job portal” and “classified ads portal” into a single one, “job portals” due to the fact that a new categorisation of the type of job portals was introduced in the landscaping 2021: the former “general” category was replaced by “classified ads portal”.

[11] In Lichtenstein, 14 portals are registered abroad: 11 portals in Switzerland, 1 in Austria and 1 in Germany. Analogously, considering new potential sources, 2 job portals found in Switzerland are registered in Germany while 3 portals listed among Luxembourg new potential sources are registered abroad: 1 in Germany and 2 in France.

market shares of largest job portals, seems to suggest that specialisation on specific market segments is a strategy for newcomers to enter the market.

The rise of multinational OJAs websites Multinational companies are expanding in new countries as presented in Table 2. The largest expansion is observed among secondary job portals, Indeed and Jooble, and recruitment agencies, Adecco and Randstad. It is interesting to note that the expansion is independent on proximity or common language, except for a few cases (Academic work, Biuro, Jobbsafari, Kariera, Karriere, Profesia and Unique). The important fact is that multinational portals are likely to apply the same structure to their webpages in different countries and for different languages. Moreover, some of the largest portals are aggregators, which imply the indirect coverage of other job ads publishers in the country.

Table 2 Multinational portals diffusion in EU27, EFTA countries and UK.

	2017	New in 2021
Academic work	SE	FI, NO
Adecco	DE, EL, FR, IT, NL, SI	BE, BG, *CH*, DK, ES, FR, LU, PL, RO
Adzuna	DE, IT, NL, PL, UK	
Biuro		LT, LV
Careerbuilder	DE, SE, UK	DK, IE, PL
Careerjet	BE, EL, FI, HU, IT, SI, SK	LU, RO
Hays	DE, ES, IT, NL	DK, IE, PL
Indeed	AT, BE, DE, EL, ES, FI, FR, HU, IE, IT, NL, PL, PT, RO, UK	CH, CZ, DK, *LI*, LU, MT, *NO*
Jobbsafari	SE	*NO*
Jobijoba	ES, FR	LU, UK
Joblift	DE, FR	UK
Jobrapido	BE, DE, IT, NL, PL	CH, HU, UK
Jooble	BE, BG, HR, IT	AT, CH, CZ, EL, ES, HU, PT, SE, SK
Kariera	EL, SK	CY, SI
Karriere	AT, DE	
Manpower	BE, DE, FI, FR, IE, IT, NL, SI	BG, EL, *NO*, PT
Monster	AT, BE, DE, ES, FI, FR, HU, IE, IT, LU, NL, PL, SE, UK	*LI*
Olx	PL, PT, RO	
Profesia	CZ, SK	
Randstad	BE, DE, EL, FR, HU, IT, NL	DK, ES, LU, PT, SE
Stepstone	AT, BE, DE, DK, FR, NL, SE	
Studentjob	BE	CH, ES, FR, SE, UK
Trenkwalder	HR	HU, SI
Unique	NL	BE
Welcome to the jungle		FR, LU, SK

Pricing According to ICEs reports, the business model in the last years has been evolving from job-portals as passive providers of job advertisements to job-portals as marketplaces to match jobseekers and vacancies.

In general, the variety of pricing models has been changing over the period, with pay-per-click and pay-per-ad being the most diffused. In the last years, the former has been gaining ground over the second, while new models have appeared. Pay-per-application was documented in Switzerland and UK. In fact, in UK, next to the pay-per-application model, which is already quite diffused, pay-per-placement is expected to increase its importance.

Besides paid job advertisements, a range of subsidiary and complementary paid services are offered to the users[12]. The range of services clearly depend on the type of operator that run the source. Job portals offer the possibility to streamline the publishing of job postings by scraping company websites. Recruitment agencies curate the whole recruitment process, helping prospective employer to identify their needs, posting job-advertisements if needed, managing the pool of potential hires and selecting them. New intermediaries, such as programmatic agencies in UK, are developing in this segment, providing workforce development tools.

3.2. Online Job-portals: market structure and the role of PES

Under the spur of the increased use of digital technologies and COVID-19 pandemic, the market of OJA has been growing in the period 2017-2021. Public and private job-portals have been increasing in number and are exploring new core activities. The frontier is the active matching of jobseekers and vacancies, which is expected to be a pivotal activity as it enhances the effectiveness of operators in clearing the market. At the same time traditional operators, that focus on publishing job postings, are still present on the market, with a strong growth of secondary operators. The market is open to new entrants and there is evidence that competition is reducing margins in many countries.

The diffusion of large international portals, with established reputation and trustworthiness, also linked to easy-to-scale services, may be related to the specialization of national new entrants. Nonetheless, the market is described as stable by the vast majority of country experts. This evidence, read in relation with the expanding user base, may be a sign that the OJAs market is far from being mature.

As we have seen in Section 3.1.1, the activities of PES portals impact on the activities of private portals. A comprehensive picture of the market is provided in Table 2. The table reports the level of concentration in the market as they emerge from the reports and the degree of relevance of the PES job-portal. The matrix presents the most important changes that has taken place in the period 2017-2021.

[12] Diversification may allow cross-subsidisation of free publishing of job-ads. In Norway, the larger income for portals comes from other services such as matching vacancies and candidates.

Table 3 The role of PES compared to the level of market concentration in 2021 and changes compared to 2017.

	PES as a strong player compared to the private online job-portals	**PES as a considerable player**, but only under certain conditions/for certain target groups	**Domination by private online job-portals** rather than the PES
High level of concentration (dominance of the online job-portal landscape by a few players)	CY, DK, FI*, FR, HR, SE, **NO**	CZ, EE, LV, MT, SK, **CH**	ES*, SI
Medium level of concentration (several influential players in the online job-portal landscape)	BE	LT	BG, HU, PL, PT
Fragmented online job-portal landscape (many different players, limited consolidation)		AT, DE, NL, ~~RO,~~ **LI**	EL*, IE, IT, UK, *RO**, **IS**

Source: CRISP's elaboration on Cedefop (2018). EFTA countries (CH, IS, LI, NO) and Luxembourg (LU) were not mapped 2018 and are added in bold. Repositioned countries have the 2017 position formatted with a strikethrough and the new position marked in italic (RO). Countries noted with * are undergoing restructuring of the PES. The table reports the situation at time of writing.

New countries entered the survey. Switzerland is reportedly a very concentrated market with few leading portals and a PES with a strong mandate to promote employment in occupations with high unemployment rates. Norway is characterised by a very influential PES, that reposts advertisements of the largest private job portal. These two players have the largest market share, while a few other competitors are present in the market. Lichtenstein has many operators that cover the whole market, which is also highly integrated with neighbouring Switzerland. Finally, Iceland, whose market is very limited in size, is characterised by high reliance on informal channels to recruit and look for a job. Portals are used mainly in tight segments of the labour market – construction and tourism – that usually rely on foreign temporary work, mediated by temporary work agencies.

