



International  
Labour  
Organization

## ► Global report

**Technology adoption in public employment services**

Catching up with the future



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**Technology adoption in public employment services**

Catching up with the future

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# Foreword

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Over the past years, the public employment services in countries around the world have been investing in new ways of making their services more easily accessible and simpler to use. This is having significant benefits for their clients, particularly those who are looking for a job or interested in a career change, as well as for businesses looking to recruit workers. The COVID-19 pandemic has demonstrated the value of technology for improving employment services facilitation and broadened the provision through remote registration, online job matching, virtual upskilling and reskilling modalities and backstage process automation, especially where face-to-face delivery has not been possible due to lockdowns implemented to contain the spread of the virus.

This report provides a global overview on how public employment services are approaching technology to improve service delivery. From better use of data to more effective service design and accessibility, the report explores the advantages offered by the utilization of long-tested as well as newly introduced technologies. It also analyses the barriers to the effective use of technology in service delivery. The findings of the report are based on an International Labour Organization global survey that was conducted in 2021 with the support of the World Association of Public Employment Services to explore how public employment services have engaged in digital services prior to and after onset of the COVID-19 pandemic. To date, this survey is the only global instrument that explores the technological transformation status of the public employment services systems.

The COVID-19 crisis has emphasized the pivotal role of effective, inclusive and accountable public employment services and particularly the importance of technology for ensuring continued operations and delivery. Strong institutions and effective labour market policies are crucial for tailoring digital solutions to a country's needs and for prioritizing security, equity and the protection of privacy. Technology increased interoperability and coordination across the full range of employment and labour market policies that governments deployed in response to the pandemic and has potential for much more. The report explains how public employment services' capabilities could be enhanced to make services even more accessible, seamless, responsive, resilient and transparent.

As governments begin to shift from the crisis phase of COVID-19 to recovery, many public employment services are focused on closing capacity gaps and capitalizing on the changes made to their service delivery models. We hope this report helps them to make more strategic decisions when investing in technology. Adopting a human-centred approach when engaging in digital services requires placing people at the core of the policies and programmes. This will encourage and promote labour market participation, particularly of those segments of the population who have limited online access and insufficient digital skills and need enhanced support from public employment services. What comes through clearly in the global survey findings is that freeing staff from routine tasks enables them to focus on more specialized functions, such as working with targeted beneficiaries and underserved groups. It is among the top benefits of technology adoption for service delivery cited by respondents. When appropriate strategies for outreach are in place and in-person support is maintained, new technology has the potential to enhance delivery of employment services to populations disadvantaged in their access to digital technology.

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<sup>1</sup> Infographics with preliminary results: [ILO maps out how Public Employment Services are using technology to improve service deliver](#) and [ILO maps out technological transformation in Public Employment Services](#)

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# Executive summary

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Public employment services worldwide responded to the COVID-19 crisis by deploying immediate support to workers, jobseekers and enterprises affected in terms of business shutdowns and job losses. But they also mobilized resources to sustain infrastructure and deliver services remotely and to develop innovative technology-based solutions for employment searching and hiring. The combined effects of the global pandemic and the general trend of digitalization are pushing public employment services to accelerate their use of innovation to develop and deliver simpler, faster and better services for clients. Even prior to the pandemic, technology had become increasingly important for public employment services to modernize. Public employment services officers were looking at technology as a helpful means for expanding service coverage and for introducing automation and faster processes. To explore the state of practice in the public employment services' use of technology to facilitate service delivery, the International Labour Organization (ILO) designed a global survey prior to the COVID-19 crisis. It was conducted with the support of the World Association of Public Employment Services between May and October 2020, when the COVID-19 pandemic was in full swing. In total, 69 public employment services officers in 64 countries from all ILO regions responded to the self-administered questionnaire, voicing the position of their respective national employment service system.

The global survey was designed to identify trends in the use of technology for service delivery and map the opportunities and challenges that public employment services faced when developing and deploying technology-based solutions that responded to the needs of clients in a period of tight public budget and increasingly complex challenges. The following overview summarizes the main findings.

- **All public employment services participating in the global survey had digitalized or automated at least one core service using technology by the time the COVID-19 crisis hit.** Such services ranged from those involving routine tasks, like the registration of jobseekers and job vacancies or clients' access to labour market information, to those requiring more specialized processes and technology, including job matching, self-assessment tools, counselling and case management. Automation and digitalization service levels were, however, quite dissimilar across respondents of the global survey.
- **Harnessing technology to improve service delivery, however, is not a linear process nor one that occurs in the same manner across countries.** Some public employment services were at an early stage of digitalization when they took part in this survey, while others had long adopted a digital-first approach. The survey found that 28 per cent of the responding public employment services had adopted a predominantly technology-based approach to deliver services prior to the pandemic, while 52 per cent had used technology to facilitate the provision of selected services and 20 per cent had a service delivery model favouring face-to-face interactions without excluding technology-supported services.
- **Technology has been critical for public employment services to activate, augment and expand support to jobseekers, workers and employers affected by the COVID-19 crisis.** Ensuring service delivery during the pandemic-related lockdowns and stay-at-home measures that were implemented would not have been possible without the support of different technology interfaces and digital tools. While there was a clear trend towards a more intense use of technology, face-to-face services were maintained even in countries adopting digital-first policies in order to safeguard equal access for clients with low digital literacy and accessibility or in need of a regular and intense level of support from a job counsellor.
- **The survey findings confirm that more intense use of web-based technology is necessary to deliver services. But not all respondents had migrated their full menu of services to online access.** At the time of the survey, all public employment services respondents were using web apps and online job portals to facilitate clients' registration and access to general information. The level of support available to access information or complete registration differed considerably, ranging from one-way transactions in which clients download and print templates, for example, to end-to-end automated processes not requiring the intervention of public employment services staff. The public employment services in upper- and

lower-middle-income countries worked amid the pandemic to improve web-based job matching. Nine in ten of the surveyed public employment services continued handling front-desk processes to deliver services over phone through help desk facilities and toll-free numbers after onset of the pandemic. Eight in ten public employment services took advantage of wide-scale brand accessibility via social media to disseminate information on available job vacancies and on job-search support.

- ▶ **Adopting web-based technology is not enough to facilitate service delivery. There are multiple factors to consider, including the ability to leverage the systems already in use, accessibility by clients through different service touch points, data governance and investment.** In all cases, the survey found that technology had been instrumental in boosting performance and expanding service coverage. Public employment services in the high-income economies indicated that improving clients' experience was a top priority. Instilling transparency via the use of technology was more important for public employment services in upper- and lower-middle-income countries, particularly to build a relationship of trust with their clients. Benefits, however, only materialized when technology and digital tools were part of a service delivery strategy instilling coherence and giving direction to investments in technology. Those public employment services that had balanced technology adoption with internal process improvements and new ways of working were able to adapt quickly during the pandemic. As the recovery period gains traction, they now have a considerable margin for making adjustments.
- ▶ **Technology and digital tools in particular offer great potential for improved targeting, evidence-based decision-making and faster response times. However, there are core capabilities that public employment services need to secure.** Availability and quality of data remain the biggest challenges for the public employment services in emerging economies and in upper- and lower-middle-income countries to scale up their use of digital technology. Transparent data practices, adherence to privacy policies and sound cybersecurity frameworks need prioritizing when developing and implementing technology-based services. Limited infrastructure to support data transmission, insufficient digital-skilled staff and clients' accessibility to internet connection are inhibiting many of the public employment services in developing countries from going digital.
- ▶ **Trained and qualified staff are essential for technology to permeate the daily functioning of employment offices.** Public employment services need to be staffed with the right set of skills and mindset to drive a client-oriented culture and to balance technology-adoption strategies with internal process improvements. The global survey found that for most public employment services the need to train staff across the delivery chain more frequently remains a critical challenge. Other common challenges in public employment services moving into digital services include overlapping or redundant solutions, processes and siloed teams and communications. An additional critical area for most public employment services is finding the right balance between the optimal level of personal interaction with clients and the degree of automation that would fit clients' needs and their ability to use or access such services. What comes through clearly in the survey findings is that freeing staff from doing routine tasks so they can focus on more specialized functions, such as working with targeted beneficiaries and undeserved groups, is among the top benefits of technology adoption for service delivery.
- ▶ **The survey findings also reveal another major transformation taking shape, one based on the use of artificial intelligence and other advanced technologies.** Artificial intelligence capabilities are still limited for delivering employment services. Only one third of the public employment services responding to the global survey offered this type of solution at the time of the survey, and they were overwhelmingly based in high-income countries. Because of that capacity, clients in those public employment services are now more likely to access individualized support and have a more accurate offer of services based on algorithm-profiling systems and job matching supported by machine-learning technologies. It is expected that these advanced technologies will be widespread in the next decade, pushing public employment services into the next wave of government services digitalization, mainly driven by data analytics. Investments in digital infrastructure, skills and connectivity will become core capacities for a smooth digital transformation of public employment services.

- ▶ **Overall, public employment services' modernization goes beyond technology adoption. The survey findings confirm that technology is a vehicle to streamline, automate and improve operations.** While technology can be the primary driver of change, good process design adapted to clients' needs and behaviour are as important. Transforming public employment services using technology, however, implies a renewed organizational culture – from front to back offices – that places clients at the centre of service-delivery strategies.
- ▶ **Technology offers public employment services, especially in developing countries and emerging economies, the opportunity to leap forward.** To make this technological leap sustainable in time, investments in the critical enablers of digitalization are necessary, including skills, data and reliable internet connectivity. The findings from this global survey confirm that progress towards effective public employment services' digitalization remains fragmented, with an increasing risk to greater digital exclusion for groups already facing vulnerability in the labour market.
- ▶ **The digital divide makes disparities persist for groups facing disadvantage in the labour market. Public employment services need to ensure that technology-facilitated services are accessible, secure and easy to use for all.** Small and medium-sized enterprises with limited internet connectivity and jobseekers with low digital skills or who lack the devices to go online need to be able to use and benefit from digital services, including women, senior workers, at-risk youth, long-term unemployed persons, people living in rural areas and migrant workers. While the COVID-19 crisis is far from over, an increased reliance on digital services is expected for the future. *Public employment services migrating to digital technology need to uphold the principles of equal treatment, fairness and social inclusion.*
- ▶ **Digital technology continues to be critical for supporting the economic reactivation, albeit at differing paces.** The trend towards digitalization will remain the new normal in the delivery of services to the extent that the COVID-19 crisis and its many transformations remain. It will probably permanently transform the way public employment services operate. The success of the public employment services' digital transformation, however, is not entirely dependent on state-of-the-art technology. It also is reliant upon making technology work for people. This is one aspect of technological transformation of public services that the ILO strongly promotes.
- ▶ **Advanced technology still needs a human touch to be responsive and inclusive.** The survey findings lead to the conclusion that to remain inclusive, public employment services must consider digitalization strategies that are driven by a human-centred approach. When making decisions on technological investment, public employment services need to reflect on what is important to automate, what artificial intelligence will bring in terms of progress and which delivery channels should be kept in order to best serve clients with low digital skills and limited connectivity.
- ▶ **For this to be a human-centred transformation, public employment services will need to rely more on increased social dialogue to keep up with the promise of leaving no one behind.** Taking social partners and key stakeholders on board is essential to initiatives of technological transformation. The technology infrastructure supporting service delivery is rarely solely developed by public employment services in-house. Public employment services work with software developers and specialized providers in the information and communication technology industry. But there are other partners who make it possible to ensure investment and adopt technological solutions – they include the private sector, non-profit organizations and national and local players. The social partners are necessary actors, and involving them from the beginning and throughout the effort of incorporating technology in service delivery pays off. The social partners, for example, can contribute to removing barriers to digital inclusion and leapfrogging.

# Methodology

## About the global survey

The International Labour Organization's global survey Public Employment Services Making Use of Technology to Improve Delivery<sup>2</sup> was designed in 2019 to map long-term trends taking place. It was then conducted from May to October 2020, during the first year of the COVID-19 crisis, with the support of the World Association of Public Employment Services secretariat and its members network. The severe impact of the pandemic on labour markets increased the need for remote and web-based delivery mechanisms to protect jobs, facilitate job matching and channel support to affected workers and enterprises in distress to prevent further increases in inactivity. Because the public health emergency put public employment services under great pressure and technology-facilitated services were offering a practical solution to maintain and expand operations, the ILO went ahead with the planned global survey. This offered the opportunity to explore how public employment services have engaged in digital services prior to and after onset of the COVID-19 pandemic. The results of this global survey form the basis of this report.

## Geographic coverage

A total of 69 officers responded to the self-administered questionnaire, voicing the position of their respective national employment service system in 64 countries across all ILO regions. They responded by email or using a web-based application tailored-made for the global survey. All responses collected were verified, and if there was some doubt to a response, clarification was sought with the national officer participating in the survey. The distribution of responding public employment services is shown in figure 1.

► Figure 1. Distribution of survey-responding public employment services, by country, 2020



Note: See Annex 2 for the full list of responding public employment services.  
Source: Authors.

2 Hereinafter referred to as the “global survey”. See Annex 1 for a copy of the survey.

Results are broken down by country income level, following the World Bank classification of the world's economies by income groups in 2019.<sup>3</sup> Of the total number of respondents, however, the public employment service of Burundi was the only one falling within the low-income group. To facilitate analysis of data, the responses to the global survey collected for Burundi were integrated into the lower-middle-income category. For the purposes of this report, only three income groups were retained: high, upper-middle and lower-middle.

## Scope of analysis

The global survey (table 1) was designed to collect information across five areas in which technology has a critical role in the functioning of public employment services.

► Table 1. Summary of the global survey design

Cluster	Subcluster	Content
<b>1. Governance</b>	<b>Drivers for technology adoption</b>	Investigates the main motivations behind the public employment services' drive for technology adoption, for example, lowering operational costs or expanding service coverage.
	<b>Strategy</b>	Inquires whether the public employment services agency has adopted a digital transformation strategy and how it has materialized, including in formal policy documents and specific resource allocation.
	<b>Data protection</b>	Refers to existing regulations requiring the public employment services, for example, to have the consent of subjects for data processing or implementing protocols for anonymizing data.
	<b>Cyber security</b>	Asks the public employment services about the protocols in place to ensure data protection and to activate contingency plans in the event of disruption or interruption of digital services.
	<b>Dialogue with social partners</b>	Explores how social partners are involved in decision-making processes concerning public employment services' technology adoption, including the sharing of information or seeking validation.
<b>2. Service delivery</b>	<b>Availability of technology-based provision</b>	Takes stock of the services that the public employment services deliver using technology from a specific matrix covering basic services, such as the provision of information and registration to services needed and more complex processes and technology, like counselling and case management.
	<b>Level of support</b>	Looks at the level of support clients can get from the public employment services when using a list of specific services through selected technology interfaces. The options range from static information on a web page to interactive counselling session via a chatbot.

3 See <https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2019-2020>.

Cluster	Subcluster	Content
<b>Service delivery (cont.)</b>	<b>Delivery approach</b>	Asks the public employment services officers about whether service provision uses predominantly technology-based or face-to-face models or if technology is only used to deliver selected services.
	<b>Target groups</b>	Investigates if technology has contributed to improve delivery for groups facing disadvantage in the labour market, including people younger than 25 years, older workers and people with disabilities.
<b>3. Staff and clients skilling on technology</b>	<b>Staff learning and training</b>	Establishes whether the public employment services agency provides regular information technology training to different categories of staff and the learning methods used.
	<b>Digital skills for clients</b>	Inquires about how the public employment services agencies help digitally illiterate clients use and access technologically facilitated services.
<b>4. Data processing</b>	<b>Use of data</b>	Asks how the public employment services use technology to collect, store and analyse data.
<b>5. Challenges and opportunities</b>	<b>Governance</b>	Seeks to understand the opportunities and challenges apparent following the adoption of technologies to facilitate service delivery in key areas ranging from governance (vision and strategy), infrastructure (compatibility of IT systems, obsolescence), staff (freeing staff time to serve most-in-need clients) and clients (whether the technology facilitates service access or improves users' experience in using such services).
	<b>Public employment services infrastructure</b>	
	<b>Staff</b>	
	<b>Clients</b>	

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## Additional metadata

This global report also makes use of the E-Government Development Index, Index (EGDI), and the E-Participation Index (EPI), which track the state of development of electronic government in the member States of the United Nations, based on the E-Government Survey findings.

