Report on the global survey into the use of information and communication technologies in national labour administration systems

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November 2015

GOVERNANCE AND TRIPARTISM

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Foreword

Current global technological changes present national labour administration systems with opportunities to increase the efficiency and effectiveness of the internal management and external delivery of their services. However, the International Labour Organization finds that many labour administrations perceive deficits in their knowledge regarding the experiences of adopting, implementing and using new Information and Communication Technologies, both in terms of the benefits they offer and the challenges they pose. These experiences – both good and bad – must be shared and understood in order to improve the potential of new technologies to enhance the performance of the key pillar of labour administration – that of labour inspection – as well as the functioning of other important functions, such as dispute prevention and resolution and public employment services.

The principal objective of this publication is to provide an overview and analysis of the current situation regarding the use of Information and Communication Technologies in labour administrations worldwide, in order to help practitioners who seek to respond to the demands of the current technological environment and harness its potential. This paper is based on a global comparative study of the Information and Communication Technology strategies of national labour administration systems, commissioned by the International Labour Organization within the framework of Area of Critical Importance 7 (Strengthening Workplace Compliance through Labour Inspection). Indeed, the evidence discussed within this paper suggests that new technologies can significantly strengthen the capacity of governments to enhance compliance with labour laws and regulations. Comparing international practices in this area may indeed present a new avenue for the International Labour Organization to provide technical cooperation and advisory services.

This paper is the first initiative of the International Labour Organization to focus broadly on the use of Information and Communication Technologies in national labour administration systems. The majority of the information presented herein was collected directly from the field of labour administration through the use of a survey questionnaire, electronic interviews and in-person consultations with field specialists. The value of this study is also enhanced by presenting the experiences of both developed and developing countries. The paper is intended to stimulate further debate on the benefits and challenges of the wider use of Information and Communication Technologies in labour administration systems and to make appropriate recommendations for labour ministries and other labour administration bodies.

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Executive summary

The placement of new technologies on the public sector modernization agenda over 25 years ago has revolutionized the way in which many labour administration institutions manage and deliver their services. New technologies, or Information and Communication Technologies (ICT), are understood to describe any mode of digital technology that exists to help public sector agencies gather, manage, transmit and use information to manage and deliver services to constituents. Most commonly, this refers to the various uses of computer-based and networking technology, including the Internet and cellular networks. However, so far there has been little analysis of how labour administration institutions operate in a complex technological environment in terms of the organizational adoption, use, results and impact of new technologies. This is particularly relevant in relation to promoting and ensuring labour law compliance, delivering public employment services, preventing and resolving employment disputes, as well as the internal systems for personnel management, planning, budgeting and knowledge sharing.

Appropriate use of new technologies has the potential to improve the efficiency and effectiveness of national labour administrations. The study reported herein paves the way for a discussion about how the use of new technologies can further increase the efficiency and effectiveness of service management and delivery in labour administration systems, through providing institutions with comparative information and advice. It is intended as a tool to assist policymakers and practitioners involved in labour administration at the national level to assess their own ICT practices and policies.

Methodologically, the study is based on an electronic questionnaire which was sent to 185 Member States of the International Labour Organization and returned by 101 labour administration institutions from 81 countries. [1] Moreover, electronic interviews with labour administration actors and in-person consultations with labour administration field experts were also conducted.

As the first of its kind, this study is founded on three crucial dimensions of ICT adoption: its extent, the benefits it brings and the challenges it poses. The survey was focused on establishing which tools and channels were being used by the various institutions forming the system of labour administration, and the extent to which they are used in the provision of employment information and services to employers, workers and other governmental institutions. Another area of focus was the perceived benefits and challenges in terms of both human and institutional capacity, the employment relationship and barriers to further ICT expansion. The overview and analysis is presented in five chapters.

Global trends in the use of ICT in labour administration in 2015

Chapter 1 provides a background for the study by summarizing the scope of recent changes in the use of ICT in labour administration. All over the world, the extent of ICT use in labour administration systems has increased. However, while the diffusion of new technologies across the labour administration functions in developed countries is both profound and continuing at a rapid pace, developing countries do appear to be catching up and are also making progress, albeit at a slightly slower rate. Most labour administration institutions adopt new technologies because they are aware of their operational benefits (92 per cent of respondents). However, labour administrations in developing countries

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[1] At the time of going to print, two more questionnaires were returned by Service public fédéral Emploi, Travail et Concertation sociale of Belgium and Employment Directorate of India. Moreover, interest in providing futher information for the study was expressed by Ministerio de Trabajo y Promoción del Empleo of Peru. This information has been retained and may by subject to further review in the future.

seem to be attaching more importance to following the practices of other institutions (40 per cent of respondents in developing countries versus 18 per cent of respondents in developed countries). Many labour administration systems are making use of new technological tools, either through on-site institutional provisions or – in some developing countries – through resorting to the use of personal devices. Email and websites continue to be the most commonly used digital communication channels. Intranets are relatively popular, but significantly more so in developed (89 per cent of respondents) than in developing countries (61 per cent of respondents). Social media is emerging as a budding new digital communication tool, with its communicative potential being harnessed by just less than half of respondents. Mobile applications, Google reference and Wikipedia own pages are however only just being explored. Labour administration practitioners undertaking work in the field are often equipped with portable computers and mobile phones, yet there is still significant scope for greater deployment of mobile devices.

Benefits of ICT use in labour administration

Chapter 2 discusses the benefits of ICT adoption and highlights how the potential of ICT has been realized to improve institutional communication and collaboration for knowledge sharing. In particular, the greatest improvements were reported in the information flows between officials at different levels of the organizational hierarchy (72 per cent of respondents), both up and down the chain of command. These improvements were mainly attributed to the easier collection, presentation and provision of work-related information to employees (70 per cent of respondents) and the subsequent improvements in employee awareness of organizational activities (71 per cent of respondents). The reach of labour administration institutions was also reported to have increased (87 per cent of respondents), linked predominantly to the increased use of websites and emails (84 per cent and 74 per cent of respondents respectively), as well as to the growing deployment of social media in the form of Facebook (48 per cent of respondents), Twitter (32 per cent of respondents) and YouTube (34 per cent of respondents).

Challenges and risks of ICT use

Chapter 3 discusses the challenges, drawbacks and costs of introducing new technologies into labour administration, issues which future efforts must consider. Contrary to popular beliefs, the implementation of ICT does not always result in any cost reduction (15 per cent of respondents). Moreover, limited financial resources remain the biggest challenge to the further use of ICT (73 per cent of respondents). Despite the prevalence of ICT budgets (70 per cent of respondents), there is disparity on a global scale regarding the importance attached to further investments in new technologies. The digital divide persists both within and between developed and developing countries, typically due to poor technological connectivity of the general public (28 per cent of respondents) and relatively high levels of technological illiteracy (30 per cent of respondents). This issue is often addressed through the provision of public-access points, whose infrastructure is adjusted to the needs of the general public. However, simultaneous ICT capacity building programmes must also be provided for labour administration officials in order to address the insufficient level of ICT skills and capabilities (44 per cent of respondents). This can be facilitated through the creation of dedicated ICT departments (currently reported by 74 per cent of respondents) and incorporation into official organization-wide ICT plans (reported by 72 per cent of respondents).

Innovative use of technology in labour administrations worldwide

Chapter 4 looks at case studies of the use of new technologies from the fields of labour inspection, public employment services and dispute prevention and resolution. With 56 per cent of respondents reporting the use of an integrated computerized inspection management system, only 20 per cent noting the use of mobile inspection software, just under half of respondents transferring some public employment services to the online domain and only 26 per cent using a specialized computer-based toolkit for managing

workplace conflicts, it would appear that there is significant scope for the better use of new technologies across all functions of labour administration systems.

Issues of priority on the ICT policy agenda of global labour administration

Chapter 5 combines key findings from the study with insights from the e-government literature to outline general recommendations on the preconditions for the effective use of new technologies and, relatedly, to provide implications for policy makers from specialized areas of labour administration.

- There must be a careful identification of genuine needs for the use of new technologies in labour administration to enhance service management and delivery.

- Investment in physical ICT infrastructure should be placed high on the modernization agenda, particularly in developing countries where labour administration officials often resort to using personal devices.

- Organization-wide planning and visions should be elaborated and communicated clearly in order to stimulate a shared ICT culture and to promote a sense of commitment to the technological transformation of the institution.

- ICT departments or units could also be established to provide labour administrators with technical support, as well as to initiate and facilitate ICT capacity building programmes to meet appropriate staff training needs.

- More planning is still needed with regards to social media to help mitigate the problems associated with the appropriateness and accuracy of the information put out, the privacy of the information being exchanged and the allocation of human and financial resources for overseeing social media activity.

Introductory remarks

Technological development has produced an ever larger and more expensive material component (the "hardware") and this facet has necessarily resulted in ever larger organizations, ever more centralization (…) Only a science-fiction-type technological breakthrough – like a breast-pocket computer, perhaps – could reverse this trend toward increasing organization size and centralization (Thompson 1975, p. 33).

As the above quote illustrates, 40 years ago it was understood that the extent of technological transformations could drive organizational structures, but the timing and extent of future developments could at this point only be imagined. The computer revolution – which began in the 1970s, expanded dramatically in the 1990s and was further propelled by the arrival of Web 2.0 in the 2000s – has brought attention to the emergence of new discourses and practices under the umbrella term of the digital age, in both developed as well as in developing countries. The main force enabling the response to these new demands and opportunities is embodied by Information and Communication Technology (ICT), which is commonly understood as encompassing the various uses of computer-based and social networking technology, including the Internet and mobile communication solutions (ILO 2010b). In particular, the literature on e-government – a term which has come to describe the use of the Internet or other digital means for the enhanced delivery of government information and services (UN/ASPA 2002; OECD 2003; West 2004) – has positioned ICT at the centre of this innovative strategy, arguing that the adoption of ICT can enhance the way in which public institutions, including labour administration and inspection bodies, manage and deliver services (ILO 2010b).

In practice, the public sector has responded incrementally to the challenges of new technologies, in both developed (Allen et al. 2001) and developing countries (Ndou 2004; Gichoya 2005; Lau et al. 2008; Schuppan 2009; Weerakkody et al. 2012; Thapa and Sæbø 2014). In light of the limited resources available to labour administration systems, it is particularly imperative to scrutinize the optimistic proclamations of public administrators and technology gurus, something which this paper undertakes through analysing the actual impact of ICT on the efficiency and effectiveness of systems of labour administration. What forms of technology do systems of labour administration use and what services do they provide through the use of technology (Part I)? What are the main benefits of using ICT in labour administration (Part II)? What are the drawbacks, challenges and costs on which future efforts should be focused? (Part III)? How can these lessons be demonstrated by case studies from the fields of labour inspection, Public Employment Services (PES) and dispute prevention and resolution (Part IV)? And finally, what are the basic preconditions for the effective use of new technologies and, relatedly, what are the relevant policy implications for labour administration officials (Part V)?

With a view to explore these questions, in the winter of 2015, the International Labour Organization (ILO) surveyed national labour administration systems in its 185 Member States. In-person invitations to complete the questionnaire were also issued during various meetings of ILO specialists. Finally, hard copies of the survey were distributed to designated government representatives attending the 104th Session of the International Labour Conference (ILC), held in June 2015. The survey can be consulted in Appendix 1. Table 1 summarizes the profiles of the respondents who completed the questionnaire. It was left to the ministries of labour to decide whether they would complete one questionnaire for the entire labour administration system, or whether they would distribute the survey to the institutions under their purview. In consequence, some countries returned multiple surveys, meaning that there is not a one-to-one correspondence between the number of returned surveys and the number of responding countries (Table 2). Therefore, some countries may be over-represented among survey respondents, while other respondents may perceive their responses as being potentially diluted by multiple

responses from other Member States. For this reason, the findings reported herein must be treated with caution. Further details of survey respondents can be found in Appendix 2.

Table 1.   Respondents by income and development

By stage of development	Number of returned surveys
Developed [2]	57
Developing [3]	44
Total	101

Table 2.   Respondents by region

By region	Number of returned surveys	Number of responding countries out of all countries within the region
Europe and Central Asia	54	35 out of 51
Asia and the Pacific	12	11 out of 34
Arab States	8	8 out of 11
Americas	15	15 out of 35
Africa	12	12 out of 54
Total	101	81

Additional information, both general and national context-specific, was collected through follow-up, clarifying and explanatory email interviews with respondents who had returned completed questionnaires, face-to-face consultations with labour administration and inspection specialists, and desk research consisting of reviews of official reports, academic and official work-in-progress documents, minutes and presentations from thematic expert meetings and publicly available multimedia materials.

Unless otherwise stated, all data reported herein comes from the questionnaire or from the qualitative follow-up research. The statistical data has been rounded to the nearest whole number. Throughout the paper, the term ILO Survey is used to refer to primary data. Secondary data is acknowledged conventionally through the use of footnotes, in-text citations and references which can be consulted at the end of the document.

This paper relies on self-reported measures provided by the responding institutions. Their correctness could not be verified independently (such as through face-to-face interviews or on-site observation) due to the exploratory nature of this study. Relatedly, as all questions were prepared in English, French, Spanish and Chinese, they may have been understood differently by the various respondents. The lack of direct interaction with respondents also means that a proper understanding of the questions could not be established. Finally, some respondents failed to provide answers to general questions or skipped appropriate follow-up questions. The findings and recommendations presented in this paper are therefore based on incomplete data and thus must be treated with caution.

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[2] Following the World Bank country classification, developed countries comprise of high income economies (World Bank 2015).

[3] Similarly, developing countries comprise of low income, lower-middle income and upper-middle income economies (World Bank 2015).

Part I. Global trends in the use of ICT in labour administration 2015

Since its placement on the public sector modernization agenda, ICT has been touted as the critical change agent in public administration (OECD 1997). Although often thought of in terms of Internet-capable devices – owing to the growing online presence of the public sector since the 1990s (Kampen and Snijkers 2003) and the adoption of interactive e-government tools since the 2000s (Nasi and Frosini 2010) – public administration's adoption of technology is much broader than this. It covers everything from the use of mobile data infrastructure through Web portals and networked computer systems, traditional telecommunication through the telephone, television and radio, to investments in basic office equipment. As one might expect, the ILO Survey found that not only can ICT improve the internal efficiency of public administration through automation, it also enhances the effectiveness of external functions by broadening the channels of communication and facilitating the expression of a development agenda grounded in sustainability, knowledge sharing and social inclusion.

1. Changes in the extent of ICT use

The ILO Survey found that all responding Member States have taken advantage of ICT developments to drive significant reforms in their internal management and external service delivery systems. As demonstrated by Figure 1, the vast majority of respondents (69 per cent) have seen a significant increase in the computerization and digitization of their institutional processes in times of technological progress within the business environment. Joining the trend towards the greater use of new technologies, 27 per cent of responding labour administrations have also seen some increase. This suggests that overall, both access to technological infrastructure and the technological capacity of labour agencies and their subordinate specialized agencies are growing. However, the statistical distribution reveals that this growth was slightly higher in developed than in developing countries, with 74 per cent of respondents seeing it as significant in developed countries, against 64 per cent of respondents in developing countries. Additionally, 21 per cent of respondents from developed countries noted only some increase, versus 34 per cent of respondents from developing countries.

Figure 1.   Percentage of labour administrations reporting significant, some or no change in ICT use
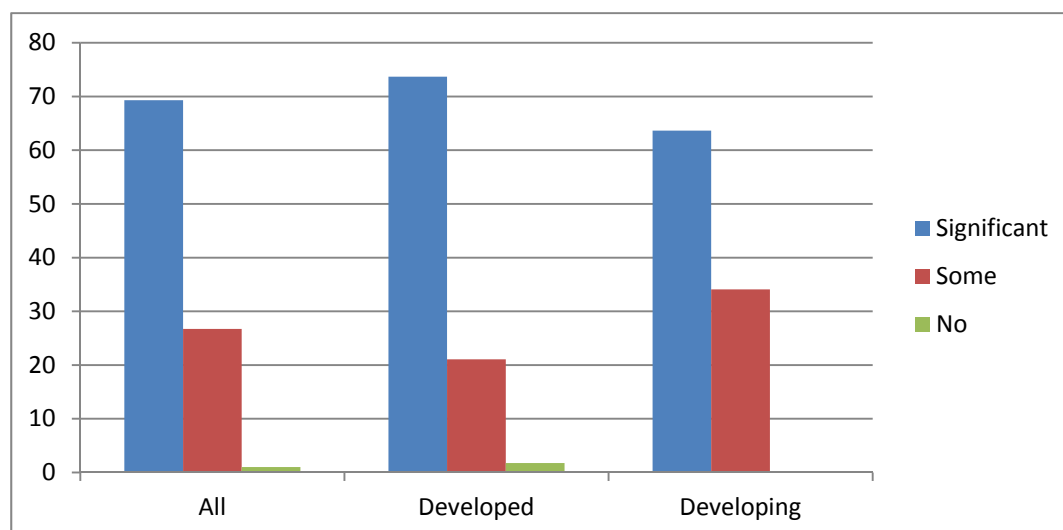
These findings suggest that while the diffusion of new technologies across the labour administration functions in developed countries is both profound and continuing at a rapid pace, as exemplified in Box 1, developing countries are also making progress, albeit at a slightly slower rate.

Box 1: The use of ICT in the Ministry of Social Affairs of the Republic of Estonia

In Estonia, many of the public services are available online on the State Portal website (www.eesti.ee/eng/start), meaning that many interactions and transactions between citizens and the government can take place online. More than 1.1 million people in Estonia (approximately 90 per cent of inhabitants) have identity cards, which can be used as proof of identity when using online services. Inside the card is a chip that holds two certificates, one to authenticate identity and one to render a digital signature. In addition to the ID card, citizens can also use a mobile phone to identify themselves for online services.

According to the Public Information Act, courts, government agencies and legal persons in public law are required to maintain websites for the disclosure of information. A lot of information, including contact details, is available on these websites, meaning that the general public is able to communicate easily with government agencies and other public bodies via email or telephone. For example, the Labour Inspectorate maintains a hotline for people seeking advice or answers to their questions concerning labour law and the working environment.

The Ministry of Labour maintains a website with considerable information about its various programs, as well as an Intranet for its employees which includes a noticeboard, a calendar of forthcoming events, a news section and so on. The Ministry's employees use landline telephones, mobile telephones and email to communicate with each other. Workstations are equipped with a personal computer, personal telephone and shared printers and scanners. Fax machines are not used frequently as most documents are now sent via email.

The Ministry maintains a portal where individuals are able to, among other things, notify the labour inspectorate about the start of activities and submit required reports on work accidents and occupational diseases. Also, in collaboration with the Ministry, the Labour Inspectorate maintains a website that gives an overview of areas concerning the working environment and employment relationships, as well as information about training and events. The Ministry also has a Facebook page in an effort to reach a younger audience.

Filing an application with the labour dispute committee can also be done electronically by signing the application digitally and sending it via email. Email is also used to notify the parties of hearings and to deliver decisions.

Jobseeker registration, employment registration, vacancy advertising, job matching and tax advice are all available online. The Estonian Unemployment Insurance Fund maintains a website with all the necessary information for jobseekers and employers, including information about services and financial benefits.

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2. Reasons for the use of new technologies

The ILO Survey found there to be an overall consensus that the sensible adoption of ICT can improve the efficiency and effectiveness of labour administration. As can be seen from Figure 2, benefiting from ICT in support of work was the main reported reason for adopting ICT, with a staggering 92 per cent of respondents describing this as being very important. Using technology to meet the increasing demands for public services was also almost uniformly recognized as very important, by 73 per cent of respondents, and classed as important by 22 per cent of responding state labour institutions. However, there was some variability in the perception of ICT's potential to improve legislative compliance, with 14 per cent of respondents questioning its importance. Nevertheless, following the practices of other labour institutions was the least frequently described as very important (29 per cent of respondents), at best seen as only important (by 45 per cent of respondents) and most often marked as unimportant or not applicable to the situation of the responding state labour institution (18 per cent). On the one hand, this could mean that most labour administration institutions adopt new technologies because they are aware of their operational benefits, as opposed to uncritically jumping on the ICT bandwagon or succumbing to political or institutional pressures. On the other hand however, it could also mean that national labour systems have missed an opportunity to learn collaboratively from each other's experiences.

Figure 2. Percentage of labour administrations reporting various reasons for the use of ICT
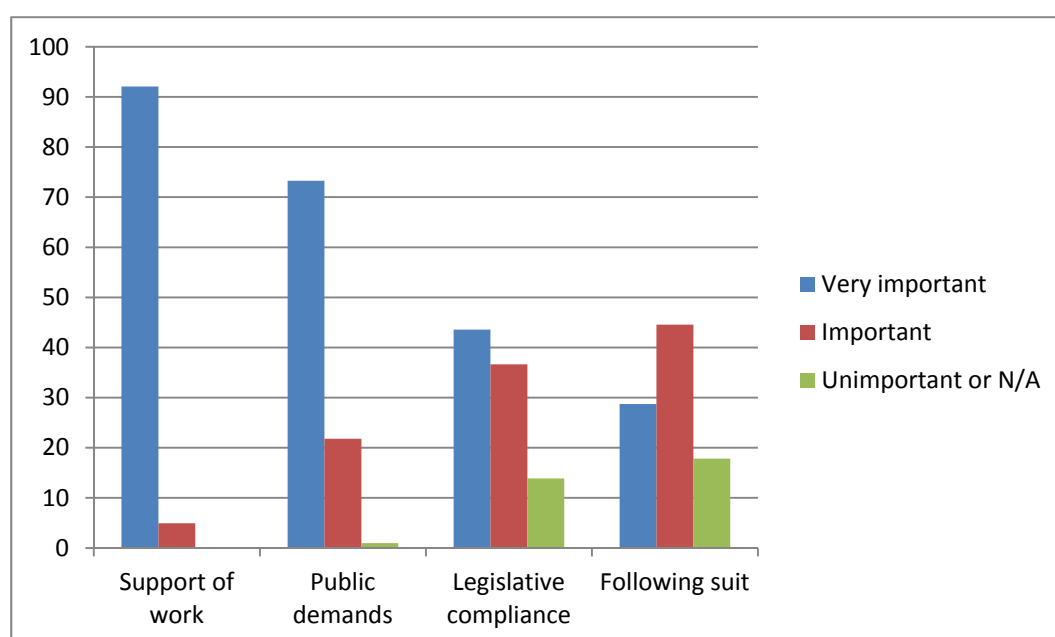
Although in general a similar pattern of responses was provided by respondents from developed countries (Figure 3), the evidence suggests that in developing countries (Figure 4), greater significance is attached to adopting ICT to better comply with legislation or to follow the practices of other institutions. Though this evidence is not sufficient enough to suggest a polarization of reasons why labour administrations embrace new technologies (associating objective policy planning with the strategies of developed countries and following the crowd with developing countries), there are grounds to suspect that while developing countries aim to realize the potential of ICT to enhance service delivery in line with public expectations, they are also juggling additional pressures from legislators. However, without a careful prior identification of a genuine need to adopt ICT into their labour administrations, there is a risk that such initiatives might fail.