A very vivid summary of the current phase of transformation of the European market is given by an excerpt from the Czech country report: "In the past years, the two most popular job portals owned by one company (LMC) and the PES portal have retained a stable position. At the same time, the popularity of two global aggregators (Indeed and Jooble) has increased. It therefore seems that while people are used to using reliable job portals, they now also appreciate the breadth of possibilities offered by the aggregators. The portals that are able to collect job postings from around the web can in the next years complement the established national portals where employers advertise directly." In this moment, the two main factors determining the trajectory of the OJA market are the increasing role of PES and the diffusion of multinational players, both recruitment agencies and secondary job-portals, which are challenging incumbent national portals.

4. Implementation of the landscaping activities

In this chapter we discuss the implementation of the landscaping activities, detailing the different phases that characterise the process and reporting the salient moments. The landscaping activity aims at mapping the existing sources of OJAs and contextualise them. The knowledge that is produced in this stage is critical for the subsequent selection of the relevant sources to analyse, whose characteristics and quality determine the value of the data produced and, eventually, of the knowledge that can be extracted.

The involvement of Individual Country Experts in this stage is crucial. They provide language- and context-specific knowledge that allows to highlight the relevant information on the base of the standardised questionnaires prepared centrally. Their professional network can be activated for specific insights, such as interviews to inform the reports and, vice versa, it can be addressed as a net of potential users of the statistics on Online Job Vacancies.

Operatively, the process is constituted by two steps, the survey of websites that publish OJAs and the writing of the national landscaping reports, described in section 4.1 and 4.3 respectively. An expert internal workshop, described in section 4.2, was organised by CRISP and involved ICEs, Eurostat, Cedefop, EMSIBG and CRISP itself. The workshop was divided in three meetings, held regularly throughout the time span of activities. It contributed to facilitate the involvement of ICEs, foster discussion to help ICEs critically assess and improve their contributions and keep them in line with the scheduled timeline. This was especially important for the fact that almost half of experts (15 out of 32) were new to the project and four countries did not participate in any previous activity.

4.1. Updated registry of sources

The first activity of the landscaping is the survey of potential sources of OJAs and constitutes *Task 2* of the contract. The activity was implemented by ICEs following a protocol designed by CRISP and described in the OJA landscaping methodological guide, *Task 1*[13]. The activity took place in the period 30th September 2021, 10th November 2021.

The activity was composed by the following steps. First, ICEs have been asked to translate in their language some keywords that CRISP prepared in English. Keywords have been selected to mimic the behaviour of a jobseeker looking for a job online. The reason for the centralisation of the definition of the list of keywords was to maximise the standardization of the search activity while leaving to the ICE the task of finding the translation that more accurately describe the keyword in their national languages, increasing the consistency of the results. Second, ICE used the translated keywords to run a query on Google Search, localised in their own country in an anonymised way and register all the search results that are produced by the search engine. Third, each source was analysed according to a predetermined

[13] The guide is the output of *Taks 1 - Review and fine-tune OJA landscaping methodology* of the specific contract 2020-FWC7-AO-DSL-VKVET-JBRAN-WIH-OJA002/20.

matrix of characteristics and constraints on valid values. ICEs received a definition of each variable and its metadata and a description of the operative steps required to complete the activity.

Some issues were encountered during the activity. Almost half of ICEs could not fill the form online, which was prepared in Excel and hosted on CRISP's Google Drive cloud. They executed the task offline. In some cases, it led to the ineffectiveness of the data validation rules and some fields were filled with mislabelled values or using invalid categories. In the first case CRISP corrected the typo, while in the latter ICEs were asked to correct the problematic entries. Therefore, the impact on the final quality of the gathered data is estimated to be not problematic.

The survey led to the identification of 505 new potential sources, 108 of which in countries that ran the landscaping for the first time. The avoidance of highly descriptive keywords for the search of job portals likely resulted in an underestimation of niche or specialised primary portals – which are less relevant in terms of contribution to the volume of vacancies and are likely to be scraped by larger secondary operators. The assessment of the specificities of each source and the priority in engaging for agreements and analysis is therefore crucial. This step is performed in the subsequent task, *Task 4*, that is devoted to the proposal of a method to rank sources and its application to the list of known the potential sources. Two measures are developed. The first is a qualitative evaluation of sources' relevance in the context of the country in which they are surveyed and is performed by ICEs. CRISP provides ICEs with information on each source along three dimensions: popularity, stability and coverage[14]. ICEs are asked to assign each source an importance score and to report the criterion they used, together with features of the source that make it relevant. The second is a quantitative measure of the quality of new sources[15]. The criterion to define quality is a hierarchy of sources' features surveyed in *Task 2* that is mapped to a numerical ranking based on the preferences of the involved stakeholders, namely Eurostat, Cedefop, EMSIBG and CRISP. The expression of preferences over criteria is performed by each stakeholder and is then integrated in an AHP model to obtain a global score for each criterion. These scores are mapped to the sources' features surveyed in *Task 2* to calculate a score for each source. Sources can be sorted according to the score to obtain a quality ranking that accounts for the preferences of all the stakeholders.

Sources with both high ICEs priority score and high quality-score are prioritised in subsequent phases of agreement, development of scrapers and integration in the DPS.

4.2. The expert internal workshop

A workshop has been organised alongside ICEs' activities to coordinate and train them[16]. The goal of the workshop was manyfold. First the workshop aimed at internal dissemination, presenting the whole project to ICEs, introducing them to the partner institutions and giving ICEs an overview of the features of the existing system and of the subsequent steps of the project. Second, it aimed at presenting

[14] The first is an indicator computed on Google Trends data and inform on the interest in the source based on direct Google searches. The second is a set of information on the degree of development of the scraper for each source and the stability of the source in the DPS system. The third, computed for sources already in the DPS, is the distribution of vacancies by ISCO08 Major-groups, NUTS Macro-regions and NACE Macro-sectors. The indicators are discussed in detail in the *OJA landscaping methodological guide*, Section 3.3.

[15] The indicator is discussed in the *OJA landscaping methodological guide*, Section 3.2.

[16] Despite being functionally intertwined with landscaping activities, the workshop is object of a standalone order form with Cedefop, 2020-FWC7-AO-DSL-VKVET-JBRAN-WIH-OJA002/20.

specifically the landscaping exercise as a core step in the development of the data production system. Third, the workshop was the occasion for ICEs to interact and discuss, to critically reflect on the landscaping to improve the quality of their contribution.

Due to travel restrictions linked to the pandemic, the expert internal workshop has been held remotely. Leveraging on the advantages of online meetings, the format of the workshop was changed with respect to the former landscaping edition. While in 2017 the workshop was held in presence in Thessaloniki and lasted for one and a half day, in the current edition it has been split in three parts, held on different dates. The schedule of the meetings was designed to be regular and in line with the core activities of the landscaping. The choice of the dates was made via polls to maximise the number of participants. The attendance to workshops was high[17].