- ▶ EGDI is a composite measure of three important dimensions of e-government: provision of online services, telecommunication connectivity and human capacity.
- ▶ EPI is a supplementary index to the United Nations E-Government Survey. It extends the dimension of the survey by focusing on the use of online services to facilitate provision of information by governments to citizens (e-information sharing), interaction with stakeholders (e-consultation) and engagement in decision-making processes (e-decision-making).

# Definitions

The global survey and the analysis of its findings relied on the following terms, explained in logical order.

## Technology

The global survey used the term “technology” as an interface that supports the delivery of employment services and allows for 24-hour remote access, self-service, sourcing and connecting information for assisting decision-making processes and introduces automation and faster processes. The survey inquired (table 2) about a comprehensive range of technologies that public employment services use, from traditional phone- and web-based services to social media and advanced technology, such as semantic artificial intelligence and machine learning.

► Table 2. Range of technologies used by public employment services, 2020

Telephone 	Online and mobile apps 	Social media 	Advanced technology 
<ul style="list-style-type: none"> <li>► Fixed line</li> <li>► Mobild</li> <li>► SMS</li> <li>► Toll-free numbers</li> <li>► Help desk and call centres</li> </ul>	<ul style="list-style-type: none"> <li>► Email</li> <li>► Wed apps</li> <li>► Internet protocol-based geolocation</li> <li>► Voice over Internet protocol</li> </ul>	<ul style="list-style-type: none"> <li>► Facebook</li> <li>► Twitter</li> <li>► Instragram</li> </ul>	<ul style="list-style-type: none"> <li>► Artificial intelligence</li> <li>► Big data and data mining</li> <li>► Blockchain</li> <li>► Machine learning</li> <li>► Chatbots and smart software</li> <li>► Face, voice recognition</li> </ul>

Source: Authors, based on Pieteron and Johnson 2011.

## Digital technology

For the purposes of this report, digital technologies are “electronic tools, systems, devices and resources that generate, store or process data”.<sup>4</sup> Some examples include online websites, multimedia, smartphones, social media and geolocation. This report also acknowledges that technology in analogue form continues to operate in some countries, including the basic landline phone. With the accelerated progress of information and communication technology, most technology has become digital, including the phone and the television.

## Advanced technology

“A technology that is still immature but promises to deliver significant value or that has some technical maturity but still has relatively few users.” Some examples include artificial intelligence, data mining, blockchain, self-learning algorithms, chatbots and face and voice recognition.<sup>5</sup>

## Information and communication technology system

An information and communication technology (ICT) system is a set-up consisting of hardware, software, data and the people who use them. It commonly includes communication technology, such as the internet.<sup>6</sup>

## Service automation

The automation of services, in its very essence, involves the use of a technology interface to deliver specific services end to end or segments of them. This technology interface provides the means through which clients can solicit information or a service and receive a response from the public employment service agency. The

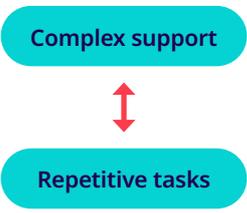
4 Definition taken from Victoria State Government 2019.

5 Definition taken from Gartner 2021.

6 Definition taken from BBC 2021.

services or segments of them that public employment services have likely automated often comprise routine tasks and frequently occurring or predictable processes, which can be front-desk or internal processes that involve a low level of discretion. The level of service automation links to the specific organizational structure, the laws and regulations and existing ICT systems and processes that public employment services depend upon to deliver their offer of services.<sup>7</sup> Automation of services does not necessarily imply the delivery of a digital service (see the definition further on). This report considers that most public employment services deliver the services listed in table 3 using interfaces ranging from telephone, online and mobile apps, social media and advanced technology (see table 2), whether they are fully or partially automated. Such services are organized starting from simple repetitive tasks to more complex support that must address individuals' needs and might require multiple client-provider interaction and data.

► **Table 3. Support delivered by public employment services, 2020**

Service complexity	Service category
 <p>Complex support</p> <p>↕</p> <p>Repetitive tasks</p>	<ul style="list-style-type: none"> <li>► Clients' self-assessment tools</li> <li>► Counselling services and case management</li> <li>► Job-matching services</li> <li>► Information on the labour market</li> <li>► Registration with the public employment service</li> <li>► Provision of general information on services</li> </ul>

Source: Authors.

### Digital service

A digital service is one delivered through web-based technology. It has been entirely automated or requires little to no human intervention. Digital services include the delivery of digital information (data or content) and transactional services (online forms and benefits applications) across a variety of platforms, devices and delivery mechanisms (websites, mobile applications and social media).<sup>8</sup>

### Service delivery

The delivery of service involves all actions by public employment services related to providing a service or benefit to a client, whether this is directly delivered or through a partner service. The range of services available varies and is directly dependent on country-specific conditions, national laws, organizational resources, rules and policy goals. Examples of service delivery include registration through any of the available access points to obtain information and support on how to look for a job, filing unemployment insurance claims, counselling services and referral to active labour market programmes, such as skills training, public works and job preservation.

### Client experience

The perceptions of jobseekers and employers and their overall satisfaction with interactions and services delivered by public employment services. When public employment services work in partnership with other government agencies to provide a service, coordination among them is necessary to achieve an integrated experience that meets clients' needs through the exchange of data with appropriate privacy protections.<sup>9</sup>

7 Definition based on Middelburg and Spets 2019.

8 Definition based on Office of the Press Secretary 2012.

9 Definition based on The White House 2021.

### Interoperability

“It is the ability of different information systems, devices and applications (systems) to access, exchange, integrate and cooperatively use data in a coordinated manner, within and across organizational, regional and national boundaries, to provide timely and seamless portability of information and optimize [service delivery].”<sup>10</sup> Without the assurance of interoperability, citizens will have fragmented interactions with several agencies.

### Artificial intelligence

“Artificial intelligence applies advanced analysis and logic-based techniques, including machine learning, to interpret events, support and automate decisions and take actions.”<sup>11</sup>

### Digital transformation

“Digital transformation can refer to anything from IT modernization (for example, cloud computing) to digital optimization and the invention of new digital business models. The term is widely used in public-sector organizations to refer to modest initiatives, such as putting services online or legacy modernization.”<sup>12</sup>

### Level of service interaction between public employment services and clients through technologically facilitated services

For the purposes of the global report, the following are the different levels of support that clients of the public employment services can obtain when using technology-facilitated registration of jobseekers, job vacancy listing and job matching:

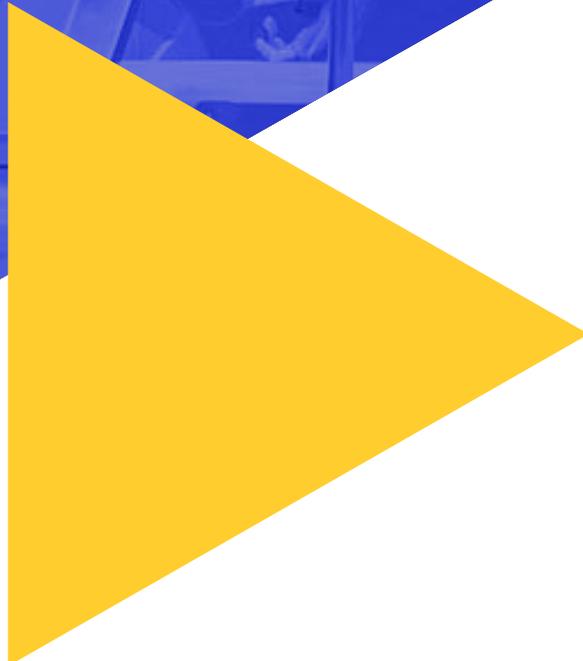
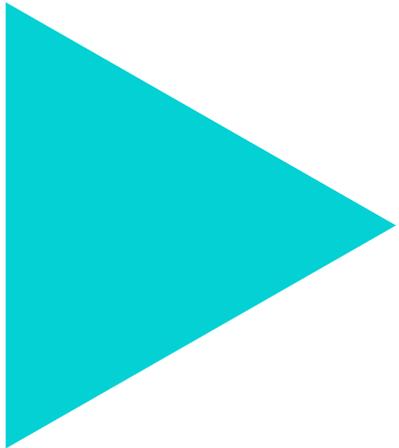
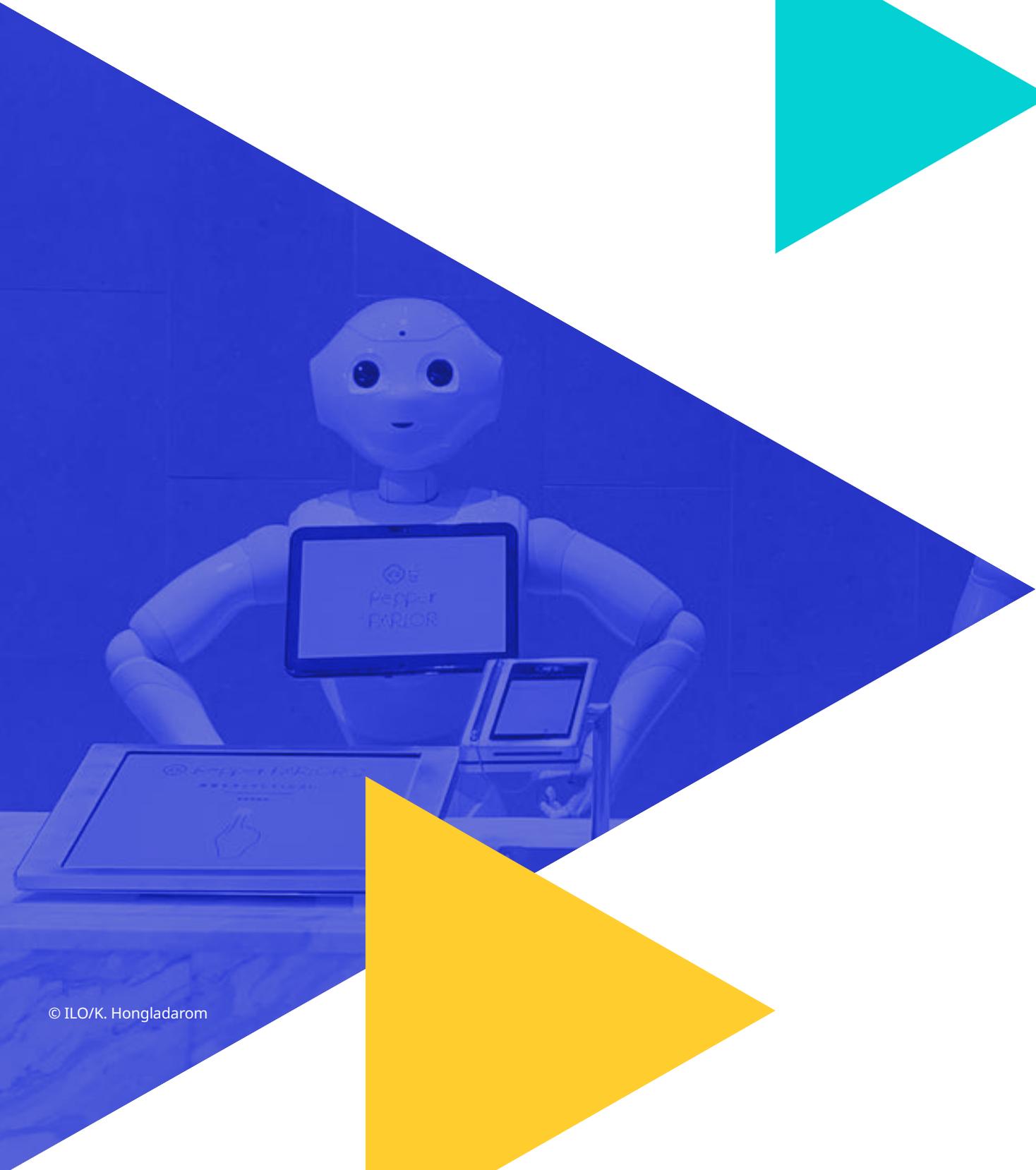
- ▶ Clients can only obtain information (static web pages or blogs, video, TV, radio).
- ▶ Clients can invoke a service and receive only one response or return (printable forms from web pages, applications, phone menu, commenting on blogs).
- ▶ Clients can solicit a service and submit information that will be processed by the public employment services (forms can be filled out and submitted online, over-the-phone support, alerts through SMS and email, helpdesk, including authentication).
- ▶ Clients are involved in a loop of request–response operations without a need to be physically present in the public employment services’ premises (case handling, decision and delivery, including fully – electronically – executable services).
- ▶ Clients receive services automatically based on a previous registration of an event and preferences (proactive services and notifications).

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10 Definition taken from HIMSS 2021.

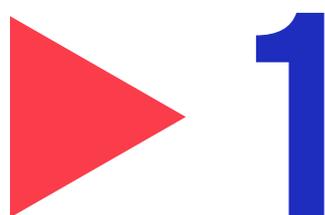
11 *ibid.*

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# The state of public employment services' technological transformation

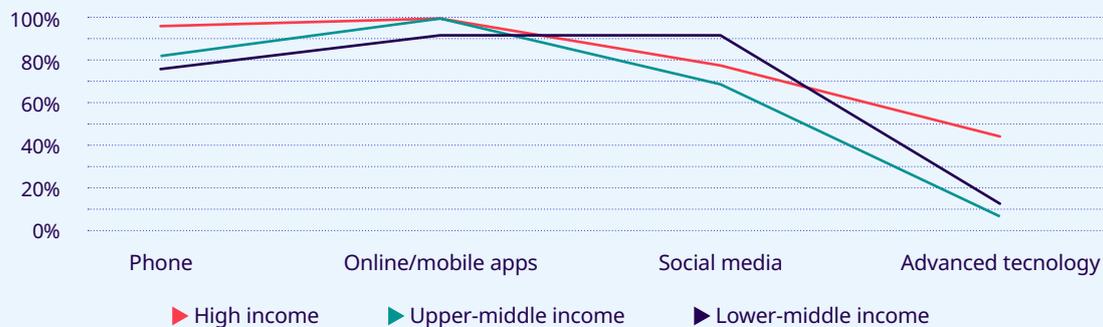
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Technology and digitalization are two of the most important mega trends of our time. Their combination is a central driving force affecting many aspects of our daily life, including how we look for jobs and how businesses recruit and hire new workers (UN 2020). Public services for job searching and job matching are becoming more accessible and transparent as public employment services embrace technology to facilitate service delivery. Even before the ongoing pandemic, technology-supported services were considered an essential enabler in expanding public employment services' coverage and for improving overall performance. Technology-enabled services have been critical for public employment services to activate, augment and expand support to jobseekers, workers and employers during the job crisis caused by the unprecedented coronavirus pandemic. Online registration for job matching, call centres with reduced waiting times and other recruitment aids supported by machine learning have sustained, one way or another, service delivery. Technology adoption, however, is not a linear process nor one that occurs in the same manner across countries. While some of the public employment services that took part in this global survey were at the early stage of digitalization when the global COVID-19 crisis hit, others had adopted a digital-first approach long before.