Figure 3.   Percentage of labour administrations from developed countries reporting various reasons for the use of ICT
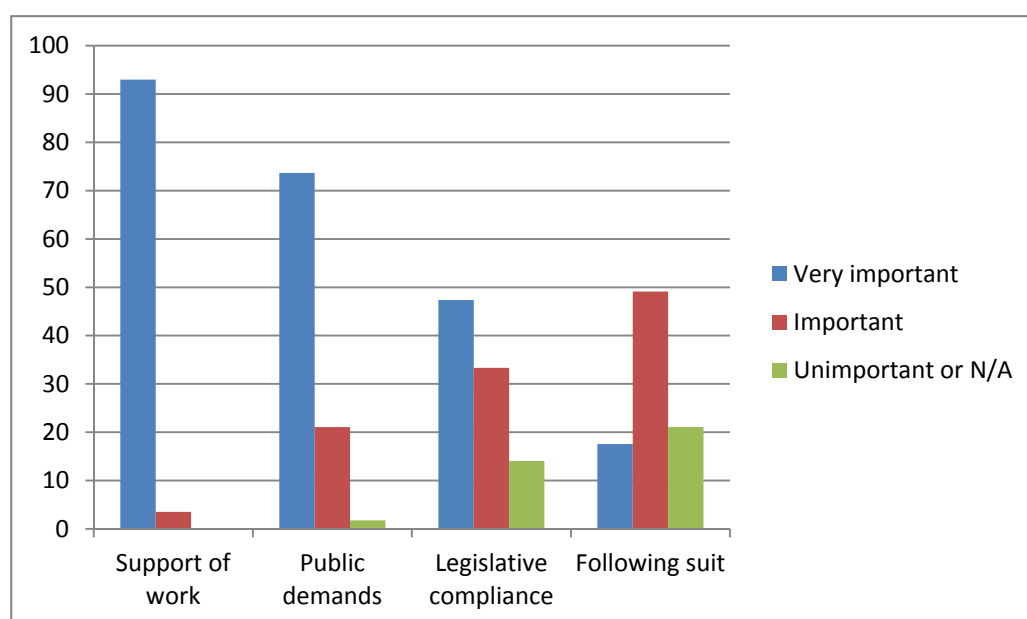
Figure 4.   Percentage of labour administrations from developing countries reporting various reasons for the use of ICT
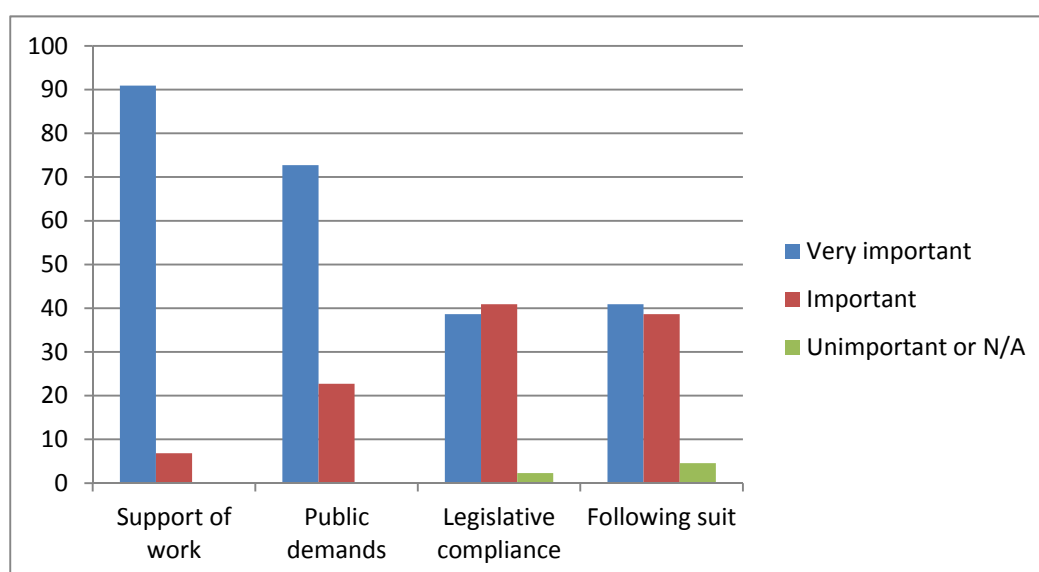
Very few labour administration bodies provided their own reasons for the adoption of ICT. These are summarized in Table 3. Most of them fall under one of the reasons from the pre-defined list. However, economic pressures to reduce costs through the automation of institutional processes did emerge as a potentially important factor to consider when deciding whether to adopt ICT. According to the Ministry of Welfare of **Latvia**, ICT investment can help to address the problems associated with the financial crisis through its ability to transform business processes by using resource-saving alternative communication channels. This fiscal dimension of ICT is explored further in Part II.

Table 3.   Additional reasons for ICT use in national labour administration systems

Region	Reason for ICT adoption specified by the responding agency	Reason for ICT adoption specified in questionnaire
Europe and Central Asia	Intergovernmental and international communication and submitting coordination tasks	Support of work
	Administration of large quantities of data	Support of work
	Response to the economic recession	
Asia and the Pacific	Prompt and better informed decision making through the collection and analysis of feedback, data on satisfaction levels and suggestions for improvement	Support of work
	To give up to date information to labour and give more services by using ICT	Support of work
Americas	E-government	Institutional pressure
	Coordination of work with different agencies	Support of work
	E-government	Institutional pressure
	Actualization of high-impact processes internal to the institution, with a view to a high level external impact, in the exercise of public service provision	Support of work
	Maintaining important linkages with other organizations and business partners, creating and maintaining important records, and keeping abreast of current trends in the business and information sector	Support of work / Institutional pressure
Arab States	Effective service delivery	Support of work
Africa	Improved information sharing	Support of work

Response to the economic recession' not specified in questionnaire as reason for ICT adoption.

3.   ICT infrastructure in national labour administration systems

Investment in ICT hardware has been high on the modernization agenda of many labour administrations in developed and developing countries alike. A multitude of technologies have been implemented internally within labour ministries and their components to help employees with their day to day work. For example, **Viet Nam** has approved a plan to modernize its labour inspection function, a key element of which being investment in personal computers (Casale and Sivananthiram 2015). However, the labour ministry in **Lao PDR** does not provide its employees with any form of ICT for personal use. While there is equipment for communal use, there are no centralized networks, Intranets or databases for the collection of information, with workers using their own personal laptops and mobile phones in support of their work. The labour inspection service in **Albania** does not have any technological tools to document its inspection visits, instead relying on manually-filled forms and registries (ILO 2009a). In **Ethiopia**, labour inspectors only have

access to basic computers, often on a shared basis, and there are no computerized systems for the registration of employees (ILO 2009b). This suggests that access to basic technology is uneven and that some developing countries are struggling to keep up. Table 4 maps out the accessibility and connectivity of national labour administration systems to various technological tools and systems.

Table 4. Percentage of labour administrations reporting the use of ICT tools and systems

Workstation hardware and communication systems	All	Developed	Developing
Personal computer	92	93	91
Personal telephone	85	88	82
Printer	93	91	95
Scanner	85	82	89
Photocopier	80	77	84
Fax machine	62	63	61
Television set	32	25	41
Radio	18	18	18
Webcam	41	41	41
Microphone	43	44	40
Own dedicated Website	91	93	89
Intranet	77	89	61
Ethernet	74	72	77
Wi-Fi	60	60	61
Professional email	78	88	66
Cloud computing	24	28	18
Social media	46	42	50
Mobile applications	39	33	45
Google reference search	38	33	43
Wikipedia own page	17	23	9

Overall, while national labour administrations often possess some of the traditional hardware items, such as personal computers, telephones, printers, scanners and photocopiers, more recent communicative technologies such as cloud computing, social media and mobile applications appear to be used less frequently. In particular, very few labour administration systems make use of Wikipedia – online pages for the dissemination of information which can be modified by any user – to communicate their messages to wider audiences. The experience of the US National Institute for Occupational Safety and Health (NIOSH) (Box 2) is an example of how new communication technologies can be used to increase the reach of the information generated by national labour administrations.

Furthermore, as demonstrated by Table 4, there is a disparity between developed and developing countries regarding the extent of Intranet use for the secure integration of back-office operations. In this regard, 89 per cent of responding national labour institutions from developed countries are equipped with Intranets, compared with only 61 per cent of responding labour administrations from developing countries. As shown in Table 5, among respondents who do use Intranets, there are several variations in their functional infrastructures in terms of how advanced they are, with many features reported more frequently by respondents from developed countries than by those from developing countries. However, the use of Intranets to foster cross-agency communication and collaboration networks through labour expert profile searches, and to provide links to relevant blogs is extremely limited, with only 10 per cent of respondents reporting their use, the majority of which being from developed countries.

Table 5.   Percentage of labour administrations reporting applications which run on institutional Intranets

Intranet feature	All	Developed	Developing
Professional email domain	60	65	55
Noticeboard and forthcoming events	49	60	34
Latest news	58	67	48
News archive	51	60	41
Article submission	32	40	23
Newsletter	41	46	34
Resource centre/electronic library	41	47	34
RSS feeds	14	17	11
Distant access to personal electronic files	28	37	16
Quick links to other labour institutions	31	37	23
Fast-files drop off/pick-up	24	25	23
Labour expert profile search	10	18	0
Team-place	16	26	2
Links to blogs	10	9	11

Some labour agencies are equipped with portals which deliver additional functions not explicitly probed in the comprehensive questionnaire. These are specified in Table 6.

Table 6.   Additional applications which run on the Intranets of state labour agencies

Country and responding institution	Additional Intranet functionality
Finland – Ministry of Employment and the Economy	Blogs, videos and video archives
Iceland – Directorate of Labour	Staff information, photos, contact information, department and occupation, information regarding obligations, rights and benefits
Lithuania – Lithuanian Labour Exchange under the Ministry of Social security	Contact lists, methodological support, information gathering forms

However, volunteered information may not provide a true indication of how widespread the adoption of these functionalities is, how they are used, how critical they are to the operations of the government agency and how they suggest new ways of service management and delivery. All of these factors must be carefully considered, given that a central point in expanding the use of technologies to supplement internal operations is to also enhance the outward facing administration.

ICT helps to facilitate communication between and amongst labour administration officials through various means, yet predominantly through email, landlines and to a slightly lesser extent, mobile telephony. Video or voice conferencing is used by less than half of respondents from developed countries and by just over a quarter of those from developing countries. In general however, comparable patterns of communication within and between institutions can be seen from Tables 7 and 8.

Table 7.   Percentage of labour administrations reporting the use of ICT tools in communication within labour agencies

ICT tool	All	Developed	Developing
Landline telephony	85	84	86
Mobile telephony	79	75	84
Electronic mail	90	89	91
Fax	52	52	52
Video and/or voice conferencing	37	44	27
Social media	27	23	32
Discussion groups and/or forums	32	39	23
Communication through specialist information system	23	21	25

Table 8. Percentage of labour administrations reporting the use of ICT tools in communication between labour agencies

ICT tool	All	Developed	Developing
Landline telephony	80	79	82
Mobile telephony	78	80	75
Electronic mail	86	89	82
Fax	67	74	59
Video and/or voice conferencing	36	42	30
Social media	28	25	32
Discussion groups and/or forums	23	25	20
Communication through specialist information system	14	13	16

Overall, respondents reported the use of various ICT tools more frequently for communication within labour agencies than for communication between labour agencies. The only exceptions were fax and, marginally, social media, which were more popular in communication between labour agencies. Regarding communication within the institution itself, some respondents described additional means not accounted for in the survey. These included an IBM real-time communication system used by the Directorate of Labour of **Iceland**, the use of the popular WhatsApp by the Secretary for Labour and Social Security in **Honduras** and a Microsoft Lync conferencing app used by the Ministerio de Trabajo, Empleo y Seguridad Social of **Argentina**. No additional channels were mentioned in the communication between institutions. However, discussion groups, forums and specialist communication information systems were reported to be used less often. This hints at the existence of technological incompatibilities across different labour agencies, confining the use of specialized software for communication within institutions. Such inter-governmental exchanges of data, information and knowledge may thus be hindered by the use of different ICT systems.

The arrival of social media applications and the growth in the number of users of mobile devices globally signal a possible move towards mobile labour administration. It is predicted that by 2016, a quarter of the world's population will be using Smartphones (Curtis 2014). A large proportion of this growth is driven by advances in developing countries, mostly China and India. At the same time Africa, the world's poorest continent, is living up to its claims of going mobile-only, with researchers predicting that in regions with weak or non-existent landline infrastructure, Internet use on mobile phones will increase 20-fold over the next five years, double the rate of growth expected in the rest of the world (Smith 2014). With these statistics in mind, labour administration practitioners and labour policy makers should consider innovative ways of deploying mobile technology to increase their reach to members of the public externally, while not forgetting the potential of mobile technologies to also improve internal labour administration work. Trends in the use of mobile technologies in global labour administrations are summarized in Table 9.

Table 9.   Percentage of labour administrations reporting the use of mobile ICT tools

Mobile ICT tool	All	Developed	Developing
PDAs	12	16	7
Portable computers	73	77	68
Mobile phones	63	68	57
Smartphones	49	56	39
Tablets	41	40	41
Tablet PCs	20	23	16
Voice recorders	26	23	16
Cameras	46	51	39
Video recorders	28	30	25
Portable printers	18	19	16
Portable clocks	2	2	2
Portable devices for tachygraphy	9	11	7

Part II.   Benefits of ICT use in labour administration

1.   Easier communication among labour administration officials

Achieving improvements in the management and delivery of labour administration services requires strong communication and collaboration both within and between relevant labour administration bodies. New technologies offer the possibility of using multiple channels to foster communication and collaboration between officials through an Intranet or Internet. In particular, they enable the instant transmission of textual, audio and visual messages, allowing a more holistic interaction at the click of a button regardless of time and geographical distance, all at a nominal cost. Labour administration officials thus have more liberty to choose their preferred method of communication based on their personal availability and the nature of the message. The opportunities for cross-agency employee consultations are also growing. For example, they are enhanced by inter-organizational data storage systems which reinforce the linkages between employees and requisite knowledge resources, which are not always readily available within the institutions themselves (Gichoya 2005). This can eliminate repeat requests for the same information, thus reducing the administrative burden on labour administration officials. Overall, the integration of ICT into labour administration can result in a dispersion of previously safeguarded information and expand the knowledge base of institutions, replacing traditional bureaucratic vertical governance modes in support of more open, flexible digital governance (Allen et al. 2001).

The ILO Survey has shown that respondents observed some improvement in communication as a result of implementing ICT, in terms of sharing knowledge both within and between institutions. Firstly, with regards to collaboration within institutions, 65 per cent of respondents – including 59 per cent from developed and 73 per cent from developing countries – noted an improvement in the horizontal communication between employees, divisions, departments and sections at the same level of the organizational hierarchy. Seventy two per cent of respondents – with 70 per cent coming from developed and 75 per cent from developing countries – also attributed ICT to improvements in the vertical communication between officials at different levels of the organizational hierarchy. Secondly, knowledge sharing within state labour agencies was improved to a slightly greater extent than knowledge sharing between agencies (Figures 5 and 6). This suggests that though ICT can generally facilitate the exchange of information among labour administration practitioners, barriers to cross-institutional knowledge sharing may be slightly more pronounced. This could be attributed to soft issues, such as the level of trust surrounding the sharing of valuable information, or hard issues such as incompatibilities in technological infrastructures which prevent information sharing and access to data.

Figure 5. Percentage of labour administrations reporting improvements in knowledge sharing within institutions
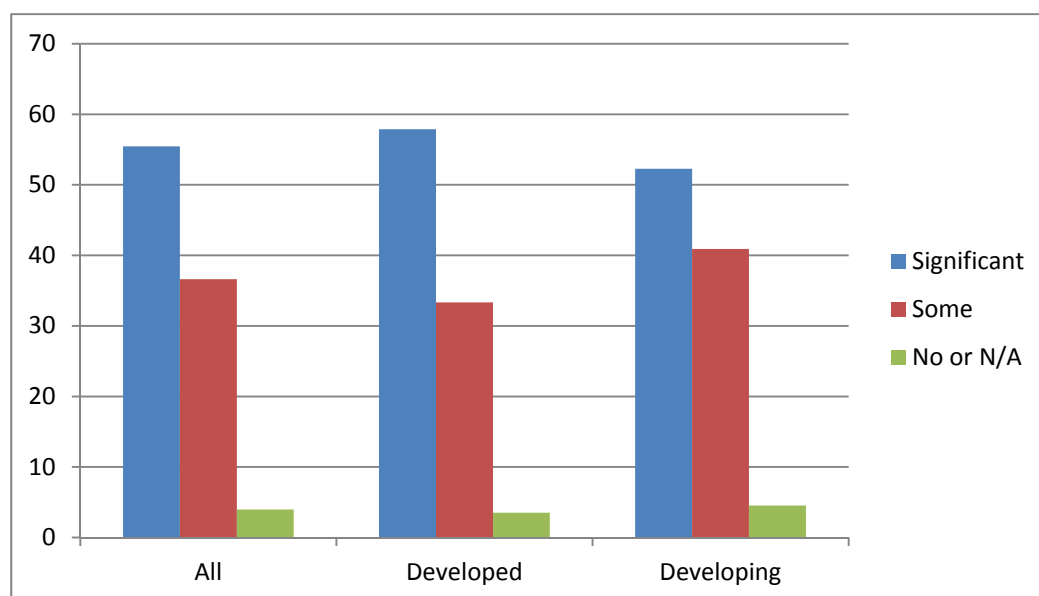
Figure 6. Percentage of labour administrations reporting improvements in knowledge sharing between institutions
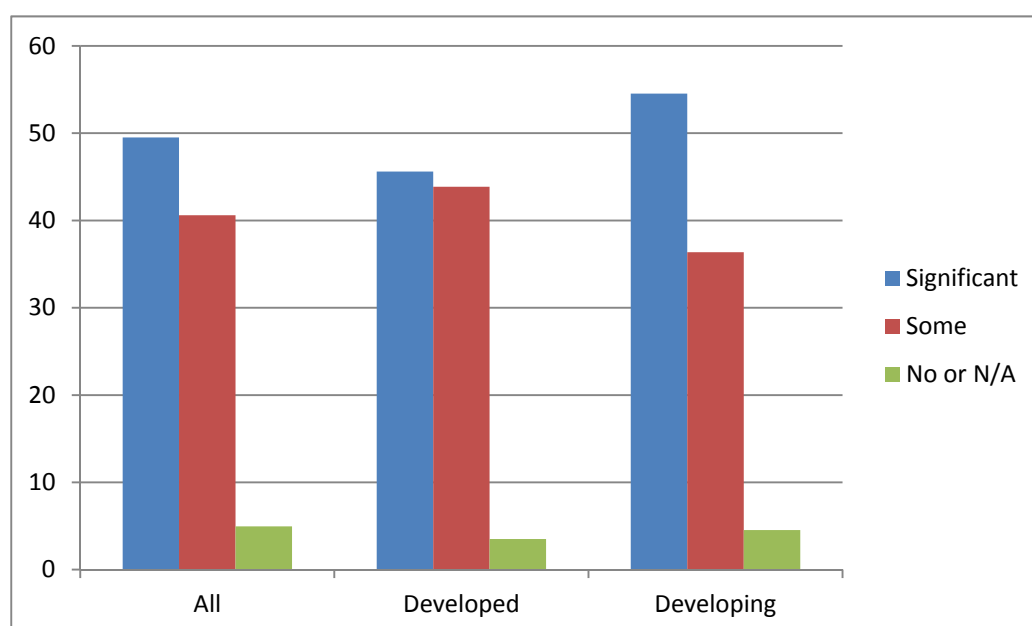
2. Potential of ICT for better human resource management by employers

All state labour agencies are employers. As such, they can take advantage of technological advances to process vast quantities of information, share and access data and communicate information to workers to better manage organizational human resources. For example, Internet connectivity allows easy access to the latest industry and sector news published on websites. Such information can be searched and retrieved at any time through the use of Internet search engines and is increasingly being brought to the attention of interested audiences through the use of social media. Employees can use email or social media to

communicate with their superiors in order to provide feedback and suggestions on how to strengthen organisational operations. Internal information management systems enable the documentation and storage of employee information for instant retrieval when needed. Accidents can be reported to the employer immediately using a mobile phone. Accident reports can also be completed electronically and uploaded to the relevant inspection bodies with the push of a button. New technologies have also had an impact on recruitment and training, with the Internet widening access to a greater pool of qualified candidates for employment. Given that some labour administration institutions might not have sufficiently trained ICT staff, electronic recruitment can help to attract new and appropriately qualified employees, or increase their commitment to training existing staff internally (Ebrahim and Irani 2005). All of these benefits were reported by national labour institutions, with their extent summarized in Table 9. Table 10 expands the reported benefits by summarizing respondents' own additions.