Meetings were structured in three main moments: presentations of contents on the topic of the meeting, a group discussion and a final roundtable discussion. Group activities played an important role to increase the involvement of ICEs and to foster their contributions. Groups were formed according to the three criteria. First, the presence of few big countries and several small countries required to balance the distribution of countries by size. Second, Iceland, Norway, Liechtenstein, and Switzerland were new to the project and never run the landscaping, so that ICEs were distributed one per group. Third, some ICEs participated for the first time, so that groups composition balanced new and old ICEs.

The first meeting was held on 22nd October and devoted to framing the landscaping activities in the overall project. The second meeting was held on 22nd November. The focus was on the instructions regarding the second activity of the landscaping, namely the editing of the country landscaping report. The third and last meeting was held on 26th January 2022 and was presenting the main results of the landscaping phase held in 2021, the preliminary results on the features of the new potential sources of OJAs and the main trends that emerged from the country landscaping reports.

The workshop was effective in reaching its goals and the topics emerging from the discussion helped make reports converge in terms of covered content and quality. Moreover, the online format was successful in providing timely information and had negligible logistic costs. Nonetheless it also had many drawbacks. In-person meetings facilitate involvement and participation, and relationships are established more easily.

4.3. Updated landscaping report

The activity was implemented by ICEs following a protocol prepared by CRISP and described in the OJA landscaping methodological guide[18]. The activity took place in the period 30th September 2021 to 10th November 2021 and constituted *Task 3* of the landscaping contract.

ICEs from countries that already performed a landscaping exercise received the old report and were asked to amend the parts highlighted in the protocol. New countries received the table of content and the Italian report as a reference. CRISP provided computed tables of statistics on digitalisation, composition of occupation and its trend by occupation in the country based on Eurostat data. The DESI

[17] Out of 32 ICEs, 29 participated to the first meeting, 30 to the second and 28 to the last. In any case, all ICEs participated in at least 2 activities, except for the Luxembourg ICE that pulled out of the activities in December 2021. The main reasons why ICEs could not attend were illness, travel and the participation to other previously appointed meetings.

[18] The guide is the output of *D1.1 - OJA landscaping methodological guide* of the specific contract 2020-FWC7-AO-DSL-VKVET-JBRAN-WIH-OJA002/20.

report was also made available. Next to the tables, ICEs were provided a set of standardised questions to guide their contributions and make the output as homogenous as possible in term of structure. The main element of complexity was constituted by the fact that, as already mentioned above, 11 out of 28 ICEs were new to the activity and elaborated on a report written by another expert.

5. Conclusions

Four years after the first landscaping was performed in 2017, the exercise has taken place again in the framework of the newly established WIH-OJA project. In the meanwhile, many changes have been taken place in European economies, due to long-term structural transformations interacted with the COVID-19 pandemic. European economies have been experiencing the diffusion and integration of digital technologies in all economic activities.

The growth of the infrastructural endowment of communication is observed in all countries. Despite some countries show marked evidence of backwardness in its development, convergence at higher levels is expected thanks to EU policies and investments that will follow the Recovery and Resilience Plans.

The online channel is increasingly present among the recruitment and job search options of employers and jobseekers. This channel adds to the traditionally solid informal channels. The years of the pandemic have facilitated the spread of the tool, increasing the user base. A similar push was also brought about by the growth of digital public services, increasingly widespread during the pandemic and for which the online access channel has become the norm.

The OJAs market has therefore grown in volume and further growth is expected in the coming years. The number of registered operators is doubled. Multinational operators are increasing while national portals are stable, with the exception of small portals focused on specific parts of the labour market, such as specific professions or sectors of economic activity. This evidence hints toward higher concentration in the market and consolidation of existing portals.

PES portals have undergone numerous transformations. The trend – with the exception of some countries that have divested from these services – is the central positioning that PESs tend to have in the OJAs market. Indeed, they operate as primary portals in the promotion of job positions for disadvantaged categories of jobseekers and secondly, in an increasing number of countries, as aggregators of advertisements from private portals. Public portals are also focusing on AI tools to facilitate the matching of jobseekers and job advertisements. These services, usually paid when supplies by private portals, increase the attractiveness of PES for companies in the recruitment phase.

The role of EURES is marginal among national users who prefer to rely on government portals. Nonetheless, the transmission of national announcements to EURES is effective and the cause of the low presence of advertisements related to some countries is first of all to be traced back to the scarce presence of advertisements on national portals.

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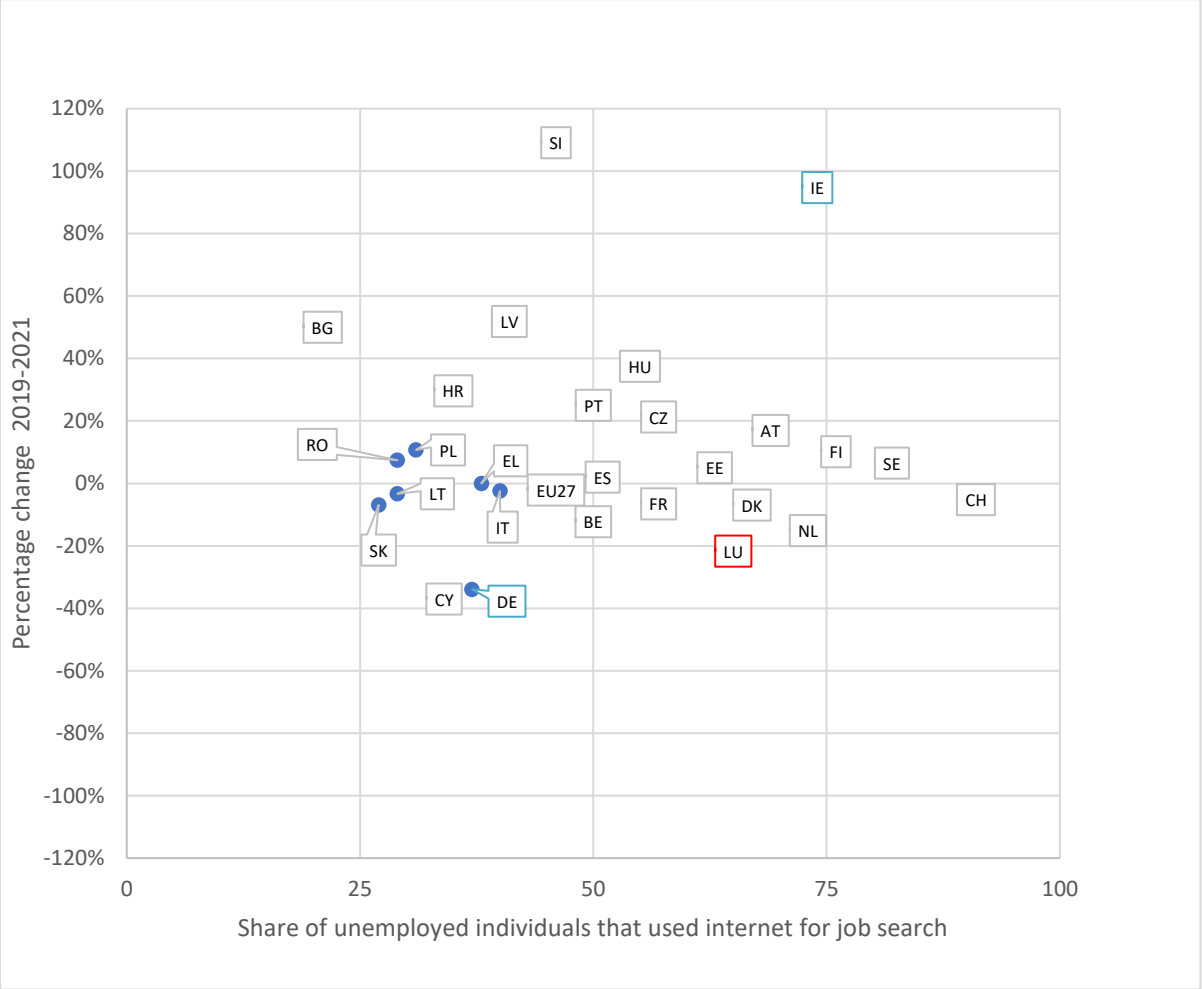
Appendix