## 1.1 Public employment service approaches to technology adoption

**All public employment services participating in the global survey reported they were relying on technology to deliver at least one core service by the time the COVID-19 crisis hit.** Such services ranged from those involving routine tasks, like the registration of clients or access to labour market information, to those requiring more specialized processes and technology, including job matching, self-assessment tools, counselling and case management. In 2020, when the International Labour Organization (ILO) conducted the global survey, the types of technology in use to facilitate provision of services were very diverse (figure 2), including traditional phone and digital call centres for registration and access to information, web-based apps and online job portals for job matching as well as social media networks such as Facebook and Instagram. Public employment services officers were also using other recruitment aids supported by algorithms and machine learning, for example, conversational chatbots answering clients' queries, proactive services suggesting participation in skills training programmes or tools to pre-screen job applicants.

► **Figure 2. Technology used to deliver services, by country income group, 2020 (percentage)**



Note: The use of technology to deliver services ranged from end-to-end processes to segments of a given service.  
Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

The global survey revealed that all public employment services had digitalized or automated at least one core service, whether fully or partially, at the time of survey. The technology used to deliver digitalized or automated services acted as an interface between the public employment services and the clients at the onset of the pandemic, providing the means through which jobseekers and employers could access or use a service or segments of it.<sup>13</sup>

**Web-based technology was the most used interface to deliver services.** The national public employment services systems, however, were in different stages of maturity, efficiency and effectiveness to meet clients' needs and expectations, ranging from static flows of information on webpages to automated provision based on a previous client's registration or preferences. Nevertheless, even in developing countries where digital networks are poorly operating, increasing mobile connectivity has made it possible to access public employment services support online. The global survey also revealed that seven in ten responding public employment services from the lower-middle-income countries were managing segments of the registration and job-matching services online.

**Public employment services were using different approaches to uptake and adopt technology for service delivery.** According to the global survey findings and across all ILO regions, 52 per cent of the responding public employment services chose to use technology to deliver selected services only; 28 per cent adopted delivery models predominantly supported by technology; and 20 per cent prioritized face-to-face delivery methods. By country income group, those public employment services implementing a predominantly technology-based delivery were mainly in the high-income countries (30 per cent). Contrary to expectations, a similar proportion of public employment services from lower-middle-income countries (29 per cent) were trying this delivery model as

13 See Definitions in the methodology notes for additional detail.

well. A large majority of public employment services relying on technology to deliver only selected services were in the upper-middle-income countries (60 per cent). This group of public employment services also represent the smallest percentage among those that **were** offering in-person services as a main delivery model. Face-to-face services were maintained even in high-income countries adopting digital-first policies to safeguard equal access for clients with low digital literacy or limited internet connectivity (table 4).

► **Table 4. Approach to delivering services, by country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Only in selected services	52	47	60	50
Predominantly technology based	28	30	24	29
Face-to-face	20	23	16	21

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**The global survey findings provide snapshots from practice at the regional level on approaches to technology adoption for facilitating service delivery.** The combined effects of the COVID-19 pandemic and the general trend of digitalization (pre-crisis) continues pushing public employment services towards web-based service delivery. These findings, however, also show how important mixed approaches to deliver services continue to be in serving different groups of clients, particularly when they require a dedicated level of support to address complex employability barriers. In the context of the COVID-19 pandemic, in which countries instituted different levels of physical distancing measures, public employment services' reliance on phone-based and web-based service delivery substantially increased. However, other ILO sources show that the majority of public employment services maintained walk-in services in recognition that important segments of their clients needed support to access and navigate services online (ILO et al. 2020). While it is clear that all the public employment services responding to the survey have made progress in moving services online or to remote channels, the overall picture across income groups is mixed, as the following box explains.

► **Box 1. Public employment services moving towards web-based technologies: Snapshots from practice at the regional level**

While the International Labour Organization's global survey outcomes are not representative by region, in 2020, all public employment services in the **Americas region** that responded to it were using a technology-based approach except in **Brazil** and **Colombia**, which had digitalized selected services only. Face-to-face delivery was still predominant in some countries, such as **Uruguay**, and in the Province of **Quebec** in Canada. When interpreting outcomes by region, it should be considered that some countries were rolling out digital transformation strategies at the moment of responding to the survey. For example, **Mexico** was about to finalize implementation of a digital web portal using advanced technology to maintain service-delivery levels following budgetary cuts in 2020.

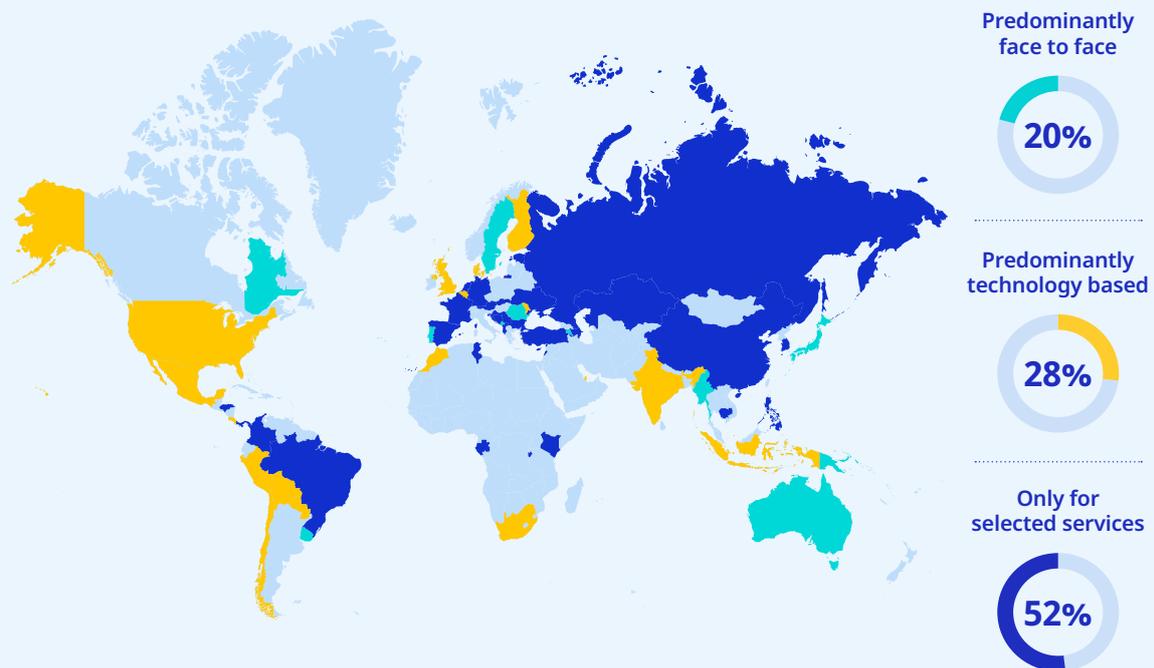
Most of the public employment services in **Europe and Central Asia** were running operations using mixed approaches as a delivery choice while seeking greater digital innovation in service design and delivery. Many digitally mature public employment services systems, including in **France**, had achieved paperless employment centres and had automated many end-to-end processes. However, a strong level of investment was also maintained in one-to-one assisted services. In some other countries, the difference across regions was also visible, like in **Belgium**. The agencies responsible for the provision of public employment services in the Walloon and Flanders regions, for instance, had both adopted a digital-first approach, while the public agency responsible for the Brussels capital region was driven by a mixed-delivery model. In the case of **Bosnia and Herzegovina**, mixed approaches prevailed in the agencies located in Eiors and Fei, while the agencies in Esobd and Lea followed a predominantly face-to-face service provision model.

► **Box 1. (cont.)**

In **Asia and the Pacific**, most of the public employment services responding to the global survey were also using mixed approaches to deliver services, including in **Cambodia, China, Republic of Korea, Philippines** and **Singapore**. **Australia**, one of the largest economies in the region, reported having face-to-face service delivery models, as did respondents in **Japan, Myanmar** and **Papua Guinea**. In 2020, Jobactive, the Australian Government-funded network of employment service providers, was about to launch a new digital platform to promote a better integration of passive and active support to unemployed jobseekers and employers while reinforcing individual case management support and a focus on early interventions for clients most in need. **Indonesia** is another country turning to technologically facilitated services. Meanwhile, other lower-middle-income countries in Southern Asia, such as **India**, had fully embraced digitalized delivery.

**African** public employment services, such as in **Kenya** and **Gabon**, were investing in digitalizing selected services only as a way to extend the availability of basic job-search support, while **Morocco** and **South Africa** had oriented their strategies to technology driven delivery. The complete digitalization of the **Tunisian** public employment services was ongoing at the time of the survey, to be completed in 2022 to allow specialized staff to focus on assisted training and support for local businesses and jobseekers. The global survey only obtained information from two countries among the **Arab States: Lebanon**, indicating the use of technology for delivering selected services only, while **Qatar** was deploying a technology-based approach to providing publicly funded employment services.

► **Figure 3. Delivery models: Technology uptake and adoption, 2020**



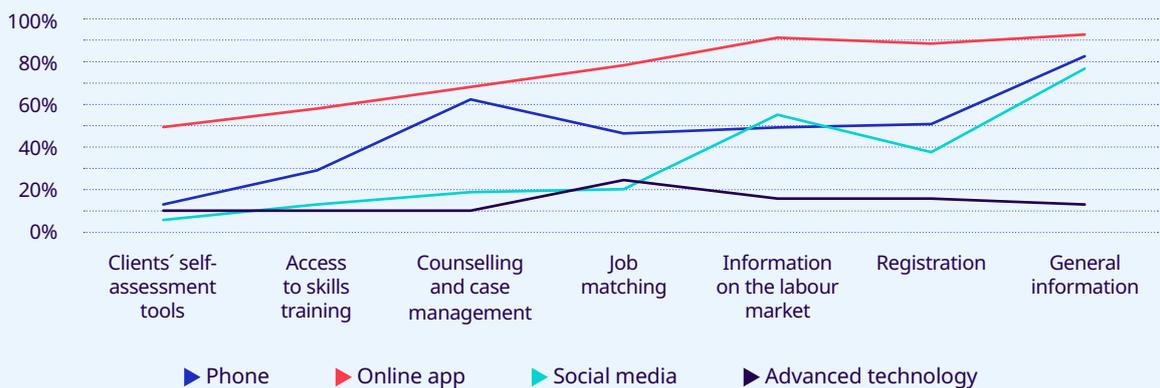
Note: See Annex 3 for detailed information.

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## 1.2 Technologies supporting service delivery

**Public employment services were using different types of technologies to deliver specific types of services.** Global figures from the survey findings show that web-based technology is proving highly versatile, allowing public employment services to deliver a wider range of services involving different levels of interaction with clients and automation. Job-matching services were reported as available in nearly eight of ten public employment services responding to the survey. There appears to be a correlation between an increasing use of online technology to facilitate services needing closer interaction with clients, such as counselling and case management, but also to give more autonomy to clients through self-assessment tools online. Access to skills training was another service strongly associated with web-based interfaces for delivery. Phone-based technology was mainly associated with access to general information, counselling and case management. For nearly half of the responding public employment services, this technology was also supporting, in one degree or another, registration, job matching, the provision of labour market information and access to skills training, although to a lesser extent. Social media was clearly a technology basically used to disseminate information. As for the utilization of advanced technologies, such as artificial intelligence, a similar level of versatility was used to facilitate the delivery of services with online technology. Still, advanced technologies are not yet as accessible to all public employment services as web-based solutions (figure 4).

▶ **Figure 4. Technologies that public employment services reported using to deliver different types of services, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Over-the-phone service is a long-established technology enabling public employment services across all country income groups to widen citizens' access to services, from basic to complex interactions, including counselling and case management.** Worldwide in 2020, public employment services were using phone services mainly to provide general information and to facilitate registration to their services, including skills training programmes, counselling and case management. More than 50 per cent of the surveyed public employment services in high-income countries had call centres ensuring delivery in all service categories, except for clients' self-assessment tools. Over-the-phone service proved helpful (table 5) to public employment services in upper-middle-income countries to make general information available (80 per cent), ensure access to counselling and case management (56 per cent) and keep clients abreast of the labour market situation (52 per cent). Public employment services in the lower-middle-income economies used the telephone to a lesser extent and mainly for providing general information, including on how to access specific programmes, such as skills training (64 per cent). This technology, however, helped three quarters of public employment services in that income category deliver advice and counselling and do some individual case handling.

► Table 5. Over-the-phone services for employment service delivery, by country income group, 2020 (percentage)

Phone	World	High income	Upper-middle income	Lower-middle income
<b>Total</b>	<b>88</b>	<b>97</b>	<b>84</b>	<b>79</b>
General information	83	93	80	64
Registration	51	67	48	21
Job matching	46	57	44	29
Labour Market Information	49	53	52	36
Counselling and case management	62	77	56	43
Client's self-assessment tools	13	10	16	14
Access to skills training	29	50	17	7

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Web-based technology is a time-tested workhorse of public employment services systems to facilitate service delivery.** Even prior to the COVID-19 pandemic, web-based technology to make employment services easy to access was widely used. Public employment services reported harnessing the advantages of online technology to extend service provision using electronic job portals, chatbots and web apps for job searching. Globally, 93 per cent of the public employment services taking part in the survey reported that they were providing general information and facilitating registration using online tools, while 78 per cent of them also offered some form of job-matching support online. More widespread online delivery was reported by the public employment services in the high-income countries, with 83 per cent of them delivering some form of counselling and case management. The percentage of those public employment services (in the high-income countries) offering skills training online was a bit lower, at 77 per cent, while only 63 per cent had made self-assessment tools available online. Public employment services in the upper- and lower-middle-income economies had also made significant progress in moving basic employment services online, although the differentials in capacities (between them and the high-income countries) widened for services that required more complex interactions, software and data. For example, online counselling and case management services in the upper-middle-income countries still needed to be scaled up at the time of the survey. When complex services were available in the public employment services in the lower-middle-income countries, delivery was more likely to take place in person (table 6).

► Table 6. Web-based apps for employment service delivery, by country income group, 2020 (percentage)

web-based apps	World	High income	Upper-middle income	Lower-middle income
<b>Total</b>	<b>99</b>	<b>100</b>	<b>100</b>	<b>93</b>
General information	93	97	88	93
Registration	88	93	88	79
Job matching	78	87	72	71
Labour Market Information	91	90	100	79
Counselling and case management	68	83	64	43
Client's self-assessment tools	49	63	40	36
Access to skills training	59	77	54	29

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**The public employment services took advantage of the wide-scale accessibility offered by social media to keep clients updated about available support and changes in operations after onset of the COVID-19-related restrictions.** Social media offers a low-cost and efficient channel for quickly disseminating relevant information at large scale, including on job vacancies and job-training opportunities. During the survey period, public employment services in the lower-middle-income (86 per cent) and high-income (80 per cent) countries were using this technology for publicizing general information somewhat more than those in the upper-middle-income tier (68 per cent). Social media platforms have increased in popularity, particularly among some groups of the population, like teens and young adults, who are making career choices or looking for internship opportunities and entry-level jobs. Public employment services could consider developing a stronger social media engagement strategy to expand outreach, provided data protection and privacy policies are part of that strategy to render a trusted environment for clients (table 7).