Table 10.   Percentage of labour administrations reporting benefits of ICT use for employers

Benefits for employers	All	Developed	Developing
Better access to sector or industry news	63	58	68
Quicker access to front-line employee information	66	65	66
Better access to accident reports	50	53	45
Better selection through e-recruitment	44	44	41
Improved access to training	43	44	40
Increase in ICT skills	68	68	66
Easier dissemination of work-related information	70	75	61

Table 11.   Additional benefits of ICT use for employers

Country and responding agency	Benefit for employers
Latvia – State Labour Inspectorate	Faster and easier coordinated correct information flow (vertical) and easier to organize regular operative meetings of heads (videoconferences)
Greece – Greek Labour Inspectorate	More efficient preparation before inspection and full support of findings after the inspection
Jamaica – Ministry of Labour and Social Security	Improved submission of leave applications and uploading of records

Moreover, 49 per cent of respondents reported a significant improvement in the quality of management through the automated reporting of results against set objectives and goals. In terms of employee productivity effects of task automation through the use of ICT, half of the respondents saw an increase in overall productivity of government officials.

3.   Increasing employee participation through ICT adoption

There is growing recognition that technological innovations can improve employee participation. Providing employees with appropriate work tools to facilitate connections with colleagues, as well as creating avenues for having their voice heard can improve the engagement and collaboration of employees. For example, the use of ICT in soliciting workers' feedback and opinions can provide user anonymity, thus encouraging a higher level and depth of employee participation in organizational activities (Lufi et al. 2000). In this regard, just over half – 51 per cent – of responding labour agencies linked their use of ICT with the easier collection of feedback from employees, and more than a third – 40 per cent – with easier reporting back to employees on how their feedback has been acted upon. The ILO Survey also asked respondents about the changes regarding employee participation observed within their institutions as a result of adopting ICT. The results suggest some realized potential of ICT to increase employee participation. Fifty-four per cent of respondents reported greater employee involvement in the designing of systems for use in their daily work; 71 per cent saw greater employee awareness of organizational activities; 33 per cent reported greater employee participation in decision making; 48 per cent said that ICT had resulted in a stronger sense of community; 52 per cent praised better consultative arrangements and 56 per cent observed improvements in their briefing system. Only three respondents stated explicitly that they did not see any positive changes in employee participation as a result of adopting ICT. Seventeen per cent of respondents indicated that they had observed improvements in all six areas of employee participation. The findings from this study suggest that additional ICT investment in labour administration can further enhance employee involvement in improving institutional operations.

4.   Increasing the reach of labour administration
through the use of ICT channels

Advances in new technologies are increasingly driving labour administration institutions to harness the benefits associated with computerizing, digitizing and eventually mobilizing some of their functions. New technologies present an opportunity to increase the informational and psychological proximity between labour administration bodies and members of the public by affording citizens the time-saving and convenient provision of information and delivery of services which suit their everyday lives (Hazlett and Hill 2003). According to the ILO Survey data, 59 per cent of respondents reported a significant increase - and 28 per cent some increase – in the reach of their labour administrations. In light of this assessment, the ILO Survey sought to understand whether labour administration bodies used ICT to expand the ways in which citizens can receive information and services (HMSO 1999). Table 12 details the current state of multi-channel information and service delivery.

Table 12.	Percentage of labour administrations reporting the use of ICT channels in communication with the general public

ICT channel	All	Developed	Developing
Landline telephony	75	70	82
Mobile telephony	50	52	50
Email	74	79	70
Website	84	89	80
Social media	43	38	45
Television spots	36	29	48
Digital television	11	7	16
Radio spots	34	27	43
Electronic billboards	15	14	16
QR codes	9	9	7

Among the newer technologies, websites were the most commonly used ICT channel to reach the general public, followed by email. A promising new digital communication tool in the form of social media is currently used by less than half of responding institutions, but is growing in popularity, as reported within the qualitative elaborations provided by selected respondents.

## 4.1.	Documenting official interactions through email

Email emerges as the most prevalent form of communication between citizens, businesses and public sector labour authorities. This is not surprising given the global pressure for greater transparency and the potential of electronic communication to permanently document people's interactions with each other and with the law. In addition to increasing transparency and accountability – promisingly reported as significant particularly in developing countries (Figure 7) – the use of email has also been reported to reduce the opportunity for corruption (Schuppan 2009).

Figure 7.	Percentage of labour administrations reporting improvement in transparency and accountability
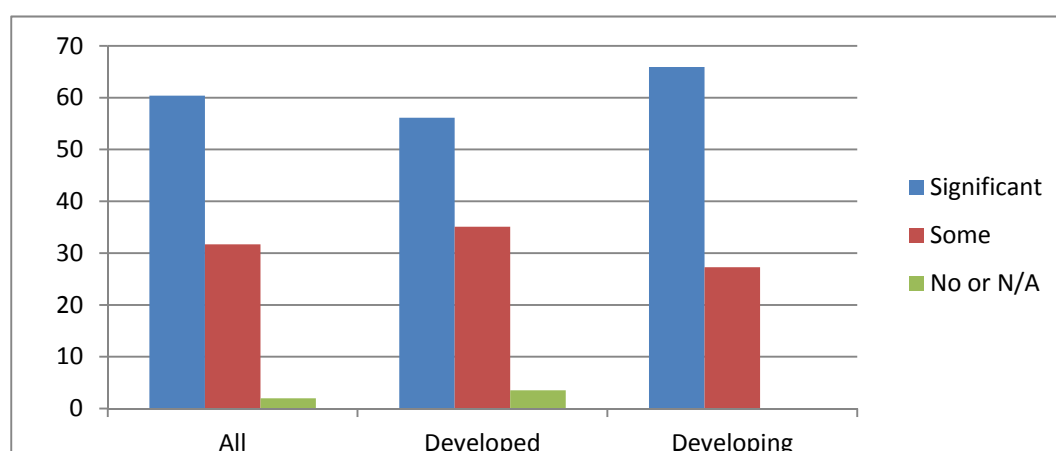
For example in the United Arab Emirates, the Ministry of Labour promotes the use of email for all work-related transactions, including requests for legal advice, as electronic correspondence represents documented evidence of work activities which can be used as

proof of work rights. This message is spread through the Ministry's website. Moreover, the Ministry of Employment of **Denmark** introduced a Bill to the Danish Working Environment Act to authorise the requirement of the Danish Working Environment Authority for all communication to take place electronically, in order to be deemed duly received. The bill was driven by a desire to encourage quick and efficient communication, as well as the optimization of routines and procedures (Aaes-Jørgensen 2014).

4.2. *More accessible and transparent information and service delivery through websites*

The ILO Survey showed that most national labour administration systems now have their own dedicated website for the continuous online delivery of information and services: 93 per cent of respondents from developed and 89 per cent from developing countries. This clearly demonstrates the scale of the rapid adoption of new technologies within the public sector (Norris and Reddick 2012). The ILO Survey sought to assess the sophistication of the websites used within labour administration, enquiring about 1) usability and accessibility of the website, 2) interactivity and maturity of the website's delivery of information and services, and 3) transparency and accountability through the website.

Usability and accessibility

First of all, materials available on the website must be easily identifiable and accessible for a variety of different user needs. Mechanisms must therefore be in place to locate the necessary information.

Table 13.   Percentage of labour administrations reporting navigation features of their websites

Website navigation feature	All	Developed	Developing
Sitemap	71	84	55
A-Z Index	31	46	14
FAQs	67	67	68
Search engine	76	84	66
Most popular	37	37	36
Master list of online services	43	46	39

Out of all the navigation features reported to be deployed by respondents (summarized in Table 13), the most common were search engines, which are classed by researchers as among the most crucial tools to locating relevant information online within satisfactory response times (Jansen and Spink 2006). The second most popular accessibility tools were sitemaps and Frequently Asked Questions. Interestingly, the Ministry of Labour and Social Affairs in the Czech Republic explained that their website did not make use of some of these features (such as sitemaps) due to the large number of pages.

Other more technical aspects of website usage includes the availability of interactive technological assistance and support for different web browser resolutions, a consistent website navigation scheme and the option to download additional software to make full use of the information available on the website (such as Adobe Reader or PowerPoint Viewer). Related technical barriers must be addressed by labour administration system technicians to encourage service recipients to use the website (see Table 14). This mitigates the risk of potentially wasting invested resources through creating websites without fully understanding the needs of the users (Hazlett and Hill 2003).

Table 14. Percentage of labour administrations reporting technical usability and accessibility features of their websites

Technical website features	All	Developed	Developing
Interactive technological assistance	19	18	20
Support for different Web browser resolutions	61	67	55
Consistent navigation scheme	55	63	45
Downloadable software	25	35	14

Finally, the needs of website users extend into the cultural and socio-demographic domains. Website functionalities should be designed while bearing in mind the accessibility standards for those who require special assistance. These softer considerations of website use, most of which can be addressed at the technical level, seem to have received the least amount of attention from labour administrators. The results, summarized in Table 15, suggest that most labour administration bodies do not yet sufficiently cater for people who require special assistance and should therefore avoid going digital by default before making appropriate and adequate provisions.

Table 15. Percentage of labour administrations reporting usability and accessibility features of their websites for users requiring special assistance

Website accessibility features for disabled users	All	Developed	Developing
Web accessibility standards	28	42	11
Variable font sizes	51	60	41
Variable spacing	33	37	27
Variable colouring	30	32	27
Text-only version	23	33	9
Audio-only version	13	18	7

Despite continuing globalization, intensified migration and multiculturalization of societies, not all labour administration institutions offer foreign-language versions of their websites, with the figure currently standing at 46 per cent (66 per cent from developed and 23 per cent from developing countries). Moreover, very few respondents specified the languages that their websites were available in, or accompanied their explanations with annotations about the extent of website translation (i.e. full or partial). Among those who did however, English is the most popular foreign-language version. The details can be consulted in Appendix 3. Nonetheless, the challenge of offering multilingual information and services has not yet been sufficiently addressed, requiring labour administration systems to evaluate the needs of the general public, for example through cooperation with local public sector organizations, and to adjust the contents of their websites accordingly.

Interactivity and maturity

One way to improve the success of labour administration in increasing the level of electronic communication and interaction with its target audience is through offering transactional and interactive services through the institution's website, in order to foster modern and responsive means of increasing public interest and involvement in labour administration's activities. This hands over a certain level power to the service users to create a familiar environment for the delivery of information and services. Moreover, features such as online payment can facilitate interaction and increase transparency, given that they allow for detailed evidence of clear financial obligations and receipts of payments. Qualified electronic signatures increase the power of legally binding

communication. Other interactivity and maturity features of institutional websites reported by respondents are summarized in Table 16.

Table 16. Percentage of labour administrations reporting interactivity and maturity features of their websites

Website interactivity and maturity feature	All	Developed	Developing
RSS alerts	37	47	25
Comments and suggestions areas	43	44	41
Message boards and/or Internet forums	19	14	25
Real-time chat rooms	5	4	7
Downloadable documents	74	82	64
Document upload	27	35	16
Downloadable Internet banners	18	19	16
Downloadable logos	26	26	25
Downloadable animated banners for websites	8	7	9
Downloadable wallpapers	6	4	9
Personal account registration	26	30	20
Personalized website sections	28	30	25
Submitted request status	19	19	18
Online credit card payment	5	7	2
Digital signature/online authentication	14	19	7
Recorded audio and/or video clips	33	35	30
Live broadcasts	12	11	14

Accountability

Out of all the ICT developments adopted by public administration institutions, websites represent an important way for labour administrations to explain to the public exactly what they do. Transparency and interactivity of websites are, therefore, two critical facets of the accountability dimension of electronic administration (Wong and Welch 2004). Transparency has been defined as a "layman's basic map of the organization as depicted in the information on the site [which] reveals the depth of access it allows, the depths of knowledge about processes it is willing to reveal and the level of attention to citizen response it provides" (La Porte et al. 2002, p. 415). Website interactivity refers to quality reciprocal communication between users and the website (Lowry et al. 2006). Respondents were asked to select the attributes of transparency and interactivity present on their dedicated institutional website from a pre-defined list. These are summarized in Table 17.

Table 17.   Percentage of labour administrations reporting accountability features of their websites

Website accountability features	All	Developed	Developing
Institution's contact details	88	89	86
Organizational chart	81	82	80
Mission statement	80	86	73
Opinion polls/surveys	31	32	30
Free publications	76	82	68
Searchable databases	54	63	43
Testimonials	17	21	11
Date of last update	56	58	54
Financial statements	36	39	32
Business/action plans	43	49	34
Annual reports	68	74	61
Security policy	24	28	18
Privacy policy	36	47	20

4.3.   Improving responsiveness and engagement through social media

Through allowing two-way interactions, social media has fostered greater citizen engagement in shared democratic governance (Chun and Luna-Reyes 2012). Social media provides users the opportunity to use multiple communication channels to submit comments and questions hence sharing site contents, to join groups for exchanging ideas and to provide feedback to site owners on their policies and actions (Davis and Mintz 2009). For these reasons, social media has the potential to increase the informational proximity between citizens and public sector institutions, which can foster citizen trust, satisfaction, social support and political engagement (Welch et al. 2005; Hampton et al. 2011).

The majority of recent transparency and interactivity enhancing technological initiatives of labour administrations involve the use of social media applications such as Facebook, Twitter and blogs. For service providers, social media presents an opportunity to instantly reach out to citizens who normally do not seek information through traditional government communication channels. For service users, online social platforms provide a means to express their opinions and concerns more freely, to monitor the activities of public servants and to blow the whistle, thus granting public servants with access to citizen journalism (Chun and Luna Reyes 2012).

The most commonly cited and all-encompassing deciding factor for the adoption of social media applications is the need to be brought up-to-date with the digital age, particularly in terms of the bidirectional communication channels preferred by the general public today. By paying due attention to these public expectations, the goal is to become more engaging, participatory and responsive. For example, this has been explicitly recognised by the Ministry of Labour and Social Affairs of the **Czech Republic**.

Here, social media is justified by a desire to move towards the model of an open government through quicker and easier communication with the public, as well as through improved promotion and information dissemination of the Ministry's activities, particularly to those segments of the population who do not typically use more traditional communication channels. Not only does an openness to social media technologies allow

for a more prompt dissemination of information to the public – the previously mentioned Ministry of Labour and Social Affairs in the **Czech Republic** keeps citizens informed during emergency situations such as major legislative changes – but it also facilitates the efficient collection of information directly from the source. Social media users become self-selected research participants for the investigative endeavours of labour administration bodies. For example, in the **United Arab Emirates**, through the use of Facebook and Twitter the Ministry of Labour receives feedback and suggestions from the general public which contribute to efforts to raise the level of citizen satisfaction and ultimately to improve the quality of the delivered services.

Indeed, Facebook, Twitter and YouTube appear to be the most commonly deployed social media applications. Respectively 48 per cent, 32 per cent and 34 per cent of survey respondents explicitly specified their use. As explained by the Ministry of Labour and Social Affairs in the **Czech Republic**, opting for the use of Facebook and Twitter is motivated by considerations of practical usability, reach to wider audiences particularly for emergency communications, low cost and ease of administration.

The reason why specific social media applications are used is closely tied to how they are used. In the **United Arab Emirates** for example, workers can post comments and questions on social media, such as what procedure to follow when reporting breaches of legislation by employers, and have them answered within hours on the same channel. In **Brunei Darussalam**, the Occupational Safety and Health Section of the Department of Labour uses Facebook to enable members of the public to file complaints. Moreover, in addition to having the arrangements in place for in-person and email contact, the Labour Enforcement Division also permits the use of mobile applications such as WhatsApp. With the changing patterns of work and an increased emphasis on the importance of work-life balance and psycho-social well-being, at the turn of the previous decade the **Norwegian** Labour Inspection Authority launched a campaign on Facebook to encourage workers to praise their colleagues. The aim of the 'Good colleagues – part of the job' social media campaign is to reach a wide audience of workers regardless of location and time and encourage a more favourable social environment at work, but also to tackle the problem of invisible labour in order to promote compliance with working hours regulations (Kvam 2011).

Part III. Challenges and risks of ICT

The ILO Survey shows that there are challenges and risks hindering further technological transformation of labour administration. Policy makers should pay attention to them so that they can be better understood and steps can be taken to overcome them throughout the entire policy-making process. These challenges and risks fall into three categories: structural resources, human resource challenges and organizational culture challenges.

1. New technologies and financial resources: Doing more with less?

A digital administration strategy can reduce the cost of simple processes such as data collection, integration, transmission and communication, freeing up costly labour time which can instead be spent on dealing with more analytically complex labour issues (Ebrahim and Irani 2005). For example, the ILO Survey found that 58 per cent of respondents reported a significant improvement in the dissemination of labour-related information. With regards to the processing of services, 50 per cent saw a significant improvement in the speed of the resolution of labour problems as a result of easier access to relevant data and 65 per cent noted a significant improvement in the speed of labour-related service delivery. Relatively comparable answers were provided along these three dimensions by respondents from both developed and developing countries.

However, the ILO Survey suggests that despite over half of respondents linking the adoption of ICT to improvements in these otherwise time and cost consuming areas of labour administration activity, new technologies may not be living up to their promises of cost-reductions. Fifteen per cent of participants explicitly stated that they did not report any cost reduction associated with the implementation of new technologies, making it one of the least reported improvements from the pre-defined questionnaire list. It is likely that the cost-saving potential of ICT has not yet been realized due the amount of time needed between the initial investment and the repayment of the investment. Such investments in the development of technological infrastructure can be substantial. They require careful planning of financial expenditure for the initial provision of hardware and software, as well as subsequent operational costs such as maintenance, replacement, upgrades and the training of employees on how to use them. Moreover, although the costs of ICT solutions are generally decreasing, the latest and most comprehensive systems which appeal to the technologically advanced countries can still appear relatively expensive. Even basic ICT solutions can seem too costly to justify investment compared with relying on the provision of the same services by cheap labour in the developing world. It is likely that if such financial aspects of the ICT policy agenda were carefully planned, labour administrations could see more clearly the possibilities for cost reduction.

As a starting point, dedicated and on-going funding is a crucial component of the ICT agenda (Nasi and Frosini 2010). Overall, approximately 70 per cent of all respondents had a distinct ICT budget. This suggests an awareness of the importance of ICT, as well as a generally high level of planning of ICT investment. However, as expected, this was higher in developed (81 per cent of respondents) than in developing countries (56 per cent of respondents). There was no consistent pattern regarding the changes in ICT budgets over the past five years, with similar numbers of respondents reporting increases (25 per cent), decreases (20 per cent) and no change (21 per cent) in the amount of financial resources allocated for the use of ICT (Figure 8). Such inconsistencies in the patterns of fund allocation implies different levels of commitment to further expanding ICT use, uneven effects of the financial crisis or a lack of understanding of financial flows. The latter explanation is particularly likely in the developing world. Statistical distributions of budgetary changes for developed and developing countries (Figure 9) revealed a substantially lower awareness of the relevant changes among labour administration practitioners in developing countries, with many respondents omitting to answer this

question. This lack of information may be caused by poor communication regarding ICT funding and its allocations within labour administration systems. This is a likely explanation given that just over a third of respondents from developing countries (compared to a fifth from developed countries) reported the lack of information about costs to be a barrier to further ICT-led transformation of their labour administration system (see Figure 9). Dealing with the financial challenges requires transparent communication about the availability and allocation of funds. If this kind of information was easily accessible, labour administrations could more easily justify their return on investment (see Figure 9) and the ILO could more appropriately target its technical cooperation programmes.

Figure 8.   Percentage of labour administrations reporting changes in ICT budgets
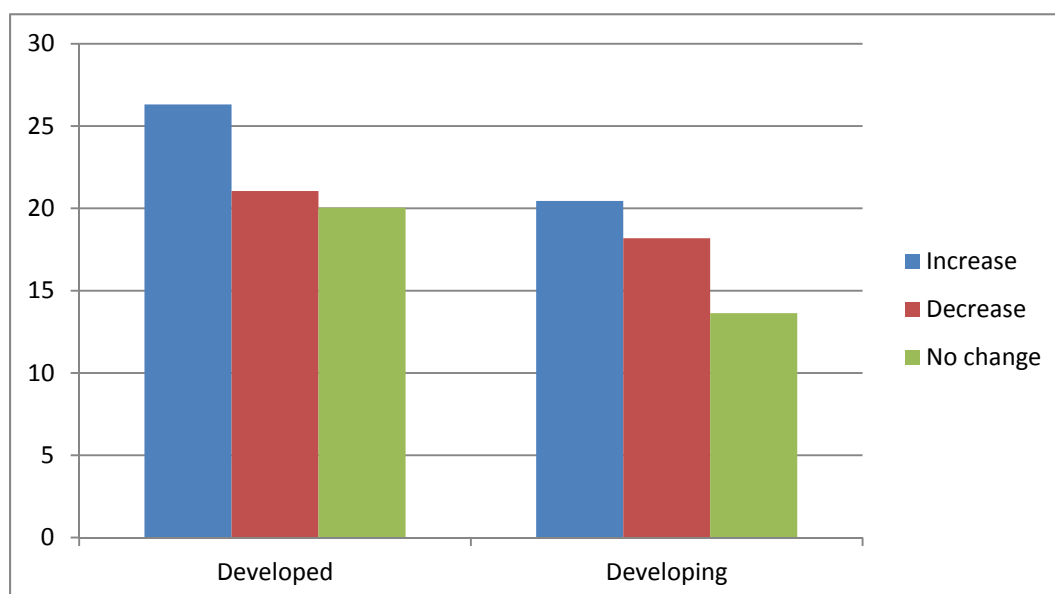
Not only did the largest number of respondents select limited financial resources as a barrier to further ICT use – 74 institutions, including 70 per cent of respondents from developed countries and 80 per cent of respondents from developing countries, as shown in Figure 9 – when asked separately to indicate the most prominent challenge faced by their institution, again the largest number of respondents chose precisely this factor (see Box 3 for a case study on Trinidad and Tobago). Finally, all three types of financial barriers were more frequently reported by developing countries than by developed countries, lending credence to the above-proposed hypothesis that in developing countries, investment in even basic technological infrastructure may be prohibitively more expensive than the reliance on cheap labour.