Table 4 Share of individuals that used internet to search for a job or send a job application. Incidence in the whole population and among unemployed individuals. Years 2021, 2019, 2015.

	All individuals						Unemployed					
	2021		2019		2015		2021		2019		2015	
AT- Austria	12%		11%		13%		69%		59%		71%	
BE- Belgium	14%		12%		18%		50%		57%		53%	
BG- Bulgaria	7%		7%		11%		21%		14%		18%	
CH- Switzerland	24%		26%		27%		91%		96%		83%	
CY- Cyprus	9%		14%		13%		34%		54%		44%	
CZ- Czechia	6%		6%		5%		57%		47%		37%	
DE- Germany	8%	b	17%		19%		37%	b	56%		61%	
DK- Denmark	36%		37%		36%		67%		72%	u	76%	u
EE- Estonia	20%		21%		22%		63%		60%		62%	
EL- Greece	10%		13%		18%		38%		38%		49%	
ES- Spain	19%		18%		20%		51%		50%		54%	
FI- Finland	34%		32%		27%		76%		69%		68%	
FR- France	16%		17%		17%		57%		61%		65%	
HR- Croatia	15%		14%		16%		35%		27%		33%	
HU- Hungary	17%		15%		17%		55%		40%		42%	
IE- Ireland	21%	b	17%		14%		74%	b	38%		41%	
IS- Iceland	23%		20%		22%		82%	u	.	u	.	
IT- Italy	14%		14%		12%		40%		41%		39%	
LT- Lithuania	15%		16%		12%		29%		30%		30%	
LU- Luxembourg	15%		20%	b	20%		65%	u	83%	bu	61%	u
LV- Latvia	12%		14%		15%		41%		27%		44%	
MT- Malta	15%		18%		23%		28%	u	.	u	44%	u
NL- Netherlands	22%		25%		24%		73%		86%		90%	
NO- Norway	30%		26%		29%		65%		.	u	57%	u
PL- Poland	6%		9%		10%		31%		28%		31%	
PT- Portugal	15%		15%		14%		50%		40%		43%	
RO- Romania	5%		5%		6%		29%		27%		22%	
SE- Sweden	28%		30%		26%		82%		77%	u	83%	u
SI- Slovenia	12%		13%		13%		46%		22%		45%	
SK- Slovakia	15%		15%		10%		27%		29%		33%	
UK- United Kingdom	.		25%		26%		.		81%		68%	
EU27_2020- European Union- 27 (2020)	13%	b	16%		16%		46%	b	47%		49%	

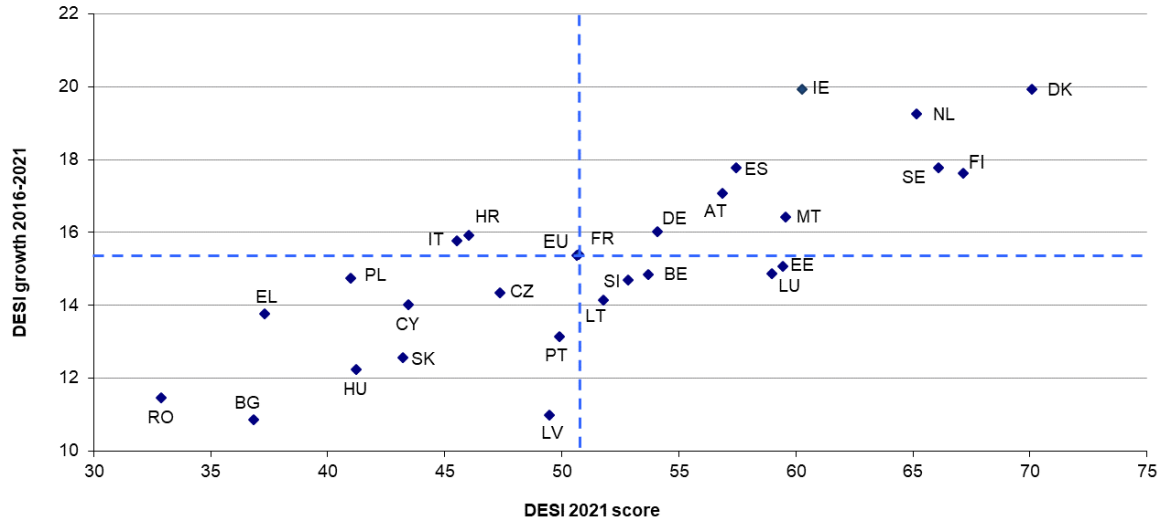
Notes: Available flags: b: break in time series; c: confidential; d: definition differs, see metadata; e: estimated; f: forecast; n: not significant; p: provisional; r: revised; s: Eurostat estimate; u: low reliability; z: not applicable. Table: isoc_ci_ac_i

Figure 2 Use of internet for job search among unemployed individuals. Incidence of adoption in 2021 (horizontal axis) and percentage change in adoption between 2019-2021 (vertical axis).