► **Table 7. Public employment services using social media for service delivery, by country income group, 2020 (percentage)**

Social media	World	High income	Upper-middle income	Lower-middle income
<b>Total</b>	<b>80</b>	<b>80</b>	<b>72</b>	<b>93</b>
General information	77	80	68	86
Registration	38	50	28	29
Job matching	20	23	20	14
Labour Market Information	55	47	64	57
Counselling and case management	19	13	24	21
Client's self-assessment tools	6	0	8	14
Access to skills training	13	17	8	14

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Artificial intelligence-driven solutions were offered by one third of the public employment services respondents, reinforcing that not all are ready for advanced technologies.** The global survey found that the overwhelming majority of the public employment services with advanced technologies in 2020, such as artificial intelligence, were in high-income countries. Those public employment services were primarily applying advanced technologies for job matching (40 per cent) and the production of labour market information (27 per cent). Efforts to introduce advanced technologies in the upper-middle-income economies were still nascent and focused on specific processes involved in registration, job matching and the provision of general information. To a lesser extent, these technologies were used to analyse and disseminate labour market information. The public employment services in the lower-middle-income countries attached greatest importance to the introduction of advanced technologies in facilitating access to skills training and improving job matching (table 8). Despite the evolution of artificial intelligence, most public employment services still struggle to harness the power of advanced technologies to support the delivery of complex services, such as counselling and case management or clients' self-assessments.

► Table 8. Advanced technology supporting public employment services' service delivery, by country income group, 2020 (percentage)

Advanced technology use	World	High income	Upper-middle income	Lower-middle income
<b>Total</b>	<b>80</b>	<b>80</b>	<b>72</b>	<b>93</b>
General information	13	20	12	0
Registration	16	20	16	7
Job matching	25	40	12	14
Labour Market Information	16	27	4	14
Counselling and case management	10	17	8	0
Client's self-assessment tools	10	20	4	0
Access to skills training	10	17	4	7

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.



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## ▶ 2

# Drivers of the technological journey

The global survey asked public employment services officers to rank the top drivers in their agency's use of technology and for promoting greater digitalization of their services. Achieving digitalized public employment services, however, is a transformational process simultaneously involving internal operations and the interactions with clients. This transformative journey has been accelerated and sometimes disrupted by a confluence of factors, including:

- ▶ widespread adoption of web-based services facilitated by increasing internet penetration rates in the past decade;
- ▶ heightened expectations from citizens about accessibility, user-friendliness and the responsiveness of government agencies; and
- ▶ increased pressure to make services available at a large scale but with reduced budgets by using alternative delivery channels.

Because the coronavirus crisis has also exposed the digital gap between countries and societies, this section provides insight into how public employment services' clients and in particular their target groups have experienced the remote delivery of support.

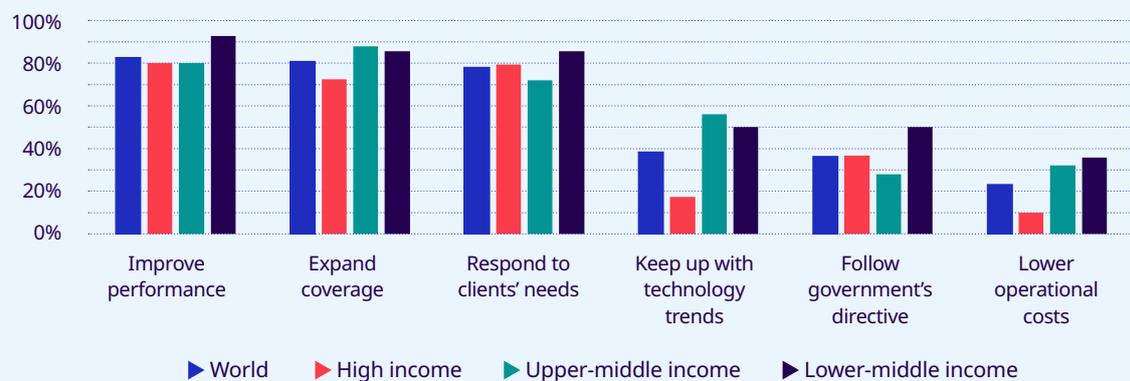
## 2.1 Drivers

**Boosting performance and expanding service coverage were reported as the primary motivations for public employment services to adopt technology.** While this was true for public employment services respondents across all country income groups, bridging service coverage gaps was particularly important for the agencies in the upper- and lower-middle-income economies. The public employment services in the lower-middle-income tier expressed the simultaneous need to optimize internal processes and operations when adopting technology to effectively achieve better and broader service provision (figure 5). This is an indication that technology is not

only a delivery interface but it also has as an immediate impact on internal operations and service protocols. In most cases, the introduction of technology to facilitate service delivery required the public employment services respondents to review their working methods, processes and ways of interacting with clients. This provided opportunity to automate or semi-automate routine administrative tasks; for example, frequently asked questions by clients are displayed on a webpage or handled by conversational chatbots instead of staff members. When those factors all together worked in an articulate manner, an increased overall performance resulted.

**Responding to clients' needs was one of the top-three drivers of technology integration into public employment services' operations.** Clients expect rapid and simple accessibility to employment services, regardless of the channel used to contact a public employment services agency. Achieving good customer experience through non-face-to-face interactions, however, imposes the complex challenge of ensuring that investments in technology-facilitated services achieve maximum benefit through clients' continuous use of such services. There is no value in spending public money on large-scale information technology projects or upgrading existing public employment services' technological interfaces if in the long run daily operations will not work optimally and respond to citizens' needs. This intrinsic relationship between service quality, interactivity and responsiveness that clients perceive and their intention to reuse the services was captured well in the responses to the global survey from the public employment services in the lower-middle-income countries, which considered that responding to clients' needs was as important as expanding service coverage. Responses from the public employment services in high-income economies also confirmed the importance of meeting clients' expectations over expanding service coverage. In contrast, most public employment services in the upper-middle-income countries replied that responding to clients' needs and expectations was a key driver but not any more relevant than expanding service coverage and boosting performance.

► **Figure 5. Drivers of technology adoption among public employment services, by country income group, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Keeping up with technological trends came as the fourth-most important motivation for public employment services to use technology to facilitate service delivery.** According to the survey responses, public employment services were not only confronted with different behaviours and new preferences among clients but also with the need to keep up with technological trends. Keeping up with technology trends was a pressing priority for the public employment services in the upper- and lower-middle-income countries. Using web-based and mobile device technologies effectively for many of them, particularly those in the lower-middle-income tier, was often subject to the availability of the infrastructure that is necessary to support online and digital services. This might explain why the large majority of the public employment services in the lower-middle-income countries attached a great deal of importance to following an explicit government directive on technology adoption, in comparison with their peers in the upper-middle-income group. Keeping pace with technological development did not have the same relevance for public employment services in the high-income countries, however, with only 17 per cent of them indicating this factor was influencing technology adoption. A stark reality across government agencies, including public employment services, is that the speed of advancement in technologies undoubtedly exceeds the speed of innovation in the services that the private sector provides, which have expanded to many dimensions of daily life, including working, purchasing online or ordering a taxi using digital platforms.

**Developing more cost-effective front-line services was important but not the main driver for public employment services taking up technology.** However, public employment services in the upper- and lower-middle-income economies attached more importance to achieving savings through a more intensive use of technology than in the high-income countries.

## 2.2 Technology is fostering service personalization

**Public employment services that were using technology were progressively moving from passive to dynamic interactions with their clients. However, personalized service delivery still needed developing.** Most of the public employment services at the time of the survey engaged with clients in a two-way interaction mode to facilitate the registration of jobseekers, publicize job vacancies and assist with job matching. And, yet not all jobseekers and employers experienced remote access to the services of the public employment services in the same way (table 9). Overall, the global survey findings indicate that for 42 per cent of respondents, the public employment services' clients could solicit a service and submit information. Interestingly, 50 per cent of the public employment services in the lower-middle-income countries reported establishing this level of interaction with clients, in contrast with only 40 per cent of the public employment services in the high-income and upper-middle-income countries. The responses, however, show that when the level of interaction became more complex, the public employment services in the lower-middle-income group were less likely to get involved in a loop of requests and responses for clients to fully deliver a specific service online or remotely. In contrast, 33 per cent of the public employment services in the high-income countries offered clients enhanced service interactions using remote technologies. Clients from these public employment services (in high-income countries) were also likely to access proactive and individualized technology solutions, such as pre-filled registration forms to participate in skills training or to claim unemployment insurance benefits. In the upper-middle-income economies, the public employment services continued to mainly communicate with clients in a two-way interaction mode: only 28 per cent of them were able to establish a loop of requests and responses with clients to complete the various steps involved in delivering services, and barely 8 per cent of them were providing services automatically in a proactive manner.

► **Table 9. Public employment services' level of interaction with clients using technology, by country income group, 2020 (percentage)**

Public employment services–client transactions	World	High income	Upper-middle income	Lower-middle income
Only obtain information	9	0	16	14
Invoke a service and receive one response	6	3	8	7
Solicit a service and submit information	42	40	40	50
Are involved in loop of request responses	28	33	28	14
Receive services automatically	16	23	8	14

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**The findings of the survey indicate that in general, public employment services officers are aware that using technology to interact with jobseekers and employers adds complexity and increases the stakes.** This is because the responses that clients obtain need to be consistent and of quality, no matter their channel of choice (call centres, email, chatbots, web-based applications). Each interaction, whether submitted through self-services or assisted channels, needs to be carried out in time and correctly to create a service journey and avoid clients' dissatisfaction with fragmented responses. When interoperability is low, all these multiple interactions can have negative impacts on both the effort and the service costs for public employment services and their clients. Technology adoption to support service delivery also pushes the public employment services to revisit back-office processes, identify gaps and build a technology road map to guide the front-desk staff in delivering the expected quality and transparency. Public employment services need to consider moving away from the siloed and reactive

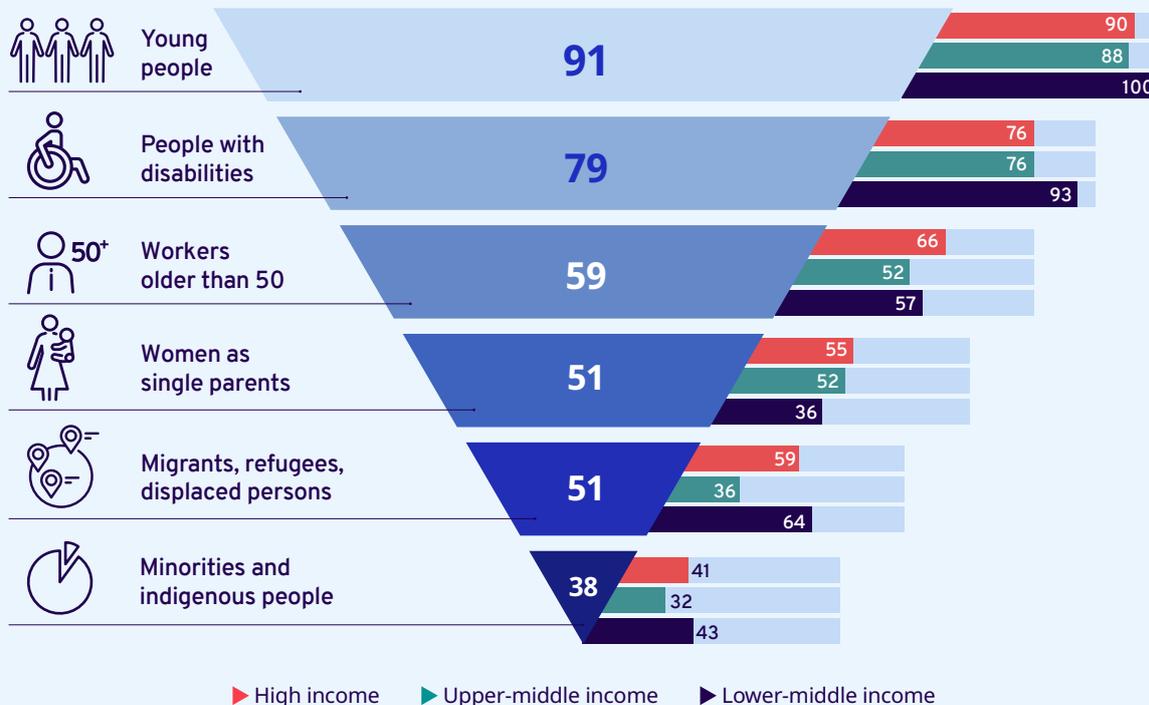
service experience that requires clients to check different channels for soliciting specific information and services. In the future, a more coherent service architecture and increasing interoperability will be essential for providing integrated employability support while maximizing efficiency and return on investment.

### 2.3 Delivering services to target groups

**Technology-based tools have contributed towards improving delivery for jobseekers who likely are facing disadvantages in the labour market, but digital gaps persist for some groups.** Access to public employment services support for returning to work, remaining in education or accessing training can be facilitated by new technologies. Web-based applications for delivery and over-the-phone service are helping to break traditional barriers for communication and mobility. Globally, 91 per cent of the surveyed public employment services affirmed that technology had contributed to improving their service delivery for young jobseekers with disadvantaged backgrounds (figure 6). As much as 79 per cent of respondents across all regions thought that people with disabilities were benefiting from the available technology-facilitated services, mainly through remote access solutions. The use of technology-based delivery channels had gained importance to improve service delivery to workers older than 50 years among nearly 59 per cent of the surveyed respondents. The findings did not show significant differences by country income group.

While technology offers new possibilities, the gap caused by inequality in access to information and communication technology persists for some groups across regions. In half of the public employment services responding to the global survey, the use of technology-facilitated services was not systematic for reaching target groups facing disadvantages in the labour market, including women as single parents, migrants, refugees, displaced workers, minorities and indigenous people (figure 6). This finding suggests that delivering in-person support to groups experiencing different combinations of employment barriers proves necessary, even if the initial contact with the public employment services is established through remote channels.

► Figure 6. Technology-facilitated services for target groups, by type of service and country income group, 2020 (percentage)



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

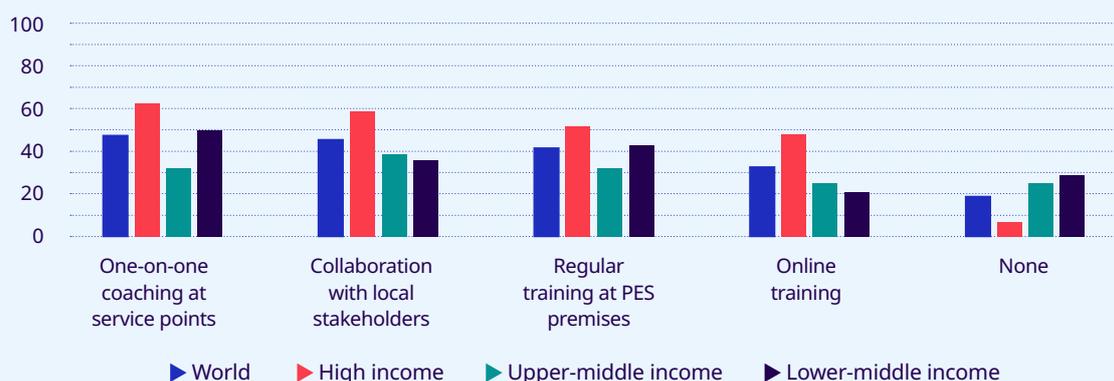
**Technology is a tool for inclusion when channels for the delivery of employment services are accessible and adapted to all.** The public employment services using a predominantly technology-based model to provide services had expanded access to young people and people with disabilities, regardless of the country *income* classification. The public employment services in the lower-middle-income countries using a technology-based approach to service provision had observed the benefits of using remote delivery on these two specific groups of jobseekers. But they did not reach (through specific service streams) single mothers, minorities and indigenous people (table 10). Often, these target groups need a mix of services to address direct employability gaps and non-related employment barriers affecting job-readiness. Barriers to gaining job access can range from lack of transportation, need for childcare and domestic violence to chronic illness or long-term welfare issues that are more complex to ensure support via digital or remote channels.

**Acquiring technology is not enough.** Public employment services need to understand the barriers facing the different groups of jobseekers to leverage the potential that technological progress offers and to ensure equal access for all clients. Those public employment services using technology to deliver only selected services were able to more easily reach and serve target groups, including single mothers, older workers, minorities and indigenous populations. Face-to-face services and support by a counsellor continued to be very relevant to serve those target groups for public employment services across all country income categories.