Figure 9.   Percentage of labour administrations reporting financial barriers to ICT


```
90
80                                                            ■ Limited financial resources
70
60                                                            ■ Difficulty justifying RoI
50
40                                                            ■ Lack of cost information
30
20
10
0
        All            Developed        Developing
```
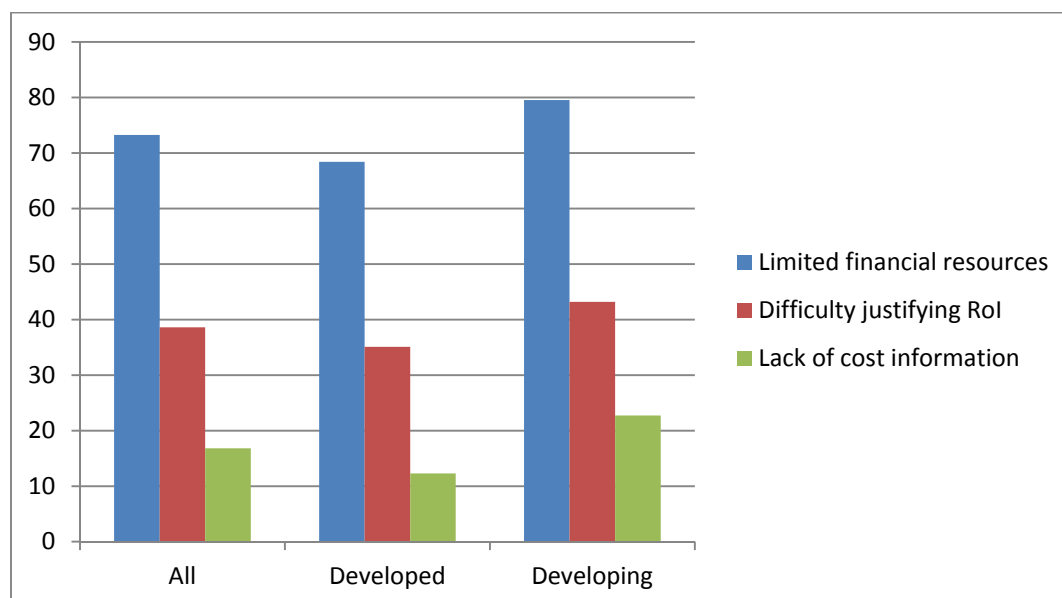
Box 3. Funding for ICT: Labour administration of Trinidad and Tobago

The funding for the projects of the Ministry of Labour and Small and Micro Enterprise Development (inclusive of ICT projects) is included in national budget allocations. The resources received by the Ministry for ICT are used to modernize and expand the ICT information architecture and application portfolio in support of the administrative and technical work of the Ministry, as far as is possible on a sustained basis, with the resources provided by the national budgeting process. It is worth noting that there is an ICT component to the Strategic Plan of the Ministry, which is aligned with the national ICT plan. Should additional resources, both financial and technical be made available, the Ministry would be in a stronger position to move forward with its ICT plan.

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2.   Digital divide

ICT is but one channel for the provision of information and services, which may not always be the most effective way of increasing the reach to users. Despite global technological developments, access to technology remains unequal both between developed and developing economies (Ndou 2004; Gichoya 2005; Lau et al. 2008; Schuppan 2009; Weerakkody et al. 2012; Thapa and Sæbø 2014) and within developed countries (Brown et al. 2011). Internet use by the general public is still relatively new, especially among the older and less tech-savvy segments of the population (Van Dijk and Hacker 2003). Referred to as the digital divide, these inequalities can stem from a simple lack of physical access to computers and network connection due to poor technological infrastructure or connectivity of the general public, low public awareness of ICT-based services due to technological illiteracy, and mental anxiety or distrust in new technologies. Socio-demographic factors, such as age, language requirements, general literacy or area of residence may also have an effect.

2.1.   Causes of the digital divide

A key area which must be integrated into national ICT policies is careful consideration of the readiness of the general public to utilize e-services. Table 18 presents the challenges to digital connectivity reported by respondents.

Table 18.   Percentage of labour administrations reporting socio-technological barriers to ICT use

Socio-technological barrier	All	Developed	Developing
Poor technological infrastructure/connectivity of general public	28	18	41
Intimidation by/anxiety about technology	17	11	25
Lack of ICT-related skills and knowledge	30	25	36
Low general public awareness of ICT-based services	16	9	25
Demographic and social factors	13	9	18

It can be seen that the gap between developed and developing countries in terms of access to computers and the Internet persists. The disparity is most prominent at the basic hardware level in terms of the physical availability of information technology and communication infrastructure. Programmes must therefore be put in place as part of government policy to promote the investment in physical ICT infrastructure as a priority in developing countries, for example in collaboration with the private sector or international organizations. Moreover, such national policies should also stimulate usage in terms of publicizing the provisions of electronic information and service delivery, in order to close the gap in awareness of the general public of ICT-based services. This could potentially be achieved through public service announcements on the radio or television and placing links to websites on informational media including billboards, newspapers and official government documents and vehicles. Through continuously familiarizing the general public with e-services, the intimidation and anxiety surrounding new technologies, particularly in developing countries, may also be lessened. Finally, the softer economic and social aspects of the digital divide related to a lack of ICT skills and knowledge among the population also substantially challenge further ICT development projects within developing, but also in developed countries. It should be an issue of priority for national policies all around the world to address the lack of ability to use new technologies through education (see Box 4 for an example).

Box 4. The United Kingdom's strategy to improve skills to use new technologies

The BBC and partners today unveiled the BBC micro:bit – a pocket-sized, codeable computer that allows children to get creative with technology. In the BBC's most ambitious education initiative for 30 years, up to 1 million devices will be given to every 11 or 12 year old child in year 7 or equivalent across the UK, for free.

(Source: BBC 2015)

2.2.   *Bridging the digital divide through alternative ICT provisions*

Still, issues of material access to digital technology appear to dominate the e-government agenda (Van Dijk and Hacker 2003). In terms of overcoming related barriers (Table 19), more than half of global labour administration institutions rely on traditional technologies, such as centralized call centres and hotlines, for people in remote or marginalized areas with little or no access to Internet (Rogers 2002). For example, Customer Service hot lines are operated in **Cuba** to help the public address the issues they generally feel anxious about. The Ministry of Human Resources of **Malaysia**, where labour inspection issues are dealt with, also uses a hotline teleservice, which is operated by desk officers to facilitate communication with members of the public who are not able to use digitalized services. Call centres can also be used to inform workers about their rights, such as in the **United**

Kingdom where a 'Pay and Work Rights Helpline' was launched in May 2009 to assist vulnerable workers.[4]

Table 19. Percentage of labour administrations offering technological infrastructure and connectivity provisions for the general public

Material access solution	All	Developed	Developing
Centralized call centres/hotlines	54	58	50
Decentralized call centres/hotlines	34	30	39
Supervised citizen information points	28	21	36
Independent citizen information points	9	11	7

Additionally, just under a third of labour administrations ensure universal access to ICT via supervised public-access facilities equipped with computers and network connections. For example, the Department of Work and Pensions in the **United Kingdom** is developing ways of supporting people to use digital services through plans to provide 6,000 Internet access devices via Jobcentres during 2014-2015, to assist those who do not have the personal equipment to access digital services. In particular, the Stevenage Jobcentre Plus introduced a digital suite in January 2013 to ensure that claimants who are unable to access digital services independently are provided the support by Jobcentre staff and third-party organizations to complete online health and safety assessments, create electronic CVs and to undertake necessary computer training by local training providers.[5] A small number of labour administrations operate independent public facilities for access to ICT. For example, the Ministry of Labour and Social Affairs in the **Czech Republic** offers an information point and a self-service kiosk in its lobby, which can be accessed by the public during office hours. In **China**, grassroots service networks are set up in the streets of communities in need. In **Argentina**, special information points in science parks and science and technology fairs are organized to educate the general public on the possibilities of ICT. In conclusion, institutions embarking on a digital transformation must carefully consider and appropriately address the physical readiness of their target audiences to utilize the proposed technological solutions.

On the other hand, the technological demands of young adults who grew up surrounded by technical advances continue to rise, and there is reason to believe that this is likely to be a challenge for labour administrations of the future. Seventeen per cent of respondents (13 per cent from developed countries and 23 per cent from developing countries) already saw this as a barrier to the further adoption of ICT. On a smaller scale, offering a sufficient choice of ICT tools and channels for the general public was reported as difficult by seven per cent and five per cent of respondents respectively. However, the diversity of the provisions for the general public is low, with most state labour institutions relying on computers with internet access and telephones, the latter particularly popular in developed countries, as seen from Table 20.

[4] See https://www.gov.uk/pay-and-work-rights

[5] See https://gds.blog.gov.uk/2013/07/04/using-digital-services-stevenage-jcp/

Table 20.   Percentage of labour administrations offering ICT tools for the general public

ICT tools and systems in public-access points	All	Developed	Developing
Telephone	49	28	55
Computer with Internet access	47	46	48
Webcam	5	2	9
Microphone	3	2	5
Camera	3	2	5
Voice recorder	2	2	2
Computer without Internet access	7	7	7
Self-service terminal	15	19	9
Interactive Voice Response Interface	2	0	5
Printer	22	18	27
Fax	19	18	20
Scanner	16	13	20
Photocopier	18	16	20
Training materials on CDs and DVDs	13	11	16
Direct speed-dial to call centre/hotline	13	9	18
Help desk for technical enquiries	18	14	23

In general, the provisions of technology at public-access points appear to be similar, albeit slightly higher in developing than in developed countries. This is unsurprising given the above-mentioned greater lack of physical access to ICT among the general public in developing countries. The only exception refers to self-service facilities, which are twice as popular in developed than in developing countries. Again, this was to be expected since the ILO Survey confirmed that the ability to use new technologies is higher among the general public in economically advanced Member States. It is worth noting that all data on the use of Interactive Voice Response Interfaces came from developing countries. This suggests that developing economies are behind developed economies in terms of the general literacy of the public, who may find it easier to follow verbal, rather than written instructions. Indeed, social-demographic factors were reported to be a barrier to the further use of ICT in labour administrations more than twice as often in developing than in developed countries (refer back to Table 20). However, with only five respondents using the system, such services are very limited in their availability. ICT policies and strategies of labour administrations should therefore address not only the issue of ICT literacy, but also general literacy issues more broadly.

3.   Human resource and structural implications of ICT use

Harnessing the benefits of ICT requires changes in the structure and decisions concerning the allocation of resources (Nasi and Frosini 2010). Having the right technological infrastructure supported by financial resources for its maintenance, operation, staff training and further platform development is a necessary but not always the most important factor. Having the right leadership in place to drive the adoption, implementation and use of ICT through appropriately designed strategies is crucial to the success of the technological transformation of labour administration.

3.1. Improving the ICT abilities and attitudes of labour administrators

To begin with, the re-configuration of public administration through ICT generates a shift in skill requirements to enable employees to use the technology effectively (Allen et al. 2001; Heeks 2006). As can be seen from Table 21, just under half of respondents reported a lack of technical ICT abilities and capacities of labour administrators, and roughly a third reported problems with developing appropriate training strategies to narrow the emerging gaps between the existing and required skills of labour officials.

Table 21.   Percentage of labour administrations reporting human resource barriers to ICT use

Human resource barrier to further ICT use	All	Developed	Developing
Lack of sufficiently trained employees	44	42	45
Inappropriate strategies to train and skill employees on ICT use	25	19	32

However, with the widespread incorporation of new technologies into the operations of enterprises, labour administrators must upgrade their technical skills. For example, labour inspectors must be able to use computer equipment to verify the accuracy of data handling by enterprises. This is because new technologies allow enterprises to quickly modify the data they have stored on the system for presentation to the labour inspector should such a request arise. Labour inspectors must thus be trained in the use of the software in order to detect any potential fraud in data reporting. In Belgium for example, appropriately trained labour inspectors can seal computer equipment when this is deemed as necessary for investigation or gathering of evidence. In Lebanon however, additional training of inspectors to increase their ICT skills and knowledge is still needed, as recent ILO audits have revealed (ILO 2010a).

The growth of new technologies presents opportunities for the re-definition of knowledge, skills and capacities of public administration employees. However, such training can be expensive (Kavanaugh et al. 2012) and the associated costs need to be balanced against those of recruiting trained personnel (Heeks 2006). Competition for talented human capital may also be heightened due to Internet-enabled recruitment of new employees from regions outside of the areas covered by the government (Allen et al. 2001). Such and related changes in institutional and operational infrastructures (Ebrahim and Irani 2005) can generate resistance to ICT, which can manifest itself in employee disregard for transformation through technology. The ILO Survey found that 24 per cent of responding institutions, with roughly the same proportions of those from developed and developing countries, struggled with staff disinterest in ICT. Moreover, previous ILO audits revealed that despite the proliferation of technology worldwide, the ICT culture can still be very low. Lebanon is a case in point, as presented in Box 5.

Box 5. Low ICT culture in the Lebanese Ministry of Labour

Recent ILO audits have revealed that the Ministry of Labour of Lebanon is struggling with a low ICT culture among its employees. Despite having drafted official plans for the automation of its main services and functions, electronic processing of applications, improving communication with other institutions and the public and accordingly equipping officials with software and PCs, the hardware is simply not being used. Further investigation into the organizational and cultural reasons behind staff resistance to ICT could provide valuable insights for countries struggling with similar challenges.

(Source: ILO 2010a)

Within this context, managerial support and leadership to instil a change in employees' values and vision emerges as a crucial factor in the creation of an environment which is conducive to further ICT implementation and organization-wide acceptance of technology at both technical and cultural levels (Leonard-Barton and Deschamps 1988; Allen et al. 2001). This is an important issue which must be considered by global labour administrations, particularly given that just over a quarter of respondents said that the lack

of a common vision impinged upon further expansion of service management and delivery through ICT, as is shown in Table 22. For the most part, this problem was more pronounced in developing countries, emphasized by over a third of respondents. Lack of support from colleagues and a lack of leadership to steer ICT-led institutional re-configuration was also quoted as a barrier, but to a slightly lesser extent and as expected, mostly in developing countries.

Table 22. Percentage of labour administrations reporting cultural barriers to ICT use

Cultural barrier to further ICT use	All	Developed	Developing
Lack of common vision	26	19	34
Lack of strong leadership to promote and push the implementation of ICT	18	14	23
Lack of support from senior management/administrators/officials	16	12	20

The ILO Survey results suggest that it might be appropriate for senior officials in labour administrations to anticipate, monitor and address the problems regarding the acceptance of new technologies by employees. One mechanism could involve staff consultations to recognize and alleviate their concerns which could otherwise lead to a reluctance to use the already introduced ICT tools. Another mechanism could involve the creation of support systems in the form of an empowered ICT department to advise and educate workers about how new technologies can optimize their everyday work.

3.2. ICT departments for overseeing the use of ICT

Distinct ICT departments are crucial to the success of e-government. Overall, 74 per cent of all respondents reported having such an arrangement in place.[6] Whether fulfilled through internal training or through external recruitment, ICT departments create new job opportunities. One such example is a Chief Information Officer, whose role is to oversee the support provided to government officials in using ICT (Gupta and Jana 2003). For instance, the Ministry of Welfare of Latvia has a Deputy State Secretary for issues related to ICT, who performs the duties of the Ministry's ICT policy planner and project manager. A commendable example of a country which has revised its functional employee structure to support institutional transformation through technology is Trinidad and Tobago (see Box 6).

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[6] Twenty six per cent of respondents did not have a separate ICT department, but some of them provided explanations of their alternative arrangements. For example, in Slovakia and the Bahamas, a single employee is entrusted with all ICT responsibilities. The Ministry of Labour and Social Policy of Bulgaria is outsourcing the related services. The Ministry of Public Service, Labour and Social Welfare of Zimbabwe collaborates with the Ministry of Information and Communication Technology on ICT issues.

**Box 6. Trinidad and Tobago's revision of its employee structure to support
the transition to e-government**

The Ministry of Labour and Small and Micro Enterprise Development has sufficient human capital to support institutional transformation through technology. The organizational structure of the Information Technology (IT) Unit has recently been revised to meet the human resource requirements to implement the Ministry's ICT strategic plan, which facilitates the transition to e-government. The professional profiles of those within the IT Unit include fully managerial, partially managerial, partially technical and fully technical staff. The functional areas covered by the IT unit comprise of Information Technology Management, with responsibilities for managing IT in line with the strategic business direction of the Ministry; Systems Development responsible for facilitating the automation of the Ministry's business processes; Systems Administration responsible for the administration and maintenance of the Ministry's information architecture and application portfolio; Security responsible for protecting the integrity of the Ministry's data and finally, Information Technology Administration, responsible for administering the general support services required for the day-to-day operations of the unit. As a result of this revision, the Ministry does not currently experience a skill shortage. The ICT component of the strategic plan of the Ministry includes the use of ICT in the establishment of the Labour Market Information System for Trinidad and Tobago. The development of this system, as well as the Labour Market Information Unit in the Ministry, was facilitated through technical assistance and support provided by the ILO.

As ICT permeates every aspect of public sector service delivery and management, it must not only be understood by the technical department, but also swiftly integrated into the daily work of all public servants and labour policy makers through education and technical training (Allen et al. 2001). Therefore, knowledgeable ICT experts must be readily accessible to provide technical and educational assistance to employees (Schiller 2003). Moreover, they should have both a technical and managerial background to not only deal with purely technical issues, but also to appropriately interpret wider organizational needs (Nasi and Frosini 2010). A successful example of how these strategies have been implemented is highlighted by the case study of **Latvia** in Box 7.

Box 7. Organization of the ICT unit of the Ministry of Welfare of Latvia

The Ministry of Welfare of Latvia employs ICT specialists, who are responsible for the maintenance of the Ministry's computer network and for providing assistance to employees in ICT-related technical matters. The ICT specialists can be easily reached via email or telephone to provide the necessary instant support. They all have experience in ICT issues – ICT hardware (for example servers, routers or firewalls) and system management (such as email or Active Directory) – and are also required to have some knowledge of project management in order to manage project implementation.

A few policy suggestions can be made regarding the provision of effective ICT support for employees of labour administrations based on the insights highlighted by the above boxes. First of all, it is recommended that ICT departments or units are established to provide labour administrators with technical support, as well as to initiate and facilitate ICT capacity building programmes to meet necessary staff training needs. Alternatively, a dedicated employee or group of employees should be appointed solely to oversee the performance of e-government. The establishment of such ICT units can be aided by technical assistance programmes of the ILO. Secondly, labour administration agencies should ensure that the professional background of their internal units responsible for ICT infrastructure related issues is neither exclusively technical nor managerial, but rather combines the two areas of expertise. Thirdly, clear communication channels must be established to enable employees to easily contact the ICT department with their queries and concerns. In essence, the ICT unit should not be a stand-alone island. Efforts should be made to bring it as close to the other employees as possible, in both professional and physical terms.

3.3. *Implications of financing ICT for human resources*

One of the major implications of e-government for the structure of employment is the heightened flexibilization of the employment relationship. Increasing reliance on networks and external workers is a significant trend, both in terms of the execution of day-to-day work and the development, maintenance and replacement of software and hardware. The latter is not always developed in-house and may be purchased from vendors. Recently, contracting has emerged as a popular tool for ICT policy implementation. This is done through the deployment of consultants and external contract workers, outsourcing to Application Service Providers, or through the establishment of Public-Private Partnerships (PPP). Additionally, ICT development is often financed through the involvement of donors and suppliers.

Some respondents reported developing their technological tools using the institution's own human and financial resources, while others sought external sources of funding. For example, the National Labour Inspectorate of **Poland** commissioned its own employees to develop an inspection system entitled 'Navigator', to computerize the entire inspection process. However, the significant cost savings achieved by doing so came at the cost of increasing the daily duties and responsibilities of employees. On the contrary, the Ministry of Welfare of Latvia uses external financing from international e-government initiatives. Another example is highlighted in Oman, where the implementation of the 'Adobe LifeCycle ES' system required cooperation with a leading independent software vendor (Anonymous n.d.). Initiatives involving PPP, from which the most valuable lessons can often be learnt, are described in the South Africa case study below.

Box 8. Private-Public Partnership: The Department of Labour of South Africa

The Department of Labour of South Africa was experiencing high turnover rates of qualified staff as a result of problems with its ICT case flow systems. A lack of properly functioning technological tools was resulting in unreliable case reports and a reduction in the ability to tackle labour law non-compliance, which was particularly high in the security, hospitality, agriculture, forestry and retail sectors. In order to improve its ICT capacity within strict budgetary constraints, in 2002 the Department signed a 10-year contract with Siemens Business Services to develop an 'Integrated Electronic One Stop Infrastructure' through the provision ICT hardware (IT help-desks, call centres and kiosks as well as desktops, portable computers and printers) and software (LAN and new systems, including staff training), at a cost which was lower than the estimated costs required for in-house development. However, because contractual responsibilities were not thoroughly thought through, irregularities in output delivery and sharp rises in costs forced the Department to terminate the contract, appoint a new Chief Information Officer to oversee the ICT case flow systems and establish collaboration programmes with new ICT service providers. Moreover, upon concluding that the Department lacked sufficient ICT capacity and leadership to enter into the contract to begin with, funds were allocated to an ICT Skills Factory for the in-house training and development of qualified ICT staff. As a result of these problems, as of April 2015 the South African Department of Labour still lacks an electronic case management system, with some satellite offices lacking electronic devices. The majority of labour inspection work is still conducted manually, resulting in problems with correct data reconciliation. [7]

All things considered, it is very important to carefully estimate the costs of in-house ICT development vis-à-vis the costs of outsourcing and contracting. Relatedly, the lack of relevant ICT knowledge and skills in-house cannot be solved merely by entering into partnerships with service providers, without planning for the enhancement of internal ICT expertise. Precautions must be taken to facilitate the management of partnerships throughout their duration, and plans must be elaborated to avoid complications when contracts are terminated.