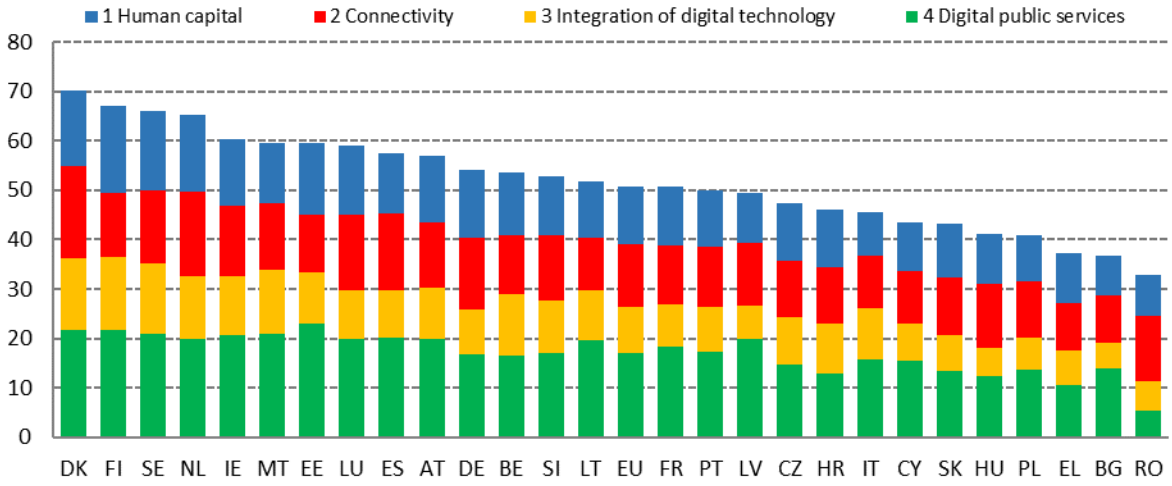
Source: *Authors' calculations on Eurostat data from ICT survey. Note: Malta, Norway and Iceland are excluded for lack of data in 2019, while the UK for lack of 2021 data. Estimates for Germany and Ireland (blue edges) are subject to break in time series, while Luxemburg (red edges) estimates are flagged as unreliable by Eurostat.*

Figure 3 Digital Economy and Society Index, 2021. Member states' progress 2016-2021



Source: European Commission (2022)

Figure 4 Digital Economy and Society Index, 2021. Breakdown by areas.



Source: European Commission (2022)

Table 5 Share of individuals that used internet to search for a job or send a job application. Incidence by age classes. Years 2021, 2019, 2015.

	Individuals, 25 to 34 years old			Individuals, 35 to 44 years old		
Country	2021	2019	2015	2021	2019	2015
AT- Austria	20%	17%	19%	14%	11%	12%
BE- Belgium	24%	21%	32%	14%	16%	23%
BG- Bulgaria	13%	16%	23%	9%	8%	13%
CH- Switzerland	36%	40%	39%	32%	31%	32%
CY- Cyprus	22%	28%	28%	8%	12%	11%
CZ- Czechia	8%	10%	9%	8%	7%	5%
DE- Germany	15% b	30%	35%	9% b	20%	22%
DK- Denmark	57%	57%	59%	45%	48%	46%
EE- Estonia	28%	28%	32%	23%	22%	20%
EL- Greece	28%	31%	39%	14%	13%	22%
ES- Spain	39%	34%	40%	21%	22%	25%
FI- Finland	50%	52%	42%	39%	38%	32%
FR- France	26%	29%	31%	20%	23%	20%
HR- Croatia	25%	35%	35%	20%	17%	19%
HU- Hungary	27%	22%	26%	20%	20%	22%
IE- Ireland	35% b	30%	22%	26% b	21%	15%
IS- Iceland	35%	25%	26%	19%	0,16	0,21
IT- Italy	30%	30%	28%	19%	19%	15%
LT- Lithuania	28%	27%	23%	19%	17%	14%
LU- Luxembourg	28%	36% b	27%	19%	24% b	15%
LV- Latvia	21%	24%	27%	14%	17%	19%
MT- Malta	21%	27%	38%	14%	0,17	18%
NL- Netherlands	31%	35%	41%	27%	29%	25%
NO- Norway	51%	39%	42%	33%	0,3	36%
PL- Poland	10%	16%	23%	7%	11%	11%
PT- Portugal	39%	39%	33%	19%	18%	16%
RO- Romania	9%	9%	11%	7%	5%	8%
SE- Sweden	45%	45%	35%	30%	33%	24%
SI- Slovenia	27%	28%	27%	15%	18%	17%
SK- Slovakia	23%	25%	18%	18%	17%	11%
UK- United Kingdom	.	37%	32%	.	26%	28%
EU27_2020- European Union- 27 (2020)	24% b	28%	30%	16% b	19%	18%

Notes: Available flags: b: break in time series; c: confidential; d: definition differs, see metadata; e: estimated; f: forecast; n: not significant; p: provisional; r: revised; s: Eurostat estimate; u: low reliability; z: not applicable. Table: isoc_ci_ac_i

Table 6 Share of working individuals that used internet to search for a job or send a job application. Manual (ISCO08 major groups 6-9) and Non-manual (ISCO08 major groups 0-5) occupations. Years 2021, 2019, 2015.

	Non-manual (ISCO0-5)			Manual (ISCO6-9)		
	2021	2019	2015	2021	2019	2015
AT- Austria	9%	10%	11%	9%	8%	6%
BE- Belgium	12%	13%	18%	13%	9%	17%
BG- Bulgaria	6%	10%	15%	4%	5%	8%
CH- Switzerland	25%	27%	30%	19%	21%	26%
CY- Cyprus	10%	15%	13%	8%	7%	7%
CZ- Czechia	5%	5%	4%	5%	4%	4%
DE- Germany	7% b	19%	21%	6% b	13%	14%
DK- Denmark	42%	44%	42%	34%	30%	37% u
EE- Estonia	18%	20%	20%	15%	19%	24%
EL- Greece	9%	11%	19%	5%	10%	11%
ES- Spain	16%	17%	15%	14%	13%	16%
FI- Finland	34%	35%	26%	25%	24%	17%
FR- France	17%	18%	16%	14%	14%	13%
HR- Croatia	18%	18%	20%	12%	12%	14%
HU- Hungary	20%	16%	17%	15%	16%	23%
IE- Ireland	.	18%	15%	16% b	19%	9%
IS- Iceland	20%	15%	18%	16%	17%	19%
IT- Italy	. u	. u	12%	. u	. u	8%
LT- Lithuania	18%	19%	13%	13%	14%	12%
LU- Luxembourg	17%	21% b	.	9%	13% b	. u
LV- Latvia	12%	17%	15%	9%	12%	14%
MT- Malta	18%	23%	31%	13%	11%	17% u
NL- Netherlands	25%	29%	26%	18%	24%	20%
NO- Norway	31%	30%	30%	27%	16%	35% u
PL- Poland	8%	11%	13%	4%	8%	8%
PT- Portugal	17%	18%	14%	8%	8%	8%
RO- Romania	6%	6%	10%	5%	4%	5%
SE- Sweden	26%	31%	26%	18%	21%	20% u
SI- Slovenia	14%	18%	17%	9%	12%	8%
SK- Slovakia	18%	18%	11%	14%	14%	10%
UK- United Kingdom	.	28%	28%	.	34%	31%
EU27_2020- European Union- 27 (2020)	14% b	17%	17%	10% b	11%	12%