**Public employment services were taking action to help digitally illiterate clients. What was lacking, however, was regular support to target groups for overcoming barriers to digital inclusion.** The utility of technology-supported service proves true when jobseekers and employers can use it regularly and effectively to gain access to jobs and staff. Public employment services need recalibrating initiatives to help digitally illiterate clients perform basic operations online, such as registration, searching and applying for jobs using trusted websites, filing unemployment insurance claims, attaching a CV file to an email or participating in a video interview. Overall, the surveyed public employment services offered jobseekers and employers low to moderate support for overcoming digital-inclusion barriers.

At the time of the survey, slightly more than four in ten of the public employment services respondents worldwide offered support to clients with low digital skills. One-on-one coaching at service points was cited as the most common method used by the public employment services in the high-income and lower-middle-income countries. More public employment services in the high-income (52 per cent) and lower-middle-income (43 per cent) economies than those in the upper-middle-income category reported providing regular training programmes at their premises for clients. Nearly six in ten of the public employment services respondents in the high-income group collaborated with municipalities and other local stakeholders to improve digital literacy and access, while the public employment services in the upper- and lower-middle-income economies rarely used these collaborative schemes to tackle digital exclusion. Online training modalities were less available, except in the high-income countries. In general, the availability of initiatives to help clients take advantage of the internet for hiring and job searching was low in the upper-middle-income category. A striking 19 per cent of public employment services participating in the global survey did not have specific systems to help their clients overcome the barriers to digital inclusion (figure 7).

► **Figure 7. Methods public employment services use to tackle digital illiteracy of clients, by country income group, 2020 (percentage)**

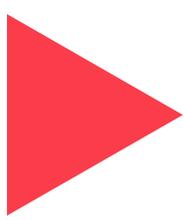


Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

► **Table 10. Public employment services' technology-based service delivery approach, by target groups and country income group, 2020 (percentage)**

PES service delivery approach	World	High income	Upper-middle income	Lower-middle income
<b>Predominantly technology-based</b>				
Young people	100	100	100	100
People with disabilities	89	75	100	100
Workers older than 50	50	50	67	25
Women as single parents	44	50	67	0
Migrants, refugees, displaced	61	63	67	50
Minorities and indigenous people	44	50	67	0
<b>Only selected services are technology based</b>				
Young people	86	86	80	100
People with disabilities	81	79	80	86
Workers older than 50	69	79	60	71
Women as single parents	58	64	60	43
Migrants, refugees, displaced	39	57	13	57
Minorities and indigenous people	42	50	27	57
<b>Face to face, mainly</b>				
Young people	93	86	100	100
People with disabilities	64	71	25	100
Workers older than 50	43	57	0	67
Women as single parents	43	43	0	100
Migrants, refugees, displaced	71	57	75	100
Minorities and indigenous people	21	14	0	67

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.



# 3

## Improving technological capabilities among public employment services for a human-centred crisis recovery

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Technology is a vehicle that offers public employment services the possibility to improve performance, expand coverage and enhance the service experience for clients. For such gains to materialize, however, sustained investment, adaptability, interoperability and agility should be part of the equation. The COVID-19 crisis has changed the role and importance of web-based technology in the delivery of employment services. It has also underlined the need to strengthen technical capabilities of public employment services. Digital technologies offer the opportunity for some public employment services to make a leap forward, provided that core capabilities and infrastructure are in place. When governments accelerate the digitalizing of public services, it is important to ensure that the services will work for everyone. Implementing innovative technologies to access employment services needs to be done in a way that is compatible with inclusiveness. This means public employment services must place clients at the centre of the service and process design using technology, investing in strong institutions and effective labour market services and programmes.

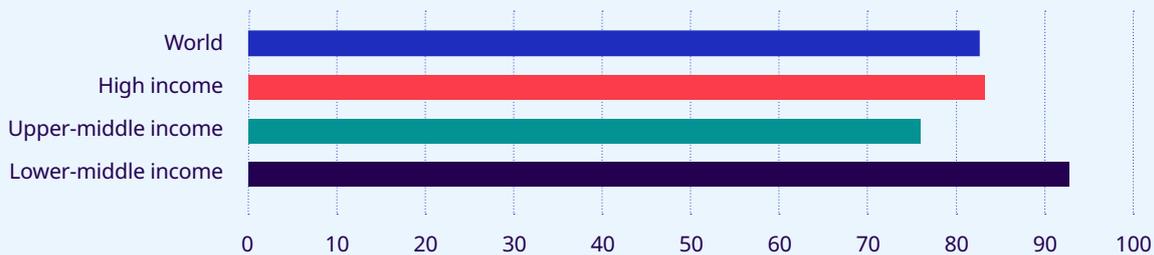
### 3.1 Core capacities for a successful digital transformation

The global survey inquired about the capacities that are helping public employment services in their digital transformation journey. Respondents cited four building blocks that had been fundamental to delivering better support and quality services to jobseekers and employers: (i) a guiding strategy; (ii) digitally skilled staff; (iii) ability to manage and analyse data; and (iv) effective data governance and cybersecurity.

#### A guiding digital transformation strategy

**At the speed that digital technology is progressing, public employment services must carefully make investment decisions to overcome capacity gaps and avoid creating silos or disjointed operations across the service delivery chain.** A digital strategy is a significant instrument that helps public employment services provide direction and set commitments concerning funding, skilled staff, data management and technology adoption approaches that work together with the overall service delivery model. The majority of the public employment services participating in the global survey recognized the importance of navigating technological change with a road map: eight in ten of the total respondents confirmed having a digital strategy in place. Figure 8 shows that the percentage of public employment services in the lower-middle-income countries with a strategy was slightly higher (at 93 per cent) than those in high-income (at 83 per cent) and the upper-middle-income economies (at 76 per cent). While such figures appear encouraging, only six in ten of the surveyed public employment services had earmarked funds to execute such a strategy, and the majority of them were in the high-income tier.

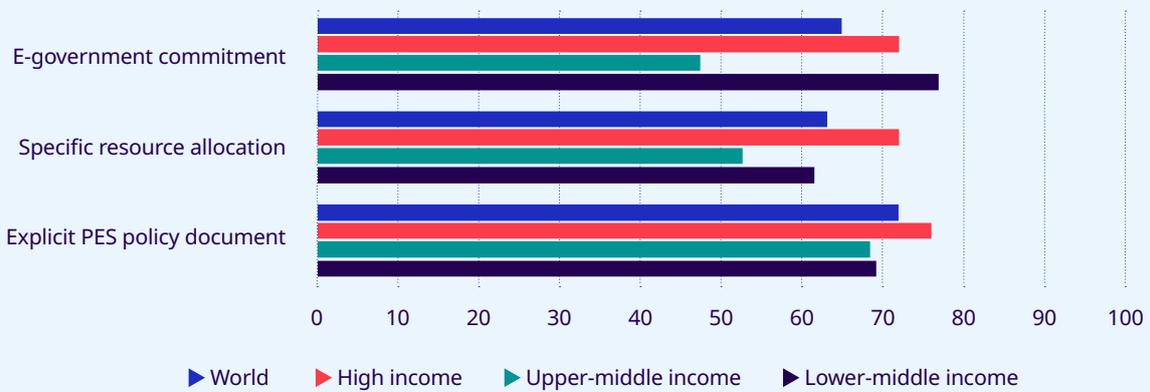
► **Figure 8. Public employment services with a digital transformation strategy, by country income group, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**In countries where the digital transformation strategy materialized in an explicit public employment services policy document, the allocation of funds for implementation typically followed.** When asked for more detail about their digital transformation strategy, only 69 per cent of the public employment services in the lower-middle-income countries confirmed having an explicit public employment services policy document. It can be inferred that the technological transformation of public employment services in the lower-middle-income countries is guided by policy objectives specified in e-government directives applying to all public agencies. Conversely, the public employment services in the high-income economies showed a clearer alignment with the higher level of governance provided by e-government commitments with an explicit public employment services digital strategy and the specific allocation of resources. The situation was slightly different for public employment services in the upper-middle-income countries, where e-government commitments indirectly influenced the public employment services' digitalization strategy (figure 9). Overall, the findings indicate that an explicit public employment services digital road map makes the allocation of resources in support of priorities more probable over time.

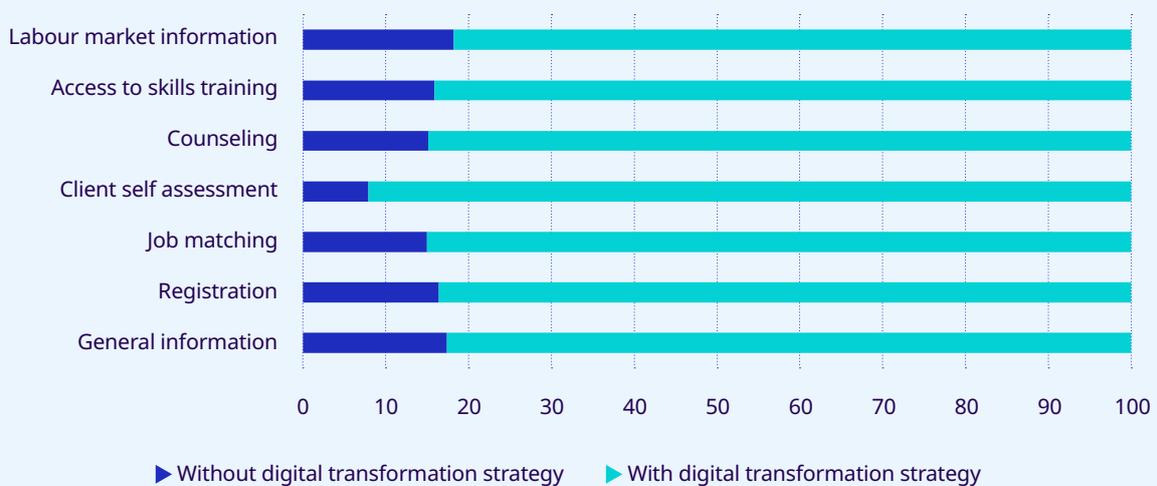
▶ **Figure 9. Links between digital strategies, resource allocation and e-government policies, by country income group, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Having a digital strategy favoured the provision of automated services, such as the introduction of self-assessment tools for public employment services’ clients.** Effective outcomes in terms of improving performance, outreach and quality of services only materialized when public employment services set up a comprehensive plan that ensured backstage processes, service protocols and overall capabilities that support front-desk delivery in an efficient manner. A digital strategy also offered a framework to assess established targets and metrics to ensure they were fit for purpose over a medium to long-term period. Investments in digital technology also decreased service delivery using face-to-face modalities, hence the importance of placing clients at the centre of public employment services’ digitalization strategies to avoid exclusion, whether through lack of a reliable internet connection, the devices to go online, digital skills or motivation (figure 10). Because low education correlates with low income and unemployment, the group of jobseekers already facing vulnerability are likely to need reinforced support to access digital services for job searching in combination with skills training.

▶ **Figure 10. A digital transformation strategy favouring technology-based service delivery, by country income group, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## Staff skilling in technology

**Upskilling public employment services staff more frequently and building internal digital expertise were essential to a real technological transformation.** Technology provides possibilities for improving service delivery, organization and design. Nevertheless, technology alone cannot solve current organizational gaps in daily operations. Public employment services staff need the right skills and mindset to use IT-supported tools in fulfilling the technical responsibilities linked to their specific role in the agency. The global survey identified a critical challenge in the technological transformation of public employment services: the need to train staff across the organization more frequently. Worldwide, 96 per cent of the public employment services respondents declared relying on “learning by doing” as the most common method to train staff on how to work with technology, including software, tools and systems. While learning by doing could work for incremental learning, for new or complex systems, regular and targeted training would be better suited. The availability of regular and targeted training diminished considerably in the public employment services from the lower-middle-income economies, in comparison with the agencies in the high-income and upper-middle-income tiers. Nevertheless, the availability of regular and targeted training on different aspects of technology was provided by seven in ten of the public employment services respondents (table 11).

► **Table 11. Public employment service staff learning how to use technology, by approach and country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Learning by doing	96	97	92	100
Regular training	86	93	80	79
Targeted training	75	80	68	79

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

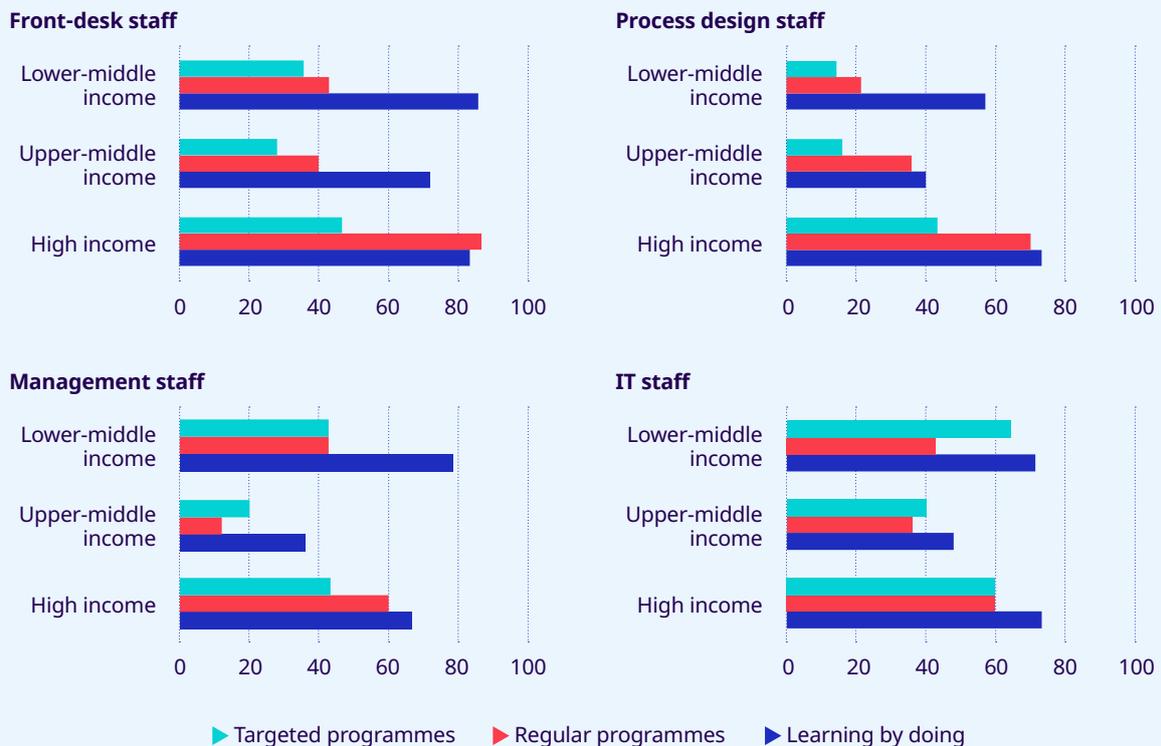
**Across the board, the public employment services respondents reported that staff were trained on new technologies mostly through on-the-job learning methods. Training staff with varying skill levels and responsibilities, however, needs targeted methods.** When looking at how selected categories of staff learned to work with technology, public employment services in the high-income countries showed a slightly different pattern. Regular training was largely available for all staff categories but also those with responsibilities directly linked to the development and deployment of technology, such as managers. People working on process design and information technology benefited more from targeted training. These technology-savvy employees were more likely to be trained regularly using a combination of learning approaches, including self-learning. Although a similar practice was identified in public employment services from the middle-income economies, the main difference appeared in the learning methods used with front-desk staff. In public employment services in the high-income countries, there was far more reliance on regular training for this specific staff category than in the upper- and lower-middle-income countries (figure 11). Such a striking difference can be explained by the fact that the skills of front-desk staff often present stronger variations regarding professional credentials. It is also more likely that these workers struggle the most with using technology. At the pace that technological change is occurring, training front-line staff requires greater investment. The lower availability of regular training for front-desk staff in the upper- and lower-middle-income countries can also be indicative of constraints, such as limited capacity to accommodate training in between daily operations, insufficient trainers, lack of equipment and other tools to set up training, whether in-person or online, and the absence of training methodologies adapted to an increasing digital environment.