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[7] See https://pmg.org.za/committee-meeting/14916/

## 4.   Uncertainty surrounding the use of social media

Although generally acknowledged as one of the most cost-effective communication channels, the use of social media can be subject to costly monitoring and management. Additional human resources may need to be brought in to handle the higher administrative workload associated with, for example, keeping social media communication channels up-to-date in terms of what is posted, how often and when (Picazo-Vela et al. 2012). This challenge was recognised by the Norwegian Labour Inspection, where the need to set aside separate financial and human resources emerged to manage and monitor its Facebook and Twitter pages. This is because social media can generate data which is sensitive in nature, as well as poor quality content which must be filtered out without breaching the citizens' right of expressing their opinions freely (West 2004). In the Survey, only 12 respondents – five from developed and seven from developing countries – reported that they struggled with the increased demands for resources required to keep their social media active.

As a new wave of technology which is slowly permeating all levels of labour administration, social media use does not yet appear to be subject to extensive formal accepted regulations and directives regarding its use. On the contrary, it appears that the adoption of social media has not yet reached the final stage of institutionalization or consolidation of practices. Originally designed as a tool for the dissemination of social rather than work-related information (Mergel and Bretschneider 2013), the incorporation of social media into daily operations generally starts with semi-formal regulation similar to that of more traditional media outputs, or is driven by the experimentation of institutional change agents. For example at present, the Ministry of Labour and Social Affairs in the **Czech Republic** operates in somewhat of a grey area, involving one employee from the Ministry's Press and PR Department administering and monitoring social media publications in the same way as its press releases. However, recognizing the specific informality of social media outputs, the Ministry strives for an apolitical presentation model, with the current Minister of Labour and Social Affairs acting as a change agent and using her personal social media accounts on Facebook and Twitter to express both political and private opinions. Nonetheless, the bidirectional and informal nature of social media-enabled communication creates a number of tensions and problems. Social media traffic encourages respect for the freedom of expression of personal views and opinions. This can however manifest itself in the publication of negative or misinformed comments, which labour administration agencies must assess in terms of gravity and react appropriately either through providing informative argumentation and explanation, taking no action, or through deleting the most offensive instances of social media misuse. Other problems stem from the ease of social media communication, which increases the workload surrounding the management and administration of the Question and Answer agenda. This is particularly relevant when the questions asked are atypical, specific or too private, and when officials face increased pressures for timely responses within hours (Landsbergen 2010). This calls for increased information sharing within ministerial departments, as well as the development of a protocol to determine when to refuse to answer questions, particularly relevant for those which are overly personal or sensitive in nature. For these reasons, plans are currently being developed in the **Czech Republic** to create an accepted social media use policy which could make responses to social media abuse clearer, and will involve nominating an employee who has sole official responsibility to manage social media and website content. This could help offset the high labour time costs required to manage all of the Ministry's social media outlets, including its own YouTube channel. In more general terms, such plans point towards a potential reduction in the above-mentioned problems of information privacy and accuracy, as well as the more general reputational problems associated with a possible negative backlash from misinterpreted ownership of inappropriate information posted on social media pages by members of the public (Mergel and Bretschneider 2013).

5.   Strategies, policies and plans

Labour administrations should reinforce their commitment towards technological transformation through incorporating their endorsement of ICT into a formalized long-term strategic vision, mid-term regulatory frameworks and day-to-day operational action plans (Brynjolfsson and Hitt 1998). Seventy-two per cent of respondents reported having strategies in place in at least one of these three levels, but only a quarter (approximately 26 per cent) had them at all three levels. Daily operative plans were reported most frequently by just over half of all respondents, as can be seen from Figure 10. However, more forward looking planning was less prevalent.

Figure 10.   Percentage of labour administrations reporting ICT strategies, frameworks and plans
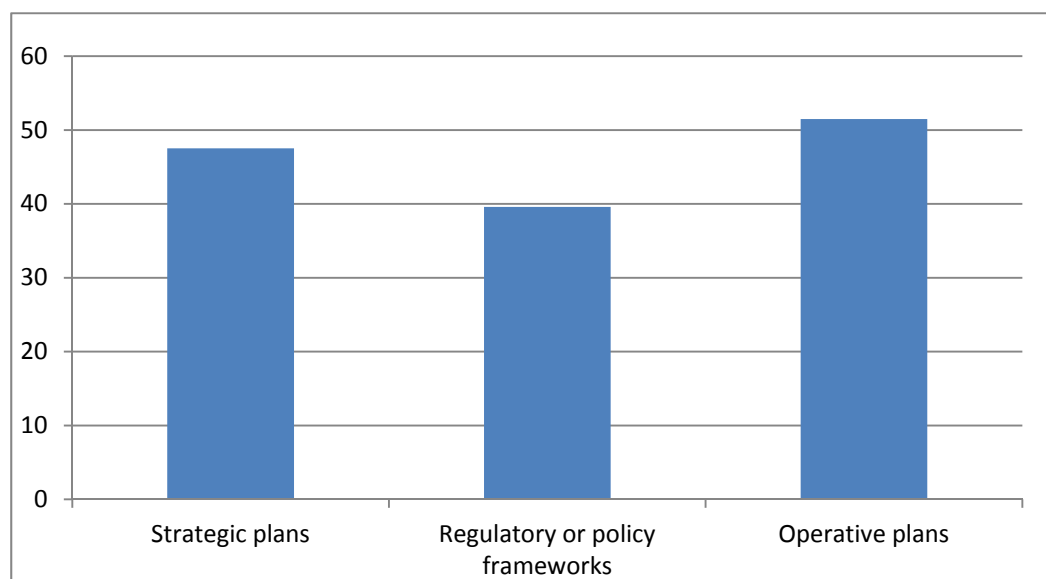
However, 14 per cent of respondents explicitly stated that did not have any ICT policies in place. This suggests that efforts must still be made to move towards a more thorough organization-wide planning, particularly as the extent of ICT institutionalization within labour administration systems is still at the development stage in many countries. Written visions must also still be employed in many labour administration agencies. Such strategies could stimulate a higher level of shared ICT culture and promote a sense of commitment to the technological institutional transformation among labour administration employees (Nasi and Frosini 2010), thus helping to overcome the previously discussed cultural barriers to further use of ICT.

5.1.   Security and privacy of data

As part of the e-government strategy, a clear and comprehensive approach to the security and privacy of data within the electronic domain is required, so as to safeguard institutional performance and productivity. Information security and privacy refers to the protection of the confidentiality, integrity and availability of information and information resources (Pfleeger 1997). A positive picture emerges from the ILO Survey in this regard, with only nine per cent of respondents – five per cent from developed and 14 per cent from developing countries – seeing the protection of sensitive information as a barrier to further ICT adoption. Moreover, as shown in Figure 11, a striking majority of respondents reported either a significant or some improvement in the security and privacy of the data they work with.

Figure 11.   Percentage of labour administrations reporting improvements in the security
and privacy of data
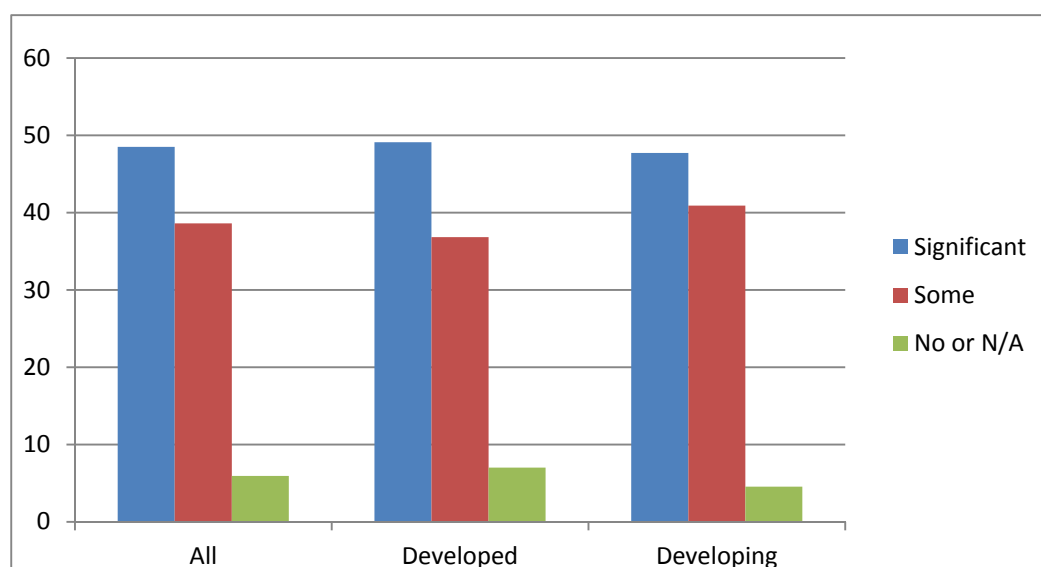
At the technical level of security, though electronic databases allow for the easy storage and identification of large volumes of labour market-related governmental and citizen information and reduce the risk of a losing or misplacing paper based confidential information, computer failures, network crashes, faults in data systems and the growth in the number of malicious software applications represent serious data confidentiality risks (Gauld et al. 2006). Such issues call for the constant development of security controls for the prevention of unauthorized access to organizational networks (Landsbergen 2010). For example, in **Lithuania**, the State Social Insurance Fund Board appointed a security manager, who coordinates and monitors the implementation of policies, performs regular risk assessments and organizes information security training for users of the information system. Similarly, in the **Lithuanian** State Labour Inspectorate, an IT Security Manager was appointed and made responsible for IT security management, security compliance controls, audits, security planning and tracking security incidents and their resolutions.[8] Box 9 is another example of how the Italian Ministry of Labour and Social Policy tackles the technical issues of information security.

Box 9. Information security culture: The Ministry of Labour and Social Policy of Italy

The Ministry of Labour and Social Policy of Italy has a centralized system in place which performs a careful authentication procedure based on the management of personal credentials before granting users with access to its stored records. A protection policy for browsing the Internet has also been established, meaning that access to the Internet is again contingent upon internal user authentication. Additionally, website content analysis is applied, to ensure its adherence to a work related category. Checks for viruses on websites and downloads is performed to block infected files. Moreover, all employee PCs are provided with a standard software installation that includes, in addition to the operating system, various personal productivity applications, and does not allow for the installation (or uninstallation) of new software. This arrangement maintains a standard application profile and prevents the installation or execution of potentially damaging software.

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[8] Whereas the Fund Board also regularly hires external security professionals to identify vulnerabilities or weaknesses of its information system, due to the current Lithuanian socio-economic situation, the State Labour Inspectorate faces difficulties in hiring or contracting IT security experts.

At the psycho-social level of privacy and trust, the public are concerned with the disclosure and misuse of their confidential information, creating the need to both inform citizens and seek their consent regarding the intended use of the data they provide. This may take the form of visible privacy statements placed on official websites prohibiting the use of visitor information for commercial marketing, informing visitors about the use of 'cookies', prohibiting the sharing of personal information without consent or notifying visitors about sharing their information with law enforcement agencies or, in the case of mobile communications, with network providers. Box 10 provides an example of how the psycho-social dimension of electronic data privacy is addressed by the Lithuanian Labour Exchange.

Box 10. Information security culture: The Labour Exchange of Lithuania

The Lithuanian Labour Exchange ensures the protection of the public's personal data by formally seeking permission from jobseekers for the internal publication of their résumés on the institution's ICT systems. These systems are not connected to the public website, are accessible solely to PES practitioners upon completion of an authorization procedure in the dedicated PES domain and are constantly monitored for details on use for personal data modifications with regards to the 'who, where and when'. Currently, plans are being drafted to expand auditing information to include viewing personal client data.

Ensuring the security and privacy of data remains a salient challenge when considered in the context of data sharing among several labour agencies. At the technical level, there are problems surrounding the interoperability among the systems of different institutions (Joshi et al. 2001). This challenge arises as the various systems are designed with different purposes in mind. This is a problem faced by numerous labour administrations all over the world, however there are some noteworthy exceptions. **Arab States** lead the way in the creation of databases of enterprises which include information on companies and their workers, are updated regularly and are made available to other databases. The Department of Labour and the Department of Safety and Health of the **Malaysian** Ministry of Human Resources both use a 'Labour Market Database', as well as materials made available through the Ministry's interactive website in order to access important information on all registered enterprises and their compliance with labour laws. Moreover, in **Singapore** the Labour Relations Workplaces Division, Occupational Safety and Health Division and the Foreign Manpower Management Division have harnessed the communicative and informative power of ICT to drive and coordinate their work, which has resulted in a reduction in the number of labour disputes in the country. In **Belgium**, the country's labour inspectorates are free to access a range of databases and applications including a database for the declaration of employment and social security registration; a database for the protection of migrant workers from new European Union Member States; a database for the systematic detection of fraud and pertinent classification of workplaces; a daily updated database for documenting all aspects of inspection visits and an application for accessing the Crossroad Bank of Enterprises, where all businesses and economic units are registered. Negotiations are also underway to establish cooperation with tax authorities (ILO 2013). Simultaneous access to data at all levels of potential legislative violations can also facilitate the allocation of scarce resources to plan and execute investigative actions. Labour administrations could therefore do with investing in top-level system designs and standards to enable greater interface interoperability across the databases of different departments and authorities. Moreover, at the policy level, legislation should be put in place to strengthen information communication and data exchange among different departments both within and outside of labour agencies. For example, the **Danish** Working Environment Authority complies with national, as well as international IT and data security standards. [9] The State Social Insurance Fund Board of **Lithuania** complies with the Law on the Legal Protection of Personal Data, which is mandatory for all governmental

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[9] According to the information provided by the Danish Working Environment Authority, this is based on combined implementation of the Danish Standard on information security DS484, which is the Danish 'implementation' on the British Standard BS7799 and the International Standard ISO27001

institutions. Additional security requirements of the Fund Board's information system are specified in the Security Documents of the Fund Board, other technical security requirements, as well as the preconditions for personal data protection as specified by the Ministry of the Interior and by the State Data Protection Inspectorate. In sum, a key point for labour administrations in relation to sharing data between several agencies is to incorporate the creation of a technologically compatible and legally secure infrastructure for the exchange of sensitive information into their ICT policy agendas.

Part IV. Innovative use of technology in labour administration worldwide

With the preceding assessment of the potential benefits and challenges of new technologies in mind, it is now possible to move on to describe how the potential of ICT to strengthen and modernize labour administration is being realized, particularly within the specialized individual areas of labour administration, all over the world.

1. Technology in labour inspection

As a fundamental pillar of labour administration, labour inspection is concerned with enforcing labour law and monitoring compliance through the provision of information to employers and workers, or through imposing sanctions. It also plays an active role in assisting legislative bodies to identify gaps in labour laws. However, ILO audits have recently identified a number of weaknesses in the labour inspection functions worldwide, including insufficient levels of inspection staff [10] and a lack of knowledge among employers and workers about existing laws, rules and institutions. Altogether, this can encourage non-compliance through overlooking failures to comply with labour law and to report labour law violations, or through failing to complete the investigation of detected or reported breaches of labour law due to limited human resources working under high workload pressures. Through combining traditional methods of labour inspection with innovative technological solutions for the enhancement of the efficiency and effectiveness of labour inspectorates, the institutional capacity to elicit greater awareness, respect for and compliance with international labour standards or national labour laws can be greatly improved.

1.1. Improving access to labour law through technology

Greater informational connectivity enabled by new technologies can improve access to the national, international and foreign dimensions of labour law. The on-going process of globalization, along with the international migration of workers at its core, has increased the interdependencies between national labour markets. Accordingly, this necessitates greater international cooperation between labour administrations. Labour inspectorates should continually monitor the developments in labour law in order to ensure that their systems appropriately address changes in the global employment law environment. This may be achieved through viewing and downloading official legal documents available on the websites of labour law institutions; signing up for notifications of labour policy plans and changes via Web 1.0 and Web 2.0 channels or simply through telephoning the relevant labour law institutions. Overall, an impressive 85 per cent of ILO Survey respondents observed an improvement in access to labour law through the use of ICT. Figure 12 below depicts the various dimensions of improvements in access to labour law, as reported by these 85 per cent of respondents.

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[10] For example, in China the total of labour inspectors stands at only 25,000 (Casale and Zhu 2013).

Figure 12.   Percentage of labour administrations reporting improvements in access to labour law
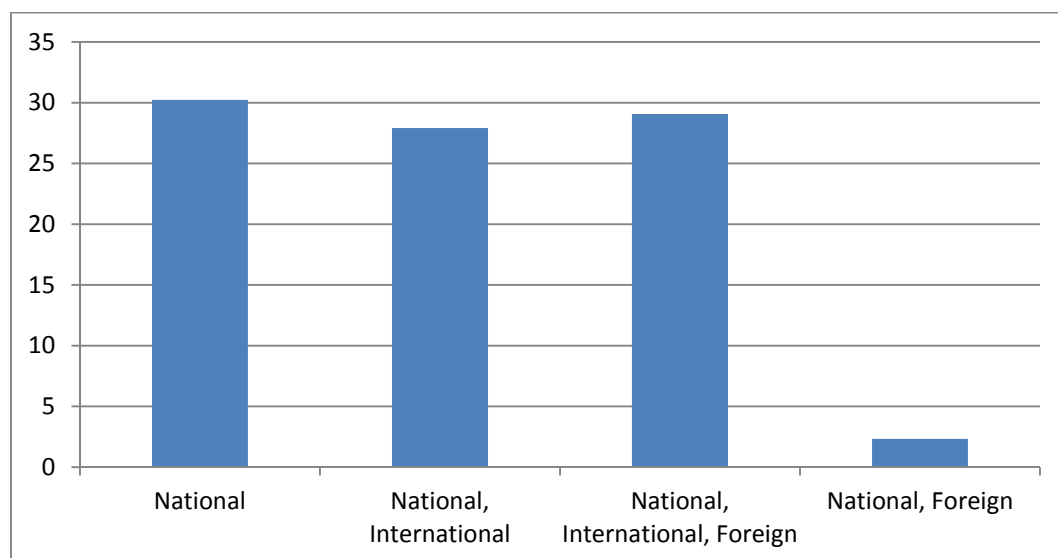
It can be seen that though most improvements were observed purely at the national level of access to labour laws, just under a fourth of respondents reported enhanced awareness of international labour standards at the same time. This suggests that there is significant scope for the ILO to tap into the potential of new technologies to promote knowledge on international labour standards and their application at the national level.

1.2.   *Integrated computerized inspection management systems*

The ILO Survey found that globally, labour inspection is the most computerized component of labour administration. Fifty-six per cent of respondents reported computerizing at least some of their functions through adopting various kinds of integrated computerized inspection management systems (ICIMS). Within ICIMS, the most commonly computerized functions were recording complaints of labour law violations and organizing and maintaining the data from previous inspections. Further details are presented in Table 23.

Table 23. Percentage of labour administrations reporting features of their integrated computerized inspection management systems

Functions of computerized inspection management system	Extent of computerization
Inspectorate profile	42
Establishment profiles	44
Risk assessment for establishments	18
Occupational safety and health report for establishments	25
History of previous inspections	45
Organizing inspections	42
Performing risk assessment	12
Managing follow-up actions	39
Documenting visit check lists	33
Registering inspection visits	44
Producing reports	40
Generating inspection protocols	20
Issuing warnings and tickets to establishments	28
Producing statistical reports	43
Recording complaints about labour law violations	46
Recording inspection procedures	45
Recording work accidents	37
Recording occupational diseases	21
Monitoring payment of wages	21
Inspector's ranking, performance monitoring and appraisal	21
Locating workplaces to be inspected	32
Linking with other concerned institutions	19
Tracking labour cases	23
Verifying migrant workers' contracts	13
Translation of workers' contracts and other relevant documents	7
Calculating wages and working hours	17
Communication between the inspectorate and establishments	27
Exchange of information between employees of a single inspectorate	25
Exchange of information between different inspectorates	20
Exchange of information between the inspectorate and headquarters	33

Nosanuri, Korea

There are a number of standout cases of ICIMS. For example, introduced into the Ministry of Employment and Labour in the Republic of **Korea** in 2003, 'Nosanuri' is an information system designed to improve the efficiency of the labour inspection's administration. The system hosts a broad range of information, from data on workplaces to be inspected along with guidance on conducting the inspection, to overdue wage complaints. The system provides a platform for the collaborative capacity building of the Ministry's employees, as both ICT experts and inspection administrators alike are invited to develop and improve the content of the operating system. As part of the internal administrative infrastructure, 'Nosanuri' is not open to the public, and decisions about

system improvements are made internally. Once a year, training courses are provided for labour inspectors to ensure that both existing as well as new users have a comprehensive understanding of the current system.

Smart Inspection System, United Arab Emirates

The labour inspectorate of the **United Arab Emirates** has at its disposal an award-winning 'Smart Inspection System', whose efficient interface facilitates close and up-to-date communication between inspectorates and enterprises. For example, through the automatic planning of inspections in light of negative data from the employment market, the system can assist labour inspectors with the complex analytical task of prioritizing inspections and follow-up visits. Members of the public are encouraged to support this system on the website by offering Smartphones as a reward – an innovative way of encouraging greater citizen participation and overcoming the digital divide at the same time. [11]

Inspection Information System, Bosnia and Herzegovina

The inspectorate of the **Republic of Srpska of Bosnia and Herzegovina** implemented an 'Inspection Information System' in 2010. The system supports all inspection work processes from the planning of inspections based on risk evaluations, through to managing and supervising the inspections being carried out and creating inspection records using mobile technological tools such as laptops and printers. This system allows for the production of statistical reports; recommendations and suggestions for the improvement of regulations and procedures; automatic allocations of case registration numbers and archiving and shipping of documents in the facilitated process of inter-inspectorate communication through electronic data exchange. The system can be accessed by other inspectorates by digital connection through a security engine to manage unauthorized access.