Notes: Available flags: b: break in time series; c: confidential; d: definition differs, see metadata; e: estimated; f: forecast; n: not significant; p: provisional; r: revised; s: Eurostat estimate; u: low reliability; z: not applicable. Table: isoc_ci_ac_i

Table 7 Share of working individuals *that used internet to search for a job or send a job application. breakdown by professional sector. Years 2021, 2019, 2015.*

	Non-ICT professionals						ICT professionals					
Country	2021		2019		2015		2021		2019		2015	
AT- Austria	9%		9%		9%		14%		21%		7%	
BE- Belgium	12%		11%		17%		17%		14%		23%	
BG- Bulgaria	5%		7%		12%		4%		19%		29%	
CH- Switzerland	24%		26%		29%		24%		32%		32%	
CY- Cyprus	10%		12%		11%	u	5%	u	23%		.	u
CZ- Czechia	5%		4%		4%		8%		10%		6%	
DE- Germany	7%	b	17%		19%		8%	b	20%		22%	
DK- Denmark	39%		41%		41%		44%		50%		37%	
EE- Estonia	17%		19%		21%		35%		33%		16%	
EL- Greece	8%		11%		17%	u	17%	u	26%	u	39%	u
ES- Spain	15%		15%		15%		26%		22%		27%	
FI- Finland	32%		32%		23%		42%		32%		30%	
FR- France	16%		17%		15%		25%		26%		31%	
HR- Croatia	16%		16%		17%	u	30%	u	30%	u	29%	u
HU- Hungary	18%		16%		20%		25%		19%		14%	
IE- Ireland	19%	b	19%		13%	u	.		.		.	u
IS- Iceland	19%		15%		18%		13%	u	14%	u	22%	
IT- Italy	.	u	.	u	10%		.	u	.	u	16%	
LT- Lithuania	16%		17%		12%	u	35%		28%		23%	u
LU- Luxembourg	15%		19%	b	16%	u	25%		29%	b	.	u
LV- Latvia	10%		15%		15%		24%		30%		16%	
MT- Malta	16%		20%		28%	u	31%	u	.	u	.	u
NL- Netherlands	24%		28%		25%		27%		34%		25%	
NO- Norway	30%		27%		30%	u	34%		30%	u	32%	u
PL- Poland	6%		9%		11%		14%		24%		17%	
PT- Portugal	14%		14%		12%		29%		30%		14%	
RO- Romania	5%		4%		5%		6%		6%		10%	
SE- Sweden	25%		29%		26%	u	22%		29%	u	13%	u
SI- Slovenia	12%		16%		13%	u	15%	u	24%	u	29%	u
SK- Slovakia	17%		17%		10%		17%		19%		16%	
UK- United Kingdom	.		29%		.		.		34%		34%	
EU27_2020- European Union- 27 (2020)	13%	b	15%		15%		14%	b	16%		16%	

Notes: Available flags: b: break in time series; c: confidential; d: definition differs, see metadata; e: estimated; f: forecast; n: not significant; p: provisional; r: revised; s: Eurostat estimate; u: low reliability; z: not applicable. Table: isoc_ci_ac_i

Table 8 Composition of job-portals; private for-profit portals and PES or public portals

Country	Private	Public	Total
AT	13	1	14
BE	60	4	64
BG	29	1	30
CH	64	1	65
CY	8	1	9
CZ	27	1	28
DE	67	1	68
DK	17	2	19
EE	15	1	16
EL	25	3	28
ES	39	8	47
FI	24	1	25
FR	47	4	51
HR	15	1	16
HU	52	3	55
IE	34	2	36
IS	7	1	8
IT	34	1	35
LI	23	2	25
LT	27	2	29
LU	24	4	28
LV	27	1	28
MT	12	1	13
NL	57	4	61
NO	9	1	10
PL	37	2	39
PT	27	2	29
RO	39	2	41
SE	34	1	35
SI	20	2	22
SK	23	1	24
UK	27	2	29
Total	963	64	1027

Table 9a Composition of OJA operators by country and type of job portal - Total

	Total									
	primary job-portal		secondary job-portal		combination of primary and secondary		not available		All	
country	N	%	N	%	N	%	N	%	N	%
AT	8	62%	2	15%	3	23%			13	100%
BE	30	50%	7	12%	7	12%	16	27%	60	100%
BG	20	69%	6	21%	3	10%			29	100%
CH	23	36%	39	61%	2	3%			64	100%
CY	7	88%			1	13%			8	100%
CZ	19	70%	3	11%	5	19%			27	100%
DE	39	58%	23	34%	5	7%			67	100%
DK	13	76%	1	6%	3	18%			17	100%
EE	9	60%	2	13%	2	13%	2	13%	15	100%
EL	15	60%	5	20%	5	20%			25	100%
ES	27	69%	7	18%	5	13%			39	100%
FI	18	75%	2	8%	3	13%	1	4%	24	100%
FR	31	66%	10	21%	6	13%			47	100%
HR	6	40%	8	53%	1	7%			15	100%
HU	37	71%	3	6%	12	23%			52	100%
IE	16	47%	5	15%	12	35%	1	3%	34	100%
IS	6	86%			1	14%			7	100%
IT	14	41%	16	47%	4	12%			34	100%
LI	9	39%	13	57%	1	4%			23	100%
LT	18	67%	7	26%	2	7%			27	100%
LU	13	54%	9	38%	2	8%			24	100%
LV	19	70%	4	15%	4	15%			27	100%
MT	7	58%	4	33%	1	8%			12	100%
NL	12	21%	4	7%	40	70%	1	2%	57	100%
NO	4	44%	2	22%	3	33%			9	100%
PL	24	65%	7	19%	6	16%			37	100%
PT	15	56%	4	15%	8	30%			27	100%
RO	27	69%	4	10%	5	13%	3	8%	39	100%
SE	21	62%	4	12%	9	26%			34	100%
SI	3	15%	3	15%	14	70%			20	100%
SK	16	70%	5	22%	2	9%			23	100%
UK	12	44%	3	11%	12	44%			27	100%
All	538	56%	212	22%	189	20%	24	2%	963	100%

Table 10b Composition of OJA operators by country and type of job portal - Variation 2017-2021