**Public employment services staff had gained more solid technology skills to perform basic operations and manage digital information, but their level of advanced IT knowledge and analytics needs boosting.** Worldwide, 83 per cent of the public employment services participating in the global survey reported to have in place learning methods for ensuring that their staff has a basic understanding of technologies, software and applications to support clients more effectively. This means that public employment services staff can share

information, use email and social media and engage with clients in a two-way interaction through email, phone or web-based apps. Some notable differences were apparent when it came to the ability of public employment services staff to perform basic data storage and management, which involves using spreadsheets, text processing and presentations software, as well as a basic understanding of core labour market statistics and trends. Only 56 per cent of the public employment services in the upper-middle-income countries provided specific training on basic data management and information, in contrast with 86 per cent of the public employment services in the lower-middle-income economies and 83 per cent of those in high-income countries (figure 12).

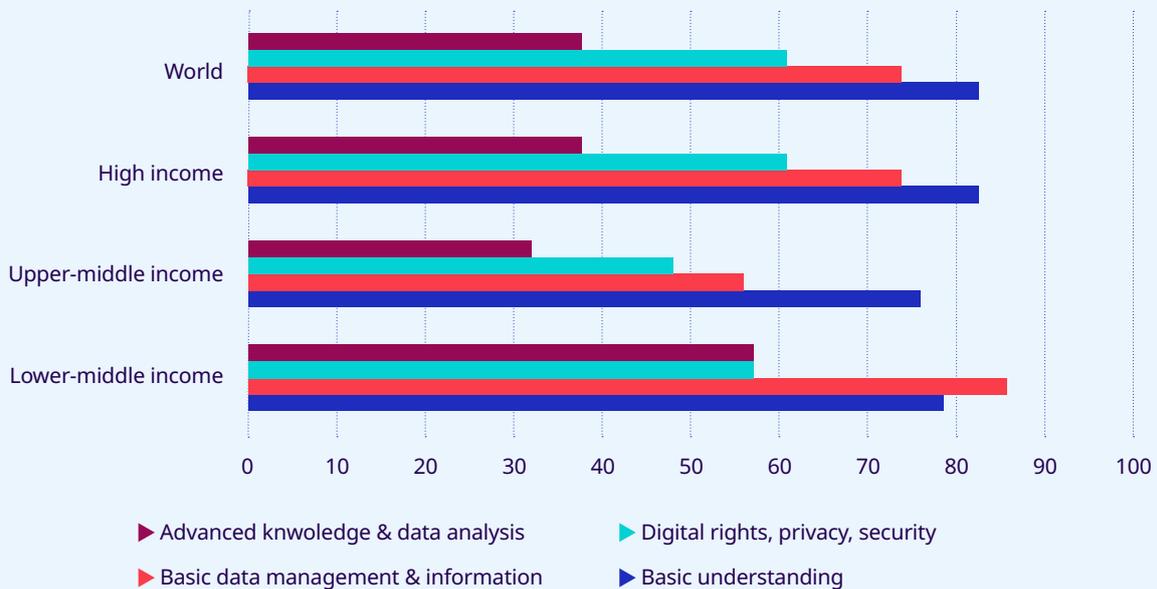
**A potential knowledge gap on digital rights, privacy and data security was detected in public employment services staff across all income categories**, based on the finding that only 61 per cent of them were providing training in this area. The public employment services in the upper-middle-income countries emerged lowest (at 48 per cent) when compared with their peers in the lower-middle-income (at 57 per cent) and high-income (at 73 per cent) countries. All staff, but especially persons managing information and data using common technologies, need training on the safe use of electronic communications, mobile services, social networks, cloud computing and all advanced technologies. As shown in figure 12, developing internally advanced IT knowledge and analytics needs boosting in public employment services across the board, regardless of country income category. Globally, fewer than four in ten public employment services were preparing their staff to leverage use of advanced technologies. It is particularly interesting to see that the public employment services in lower-middle-income economies had made substantial efforts in this area.

► Figure 11. Training public employment services staff with varying skill levels on how to use technology, by country income group, 2020 (percentage)



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

► Figure 12. Range of subjects in the training of public employment services staff, by country income group, 2020 (percentage)



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## Data management and data analysis

**Data analytics has great potential to help public employment services gain insights on labour market trends affecting clients' jobseeking and businesses' hiring decisions and planning.** Responses to the survey, however, signal that, in general, public employment services insufficiently exploit data resources for analysis and evidence-based decision-making using advanced technology, which could potentially be shared with other government agencies and combined for analysis, subject to the satisfactory management of issues around access, privacy and data protection. Worldwide, 97 per cent of the respondents affirmed using digital technology to collect, store and access data. The public employment services respondents had also made progress in managing data integration tools. However, less than 36 per cent of them had applied technology to data analysis and evidence-based decision-making.

Data analytics is a clear area of opportunity for public employment services to extract value from structured and unstructured data, given that data utilization is evolving from descriptive and explanatory to predictive uses. Algorithms and other data analytical tools can help with the understanding of labour market dynamics and reveal trends and metrics that would otherwise be lost in a mass of data. Advanced technologies can also render analysis on the labour market over several dimensions (territory, sectors, contracts, salary, digital, soft skills, etc.) to help determine the chances of individual jobseekers find a job or anticipate skill needs in a given industry. Handling more complex data often involves higher costs and development challenges, including different datasets, methods of coding and collection. Responding public employment services in the upper- and lower-middle-income countries had the longer way to go in developing predictive and intelligent labour market dashboards supporting decision-making and service planning (table 12).

► Table 12. Application of digital technology to process public employment service data, by country income group, 2020 (percentage)

	World	High income	Upper-middle income	Lower-middle income
Data collection, storage and access	97	97	96	100
Data pre-processing	72	83	56	79
Data integration tools	70	83	60	57
AI analysis and decision making	36	43	36	21

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

The ongoing COVID-19 job crisis has favoured an increasing interoperability of public employment services' digital platforms. Advances in technology can help public employment services in achieving integrated service delivery, improving targeting, optimizing resource allocation and providing individualized responses to clients. Such enhancement in service level, however, can only materialize when data are valid and available to be shared and managed effectively.

## Cybersecurity and data protection

**An increasing reliance on digital technology for service delivery makes data protection, privacy and cybersecurity a central challenge for public employment services.** Millions of transactions between public employment services, jobseekers and employers are taking place in cyberspace. The COVID-19 crisis has increased public employment services' reliance on digital services and technology for remote delivery. Data governance and privacy policies are a fundamental part of cybersecurity. As more personal data are captured with digital devices, data protection and privacy remain urgent concerns. Across the board, public employment services were highly aware of their obligations regarding the rights of data subjects. In particular, respondents in the high-income and upper-middle-income countries seemed to be especially careful with their obligations. About 80 per cent of the public employment services in the high-income countries had already come a long way on establishing transparent protocols for data protection, processing and privacy. It is worrisome, however, that all the responding public employment services admitted the need to close existing gaps in the availability of regulations and protocols to notify jobseekers and employers when a data breach occurred. Such gaps can be potentially damaging to the relationships with clients and delivery partners.

The public employment services in the upper-middle-income economies reported the largest gaps in securing transparent data collection, processing practices and safe protocols for sharing data with third parties (table 13). When developing and implementing digital and advanced technology services, the security and integrity of data should be prioritized to ensure that public employment services are seen as trusted and transparent providers.

► **Table 13. Public employment services' data protection regulations and protocols, by country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Client's consent is required for data processing	88	93	92	71
Client's access is secured and access to own records granted	74	80	72	64
Personal data are processed in a transparent manner	71	77	56	86
Collected data from clients is anonymized	68	80	56	64
Protocols for sharing data with third parties are in place	68	80	56	64
Data breach notifications are provided	54	67	32	64

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Given the increasing frequency of cyberattacks and threats to government agencies, public employment services need to urgently address vulnerabilities in cybersecurity.** The public employment services respondents had adopted specific cybersecurity measures, with protocols for authentication, internal staff awareness of threats and the implementation of security technology the most broadly used. Globally, problematic areas remain for those public employment services without a strategy to prevent and respond to cyber threats and to ensure unauthorized third-party access to the agency's data. Threats can originate from a wide variety of sources and cause serious disruption to public employment services' operations. But it can also affect their delivery partners, jobseekers and employers. The global survey figures fell significantly in these highly sensitive areas due to the large number of public employment services officers in the upper-middle-income countries who declared lacking specific strategies for when security threats occur, including data breaches taking place through third parties. Adoption of public employment services' security measures to prevent third parties from accessing their data was strongest in the lower-middle-income countries (table 14).

► **Table 14. Public employment services' cybersecurity measures, by country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Protocols for authentication	93	100	92	79
Internal staff awareness	84	90	80	79
Cyber security technology	80	90	68	79
A strategy for cyber threats	74	93	52	71
No third-party access PES data	72	83	52	86

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**Public employment services challenges also remained in contingency planning for quickly restoring services in the event of a cyberattack or data theft.** As with other government agencies, the public employment services hold sensitive information and are connected to cloud storage network systems. They need to be vigilant and prepare for cyberattacks and have contingencies for power failure and data loss. Security policies, practices and

procedures must be in place and security technology must be integrated to mitigate risks and vulnerabilities. The global survey findings reveal that contingency planning following the disruption or interruption of digital services seem to be problematic for public employment services across all regions (table 15). Lack of effective planning in the face of data theft is a critical red flag, considering the increase in ransomware attacks these days. The public employment services respondents in the high-income countries acknowledged concern when considering the highly sensitive data they handle. The situation is particularly alarming regarding the public employment services in the upper-middle-income group, with only 23 per cent of them having an action plan to react and restore services after data-stealing. In general, the public employment services respondents seemed to be better prepared to handle power failure events and data theft or loss, with respondents in the lower-middle-income countries slightly more prepared (at 92 per cent) than those in the high-income (at 88 per cent) and upper-middle-income economies (at 73 per cent).

► **Table 15. Public employment services' contingency plan in place for managing a disruption or interruption of digital services, by country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Power failure	87	88	86	83
Data loss	83	88	73	92
Cyberattacks	75	88	64	67
Data thief	52	73	23	58

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## 3.2 Technological leapfrogging

### **Leapfrogging works when coupled with investment in critical enablers of local digital transformation.**

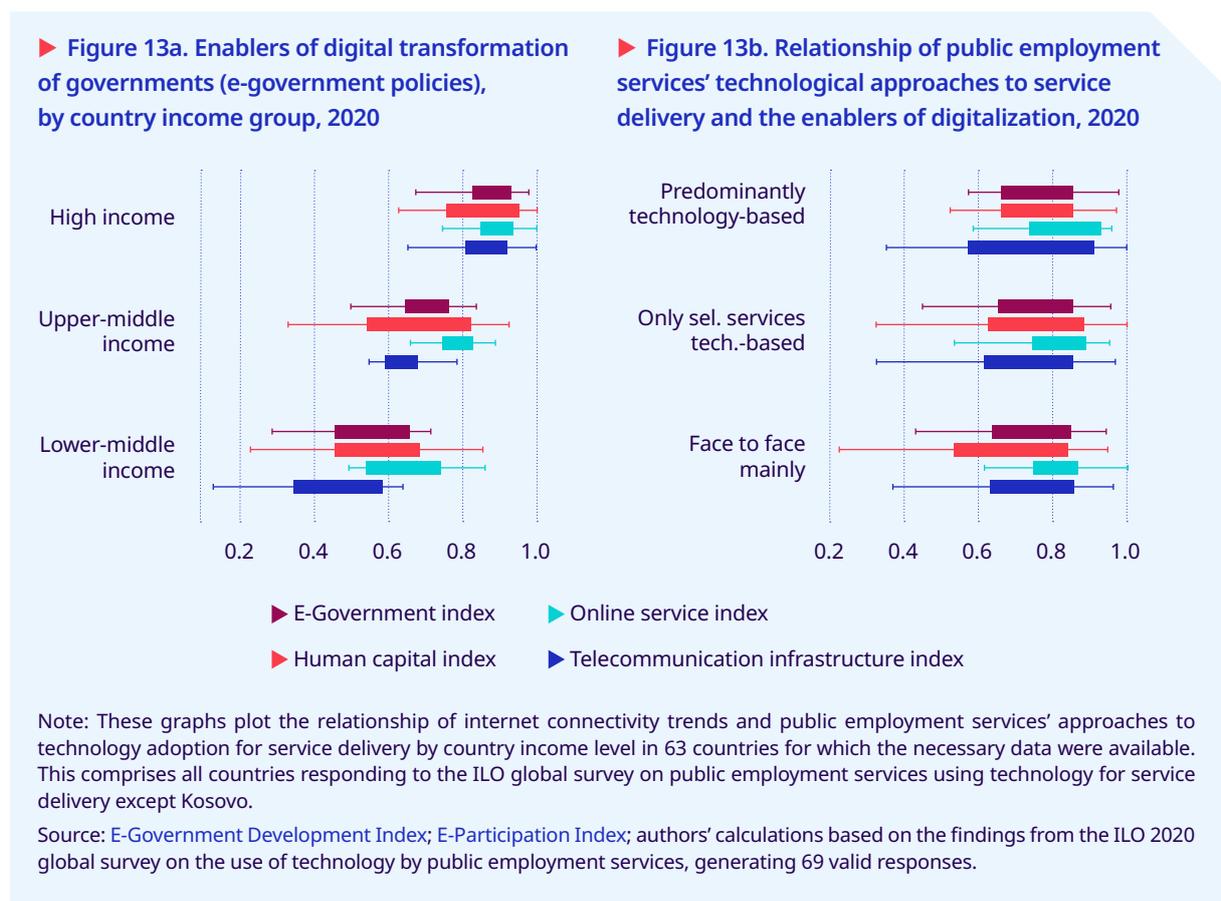
The global COVID-19 crisis has sharply increased reliance on technology to deliver services on a large scale and is forcing public employment services to accelerate change. Technology offers public employment services, especially in developing countries and emerging economies, the opportunity to make a leap forward in the digitalizing of their services. Skipping some of the technological development stages, which advanced public employment services have done, is working for some but risks temporary results. Leapfrogging falls short of being transformational when local capabilities and infrastructure are weak or absent. To make this technological leap sustainable over time, investments are also necessary in the critical enablers of digitalization. Skills, data and reliable internet connectivity are considered necessary for digitalizing public employment services to take place in those countries where the digital divide is a striking reality and could represent a major barrier to leapfrogging.

Analysis of the digital connectivity trends for delivering public services around the globe was included in this study using the E-Government Development Index<sup>14</sup> and the E-Participation Index,<sup>15</sup> which were developed by the United Nations Department of Economic and Social Affairs. The analysis combined data from the two indexes regarding the public employment services' technology adoption approaches that the global survey identified: predominantly technology-based models, digitalization of selected services only and largely face-to-face practices. Figure 13a shows that telecommunication infrastructure and online connectivity were important bottlenecks to the digital transformation of public employment services in the upper- and lower-middle-income economies. Lower levels of connectivity, infrastructure and human capital also reduced the availability at large scale of other online labour market policies that support access to decent work, such as e-learning and training.

14 The E-Government Development Index is a composite measure of three important dimensions of e-government: provision of online services, telecommunication connectivity and human capacity.