Twin Networks Management System, China

The labour inspection in **China** uses the 'Twin Networks Management System' (TNMS), the nation-wide pilot of which commenced in 2009 and has been a prominent strategic focus since 2011. With a low ratio of labour inspectors to enterprises, the TNMS presents an invaluable opportunity to monitor labour law compliance in the Chinese labour market and provide employers and workers with the high quality services they require. With only about 25,000 trained labour inspectors and approximately 100,000 labour inspection assistants in the entire country, in-person inspections of all enterprises are practically impossible operationally. To address this challenge, the TNMS divides urban or rural communities within cities into geographical grids, each of which is assigned two labour inspection assistants to help a designated labour inspector collect data and information on all businesses in that particular grid. The data and information collected are uploaded into an information network called the 'Management Information System of Labour Inspection' (MISLI). With an increasing level of online self-reporting by enterprises, the main duties of the labour inspection assistant are to verify the data and information, to better understand the real situations of businesses and their compliance with the law, to promote laws and regulations and to help mediate labour disputes on the basis of a mutual willingness of both parties. All information on employment practices entered into the system is then cross-referenced with information from other databases on social security and labour markets to establish signs of potential non-compliance. [12] The system is

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[11] See http://www.mol.gov.ae/newMolGateway/english/newIndex.aspx

[12] However, caution must be exercised in using self-reports as basis for planning the frequency of visits, as the accuracy of self-assessments of compliance with labour legislation depends on the

currently moving to improve access to the databases with relevant departments, such as taxation, based on a consensual understanding. The MISLI can thus be deployed by labour inspectors for information sharing, data comparison, dynamic monitoring, classified supervision and inspection, early warning and forecasting, one-shop processing, case management, superintendence and authority, statistics and analysis, institutional and staffing management, among others (Casale and Zhu 2013). In Jiangsu Province, workers can access the websites of a regional labour department, phone or visit its office to present a complaint. Their case will then be registered in an integrated MISLI of the Province with the provincial labour inspectorate. The case will be automatically assigned to a regional or city labour inspectorate for handling. The system will also generate a case number, meaning that the worker can trace the status of the case and provide feedback on their satisfaction with the case result.

The TNMS resulted in a range of improvements. It extended labour inspection services to cover both urban and rural areas and simplified inspection visit prioritization through the use of colours representing different degrees of law compliance, which are subjected to different treatment in terms of inspection visits. Moreover, in some cities, about 40 per cent of minor labour inspection cases and labour disputes have been resolved by the interventions of the labour inspection assistants, which prevent the escalation of cases and makes it possible for labour inspectors to invest their time in more complex and urgent cases (Casale and Zhu 2013).

However, Chinese labour authorities are facing challenges in the optimization of labour inspection through the use of ICT in three main areas: human resources, funds and technological infrastructure. Firstly, efficient use of the TNMS requires additional hiring and continuous refresher training of labour inspection personnel (Casale and Zhu 2013; Casale and Sivananthiram 2015). Labour inspectors lack sufficient ICT skills, calling for the procurement of technological solutions from external service providers. Moreover, a secure information infrastructure for interoperability among systems must be constructed. Finally, to facilitate international cooperation efforts, investment in modernizing labour inspection services, as well as labour administration services more broadly, are also necessary.

Labour Control System, Brunei Darussalam

On the 25th May 2015, the Minister of Home Affairs in **Brunei** Darussalam launched the Labour Control System (LCS) to facilitate the improved provision of online services to the public and to boost the efficiency of the Department of Labour's internal processes. The system replaces the Legacy System (Ingres), which has been in use since 1994. Due to its novelty, the LCS is being implemented in phases before its planned full operational launch online later this year.

The system is hoped to produce a range of benefits. It is expected that it will improve the convenience to the public by enabling the complete submission of online applications without having to invest time and money in travelling to Department's offices. Moreover, improvements in public service quality through the systematic and efficient electronic processing of information and a reduction in the Client's Charter – the number of working days taken to process applications – are also intended. Finally, it is hoped that forgery of documents, such as Company Licenses and Work Pass Recommendations, will be both reduced and prevented through the LCS itself printing and issuing the documents.

At the same time, technical and cultural challenges are expected ahead of the system's launch. Firstly inadequate bandwidth causes slow Internet connection and server problems,

level of training of employers and their understanding of legal regulations. A possible solution would be involving trade unions to sign and verify the accuracy of the self-assessments

presenting barriers which must be handled at the wider national structural level. In terms of the ICT capacity of human resources, a shortage of suitably trained employees at the Department has also been noted, as have subsequent problems with software and hardware maintenance. Finally, system replacement poses a challenge to institutional change management, coupled with a recognition of the problems with public adaptability to online service applications, given the level of ICT illiteracy in Brunei Darussalam.

Labour Inspection and Administration System, Costa Rica

The Inspectorate of Labour at the Ministry of Employment and Social Security in **Costa Rica** operates the 'Labour Inspection and Administration System' (SILAC). SILAC is a Web-based platform which was first implemented within the regional units, then at Headquarters, and enables the complete generation of all inspection documentation, including evaluation and information bulletins, based on the vast array of data it holds. However, the system's roll out was problematic due to initial problems with the use of its specific communication functionalities, with labour inspectors instead resorting to the use of open-source video and voice conferencing platforms such as Skype and TeamViewer. The success of the system has been significant, with all regional offices currently connected to the system, which can be remotely accessed by all labour inspectors. Among the benefits reported by the Inspectorate, there has been a quantitative increase in the number of visits, as well as a qualitative improvement in their conduct and management.

1.3. Mobile applications and devices in labour inspection

In response to the challenges of operating within a multilingual environment, the National Employment Rights Authority of **Ireland** provides labour inspectors with mobile phones and access to a call centre interpretation service. During inspection, upon encountering a worker without a sufficient command of English, the labour inspector can contact the call centre and invite an interpreter to join in a three-way inspection interview. In **India**, under a labour reform campaign launched in 2014, labour inspectors conducting assessments of factories were instructed to upload their inspection reports to the government website within 72 hours of the inspection. Inspectors were also guided in the process by an SMS system, notifying them of changes in inspection regulations (Anonymous 2014). In July 2014, the **Uruguayan** social security institute launched a free mobile application called 'BPS Trabajo Doméstico' for the employers of domestic workers (FORLAC 2015). The application allows employers to easily access the history of payments and modify employee details. Additionally, the institute is driving the launch of another online application called 'Venetus' for the registration of worksheets, and is also working on the development of software to register work-related accidents and occupational diseases within the domestic work sector as well as others. In **Norway**, smartphones and laptops provide a convenient way of working while travelling to and from enterprises (Kvam 2011). Technological advancements in this region have contributed to a re-design of the model of work of labour inspectors, with many working from home, allowing more time for the analytical handling of complex labour cases, rather than travelling to and from the office. Such office visits are now limited to once a week, substituted with the conferencing functionalities of the Internet. Skype in particular represents a new form of ICT which connects labour administrators from many different regions, freeing up both labour administrators and employees in terms of travelling to the location of labour cases.

Contrary to the popular view that the growth of teleworking creates expectations of a non-stop online presence, thus jeopardizing the work-life balance of labour inspectors, only nine per cent of respondents to the ILO Survey reported this as a problem. In actual fact, the adoption of mobile technologies by labour inspectors can create a healthier work-life balance, freeing labour inspectors from the need to complete large volumes of administrative work outside of office hours. This has been reported to be the case following the introduction of the 'Labour Inspection System Application' (LISA) in **Sri**

Lanka (Chandrasiri and Gunatilaka 2015). Up until 2012, the Sri Lankan Labour Inspectorate operated a paper-based manual system of labour inspection. Its handling placed high time demands on labour inspectors, who were often forced to complete their work outside of office hours. This would result in sacrificing the quality of the voluminous reports produced, given the potential loss of data caused by time lapses between its collection and input. After over a decade of experimentation with the possibility of moving towards a modernized technology oriented labour inspection, Sri Lanka entered into a collaborative partnership with the ILO and the US Department of Labor, fuelled by the technical assistance of a private services provider. The result of this partnership was mobile application software available for use on a tablet, which allows inspectors to complete inspection documentation on-the-spot, both reducing the amount of administrative and paper work and eliminating the need for labour inspectors to complete work outside of their office hours. 'LISA' allow labour inspectors to take pictures of any violations of labour law on premises – such as the use of child labour in factories – and instantly upload them for reporting purposes to the relevant authorities, which has greatly helped improve child protection within the informal economy. Its full use in **Sri Lanka** since April 2013 has shown the potential of new technologies to help monitor labour law violations. In **India**, 'LISA' has been praised for its potential to improve the effectiveness and transparency of labour inspection. [13]

In many countries however, the potential of mobile inspection software has not yet been realized, with only 20 per cent of respondents reporting having mobile inspection software in place. Table 24 below provides a general overview of the number of functionalities offered by mobile inspection software, suggesting a relatively low level of technical advancements.

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[13] For example, child labour inspections in 2013-14 fell to 1,380 from 2,421 in 2012-13 (Nigam 2015).

Table 24.   Percentage of labour administrations reporting features of their mobile inspection software

Function of mobile inspection software	All	Developed	Developing
Registration of enterprises, workplaces and objects	18	21	14
Route planning	8	11	2
Electronic mileage log book	5	7	2
Collection of field data	15	18	9
Comparison of field data with legislation/threshold values	8	9	5
Production of electronic reports	9	11	7
Printing of paper reports	9	9	7
Sending reports to inspectorates	9	13	5
Sending reports to establishments	9	9	7
Taking pictures of default/failures with the ability to annotate	9	13	5
Using clocks for automatic time and date stamp	8	5	9
Access to the labour inspectorate database	15	18	9
Access to inspection manuals	9	11	7
Access to legislation	9	13	2
Video or voice consultation with the inspectorate	2	4	0
Workflows	8	11	2
Performance appraisal	7	7	5
Strategic and operational planning	6	9	0
Performance monitoring	6	5	5
Project management	3	5	0
Communication with databases of other institutions	8	11	2
Communication with courts	1	2	0
International cooperation with labour inspectorates	0	0	0
Payment of sanctions	5	7	2
Training	4	6	2

Only 15 per cent of respondents stated that their mobile inspection system benefited from connectivity with the computerized inspection management system. Poor technological infrastructure and unreliable mobile connections are still issues, despite connectivity being reported as supposedly enabled everywhere by six respondents, and in some locations by the remaining nine. Resolving the problem of poor connectivity must be an objective of governments wanting to move in the direction of harnessing the potential of ICT. Without improved Internet infrastructure, labour administration institutions will not be able to make use of the possibilities afforded by mobile applications. In this regard, the inspection department at the Ministerio de Trabajo, Empleo y Seguridad Social in Argentina has come up with an innovative technical solution by means of a literal application of the idea of mobile labour inspection. Difficulty in reaching all enterprises in all sectors and remote areas is a common problem faced by labour inspectors. To increase the number of inspections and better monitor labour law compliance within such regions, the inspection department has equipped its labour inspectors with van-type inspection trucks, each housing three work stations with personal computers, printers, power generators and satellite Internet connection. The latter tool in particular allows for the instant set-up of an inspection office in all areas, regardless of mobile Internet coverage. Moreover, labour inspectors are equipped with portable computers and work mobile phones with unlimited access to mobile Internet for improved communication with colleagues in the inspection

offices. The support staff in the office also benefit from access to personal computers equipped with the latest technology (La Inspección del Trabajo en la Argentina 2013).

1.4. *The integration of technology in labour inspection through cooperation schemes*

The incorporation of new technologies into labour inspection systems can be facilitated by various cooperation schemes with the public and private sectors. For example in Ukraine, on-going support is provided by the ILO in developing a registration system for the labour inspectorate, providing information on employers, workplaces and inspection activities. In 2013, the ILO presented and handed over a new Analytic Information System for the State Inspection of Ukraine on Labour Issues, to allow for planning and monitoring as well as better comparison of statistics on labour inspection data. [14]

The US Department of Labor gave the ILO a $1,000,000 grant to assist the Philippines in the development of a new technology-enhanced 'Labour Laws Compliance Management Information System'. [15] Labour inspectors were provided with Android-powered tablets, which enabled them to complete real-time electronic check-lists against the country's decent work indicators and send the data to the system to instantly view and analyse, allowing for the generation of statistical reports. [16]

In the United Arab Emirates, drones have been deployed to improve the effectiveness and efficiency of routine inspections on construction sites, developed though a collaboration between the Ministry of Labour and technology students from Dubai. Firstly, wirelessly controlled unmanned aerial vehicles can be directed to otherwise hard-to-reach locations, which with the use of high-resolution cameras can record movements on construction sites, feeding the images and videos to a live screen within the inspection control rooms. This allows for the quick detection of any labour law violations, such as demanding workers to continue carrying out their duties during the midday break. Plans are also in place to connect the smart inspection drone technology with the labour monitoring inspection system, to enable the issuing of on-the-spot fines. Secondly, in addition to boosting the image of the labour inspectorate as innovative and dynamic, the partial replacement of manpower associated with automated technology saves labour inspectors' time and effort, as well as increasing their safety at work by reducing their exposure to dangerous locations. [17]

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[14] See http://www.ilo.org/labadmin/news/WCMS_205179/lang--en/index.htm.

[15] See http://www.interaksyon.com/article/101932/ph-new-labor-laws-inspection-system-wins-1-m-us-grant

[16] See http://www.dole.gov.ph/news/view/2784

[17] See   http://www.thenational.ae/uae/government/smart-inspection-drones-monitor-construction-sights-for-violations.

The Ministry of Labour in the United Arab Emirates [18] launched their e-services through a cooperation project with the private sector. Introduced in October 2008, 'e-Natwasal' is an electronic portal available on the Ministry's website, launched with a view to offering better services for employers, workers and labour administration authorities alike. Workers can visit the portal to review and obtain photocopies of their labour contracts (for labour card holders), access their employment details (for workers with no labour cards), obtain salary certificates, file complaints against employers about delayed payments of salaries via 'Ratiby' (my salary) service and finally track the progress of reported complaints. [19] Employers can also access reports on labour card statistics, including the number and nationality profiles of their employees, bank guarantees, workers' visa status or any fines imposed on the company. Registration of employers is free of charge and enables business owners to complete a self-evaluation report by answering questions about the company's function, recruitment policy, salary transfer details, incentives given, and Labour Code compliance in relation to emiratization, registers, absence, women's employment, wages, OSH, employment contracts, working hours and working assessment. Finally, authorities can use the portal to access transactions from typing offices via the 'Tasheel' service, including recruiting 'e-Natwasal' trained typists, requests for temporary work permits and renewal of commercial licences. Through the enhanced data imputation and processing by the Ministry's staff, e-services have enabled a quicker handling of applications and have resulted in a reduction of work-related complaints, saving time, reducing workload and affording greater transparency for a more effective implementation or revision of labour market policies. The Ministry also launched an initiative called 'Tabadol', to electronically link with the Department of Naturalization and Residency in Dubai. At the same time, it continues to recognize the importance of providing alternative communication channels for those members of the public who prefer more traditional ways of contacting the Ministry to make a complaint or seek legal assistance. Workers can call a toll-free telephone number or send an email enquiry to a call centre which is equipped to provide information on legal procedures and regulations, including the wage protection system, housing requirements for workers and working hours.

1.5. Technology as basis for wage protection

To meet the demands for timely payment of salaries to protect workers' rights, the **United Arab Emirates** has established an interface with the Central Bank based on a specified file format to enable the fully automated transfer of payment files between the employer and the bank. This Wage Protection System (WPS) includes a facility for automatically updating the database with information for further processing, such as reports for the bank and transaction audit trails for employers. In 2009, the **United Arab Emirates'** WPS system was complemented by an electronic and telephone complaints service, with confirmations of the receipt of complaints sent via email or text message. This has enhanced the overall productivity of the wage payment system by reducing errors through

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[18] See http://www.emirates247.com/news/emirates/one-million-people-use-e-natwasal-service-2010-12-12-1.328233, http://www.guide2dubai.com/973-Labour-Ministry-set-to-introduce-new-e-services-facilities.html,
http://www.khaleejtimes.com/darticlen.asp?xfile=data/theuae/2008/December/theuae_December256.xml&section=theuae, http://www.gulftalent.com/home/Internal-Administrator-Typist-jobs-in-Dubai-UAE-175623.html, and http://ifg.cc/aktuelles/nachrichten/regionen/131-ae-vereinigte-arabische-emirate-uae/32800-uae-labour-ministry-to-launch-self-evaluation-portal.

[19] http://www.emirates247.com/news/emirates/one-million-people-use-e-natwasal-service-2010-12-12-1.328233

bringing the level of manual data entry down to a minimum.[20] It has also resulted in the simplification of administrative work for employers. Most importantly, the WPS has also been linked to a decline in the number of labour disputes. Delays and issues with wage payments have also been minimized in **Saudi Arabia**, which has had a WPS in place since 2013. Under this system, companies are required to submit wage information to the Ministry of Labour via the e-service program, which helps to ensure that workers' rights in relation to salary payments are respected and illegal employment is curtailed.[21] In February 2014, a WPS was also implemented in the **Sultanate of Oman** to reduce the level of labour disputes and ensure the timely payment of salaries in accordance with the contract, in order to prevent the exploitation of low-paid and uneducated workers.[22] Other countries are also recognizing the need for similar systems to protect vulnerable workers within unorganized sectors [23] (for example **India**[24]). In February 2015, **Qatar** began taking steps towards implementing a wage protection system, which makes it mandatory to pay workers through bank transfers. However, it failed to provide workers in remote areas with Automated Teller Machines. This highlights the importance of matching institutional technological transformation with the pertinent developments in physical infrastructures to prevent the failure of government ICT initiatives.

1.6. Technology as a mechanism of social control to prevent labour law violation

Another popular way of promoting a culture of compliance and transparency is by using technology as a means of disincentivization and social control, such as through online 'Name and Shame' lists. Such lists serve as a public labour law enforcement mechanism which discourages employers from breaking labour laws for fear of high economic and social sanctions. For example in 2011, the Department for Business, Innovation and Skills in the **United Kingdom** launched a scheme to name employers who break the National Minimum Wage law through the publication of their records on its website.[25] As workers are given more detailed information about potential employers, they can make better informed decisions about which company to contract with, and feel more encouraged to come forward should they feel have been underpaid.[26] In the **Netherlands**,[27] plans were

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[20] See http://raqmiyat.com/banking/banking-operations/wages.aspx, http://uae.smetoolkit.org/uae/en/content/en/54959/The-U-A-E-Wages-Protection-System, http://www.gulfinthemedia.com/index.php?m=economics&id=714530&lim=20&lang=en&tblpost= 2014_08>

[21] See http://www.globalworkplaceinsider.com/2013/10/wage-protection-system-saudi-arabia/

[22] See http://www.timesofoman.com/news/39654/Article-New-system-of-wage-payment-helps-workers-in-Oman.

[23] See http://www.newswala.com/India-National-News/Introduction-of-an-online-wage-protection-system-to-address-labour-issues-and-complaints-in-Kerala-76456.html

[24] See http://www.timesofoman.com/news/33800/Article-Ministry-of-Manpower-Central-Bank-of-Oman-hold-meeting-on-e-system-for-wage-protection

[25] See https://www.gov.uk/government/news/government-names-and-shames-37-national-minimum-wage-offenders

[26] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/429737/bis_15_299_NMW__hm_revenue_and__customs_enforcement_prosecutions_and_naming_employers_who_break_national_minimum_wage_law_May_2015__2_.pdf

drafted to name and shame unhygienic food firms and for inspectors to go public with the fines. The ensuing reputational costs can be much higher for employers in relation to mere punitive financial fines. This is recognized by the Ministry of Labour of **Qatar**. Every six months, the Labour Inspection department of the Ministry classifies the companies operating within the country into three groups: A, B and C, based on its assessment of the companies' adherence to the labour law, with plans to upload these assessments onto the Ministry's website. The strategy is not aimed at punishing lower grade companies, but rather at encouraging the worst performing employers to bring their practices in line with those of the better performers, in the spirit of promoting respect for labour laws and encouraging healthy competition.[28] However, careful thought must be put into designing such 'Name and Shame' policies, given the permanence of online records which are often further publicized by online media. For example as part of its 'Name and Shame' strategy, the Department of Labour and Pensions of the **Cayman Islands** published a list of alleged violators of the Cayman Islands Labour Law concerning payments to workers, erroneously naming a former owner of one listed company, who was then publically criticised by online media commentators.[29] 'Name and Shame' strategies must therefore be based on carefully crafted mechanisms of verifying records to ensure the righteousness of social and reputational sanctions.

2. Technology in Public Employment Services

Public employment services comprise of departments within the ministries of labour or various executive agencies responsible for matching workers with the opportunities available in the labour market. The recent rise in unemployment following the financial crisis coupled with socio-demographic changes in the economically active population have placed heightened demands on PES practitioners to support the unemployed in securing a new positions. New technologies can enhance the delivery of PES through the rapid dissemination of timely information and services, as well as through the automation of formerly manual paper-based work practices.

2.1. *Technological modalities for the provision of labour market information and intermediary employment services*

The ILO Survey found that PES have made inroads into using new technologies to increase the informational proximity between the labour market and its participants in terms of the registration of both jobseekers and employers, as well as in broadcasting vacancies and assisting jobseekers with vacancy selection. Just under half of all respondents reported making these functions available through their website. Table 25 below details the extent to which the various functions of PES have been transferred to the online domain and the extent to which they are still available through more traditional service delivery channels.