	Variation 2017-2021							
	primary job-portal		secondary job-portal		combination of primary and secondary		All	
country	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%
AT	+2	+33%	+1	+100%		+0%	+3	+30%
BE	+7	+30%	+1	+17%	+7		+15	+33%
BG	+14	+233%	+3	+100%	+2	+200%	+19	+190%
CH	+23		+39		+2		+64	
CY	+4	+133%			+1		+5	+167%
CZ	+13	+217%	+1	+50%	+2	+67%	+16	+145%
DE	+16	+70%	+6	+35%	+1	+25%	+23	+52%
DK	+11	+550%	+1		+2	+200%	+14	+467%
EE	+4	+80%	+2		+1	+100%	+7	+88%
EL	+5	+50%		+0%	+2	+67%	+7	+39%
ES	+18	+200%		+0%	+1	+25%	+19	+95%
FI	+11	+157%		+0%		+0%	+11	+85%
FR	+5	+19%	+5	+100%	+1	+20%	+11	+31%
HR		+0%	+7	+700%		+0%	+7	+88%
HU	+18	+95%	+3		+5	+71%	+26	+100%
IE	+5	+45%	+4	+400%		+0%	+9	+36%
IS	+6				+1		+7	
IT	+5	+56%		+0%		+0%	+5	+17%
LI	+9		+13		+1		+23	
LT	+12	+200%	+7		+2		+21	+350%
LU	+11	+550%	+9		+2		+22	+1100%
LV	+12	+171%	+3	+300%	+4		+19	+238%
MT		+0%	+2	+100%	+1		+3	+33%
NL	+2	+20%	+4		+2	+5%	+8	+16%
NO	+4		+2		+3		+9	
PL	+13	+118%	+4	+133%	+2	+50%	+19	+106%
PT	+8	+114%	+2	+100%	+3	+60%	+13	+93%
RO	+11	+69%	+2	+100%	+1	+25%	+14	+56%
SE	+20	+2000%	+1	+33%	+4	+80%	+25	+278%
SI	+3		+1	+50%	+5	+56%	+9	+82%
SK	+11	+220%	+3	+150%		+0%	+14	+156%
UK	+7	+140%	+3		+3	+33%	+13	+93%
All	+290	+117%	+129	+155%	+61	+48%	+480	+99%

Table 11a Composition of OJA operators by country and type of operator - Total

	Total											
	job portal		recruitment agency		company website		national newspaper		not available		All	
country	N	%	N	%	N	%	N	%	N	%	N	%
AT	12	92%					1	8%			13	100%
BE	32	53%	8	13%	1	2%	3	5%	16	27%	60	100%
BG	25	86%	2	7%	2	7%					29	100%
CH	41	64%	5	8%	17	27%	1	2%			64	100%
CY	8	100%									8	100%
CZ	24	89%	1	4%			2	7%			27	100%
DE	53	79%	4	6%	2	3%	7	10%	1	1%	67	100%
DK	7	41%	1	6%	9	53%					17	100%
EE	10	67%	1	7%	1	7%			3	20%	15	100%
EL	14	56%	6	24%			5	20%			25	100%
ES	29	74%	10	26%							39	100%
FI	8	33%	14	58%			1	4%	1	4%	24	100%
FR	38	81%	5	11%	2	4%	2	4%			47	100%
HR	9	60%	2	13%	3	20%	1	7%			15	100%
HU	30	58%	19	37%	1	2%	2	4%			52	100%
IE	23	68%	7	21%	2	6%	1	3%	1	3%	34	100%
IS	7	100%									7	100%
IT	21	62%	11	32%			2	6%			34	100%
LI	14	61%	9	39%							23	100%
LT	17	63%	5	19%	4	15%	1	4%			27	100%
LU	16	67%	3	13%	2	8%	3	13%			24	100%
LV	14	52%	6	22%	4	15%	3	11%			27	100%
MT	7	58%	3	25%	1	8%	1	8%			12	100%
NL	28	49%	26	46%	2	4%			1	2%	57	100%
NO	3	33%	6	67%							9	100%
PL	22	59%	8	22%	5	14%	2	5%			37	100%
PT	18	67%	6	22%	1	4%	2	7%			27	100%
RO	31	79%	1	3%	1	3%	6	15%			39	100%
SE	18	53%	6	18%	9	26%	1	3%			34	100%
SI	10	50%	9	45%	1	5%					20	100%
SK	15	65%	5	22%	1	4%	2	9%			23	100%
UK	23	85%	1	4%	2	7%	1	4%			27	100%
All	627	65%	190	20%	73	8%	50	5%	23	2%	963	100%

Table 12b Composition of OJA operators by country and type of operator - Variation 2017-2021

	Variation 2017-2021									
	job portal		recruitment agency		company website		national newspaper		All	All
country	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%
AT	+3	+33%							+3	+30%
BE	+10	+45%	+4	+100%	+1				+15	+33%
BG	+15	+150%	+2		+2				+19	+190%
CH										
CY	+5	+167%							+5	+167%
CZ	+15	+167%					+1	+100%	+16	+145%
DE	+17	+47%			+2		+4	+133%	+23	+52%
DK	+4	+133%	+1		+9				+14	+467%
EE	+5	+100%	+1		+1				+7	+88%
EL	+6	+75%	+1	+20%					+7	+39%
ES	+13	+81%	+6	+150%					+19	+95%
FI			+11	+367%					+11	+85%
FR	+10	+36%	+1	+25%		+0%			+11	+31%
HR	+4	+80%	+2		+1	+50%			+7	+88%
HU	+9	+43%	+16	+533%		+0%	+1	+100%	+26	+100%
IE	+5	+28%	+4	+133%		+0%			+9	+36%
IS										
IT	+2	+11%	+3	+38%					+5	+17%
LI										
LT	+11	+183%	+5		+4		+1		+21	+350%
LU	+14	+700%	+3		+2		+3		+22	+1100%
LV	+7	+100%	+5	+500%	+4		+3		+19	+238%
MT	+2	+40%	+1	+50%					+3	+33%
NL	+6	+27%			+2				+8	+16%
NO		+0%								
PL	+6	+38%	+7	+700%	+5		+1	+100%	+19	+106%
PT	+6	+50%	+6		+1				+13	+93%
RO	+13	+72%	+1						+14	+56%
SE	+12	+200%	+3	+100%	+9		+1		+25	+278%
SI	+6	+150%	+3	+50%					+9	+82%
SK	+8	+114%	+5		+1				+14	+156%
UK	+11	+92%	+1		+1	+100%			+13	+93%
All	+290	+86%	+112	+144%	+62	+564%	+16	+47%	+480	+99%