15 The E-Participation Index is a supplementary index to the [UN E-Government Survey](#). It extends the dimension of the survey by focusing on the use of online services to facilitate provision of information by governments to citizens (e-information sharing), interaction with stakeholders (e-consultation) and engagement in decision-making processes (e-decision-making).

**A digital public employment services institution should work for everyone.** It must overcome the threat of new technology further dividing people between those who can afford access to the internet and have the possibility to participate in employment remotely and those who remain disconnected and do not receive the same level of support to access job opportunities. As part of the public machinery, public employment services can contribute towards ensuring that no one is left behind and level the playing field, especially for small businesses and jobseekers in the most disadvantaged situations, such as people with disabilities, young jobseekers, women, migrants and older workers. Providing these groups with access to basic digital skills would have an impact on several dimensions of their lives, including readiness to access job positions requiring digital literacy or ease of accessing other digital services, such as online shopping and making telehealth appointments for primary care. Figure 13b plots the relationship of the important enablers of e-government and public employment services' approaches to service delivery by country income level. The less pronounced gaps to e-government observed in this plot suggest that digitalizing public employment services could act as a catalyst when facilitating access to a basic level of web-based job searching and hiring support, even in countries with a significant digital divide.

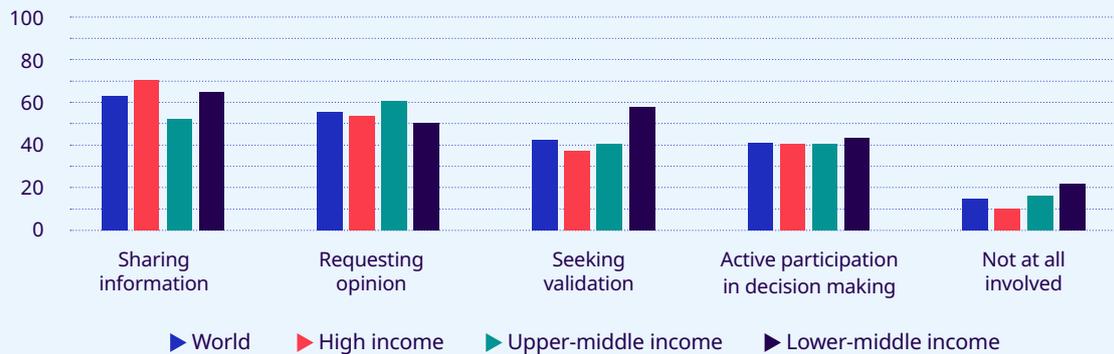


**A human-centred approach to public employment services' digitalization becomes crucial in tackling citizens' accessibility barriers and ensuring that leapfrogging is sustainable.** Digitalizing public employment services offer great potential to expand service coverage in a cost-effective manner; however, implementing digital access to employment services needs to be done in a way that is compatible with inclusiveness. As the COVID-19 pandemic continues to disrupt labour markets, it is crucial that emerging and developing economies avoid premature withdrawal of fiscal support to sustain existing jobs, facilitate job matching and maintain labour market attachment. Public spending in support of economic recovery also requires budgetary provisions to ensure that the digital leapfrogging and transformation of public employment services become a stable way of operating. Regular investment is needed to scale up the technology-facilitated services that have proven effective. Whether public employment services opt for implementing digital-first policies or digitalizing selected services only, such decisions need more than technology acquisition to make the public employment services system work for all people. Public employment services that are considering integrating technology to support delivery

also require skilled staff, good digital governance and robust cybersecurity. Across regions, public employment services also fulfil an important policy objective, which is servicing groups of the population facing compounded barriers to employment. Investment in digital technology, hence, should be balanced with functioning physical facilities to ensure that clients with weak digital skills or connectivity barriers can access a dedicated level of support for job searching and applying for employability improvement.

**Involving the social partners in the public employment services’ digital journey can contribute to removing barriers to digital inclusion and leapfrogging.** Social partners can have an active role in setting up, coordinating, advising and ensuring that the right building blocks are in place to support the digital transformation of the public employment services while services remain digitally inclusive. They can become strategical allies in mobilizing financial resources and support not always available within the area of influence of the public employment services. For example, they can reach out to decision-makers and influential stakeholders who can contribute towards improving the public employment services’ access to ICT infrastructure and technology. Around 40 per cent of the responding public employment services reported that they actively involved the social partners in decision-making for technology adoption. The public employment services respondents across all regions and regardless of country income level reported that they mainly shared information or requested the opinion of the social partners when implementing new technologies. In the lower-middle-income countries, 57 per cent of the public employment services respondents declared they sought the validation of employers’ and workers’ organizations. This practice was reportedly less common in the high-income and upper-middle-income economies (figure 14).

▶ **Figure 14. Type of technology facilitating public employment services’ interactions of variable complexity with social partners, by type of service and country income group, 2020 (percentage)**



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.



# ▶ 4

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## Preparing for the future

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All the public employment services participating in this global survey had explored, with varying degrees of success and speed, the use of information and digital technologies. The ongoing COVID-19 crisis has exposed the need for public employment services to advance with the implementation of technology in favour of more personalized services and accurate job matching. Advanced technology applications for public service delivery are expected to be central to the next technological transformation phase of government services. The pandemic has demonstrated the value of digital technologies to secure delivery of government support remotely and in a more coordinated way.

The global survey found that despite the evolution of advanced technology, most public employment services were struggling with adoption at scale. The current digital divide between persons with access to web-based services and those without risks being exacerbated by the increasing use of advanced technologies, such as artificial intelligence. Public employment services need to ensure that no jobseeker, worker or employer is left behind. Adopting a human-centred approach can help to overcome the challenges of disjointed and disconnected interventions as well as encourage an integrated policy response that is inclusive and conducive to a sustainable COVID-19 crisis recovery.

### 4.1 Towards effective digital transformation of public employment services

As the COVID-19 pandemic continues to disrupt labour markets, reliance on digital channels to deliver services is forcing public employment services to accelerate change. Investment in extending services through remote delivery channels and web-based technology was wider in scope and complexity by the public employment services in high-income countries. The public employment services in the upper- and lower-middle-income categories were confronted with operational capacity gaps, constraints in financing technological innovation and overall lack of connectivity infrastructure. In this context, the global survey investigated the existing challenges to and opportunities for the public employment services to become more digital.

## Challenges

The responding public employment services were asked to identify three main challenges to the adoption of information and digital technologies. Their responses confirm that progress towards effective digitalization remains fragmented, with an increasing risk to greater digital exclusion for groups already facing vulnerability in the labour market. At the top of the challenges was the need to more frequently upskill staff, although this was cited by more respondents in the lower-middle-income (71 per cent) and upper-middle-income (68 per cent) countries than in the high-income economies (33 per cent), which considered it a moderate challenge (table 16). Data protection threats were cited by all public employment services respondents, regardless of income level category, as the second most important barrier to technology adoption. Clients' low ability to connect to the internet and go online came as the third most significant challenge for the public employment services respondents, particularly those in the lower-middle-income countries where the digital divide is more pronounced. Insufficient interoperability of data and systems as well as the absence of infrastructure were also factors making the adoption of technology more problematic for public employment services in the lower-middle-income countries. This points to the fact that piecemeal solutions or isolated digitalization efforts could be a risk if they are not designed to be scaled or interoperable.

► **Table 16. Top challenges to public employment services' technology adoption, by country income group, 2020 (percentage)**

Top challenges	World	High income	Upper-middle income	Lower-middle income
A need to more frequently up-skill staff	54	33	68	71
Data protection threats	45	40	44	57
Clients' low digital skills/ability to go online	42	33	36	71
Insufficient interoperability of data and systems	38	33	36	50
Absence of required infrastructure	35	20	36	64

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

## Opportunities

**Information and digital technology can bring benefits to public employment services, particularly for improving the performance of staff and the client experience.** Respondents (especially in the high-income economies) considered that going digital represented an opportunity to automate some repetitive tasks (table 17). Technology was considered a time multiplier, freeing up time for staff to focus on clients who need enhanced and personalized support to overcome barriers to employment. Improving the clients' experience with digital services came as the second-most significant opportunity that public employment services can gain from using technology. The public employment services in the high-income and lower-middle-income economies attached great importance to offering clients smooth access to employment services. Another substantial benefit reported by the public employment services in the high-income category was the increases in time savings as a result of automation of tasks and processes. Similarly, the public employment services in the upper- and lower-middle-income economies indicated major transparency improvements following the integration of technology into service delivery. Because this finding derived from self-reporting, a next step would be to further analyse service statistics.

► **Table 17. Greatest opportunities for public employment services' technology adoption, by country income group, 2020 (percentage)**

	World	High income	Upper-middle income	Lower-middle income
Freeing time for most in need customers	86	93	76	86
Improving customer experience	84	90	72	93
Facilitating access	83	83	80	86
Increasing average time savings	81	87	72	86
Improving transparency	80	73	84	86

Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

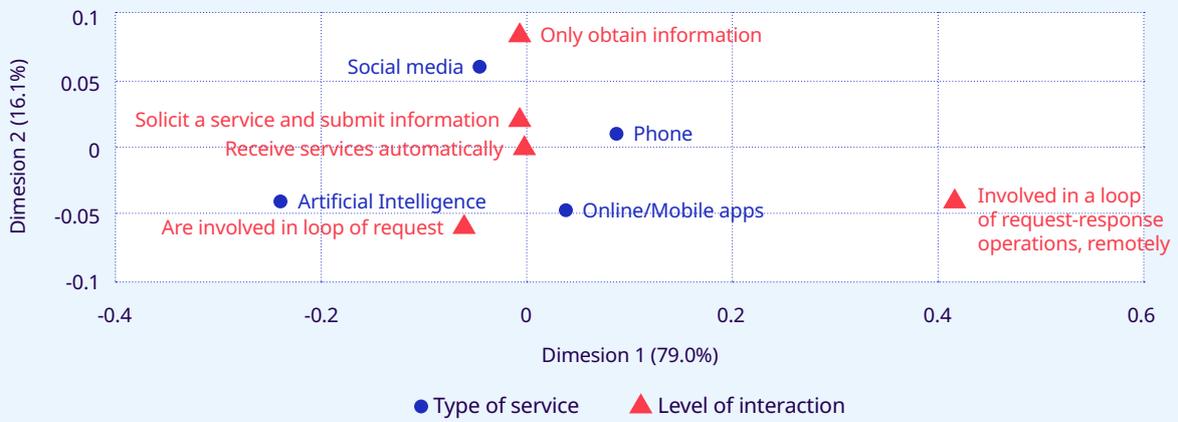
## 4.2 Making advanced technologies part of an inclusive digital transformation

**Advanced technologies will become widespread in the next decade, deeply changing how public employment services interact with clients and how they optimize service delivery.** A third of the public employment services responding to the global survey were developing modernization strategies to use new technologies, which included artificial intelligence, cloud-based services and machine learning. In the next decade, public employment services across all regions are expected to make more intense use of advanced technologies. Their success with the digital transformation, however, will not be entirely dependent on state-of-the-art technology but also on making technology work for people. This is one aspect of technological transformation of public services that the ILO strongly promotes.

Advanced technologies can have paradigm-changing benefits for public employment services, allowing for evidence-based decision-making, improved response times and more accurate targeting. All of this can then result in personalized services and connected transitions through jobs and careers. Advanced technologies also have the potential to increase interoperability and coordination across the full range of employment and labour market policies that governments are using in response to the pandemic. The global survey, however, found that most public employment services' clients could mostly only obtain information remotely and access services support over the phone or by email or SMS, as shown in the scattered plot in figure 15a. public employment services in high-income and upper-middle-income countries have primarily worked on service personalization in job matching by using technologies that range from geolocalization to job-matching algorithms. The public employment services in the upper-middle-income countries, however, are still underequipped to deliver individualized responses at scale. Service personalization is also nascent for the public employment services in the lower-middle-income economies. Self-assessment tools, counselling and case management are clearly areas of opportunity for improving responsiveness to clients. The public employment services in the upper and lower-middle-income tiers could consider adopting a service delivery strategy to advance efforts in this direction. Findings from the global survey indicate that having a digital strategy favoured provision of automated services and a higher level of interaction between the public employment services and clients (figure 15b).

Overall, the public employment services taking part in this global survey also agreed that technology offers them an opportunity to win over new clients, provided services are easy to access, safe and as intuitive as possible.

▶ Figure 15a. Technology facilitating public employment services' interactions of variable complexity with clients, by type of service, 2020



▶ Figure 15b. A digital transformation strategy favoured higher level of interaction between public employment services and their clients, by country income group, 2020 (percentage)



Source: ILO 2020 global survey on the use of technology by public employment services, generating 69 valid responses.

**The current digital divide between persons with access to web-based services and those without risks becoming wider as the use of advanced technologies grows.** The global survey found that despite the evolution of advanced technology, most public employment services were struggling with adoption. The public employment services in high-income countries were using algorithms and machine-learning technologies to make predictions on the evolution of labour markets and job matching. And yet, the potential of advanced technologies is still untapped. Capacities need to be further developed. Data quality is a major barrier particularly affecting public employment services in the upper- and lower-middle-income countries. Critical challenges also remain in core infrastructure, such as electricity and connectivity, human capital and data governance. While advanced technologies can bring efficiencies to job matching, the use of algorithmic decision-making to pre-screen job candidates and for recruitment also opens up the possibility for bias and discriminatory practices towards underrepresented groups. Good governance and the regulation of job matching and recruitment service providers operating in partnerships with public employment services are paramount for promoting equality of opportunity and treatment in access to the labour market. Public employment services are an essential resource to help jobseekers and employers in adapting to change and participating in the economy through decent work. The [Employment Service Convention, 1948 \(No. 88\)](#) requires that public employment services remain cost-free for their clients and open to everyone who needs support in searching for employment or in hiring workers, including when this takes place through digital channels.

**Advanced technology still needs a human component to be responsive and inclusive.** Placing clients at the centre of technology transformations implies redesigning processes in favour of more individualized responses and inclusive practices. Public employment services must consider digitalization strategies driven by a human-centred approach if they are to remain inclusive and reflect on what services and processes are important to automate when applying advanced technology and what delivery channels they need to keep to more effectively serve jobseekers and employers. The digital transformation must consider the ways in which the public employment services meet everyone's needs through better design of job-search support, whether online, face to face or by phone. While there is a clear trend towards service digitalization and use of advanced technologies, when it comes to ensuring greater accessibility and inclusiveness, public employment services need mixed approaches and a human touch.

### 4.3 The way forward

As the labour market starts to recover from the COVID-19 crisis, public employment services must seize this unique opportunity to use technology to strengthen service delivery with a human-centred approach that improves diversity, equity and inclusion for all. The technological transformation of public employment services involves the streamlining of processes and operations, developing new models for service delivery and connecting more closely with clients' needs. It is crucial that in the recovery phase, public employment services consolidate the investments in technology made prior and in response to the pandemic. Efforts should be reoriented where necessary and strategies developed further as part of public employment services' daily operations and long-term delivery models. For the future, it is vital that public employment services prioritize investment in closing the capacity gaps that emerged through this global survey to:

- ▶ **Break down the silos that affect optimization and interagency coordination** for a more integrated delivery of services. This needs action at (i) the technical level to ensure interoperability across automation tools, applications and other technology solutions adopted by public employment services and (ii) at the process level to streamline operations and deliver higher-value services that meet clients' expectations.
- ▶ **Place data security and privacy on top of the agenda to enhance trust among clients and partners.** As societies and the world of work become more digital, public employment services' dematerialized services, processes and transactions with clients are likely to increase after the COVID-19 crisis finally passes. Prioritizing investments in securing data and building cybersecurity capabilities is imperative for public employment services. This will involve creating security awareness across the organization, delivery partners and the final users of services. Strick adherence to privacy policies is also the cornerstone on which to build a transparent and trusting relationship between public employment services and their clients and partners.
- ▶ **Prepare public employment services staff for a more digital environment and frequent demand shifts.** Training and upskilling staff in using technology can sharpen internal productivity and facilitate quick adaptation and the scaling up of services in response to unexpected and critical shocks. Getting public employment services staff fit to work remotely and using digital aids to streamline operations is as important as ensuring willingness to embrace more frequent technological change. Improving the continuous training is essential so that staff throughout each agency understands not just how to use new tools but also how they can help them make better decisions when advising jobseekers and employers. Training methodologies should also be adapted to increasingly hybrid work environments requiring public employment services staff to frequently shift from in-office to remote working modes.
- ▶ **Make technology work for all.** The digital transformation of public employment services must consider the ways in which technology meets everyone's needs through the better design of job-search support, whether online, face to face or by phone. Technology-facilitated services in particular need to be fully accessible to clients with weak digital literacy and to pinpoint solutions for ensuring that they are easy to access, safe and as intuitive as possible. Digital solutions should take account of the gender, social and cultural sensitivities and values of the diversity of clients that are supposed to use them. Public employment services must embrace their central role in contributing to closing the digital gap and equipping jobseekers, workers and businesses for increasing digital labour markets.