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[27] See http://www.dutchnews.nl/news/archives/2015/04/name-and-shame-dirty-food-firms-labour-mps-tell-health-minister/

[28] See http://thepeninsulaqatar.com/qatar/233485-companies-classified-on-track-record.html

[29] See http://www.compasscayman.com/caycompass/2014/09/26/Naming-and-shaming-the-Labour-and-Pensions-Department/

Table 25.   Percentage of labour administrations reporting the use of ICT in public employment services

Public employment service	Computerized and accessed by visiting physical facility	Computerized and accessed by calling	Computerized and accessed by writing	Computerized and accessed online
Jobseekers registration	47	13	8	44
Employers registration	44	19	16	42
Vacancy broadcasting	42	19	14	43
Job matching	41	13	11	41
Selection	37	13	7	28
Career coaching	36	10	4	16
Issuing work permits	29	2	4	12
Self-employment assessment test	10	1	1	12
Provision of tax advice	4	3	1	3
Dissemination of labour law advice	36	28	19	30
Reporting of labour law violation	37	24	26	28
Applying for unemployment benefits	23	4	5	11

Just under a third of respondents reported that they offered the general public the possibility to seek legal advice and report labour law violations through Internet-based channels. Given that workers and employers alike use the Internet to access PES, it provides practitioners with a useful channel for disseminating information on labour regulations and occupational health and safety in order to facilitate the prevention of labour law non-compliance, reduce the risk of labour disputes and generally increase the well-being of the economically active. New ICT can thus help to build trust in labour institutions, as the transparent provision of employment information by such institutions can make workers feel reassured about their rights and discourages employers from 'cutting corners', given that workers are more empowered to take action in case of abuses of their duties and entitlements at work.

As modern PES delivery is becoming ICT-dependent, in order to perform effectively and efficiently in the environment of technological transformation, PES must build the capacity of their practitioners to enhance the competent provision of services to customers, while understanding changes in the labour market and the deployment of ICT on a technical level. In **Poland**, PES practitioners follow the ILO-based training module on employability skills. However, there is an agreement among analysts on the use of new technologies in public administration that PES are vigorously exploring the potential of ICT to help fulfil the growing needs of the public for life-long learning within an increasingly competitive world of work (OECD 2000). With socio-demographic and economic changes, the composition of the workforce is changing. The young, the elderly, pregnant women and new mothers, informal and foreign workers, first-time labour market entrants, people with disabilities, temporary workers and voluntary workers are increasingly participating in the labour market, often on a restricted or part-time basis. New technologies can be deployed to reach out to these groups (Table 26), as well as to extend the coverage of the services' communications and information to wider labour market audiences, to ensure that labour market participants are educated about their duties and entitlements (Table 27).

Table 26.   Percentage of labour administrations reporting the use of ICT in the provision of information for various workforce segments

Employment segment	Materials available on the Website	Materials available on CDs/DVDs	Materials for image projectors	Materials on the radio /television	Materials on digital television
Employment of young adults	30	6	6	6	4
Employment of pregnant women and new mothers	24	3	6	4	3
Employment of the elderly	17	2	2	3	3
Employment of informal and foreign workers	24	1	9	3	0
Employment of first-time labour market entrants	22	5	9	2	1
Employment of workers with disabilities	21	2	9	1	1
Employment of temporary workers	21	2	8	2	1
Employment of voluntary workers	13	1	3	2	1

Table 27.   Percentage of labour administrations reporting the use of ICT in the provision of training

Training service	Materials available on the website	Materials available on CDs / DVDs	Materials for image projectors	Materials on the radio / television	Materials on digital television
Sector-specific training	27	11	9	5	2
Holiday entitlement	19	1	3	0	1
Remuneration	25	1	24	0	1
Parental leave	16	2	3	0	0
Working time	24	1	5	0	0
Medical examination	10	1	3	1	0
Social security	24	2	7	2	1
Occupational safety and health	25	12	9	8	5
Employment contracts	25	4	8	5	2
Decent work	25	5	7	3	2
Business trips	7	0	1	0	1
Civil law agreements	10	1	2	0	0
Mobbing	12	3	2	1	1
Discrimination	21	2	6	2	2
Work-related stress	13	2	5	1	1
Labour law	41	9	10	3	1

Overall, there appears to be a departure from the reliance on traditional technological platforms. Websites emerge as one of the main platforms for the dissemination of employment information. In particular, an online presence impacts the capacity of PES to disseminate labour law information, as reported by 40 per cent of respondents. The latest and most disruptive technologies, such as digital television, have not yet gathered much popularity.

2.2. Computerization of Public Employment Services

The level of computerization of PES varies between countries depending on the level of their economic development.

In the **Czech Republic**, the Ministry of Labour and Social Affairs cooperates with the Labour Office through an exchange of labour market data to facilitate jobseekers' access to information on vacancies. The data is uploaded onto an Integrated Portal, allowing jobseekers to access the data without having to register with the Labour Office, which can only be done through in-person contact. In April 2011, the Institute for Employee Benefits Scheme (UWV) in the **Netherlands** saw the introduction of reforms aiming to update existing electronic systems and provide exclusively online services to 90 per cent of all jobseekers, with the requirement for in-person contact set only after six months of unemployment. The US Department of Labor also mandated state workforce agencies to implement the 'Worker Profiling and Reemployment Services' (WPRS) system. Its purpose was to create a nation-wide coordinated approach to tighten up unemployment insurance eligibility rules and facilitate the re-entry of claimants into the labour market, thus reducing their dependence on benefits. Based on computerized statistical analyses of data, composed of claimants' employment profiles and information from the labour market, the probability of the exhaustion of unemployment benefits is estimated, with eligible claimants being referred to a Service Provider for assistance in finding employment. This system has been proven to reduce the moral hazards of unemployment and increase the earnings of labour market re-entrants, while at the same time alleviating the costs for unemployment benefit providers. [30]

New technologies have also accelerated the rate at which developing countries have established their job matching services. For example, the Ministry of Labour and Social Protection of Population of the Republic of **Azerbaijan** provides an electronic unemployment benefits calculator service. There is also an 'Electronic Information System on Labour Contract Notification' in place for electronically registering labour contracts, providing employers with information, obtaining information about labour contract notifications of employees and obtaining employment references in electronic form without having to apply directly to the employer. The key aim of this e-service is to ensure effective and flexible state regulation of labour relations. Additionally, citizens can get information on their labour contract notifications at any time. The Ministry plans to further computerize the acceptance of job applications, the documents required for granting the benefits and designation of unemployment status, job searches through employment service offices and the acceptance of applications and documents related to employment, including vocational training, additional education and paid public works. Employment centres in **Viet Nam** rely heavily on the widespread use of their Internet-based jobseeker and job vacancy database, combined with bimonthly job bazaars. **Croatia** has benefited from the expertise of several other more developed European countries in successfully developing an electronic labour exchange service. **Cameroon** has also benefited from the support of European countries, which has included the transfer of computers to increase its capacity to provide electronic services (ILO 2009c).

However, some efforts to implement new technologies in PES have been unsuccessful, highlighting certain steps which must be taken to avoid similar failures in the future. The US Department of Labor funded the development of the 'Frontline Decision Support System' (FDSS), which provides front-line employees within workforce agencies the administrative tools to facilitate the re-employment of jobseekers. However, the state-wide implementation of this system relied on a new Internet-based operating system, whose

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[30] See http://www-personal.umich.edu/~econjeff/Papers/AER012703.pdf.

interface with unemployment insurance claims required frontline staff to work overtime. This, along with funding issues and leadership changes, led to the delay and subsequent suspension of the plans for the FDSS. Moreover, though improving the efficiency of PES by allowing administrators to handle more applications, the computerization and digitization of employment services increased the frequency of identity theft and fraudulent benefit provisions, given the elimination of in-person contact.

3. Technology in dispute prevention and resolution

Dispute prevention and resolution agencies are responsible for the handling of grievances and conflicts at work. Globally, the employment dispute prevention and resolution system does not appear to be making extensive use of innovative technologies to support the delivery of its functions. Only 35 per cent of respondents transfer at least some or all workplace conflict prevention and dispute management activities into the electronic domain. Even less – 26 per cent – use a specialized computer-based toolkit for managing workplace conflicts. Moreover, in some countries such systems are still in a nascent stage. For example, the Ministry of Labour and Social Protection of Population of **Azerbaijan** has recently begun preparing its first dispute prevention and resolution computer-based toolkit. Table 28 details the extent to which the management of information related to the various aspects of conflict resolution is supported by new technologies all over the world.

Table 28.   Percentage of labour administrations reporting the use of ICT in dispute prevention and resolution activities

Dispute prevention and resolution activity	Percentage of institutions performing the activity with the support of new technologies
Monitoring labour disputes	
Types of disputes	27
Categories of workers	21
Enterprise size	20
Type of business	26
Sectorial distribution	22
Monitoring labour dispute settlement	
Types of disputes	26
Categories of workers	21
Enterprise size	19
Type of business	19
Sectorial distribution	20
Volume of disputes	19
Number of resolved cases per volume of disputes	27
Number of resolved cases by outcomes	24
Time per case	13
Cost per case	5
Level of resolution	12
Level of employment relationship retained	6
Level of avoiding referral	5
Frequency of appeal	6

It appears that the monitoring of labour disputes and their resolution is supported by new technologies in less than a third of labour administration systems, and few institutions retain electronic records of labour dispute statistics. For example, the Ministry of Labour and Social Security of **Jamaica** uses a system for the analysis of information, but not for the gathering of data. In **New Zealand**, the Ministry of Business, Innovation and Employment keeps electronic records of basic information only, such as the location of mediations.

Despite the greater reliability of telephones over the Internet, only 19 per cent of respondents who answered questions on the use of ICT in labour relations and dispute resolution indicated the use of Short Message Service (SMS) to notify parties of hearings, with the majority (50 per cent) relying on voice communication over the telephone, and some (45 per cent) using electronic communication to communicate the date, time and location of the hearings. Similarly, only 3 per cent of respondents reported harnessing the potential of SMS to facilitate applications to the conciliation service, with the majority reporting the use of email (25 per cent) and telephone (24 per cent).

To increase the opportunities to benefit from new technologies in labour dispute prevention and resolution, the relevant labour administration agencies could consider continually reassessing their own strategies against the successful experiences of other labour administrations. One successful example is summarized by Poland in case study Box 11. The system has been reported to successfully facilitate the collection, analysis and sharing of large volumes of data. It has also been linked with a reduction in the frequency of collective disputes at the workplace.

Box11. Benefiting from a computerized dispute prevention and resolution tool-kit

As part of the government strategy of 'Electronic Public Administrative Services Platform', the Ministry of Labour and Social Policy of Poland implemented the 'Collective Labour Disputes Monitoring System'. Created from 2007 to 2008 and continually re-developed, it is an Internet database which is accessible through the Ministry's website and conveniently holds complete information on all the collective labour disputes registered at the Ministry. The centralized and integrated nature of the application grants access to multiple users, including the National Labour Inspectorate and the Central Statistical Office of Poland. It also allows other institutions to retrieve relevant information on specific collective disputes through defined communication channels. The system operates in five modules which register the details of all labour disputes, mediators' personal details and statistical reports of collective labour disputes. It can be securely accessed by authorized parties from their personal system profiles. Since 2010, works have been in place to add a sixth module, allowing enterprises to electronically request a mediator using a special software wizard, thus eliminating the need for traditional paper-based applications in the hope of reducing the time taken to examine and review the applications by the Ministry.

Part V.   Preconditions for the success of ICT policies and policy recommendations for labour administration systems

Disparities exist between countries with regards to the use of ICT in labour administration due to different levels of national income and related technological infrastructure, as well as due to various degrees of social and political acceptance of ICT. For this reason, detailed policy implications which would be equally applicable to all countries cannot be produced. However, based on the preceding elaboration of the benefits and challenges related to the use of new technologies reported by national labour administration systems, this paper may help labour administrations realistically and reasonably justify further investment in new technologies as a high priority. Therefore, a number of general recommendations regarding the preconditions for effective ICT use and several policy options specific to specialized areas of labour administration can be proposed.

Preconditions

First and foremost, at the national level it is imperative that governments carefully identify the rationale behind the implementation of ICT. This is to ensure that there is a genuine need for the incorporation of new technologies into their operations to enhance service management and delivery (Landsbergen 2010). The adoption of ICT driven solely by institutional and political pressures without prior evaluation of the country's socio-economic readiness for its implementation may result in costly failures of ICT initiatives. The extent of ICT adoption and use should be aligned with the level of the country's technological development, as well as its current economic situation and physical infrastructure (Thapa & Sæbø, 2014). However, as discussed earlier, political and institutional factors play a more substantial role in decisions on ICT adoption in developing than in developed countries. While their importance cannot be disregarded, the extent to which they guide ICT implementation should be subject to careful scrutiny and a thorough evaluation of the potential gains within an estimated timeframe. For example, there is a possibility that simplifying and improving back-office administrative processes, creating more technological provisions for the general public and increasing the number of advisors could prove more beneficial than simply following other labour administration systems on their path to going digital by default. This is particularly relevant in developing countries, given the early stage of their technological development. Yet, such considerations must not be disregarded in the developed world.

Secondly, at the institutional level, e-government observers (Lowery 2001; West 2004; Gichoya 2005; Heeks 2006; Nasi and Frosini 2010; Weerakkody et al. 2012) stress the importance of not rushing into complex ICT reforms without first planning an overall strategy, which should clearly state the long-term vision, medium-term goals and short-term operative plans. This should be accompanied by transparent communication regarding the availability and allocation of funds. Continual reiteration of such strategies could also help to stimulate a shared ICT culture and promote a sense of commitment to the institutional technological transformation.

ICT policies should also anticipate and address changes at the organizational or structural level, allocating separate resources not only to cover the direct costs of new hardware and software, but also the hidden costs of training current employees and recruiting new staff. The effectiveness of governments and public sector labour institutions in particular in addressing the digital agenda depends on the people and policies governing ICT adoption and use (Gupta and Jana 2003). Labour administration actors must therefore possess the necessary ICT skills and knowledge to competently perform their work duties in the changing technological environment. In addition, the way in which labour administration

officials incorporate workplace technologies into their daily duties must also be continually monitored to ensure that emerging employee concerns are dealt with promptly. To facilitate this process, approachable and easily accessible ICT departments or units could be established to both provide labour administrators with technical support and initiate and facilitate ICT capacity building programmes to meet pertinent staff training needs.

Relatedly, it is essential to carefully estimate the costs of in-house ICT development vis-à-vis that of outsourcing and contracting. In the case of the former, job structures should be redesigned so as not to create too high work pressure, which could jeopardise the quality of work. In relation to the latter, precautions must be taken to facilitate the management of partnerships throughout their duration. Plans to avoid complications upon contract terminations must also be made.

At the national policy level, legislation should be put in place to strengthen information communication and data exchange among different departments, both within and outside of labour agencies, in order to address soft issues such as the level of trust surrounding the sharing of valuable information. At the technical level, issues of incompatibilities between the technological infrastructures of institutions should be addressed through top-level system designs and standards to facilitate secure interface interoperability between the different authorities. Continual security controls for the management and protection of confidential information must be maintained through establishing regulatory frameworks for activities performed using ICT. These should cover issues of control regarding the contents of internal databases in the form of anti-virus and security programmes, and of publicly accessible social media in the form of written guarantees of individual privacy and clear data security policies, among others (Criado, Sandoval-Almazan, & Gil-Garcia, 2013).

Social media is expanding rapidly due to its functional alignment with the needs of society for instant and deformalized access to information through social networks (Landsbergen 2010). However, its use in labour administration institutions still appears to be in the early phases. This has policy implications, as labour administration agencies must pay adequate attention to the potential of the various social media applications to meet these needs and implement accordingly. Though the informality and anonymity of social media applications can be beneficial in terms of increased communication, encouraging more people to ask questions and increasing the speed of responding to such questions, it can also create several challenges. Additional formalization of social media use in labour administration is still needed, in order to help mitigate the problems associated with the appropriateness and accuracy of content, the privacy of the information being exchanged and the allocation of human and financial resources for overseeing social media activity.

Moreover, digital strategies should identify the audiences to be targeted. The government should work with local authorities such as support groups, charities and other local services to develop an understanding of the profiles and needs of their target audiences. Digital strategies must then be accompanied by the provision of any required support or assistance. Ensuring that end-users of e-administration are made aware of the existence of ICT-supported information and services, in a manner which corresponds to their levels of technological literacy, is at the core of such practices. Moreover, an adherence to disability standards must also be ensured so that users with disabilities are provided with equal access to all online services (West, 2004). By transferring the provision of information and services online without addressing the underlying causes of inequality in citizens' access to ICT, e-government initiatives can aggravate the scale of the digital divide (Gupta & Jana, 2003). To summarize, the issues previously discussed must be incorporated into design considerations to guarantee high levels of usage and to help justify further investment in electronic labour administration (Hazlett & Hill, 2003).

Recommendations

In addition to paying adequate attention to the above general preconditions for the success of ICT, specialized agencies of labour administration could also consider addressing function specific issues of priority.

With regards to labour inspection:

- The wider adoption of new ICIMS, as well as expanding the functionalities of existing ICIMS such as those identified in this study would provide labour inspection with instant access to information about the performance of enterprises in terms of compliance with labour laws, thus facilitating the rational prioritization of inspections.

- Work towards ensuring that the ICIMS is cross-referenced with databases of taxation, health and social security authorities, among others, which would reduce the administrative burden on officials by eliminating repeated requests for information and ensure the provision of holistic information to determine the most efficient allocation of limited resources.

- More creative use of the most innovative mobile devices, including the transfer of selected inspection tasks to automated technological solutions, would allow for an increase in the coverage of areas to be inspected and reduce the risks of labour inspection work.

- Using different forms of communication technologies for the provision of interpretation and translation services could reduce instances of labour law violations in linguistically diverse work settings.

With regards to PES:

- The placement of employment information and services online could increase awareness of labour law among workers and jobseekers.

- However where required, the placement of employment information and services online must be accompanied by in-person provisions for the handling of sensitive issues, as well as to prevent the misuse of PES through the elimination of face-to-face contact.

With regards to dispute prevention and resolution:

- The dispute prevention and resolution system should make greater use of computerized programs, particularly in relation to gathering data on the resolution of workplace conflicts and providing the parties involved with access to monitor the processing of their case. This would reduce the risk of conflict aggravation through perceived negligence and encourage more consensual conflict resolution.

Conclusions and future actions

The ILO undertook this study at an opportune time, as labour administrations appear to be moving to a more substantive approach to harnessing the potential of ICT through investing in the physical provision of new tools and re-evaluating their ICT policy agendas. However, the experiences of using ICT reported by labour ministries and their subordinates illustrate that though in some developed countries new technologies have become the taken for granted modus operandi of public administration, many developing countries are only just embarking on their first ICT-led restructuring programmes. As

shown by this ILO pilot study, there is a consensus across labour administrations on the importance of ICT. There is however still a misguided assumption of equal access to technology in all developed and developing contexts.

In the future, ICT will be an integral part of labour administration in developed countries, while developing countries are likely to be catching-up. The barriers stemming from insufficient ICT capacity of service providers and users are likely to diminish as a consequence of pertinent amendments and additions to the national curriculum. However, financial risks are also likely to continue. Although the costs of ICT are going down, they are likely to remain high for the more advanced and elaborate technologies, depending on their scale and management. The operational costs of ICT, its maintenance, replacement and physical access barriers may also continue to pose issues.

Although governments have different policies for the use of ICT and interact differently with existing patterns of political, administrative, ideological, economic and cultural power (Pina et al. 2010), the experiences corralled within this paper have highlighted a number of common trends, as well as many benefits and challenges of ICT use. This study can therefore serve as a formal briefing exercise to raise awareness and exchange comparative practices, acting as a baseline against which labour administrations can assess their own system's infrastructure, performance and strategies adopted to achieve objectives and ultimately better understand the areas in which it is most preferable to mobilize efforts and resources. Similarly, it can be used by the ILO as a reference point for the planning and provision of technical assistance programmes by drawing attention to the specific regions and labour administration functions where such assistance is most required.

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Appendix 1.   Questionnaire

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INTERNATIONAL LABOUR OFFICE

GOVERNANCE AND TRIPARTISM DEPARTMENT

The Use of Information and Communication Technologies (ICT) in National

Labour Administration Systems

QUESTIONNAIRE

2015

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It is becoming increasingly recognized that the growth of Information Communication Technology has had an enormous impact on how governments manage and deliver their labour administration and inspection functions. ICT is the term used to describe any mode of digital technology that exists to help gather, manage, transmit and use information to deliver services to constituents. Most commonly, this is understood as referring to the various uses of computer-based and networking technology, including the Internet and cellular networks. Its introduction has revolutionized the internal management systems of ministries, labour inspectorates and employment services, and has the potential to dramatically increase their efficiency and effectiveness.

Yet despite these clear advantages, the ILO finds that a knowledge deficit exists regarding the adoption of ICT by national bodies of labour administration. Moreover, it is acknowledged that the introduction of ICT may face or even create certain challenges when not used appropriately, suggesting that the full benefits of ICT may only be achieved when institutions have the capacity to maximize its potential. In order to assist member states develop these capacities and to better understand how the advantages of ICT can be realized, the ILO has commissioned this research to deepen understanding of this area, particularly regarding the adoption, use,

results and impact of ICT. Through the identification of best practice, the ultimate goal is for the ILO to be in a better position to provide its member states with up to date advice and materials regarding the use of ICT within labour administration systems.

By completing this questionnaire, you will be providing us with the comparative and transnational information necessary to achieve these goals. The results of this research will also feel into a potential technical meeting during the period 2016/17 on the subject of ICT, to which officials from the member states involved with the research will be invited to attend. This meeting is planned to further discuss the main findings of the research, to share national experiences and to define future priorities and directions regarding ICT within labour administration systems. The ILO would like to express its gratitude for your involvement with the research. We remain confident that with the help of constituents, the outcomes of this research will provide long-term benefits to all those involved.