Table 13a Composition of OJA operators by country and geographical scope - Total

	Total									
	international		national		regional		not available		All	
country	N	%	N	%	N	%	N	%	N	%
AT	6	46%	7	54%					13	100%
BE	3	5%	26	43%	8	13%	23	38%	60	100%
BG	6	21%	20	69%	3	10%			29	100%
CH	3	5%	45	70%	14	22%	2	3%	64	100%
CY			8	100%					8	100%
CZ	2	7%	25	93%					27	100%
DE	12	18%	50	75%	5	7%			67	100%
DK	1	6%	15	88%	1	6%			17	100%
EE			13	87%			2	13%	15	100%
EL	4	16%	21	84%					25	100%
ES	11	28%	27	69%	1	3%			39	100%
FI	2	8%	20	83%	1	4%	1	4%	24	100%
FR	1	2%	43	91%	1	2%	2	4%	47	100%
HR	6	40%	8	53%	1	7%			15	100%
HU	9	17%	42	81%	1	2%			52	100%
IE	14	41%	19	56%			1	3%	34	100%
IS			7	100%					7	100%
IT	21	62%	13	38%					34	100%
LI	22	96%	1	4%					23	100%
LT	16	59%	9	33%	2	7%			27	100%
LU	9	38%	15	63%					24	100%
LV	5	19%	17	63%	5	19%			27	100%
MT	2	17%	9	75%			1	8%	12	100%
NL	17	30%	34	60%	5	9%	1	2%	57	100%
NO			9	100%					9	100%
PL	16	43%	19	51%	2	5%			37	100%
PT	10	37%	17	63%					27	100%
RO	13	33%	23	59%	3	8%			39	100%
SE	9	26%	25	74%					34	100%
SI	11	55%	7	35%	1	5%	1	5%	20	100%
SK	14	61%	9	39%					23	100%
UK	15	56%	11	41%	1	4%			27	100%
All	260	27%	614	64%	55	6%	34	4%	963	100%

Table 14b Composition of OJA operators by country and geographical scope - Variation 2017-2021.

	Variation 2017-2021									
	international		national		regional		not available		All	
country	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%
AT			+3	+75%					+3	+30%
BE	+1	+50%	+11	+73%	+3	+60%			+15	+33%
BG	+5	+500%	+11	+122%	+3				+19	+190%
CH										
CY			+5	+167%					+5	+167%
CZ	+2		+14	+127%					+16	+145%
DE	+3	+33%	+15	+43%	+5				+23	+52%
DK	+1		+12	+400%	+1				+14	+467%
EE			+5	+63%			+2		+7	+88%
EL			+7	+50%					+7	+39%
ES	+2	+22%	+17	+170%					+19	+95%
FI			+10	+100%	+1				+11	+85%
FR	+1		+7	+19%	+1		+2		+11	+31%
HR	+6		+1	+14%					+7	+88%
HU	+8	+800%	+17	+68%	+1				+26	+100%
IE	+3	+27%	+6	+46%					+9	+36%
IS										
IT	+2	+11%	+3	+30%					+5	+17%
LI										
LT	+11	+220%	+8	+800%	+2				+21	+350%
LU	+7	+350%	+15						+22	+1100%
LV	+5		+9	+113%	+5				+19	+238%
MT	+2		+1	+13%					+3	+33%
NL			+7	+26%	+1	+25%			+8	+16%
NO										
PL	+7	+78%	+10	+111%	+2				+19	+106%
PT	+5	+100%	+8	+89%					+13	+93%
RO	+2	+18%	+12	+109%					+14	+56%
SE	+7	+350%	+18	+257%					+25	+278%
SI	+3	+38%	+4	+133%	+1		+1		+9	+82%
SK	+13	+1300%	+1	+13%					+14	+156%
UK	+4	+36%	+8	+267%	+1				+13	+93%
All	+125	+93%	+307	+100%	+41	+293%	+7		+480	+99%

Table 15a Composition of OJA operators by country and scope of economic activity - Total

	Total							
	one economic activity		more than one economic activity		not available		All	
country	N	%	N	%	N	%	N	%
AT			13	100%			13	100%
BE	9	15%	29	48%	22	37%	60	100%
BG	3	10%	26	90%			29	100%
CH	23	36%	39	61%	2	3%	64	100%
CY			8	100%			8	100%
CZ	1	4%	26	96%			27	100%
DE	4	6%	63	94%			67	100%
DK	2	12%	15	88%			17	100%
EE	1	7%	12	80%	2	13%	15	100%
EL	1	4%	24	96%			25	100%
ES	7	18%	32	82%			39	100%
FI	6	25%	17	71%	1	4%	24	100%
FR	3	6%	42	89%	2	4%	47	100%
HR	1	7%	14	93%			15	100%
HU	6	12%	46	88%			52	100%
IE	11	32%	22	65%	1	3%	34	100%
IS	2	29%	5	71%			7	100%
IT			34	100%			34	100%
LI	1	4%	22	96%			23	100%
LT	4	15%	23	85%			27	100%
LU	4	17%	20	83%			24	100%
LV	6	22%	21	78%			27	100%
MT	1	8%	10	83%	1	8%	12	100%
NL	11	19%	45	79%	1	2%	57	100%
NO			9	100%			9	100%
PL			35	95%	2	5%	37	100%
PT	1	4%	26	96%			27	100%
RO	3	8%	36	92%			39	100%
SE	18	53%	16	47%			34	100%
SI			20	100%			20	100%
SK	2	9%	21	91%			23	100%
UK	4	15%	23	85%			27	100%
All	135	14%	794	82%	34	4%	963	100%

Table 16b Composition of OJA operators by country and scope of economic activity - Variation 2017-2021

	Variation 2017-2021							
	one economic activity		more than one economic activity		not available		All	
country	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%	ΔN	Δ%
AT			+3	+30%			+3	+30%
BE	+1	+13%	+14	+93%			+15	+33%
BG	+2	+200%	+17	+189%			+19	+190%
CH	+23		+39		+2		+64	
CY			+5	+167%			+5	+167%
CZ	+1		+15	+136%			+16	+145%
DE	+3	+300%	+20	+47%			+23	+52%
DK	+2		+12	+400%			+14	+467%
EE	+1		+4	+50%	+2		+7	+88%
EL	+1		+6	+33%			+7	+39%
ES	+3	+75%	+16	+100%			+19	+95%
FI	+3	+100%	+8	+89%			+11	+85%
FR			+9	+27%	+2		+11	+31%
HR	+1		+6	+75%			+7	+88%
HU	+4	+200%	+22	+92%			+26	+100%
IE	+2	+22%	+7	+47%			+9	+36%
IS	+2		+5				+7	
IT			+5	+17%			+5	+17%
LI	+1		+22				+23	
LT	+4		+17	+283%			+21	+350%
LU	+4		+18	+900%			+22	+1100%
LV	+5	+500%	+14	+200%			+19	+238%
MT			+3	+43%			+3	+33%
NL	+3	+38%	+5	+13%			+8	+16%
NO			+9				+9	
PL			+17	+94%	+2		+19	+106%
PT			+13	+100%			+13	+93%
RO			+14	+64%			+14	+56%
SE	+17	+1700%	+8	+100%			+25	+278%
SI			+9	+82%			+9	+82%
SK	+2		+12	+133%			+14	+156%
UK	+2	+100%	+11	+92%			+13	+93%
All	+87	+181%	+385	+94%	+8		+480	+99%