- **Keep social partners and stakeholders involved.** From the early design stages and throughout the digitalization journey, these actors can prove to be strategical allies that help navigate changes in government administration, overcome capability gaps and access untapped additional resources. Building consensus takes time, but it leads to solutions with a medium to long-term perspective. Social partners and relevant stakeholders can have a positive influence in channelling efforts and resources to make internet connectivity for all a tangible reality. In addition, building partnerships with private technology companies, social entrepreneurs or other national and international organizations can represent an effective way for governments to rapidly develop digital tools that otherwise would be outside of their financial capacities.



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# Annexes

## Annex 1. ILO global survey on public employment services using technology to improve delivery

Cluster	Subcluster	Questions
1. Governance	<b>Drivers for technology adoption</b>	<p>1.1 Rank the following factors motivating your public employment services agency to adopt technology, by order of importance:</p> <ul style="list-style-type: none"> <li>▶ Lower operational costs due to fiscal constraints</li> <li>▶ Improve the public employment services' overall performance</li> <li>▶ Expand service provision to more clients (jobseekers and employers)</li> <li>▶ Follow an explicit government policy directive (e-government)</li> <li>▶ Keep up to date with citizens' needs and improving client's experience</li> <li>▶ Keeping up with other peers and technology trends</li> </ul>
	<b>Strategy</b>	<p>1.2 Do you have a digital transformation strategy?</p> <p>1.2.1 The public employment services' technology strategy has:</p> <ul style="list-style-type: none"> <li>▶ An explicit public employment services policy document or guideline</li> <li>▶ Specific resource allocation</li> <li>▶ Alignment to an overall e-government commitment</li> </ul>
	<b>Data protection</b>	<p>1.3 Data protection regulations for public employment services include:</p> <ul style="list-style-type: none"> <li>▶ Requiring the consent of subjects for data processing</li> <li>▶ Anonymizing collected data to protect privacy</li> <li>▶ Sharing data on clients with other government or partners delivering services on behalf of the public employment services</li> <li>▶ Providing data breach notifications</li> <li>▶ Securing access for clients to their own files and records</li> <li>▶ Ensuring visibility and transparency to users on how their data are used and privacy is insured</li> </ul>

Cluster	Subcluster	Questions
<b>Governance (cont.)</b>	<b>Cybersecurity</b>	<p>1.4 The public employment services agency has in place the following protocols to ensure data protection:</p> <ul style="list-style-type: none"> <li>▶ Internal organizational awareness of the negative impact of cyberattacks</li> <li>▶ Standards and protocols for authentication</li> <li>▶ A strategy for security operations and management of cyber threats</li> <li>▶ No third-party or overseas services control personal data of public employment services clients</li> <li>▶ Cybersecurity infrastructure and technology</li> </ul> <p>1.5 Do you have a contingency plan for disruption or interruption of digital services?</p> <ul style="list-style-type: none"> <li>▶ Power loss</li> <li>▶ Cyberattacks</li> <li>▶ Data loss following data migration, upgrades, updates</li> <li>▶ Data theft</li> </ul>
	<b>Dialogue with social partners</b>	<p>1.6 The social partners are involved in decision-making processes concerning technology adoption in the public employment services agency through:</p> <ul style="list-style-type: none"> <li>▶ Active participation in decision-making</li> <li>▶ Seeking validation</li> <li>▶ Requesting opinion</li> <li>▶ Sharing information</li> <li>▶ Not at all involved</li> </ul>
<b>2. Service delivery</b>	<b>Availability of technology-based provision</b>	<p>2.1 The public employment services agency delivers which of the following listed services using one or more of the following technologies [a matrix was provided].</p>
	<b>Level of support</b>	<p>2.2 Technology-based service delivery to facilitate registration of jobseekers, vacancies and job matching mainly consists of:</p> <ul style="list-style-type: none"> <li>▶ Clients can only obtain information</li> <li>▶ Clients can invoke a service and receive only one response or return</li> <li>▶ Clients can solicit a service and submit information that will be processed by the public employment services staff</li> <li>▶ Clients are involved in a loop of request-response operations without a need to be physically present in public employment services' premises</li> <li>▶ Clients receive services automatically based on a previous registration of an event and preferences</li> </ul>

Cluster	Subcluster	Questions
Service delivery (cont.)	Delivery approach	<p>2.3 The approach to deliver services is:</p> <ul style="list-style-type: none"> <li>▶ Predominantly technology-based</li> <li>▶ Only selected services are technology-based</li> <li>▶ Face to face, mainly</li> </ul>
	Target groups	<p>2.4 Has technology contributed to improving service delivery for the following jobseekers likely to face disadvantage in the labour market?</p> <ul style="list-style-type: none"> <li>▶ Young people (younger than 25)</li> <li>▶ People with disabilities</li> <li>▶ Workers older than 50</li> <li>▶ Women as single parents</li> <li>▶ Migrant workers, refugees and displaced persons</li> <li>▶ Minorities and indigenous people</li> </ul>
3. Staff and clients skilling on technology	Staff learning and training	<p>3.1 The public employment services agency uses which of the following to develop technology-oriented skills for staff training [a matrix was provided].</p> <p>3.2 Regular IT training programmes for staff focus on:</p> <ul style="list-style-type: none"> <li>▶ Basic understanding of technologies, software and applications to support clients more effectively</li> <li>▶ Knowledge of digital rights, privacy, security and permanence of data</li> <li>▶ Basic ability to make use of information and data (basic issues of data storage, management and organization)</li> <li>▶ Advanced knowledge for analysing information and data (construct calculations, data mining and modelling scenarios)</li> </ul>
	Digital skills for clients	<ul style="list-style-type: none"> <li>▶ The public employment services agency uses the following to build up capacity of digitally illiterate clients:</li> <li>▶ Regular group training programmes at the public employment services' premises</li> <li>▶ One-on-one coaching and assistance at different service points</li> <li>▶ Collaboration with municipal governments and other stakeholders to offer digital skills</li> <li>▶ Online outreach through massive open online courses, webinars, YouTube</li> <li>▶ None of the above</li> </ul>

Cluster	Subcluster	Questions
<b>4. Data processing</b>	<b>Use of data</b>	<p>4.1 The public employment services agency uses digital technology for:</p> <ul style="list-style-type: none"> <li>▶ Data collection, storage and accessing data (Excel, Access or databases that are more sophisticated)</li> <li>▶ Data pre-processing (if software solutions are used for manipulation of data into a format that is consistent and can be used for further analysis)</li> <li>▶ Data integration tools (if software tools allow to pool information across different databases so they can be delivered through a single access point to clients)</li> <li>▶ Use of advanced technology, such as artificial intelligence, for analysis of data and decision-making (if deductive and advanced analytics are used)</li> </ul>
<b>5. Challenges and opportunities</b>	<b>Governance</b>	5.1 Please indicate the level of importance for each of the challenges that you have experienced following the adoption of technology for service delivery, where 3 is most important and 1 is less important [a matrix was provided].
	<b>Public employment services infrastructure</b>	
	<b>Staff</b>	5.2 The following opportunities are apparent following the adoption of technology-based delivery [a matrix was provided].
	<b>Clients</b>	

## Annex 2. Survey-responding public employment services, by country, sorted alphabetically

No.	Country	ILO Region	ILO's sub-region	Income group*
1	Albania	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
2	Armenia	Europe and Central Asia	Central and Western Asia	Upper-middle
3	Australia	Asia and the Pacific	South-Eastern Asia and the Pacific	High
4	Austria	Europe and Central Asia	Northern Southern and Western Europe	High
5	Azerbaijan	Europe and Central Asia	Central and Western Asia	Upper-middle
6.a	Belgium (Brussels)	Europe and Central Asia	Northern Southern and Western Europe	High
6.b	Belgium (Flanders)	Europe and Central Asia	Northern Southern and Western Europe	High
6.c	Belgium (Wallonia)	Europe and Central Asia	Northern Southern and Western Europe	High
7	Bolivia (Plurinational State of)	Americas	Latin America and the Caribbean	Lower-middle
8.a	Bosnia and Herzegovina (Eiors)	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
8.b	Bosnia and Herzegovina (Esobd)	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
8.c	Bosnia and Herzegovina (Fei)	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
8.c	Bosnia and Herzegovina (Lea)	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
9	Brazil	Americas	Latin America and the Caribbean	Upper-middle
10	Bulgaria	Europe and Central Asia	Eastern Europe	Upper-middle
11	Burundi	Africa	Sub-Saharan Africa	Lower-middle
12	Cambodia	Asia and the Pacific	South-Eastern Asia and the Pacific	Lower-middle
13	Canada (Quebec)	Americas	Northern America	High
14	Chile	Americas	Latin America and the Caribbean	High
15	China	Asia and the Pacific	Eastern Asia	Upper-middle
16	Colombia	Americas	Latin America and the Caribbean	Upper-middle
17	Costa Rica	Americas	Latin America and the Caribbean	Upper-middle
18	Croatia	Europe and Central Asia	Northern, Southern and Western Europe	High
19	Cyprus	Europe and Central Asia	Central and Western Asia	High
20	Denmark	Europe and Central Asia	Northern Southern and Western Europe	High
21	Estonia	Europe and Central Asia	Northern Southern and Western Europe	High

No.	Country	ILO Region	ILO's sub-region	Income group*
22	Finland	Europe and Central Asia	Northern Southern and Western Europe	High
23	France	Europe and Central Asia	Northern Southern and Western Europe	High
24	Gabon	Africa	Sub-Saharan Africa	Upper-middle
25	Germany	Europe and Central Asia	Northern Southern and Western Europe	High
26	Honduras	Americas	Latin America and the Caribbean	Lower-middle
27	India	Asia and the Pacific	Southern Asia	Lower-middle
28	Indonesia	Asia and the Pacific	South-Eastern Asia and the Pacific	Upper-middle
29	Japan	Asia and the Pacific	Eastern Asia	High
30	Kazakhstan	Europe and Central Asia	Central and Western Asia	Upper-middle
31	Kenya	Africa	Sub-Saharan Africa	Lower-middle
32	Korea Republic of	Asia and the Pacific	Eastern Asia	High
33	Kosovo	Europe and Central Asia	Central and Western Asia	Upper-middle
34	Lebanon	Arab States	Arab States	Upper-middle
35	Luxembourg	Europe and Central Asia	Northern Southern and Western Europe	High
36	Malta	Europe and Central Asia	Northern Southern and Western Europe	High
37	Mexico	Americas	Latin America and the Caribbean	Upper-middle
38	Moldova	Europe and Central Asia	Eastern Europe	Lower-middle
39	Montenegro	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle
40	Morocco	Africa	Northern Africa	Lower-middle
41	Myanmar	Asia and the Pacific	South-Eastern Asia and the Pacific	Lower-middle
42	Netherlands	Europe and Central Asia	Northern Southern and Western Europe	High
43	Panama	Americas	Latin America and the Caribbean	High
44	Papua New Guinea	Asia and the Pacific	South-Eastern Asia and the Pacific	Lower-middle
45	Paraguay	Americas	Latin America and the Caribbean	Upper-middle
46	Peru	Americas	Latin America and the Caribbean	Upper-middle
47	Philippines	Asia and the Pacific	South-Eastern Asia and the Pacific	Lower-middle
48	Portugal	Europe and Central Asia	Northern Southern and Western Europe	High
49	Qatar	Arab States	Arab States	High
50	Romania	Europe and Central Asia	Eastern Europe	High
51	Russia	Europe and Central Asia	Eastern Europe	Upper-middle
52	Serbia	Europe and Central Asia	Northern Southern and Western Europe	Upper-middle

No.	Country	ILO Region	ILO's sub-region	Income group*
53	Singapore	Asia and the Pacific	South-Eastern Asia and the Pacific	High
54	Slovenia	Europe and Central Asia	Northern Southern and Western Europe	High
55	South Africa	Africa	Sub-Saharan Africa	Upper-middle
56	Spain	Europe and Central Asia	Northern Southern and Western Europe	High
57	Sweden	Europe and Central Asia	Northern Southern and Western Europe	High
58	Tunisia	Africa	Northern Africa	Lower-middle
59	Turkey	Europe and Central Asia	Central and Western Asia	Upper-middle
60	Ukraine	Europe and Central Asia	Eastern Europe	Lower-middle
61	United Kingdom	Europe and Central Asia	Northern Southern and Western Europe	High
62	United States	Americas	Northern America	High
63	Uruguay	Americas	Latin America and the Caribbean	High
64	Zimbabwe	Africa	Sub-Saharan Africa	Lower-middle

Note: \* World Bank classification of economies by income level, 2019 (<https://blogs.worldbank.org/opendata/new-country-classifications-income-level-2019-2020>).

### Annex 3. Public employment service delivery models: Technology uptake and adoption

ILO region	Approach	Countries	No. of public employment services
Americas	<b>Predominantly technology-based</b>	Bolivia, Chile, Costa Rica, Mexico, Paraguay, Peru and United States	7
	<b>Selected services only</b>	Brazil, Colombia, Honduras and Panama	4
	<b>Face to face mainly</b>	Canada (Quebec) and Uruguay	2
Africa	<b>Predominantly technology-based</b>	Morocco and South Africa	2
	<b>Selected services only</b>	Burundi, Gabon, Kenya and Tunisia	4
	<b>Face to face mainly</b>	Zimbabwe	1
Asia and the Pacific	<b>Predominantly technology-based</b>	India and Indonesia	2
	<b>Selected services only</b>	Cambodia, China, Republic of Korea, Philippines and Singapore	5
	<b>Face to face mainly</b>	Australia, Japan, Myanmar and Papua New Guinea	4
Arab States	<b>Predominantly technology-based</b>	Qatar	1
	<b>Selected services only</b>	Lebanon	1
	<b>Face to face mainly</b>	None	0
Europe and Central Asia	<b>Predominantly technology-based</b>	Belgium (Flanders), Belgium (Wallonia), Denmark, Finland, Malta, Moldova and United Kingdom	7
	<b>Selected services only</b>	Albania, Austria, Azerbaijan, Belgium (Brussels), Bosnia and Herzegovina (Eiors), Bosnia and Herzegovina (Fei), Bulgaria, Croatia, Cyprus, Estonia, France, Germany, Kazakhstan, Kosovo, Luxemburg, the Netherlands, Russian Federation, Serbia, Slovenia, Spain, Turkey and Ukraine	22
	<b>Face to face mainly</b>	Armenia, Bosnia and Herzegovina (Esobd), Bosnia and Herzegovina (Lea), Montenegro, Portugal, Romania and Sweden	7



International  
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