DEMOGRAPHIC INFORMATION

1. Please provide the following information to help us identify your role within the national labour administration system and to be able to contact you if needed:

Country:	
Name of institution:	
Name of official:	
Email address:	
Telephone:	
Mobile:	

VALUE ADDED TO LABOUR ADMINISTRATION THROUGH ICT ADOPTION

2. Why does your institution use ICT? Please tick all applicable reasons, marking their importance
    by selecting the box that applies to your institution.

Reason for ICT use	Please tick applicable			
	Very important	Important	Unimportant	N/A
To benefit from ICT in support of our work	☐	☐	☐	☐
To respond to the demands of the general public	☐	☐	☐	☐
To comply with legislation	☐	☐	☐	☐
To follow the practices of other labour institutions	☐	☐	☐	☐
Other (please describe)	☐	☐	☐	☐

3. How has ICT improved the operations of your institution? Please tick all applicable changes,
    marking their effect by selecting the box that applies to your institution.

Aspects of labour administration operations	Please tick applicable			
	Significant improvement	Some improvement	No improvement	N/A
Transparency and accountability	☐	☐	☐	☐
Collection and analysis of data for	☐	☐	☐	☐

policy setting and evaluation				
Privacy and security of data	☐	☐	☐	☐
Reach of labour administrations	☐	☐	☐	☐
Responsiveness of labour administrations	☐	☐	☐	☐
Dissemination of labour-related information	☐	☐	☐	☐
Speed of delivery of labour-related services	☐	☐	☐	☐
Cost reduction	☐	☐	☐	☐
Sharing of knowledge and information within labour institutions	☐	☐	☐	☐
Sharing of knowledge and information between labour institutions	☐	☐	☐	☐
Speed of resolution of labour problems as a result of easier access to relevant data	☐	☐	☐	☐
Quality of management through automated reporting of results	☐	☐	☐	☐

against set objectives and goals				
Productivity of government officials	☐	☐	☐	☐
Other (please describe)	☐	☐	☐	☐

4. Overall, to what extent have ICT developments increased the computerization of services offered by your institution?

☐ Significant increase

☐ Some increase

☐ No change

5. Please identify the positive changes that your institution has experienced regarding the use of ICT from an employer's perspective. Please tick **all** applicable.

☐ Better access to news about the latest trends in the relevant sector/industry

☐ Improved quick-time access to information from front-line employees

☐ Improved access to accident reports for informative and/or analytical purposes

☐ Improved access to labour law

    ☐ National labour law

    ☐ International labour law

    ☐ Foreign labour law (e.g. access to translator applications)

☐ Notifications of/access to changes in labour law

☐ Improved selection process from among of a pool of candidates for employment as a result of the implementation of e-recruitment

☐ Improved access to manager and employee training

☐ Improvement in employees' IT skills

☐ Easier collection, presentation and provision of work-related information to employees

☐ Improved horizontal communication between employees

☐ Improved vertical communication between employees

☐ Improved capabilities to ask employees for their ideas and/or feedback

☐ Easier reporting back to employees of how their ideas were implemented and how their feedback was acted upon

☐ Other (please describe)

☐ No positive changes observed

6. Please identify the positive changes regarding employee participation observed at your institution as a result of the adoption of ICT from an employee's perspective? Please tick **all** applicable.

☐ Greater employee involvement in the design of systems for use in their daily work

☐ Greater employee awareness of organizational activities

☐ Greater employee participation in decision-making

☐ Stronger sense of community

☐ Better consultative arrangements

☐ Improved briefing system

☐ Other (please describe)

☐ No positive changes observed

ICT TOOLS AND CHANNELS USED IN LABOUR ADMINISTRATION

7. What ICT channels does your institution use? Please tick **all** applicable.

☐ Intranet

☐ Own cable Internet network (Ethernet)

☐ Own wireless Internet Network (Wi-Fi)

☐ Own professional email domain

☐ Cloud computing

☐ Social media

☐ Facebook

☐ Twitter

☐ YouTube

☐ Flickr

☐ Blogs

☐ Mobile apps (cell phone, tablet)

☐ Google-reference search

☐ Wikipedia (own page creation)

☐ Other (please describe)

8. What ICT tools are the employees' workstations within your institution equipped with? Please tick **all** applicable.

☐ Personal computer

☐ Personal telephone

☐ Printer

☐ Scanner

☐ Photocopier

☐ Fax machine

☐ Television set

☐ Radio

☐ Webcam (computer inbuilt or external)

☐ Microphone (computer inbuilt or external)

☐ Other (please describe)

9. What ICT tools are available for mobile workers to perform their work? Please tick all applicable.

☐ PDAs

☐ Portable computers

☐ Mobile phones

☐ Smartphones

☐ Tablets

☐ Tablet PCs

☐ Voice recorders (electronic device inbuilt or external)

☐ Cameras (electronic device inbuilt or external)

☐ Video recorders (electronic device inbuilt or external)

☐ Portable printers

☐ Portable clocks (time and data stamp)

☐ Portable devices to access and read digital tachographs

☐ Other (please describe)

10. What ICT channels do employees within your institution use to communicate with each other and with other labour agencies? Please tick all applicable.

ICT channel	Please tick all applicable		
	Within agency communication	Cross agency communication	N/A
Landline telephony	☐	☐	☐
Mobile telephony	☐	☐	☐

Electronic mail	☐	☐	☐
Fax	☐	☐	☐
Video or voice conferencing	☐	☐	☐
Social media	☐	☐	☐
Discussion groups/forums	☐	☐	☐
Communicative functionalities of institution-specific specialist Information Systems	☐	☐	☐
Other (please describe)	☐	☐	☐

INTRANET USE IN LABOUR ADMINISTRATION

11. If your institution uses its own Intranet, what features does it offer? Please tick all applicable.

☐ Professional email domain

☐ Noticeboard and forthcoming events

☐ Latest news

☐ News archive

☐ Article submission

☐ Newsletter

☐ Resource centre/electronic library

☐ RSS feeds

☐ Distant access to personal electronic files

☐ Quick links to other labour institutions

☐ Fast-files drop off/pick-up

☐ Labour expert profile search

☐ Team place for centralization of labour-related projects/discussions

☐ Links to blogs of other labour experts/institutions

☐ Other (please describe)

<u>WEBSITE USE IN LABOUR ADMINISTRATION</u>

12. Does your institution have a dedicated website?

☐ Yes

☐ No

13. If your institution has a dedicated website, what features does it offer? Please tick all applicable.

Usability and accessibility

☐ Sitemap

☐ A-Z index

☐ Frequently Asked Questions (FAQs)

☐ Search engine

☐ Support for various Web browser resolutions

☐ Consistent website navigation scheme

☐ Interactive technological assistance

☐ Optimization for mobile use from tablet/smartphone

☐ 'Most popular' topic list

☐ Master list of online services

☐ Foreign language version (please describe)

☐ Compliance with Web accessibility standards (e.g. 'WAI' or 'Bobby Approved' icon)

☐ Variable font sizes

☐ Variable spacing in text

☐ Variable colouring of text

☐ Text-only version for the hearing impaired

☐ Audio-only version for the visually impaired

☐ Download of software needed to open documents (Adobe Reader, PowerPoint Viewer, etc.)

Transparency and accountability

☐ Institution's contact details

☐ Organizational chart

☐ Mission statement

☐ Opinion polls/surveys

☐ Free publications, e.g. reports

☐ Searchable databases, e.g. statistics

☐ Testimonials

☐ Date of last update of website content

☐ Financial statements

☐ Business/action plans

☐ Annual reports

☐ Security policy

☐ Privacy policy

Interactivity and maturity

☐ RSS alerts/e-newsletters/notifications/event updates

☐ Areas to post comments and suggestions

☐ Message boards and/or Internet forums

☐ Real-time chat rooms

☐ Downloadable documents (e.g. accident reporting)

☐ Document upload (e.g. certification of products)

☐ Downloadable Internet banners

☐ Downloadable logos

☐ Downloadable animated banners for websites

☐ Downloadable wallpapers

☐ Registration to create personal account

☐ Personalized website sections for various user groups

☐ Reporting of status of submitted requests

☐ Credit card for online payment

☐ Digital signature/online authentication for legal documents and/or financial transactions

☐ Recorded audio and/or video clips

☐ Live broadcasts (i.e. live audio and/or video clips)

☐ Other (please describe)

☐ Not applicable

ICT USE IN PUBLIC EMPLOYMENT AND TRAINING SERVICES

14. Please provide the following information about the use of ICT in the delivery of public employment services in your institution. Please tick all applicable.

	Please tick all applicable					
	This service is computerized and can be accessed by visiting our physical facility	This service is computerized and can be accessed by calling us	This service is computerized and can be accessed by writing to us by post	This service is computerized and available online	Other (please describe)	We do not offer this service
Job-seekers registration	☐	☐	☐	☐		☐
Employers registration	☐	☐	☐	☐		☐
Vacancy broadcasting	☐	☐	☐	☐		☐
Job matching	☐	☐	☐	☐		☐
Selection	☐	☐	☐	☐		☐
Career coaching	☐	☐	☐	☐		☐
Issuing work permits	☐	☐	☐	☐		☐

Self-employment assessment tests	☐	☐	☐	☐		☐
Tax advice	☐	☐	☐	☐		☐
Labour law: advice dissemination	☐	☐	☐	☐		☐
Violation of labour law: complaint submission	☐	☐	☐	☐		☐
Unemployment benefits application	☐	☐	☐	☐		☐
Other (please describe)	☐	☐	☐	☐		☐

15. Please provide the following information about the use of ICT in the delivery of training services by your institution. Please tick all applicable.

	Please tick all applicable.						
	Materials available online on our website	Materials available on CDs and DVDs	Materials available for image projectors	Materials available on the radio/on television	Materials available on digital television	Other (please describe)	We do not offer this training

Sector-specific training materials and advice	☐	☐	☐	☐	☐		☐
Employment of young adults	☐	☐	☐	☐	☐		☐
Employment of pregnant women and new mothers	☐	☐	☐	☐	☐		☐
Employment of the elderly	☐	☐	☐	☐	☐		☐
Holiday entitlement	☐	☐	☐	☐	☐		☐
Remuneration	☐	☐	☐	☐	☐		☐
Parental entitlement	☐	☐	☐	☐	☐		☐
Working time	☐	☐	☐	☐	☐		☐
Medical examination	☐	☐	☐	☐	☐		☐
Illegal employment	☐	☐	☐	☐	☐		☐
Foreign labour	☐	☐	☐	☐	☐		☐

Social security	☐	☐	☐	☐	☐		☐
Occupational safety and health (including office and workstation ergonomics advice and informative brochures/leaflets/manuals)	☐	☐	☐	☐	☐		☐
Employment contracts	☐	☐	☐	☐	☐		☐
Decent work	☐	☐	☐	☐	☐		☐
Civil law agreements	☐	☐	☐	☐	☐		☐
Undertaking employment for the first time	☐	☐	☐	☐	☐		☐
Labour law	☐	☐	☐	☐	☐		☐
Business trips	☐	☐	☐	☐	☐		☐
Disabled	☐	☐	☐	☐	☐		☐

employees							
Temporary employment	☐	☐	☐	☐	☐		☐
Voluntary work	☐	☐	☐	☐	☐		☐
Mobbing at work	☐	☐	☐	☐	☐		☐
Discrimination	☐	☐	☐	☐	☐		☐
Stress at work	☐	☐	☐	☐	☐		☐
National Labour Inspectorate certification	☐	☐	☐	☐	☐		☐
Other (please describe)	☐	☐	☐	☐	☐		☐

ICT USE IN LABOUR RELATIONS AND DISPUTE SETTLEMENT

16. Does your institution use a computer-based toolkit for the gathering and analysis of labour relations and labour dispute settlement data?

☐ Yes (please describe)

☐ No

17. If your institution uses a computer-based toolkit for the gathering and analysis of labour relations and labour dispute settlement data, please provide further information about when it is used. Please tick all applicable.

☐ Monitoring labour disputes

    ☐ Types of disputes (e.g. individual/collective disputes, rights/interest disputes, grounds for disputes)

    ☐ Categories of workers (e.g. contract types, gender, unionization status/collective bargaining coverage, specific categories of workers whose access to justice tends to be limited or who may be vulnerable to discrimination, such as migrant workers and those who work in the informal economy)

    ☐ Enterprise size

    ☐ Type of business

    ☐ Sectorial distribution, including between private and public sectors

☐ Monitoring labour dispute settlements

    ☐ Processes/mechanisms (e.g. judicial authorities, alternative dispute resolution processes such as mediation/conciliation including within labour administration, other services) to which the dispute was referred, broken down by:

    ☐ Types of disputes (e.g. individual/collective disputes, rights/interest disputes, grounds for disputes)

    ☐ Categories of workers (e.g. contract types, gender, unionization status/collective bargaining coverage, specific categories of workers whose access to justice tends to be limited or who may be vulnerable to discrimination, such as migrant workers and those who work in the informal economy)

☐ Enterprise size

☐ Type of business

☐ Sectorial distribution, including between private and public sectors

☐ Volume of disputes referred/actual use

☐ Number of cases resolved/settled per volume of disputes referred

☐ Number of cases resolved/settled by types of outcomes (e.g. agreements, recommendations, awards, rulings)

☐ Average time spent per case/claim

☐ Average cost per case/claim

☐ Enforcement/implementation/compliance level of resolutions (e.g. rulings, awards, recommendations, agreements)

☐ Level of employment relationships retained

☐ Level of avoiding referral to the judicial authorities

☐ Frequency of appeal/reversal

☐ Other criteria (please describe)

18. Which form of ICT does your institution use to notify parties of hearings? Please tick all applicable.

☐ Telephone

☐ SMS

☐ Email

☐ Other (please describe)

19. How can workers apply for assistance from the conciliation service? Please tick all applicable.

☐   Email application

☐   Digital application form on the website

☐   Telephone applications

☐   SMS applications

☐   Other (please describe)

ICT USE IN LABOUR INSPECTION

20. Does your inspectorate have an integrated computerized inspection management system (ICIMS), or equivalent?

☐   Yes (please describe)

☐   No

21. If you have an ICIMS, or equivalent, can it be accessed by other inspectorates?

☐   Yes, and it does have a security engine to manage unauthorized access

☐   Yes, but it does not have a security engine to manage unauthorized access

☐   No, it cannot be accessed by other inspectorates

☐   Not applicable

22. Please define the current technical features of your ICIMS, or equivalent. Please tick all applicable.

Inspectorate Information System

☐   Inspectorate profile

☐   Other (please describe)

Database of Establishments

☐   Establishment profiles

☐ Risk assessment for establishments

☐ Occupational safety and health report for establishments

☐ History of previous inspections

☐ Other (please describe)

Inspection Task Management

☐ Organizing inspections (e.g. prioritizing, allocating, planning, scheduling)

☐ Performing risk assessment

☐ Managing follow-up actions

☐ Documenting visit check lists

☐ Registering inspection visits

☐ Producing reports

☐ Generating inspection protocols

☐ Issuing warnings/tickets to establishments

☐ Producing statistical reports

☐ Other (please describe)

Labour Inspection Activities

☐ Recording complaints about the violation of labour laws

☐ Recording inspection procedures (e.g. recommendations, warnings, sanctions)

☐ Recording work accidents

☐ Recording occupational diseases

☐ Monitoring payment of wages

☐ Inspectors' ranking, performance monitoring and appraisal

☐ Locating workplaces to be inspected

☐ Linking with other concerned institutions

☐ Tracking labour cases

☐ Verifying migrant workers' contracts

☐ Translation of workers' contracts and other relevant documents

☐ Calculating wages and working hours

☐ Other (please describe)

Communication

☐ Communications between the inspectorate and establishments

☐ Exchange of information between employees of a single inspectorate

☐ Exchange of information between different inspectorates

☐ Exchange of information between the inspectorate and headquarters

☐ Other (please describe)

☐ Not applicable

23. If your ICIMS (or equivalent) can be accessed by establishments, please identify the functions that the establishments can perform. Please tick all applicable.

☐ View upcoming inspections

☐ View inspection histories

☐ Update company profiles

☐ Upload self-reports

☐ Download inspection checklists

☐ Check legal requirements

☐ Access suggested solutions to problems

☐ Perform a risk assessment

☐   Log complaints and/or appeals

☐   Track status of complaints and/or appeals

☐   Receive training in the use of our ICIMS

☐   Other (please describe)   .

☐   Not applicable

24. If field inspectors at your institution use mobile inspection software, please define its features.

Please tick all applicable.

☐   Registration of enterprises, workplaces and objects of inspection

☐   Route planning

☐   Electronic mileage log book

☐   Collection of field data

☐   Comparison of field data with legislation/acceptable threshold values

☐   Production of electronic reports, certificates or invoices

☐   Printing of paper reports, certificates or invoices

☐   Sending reports to the inspectorate

☐   Sending reports to establishments about the findings of inspection, recommendations, corrective actions and sanctions

☐   Taking pictures of defects/failures with the ability to annotate

☐   Using a clock for automatic time and date stamp

☐   Access to the labour inspectorate's databases

☐   Access to inspection manuals, instruction and checklist

☐   Access to legislation, collective agreements and court decisions

☐   Video or voice consultation with the inspectorate

- [ ] Workflows

- [ ] Performance appraisal

- [ ] Strategic and operational planning

- [ ] Performance monitoring (e.g. dashboards)

- [ ] Project management

- [ ] Communication with databases from other institutions (e.g. social security)

- [ ] Communication with courts

- [ ] Cooperation with labour inspectorates from other countries

- [ ] Payment of sanctions (e.g. fines)

- [ ] Training

- [ ] Other (please describe)

- [ ] Not applicable

25. Does your mobile inspection software connect with your ICIMS (or equivalent) using a wireless connection?

- [ ] Yes, in all locations

- [ ] Yes, in some locations

- [ ] No, in no locations

- [ ] Not applicable

USE OF ICT IN LABOUR ADMINISTRATION TO REACH GENERAL PUBLIC

26. What ICT channels does your institution use to reach the general public? Please tick all applicable.

- [ ] Landline telephony

- [ ] Mobile telephony (e.g. SMS, WAP, GPRS, UMTS)

☐ SMS updates/newsletters/notification

☐ SMS opinion polls/surveys

☐ Interactive Voice Response Interface

☐ Other (please describe)

☐   Email

☐   Website

☐   Social media (please describe)

☐   Television spots

☐   Digital television

☐   Radio spots

☐   Electronic billboard communications

☐   QR codes on off-line materials

☐   Other (please describe)

27. What physical facilities are offered to enable members of the general public with limited access to ICT to contact your institution?

☐   Centralized call centres/hotlines

☐   Decentralized call centres/hotlines

☐   Supervised citizen information points

☐   Independent citizen information points (e.g. in libraries, at train stations)

☐   Other (please describe)

☐   No facilities

28. If your institution offers citizen information points, what ICT tools and ICT-enabled services does it provide? Please tick all applicable.

☐   Use of a telephone

☐   Use of a computer with Internet access

☐   Use of a Webcam (computer inbuilt or external)

☐   Use of a microphone (computer inbuilt or external)

☐   Use of a camera

☐   Use of a voice recorder

☐   Use of a computer without Internet access

☐   Use of a self-service terminal

☐   Use of Interactive Voice Response interface

☐   Use of a printer

☐   Use of a fax machine

☐   Use of a scanner

☐   Use of a photocopier

☐   Provision of training materials (e.g. videos and presentations) on CDs and DVDs

☐   Direct speed-dial to a call centre/hotline

☐   Help desk for technical enquiries

☐   Not applicable

29. What ICT channels can the general public use to report a complaint? Please tick all applicable.

☐   Digital complaint form on the website

☐   Email

☐   Self-service terminal at a public access point

☐   Telephone (landline and/or mobile)

☐   SMS

☐ Digital television

☐ Other (please describe)

☐ No ICT channels for reporting of complaints

ICT FUNCTIONALITY AND MANAGEMENT

30. Does your institution have a separate IT department responsible for all ICT needs?

☐ Yes

☐ No

31. If your institution does not have a separate IT department, who is responsible for all ICT needs?

32. What ICT policies and plans does your institution have in place?

☐ Formal strategic plan for ICT implementation and use

☐ Regulatory or policy framework which governs ICT implementation and use

☐ Operative plans which detail the activities for ICT implementation and use

☐ Other (please describe)

☐ No ICT policies/plans

33. Does your institution have an official ICT budget?

☐ Yes

☐ No

34. If your institution has an official ICT budget, how has this budget changed over the past 5 years?

☐   Increased

☐   Remained the same

☐   Decreased

☐   Not applicable

35. What are the barriers to broader ICT implementation in your institution? Please tick **all** applicable.

☐   Lack of information about costs

☐   Lack of information about benefits

☐   Lack of information about experiences associated with ICT

☐   Difficulty justifying Return on Investment

☐   Lack of staff interest in ICT

☐   Intimidation by/anxiety about technology

☐   Lack of ICT-related skills and knowledge (poor understanding of ICT terminology and ICT use)

☐   Fast pace of hardware and software development

☐   Problems with technical implementation

☐   Insufficient design collaboration with systems suppliers

☐   Poor technological infrastructure/outdated technical equipment

☐   Inadequate bandwidth

☐   Limited financial resources

☐   Lack of employees with sufficient ICT knowledge and capabilities

☐   Inappropriate strategies to train and skill employees on ICT use

☐ ICT-caused interference of work with home schedules/decline in work-life balance

☐ Poor collaboration across internal and/or external organizational boundaries

☐ Lack of common vision

☐ Lack of strong leadership to promote and push the implementation of ICT

☐ Lack of support from senior management/administrators/officials

☐ Low general public awareness of ICT-based services

☐ Offering a sufficient choice of ICT channels for general public

☐ Offering sufficient access to ICT tools for general public

☐ Rising expectations of general public

☐ Poor technological infrastructure/connectivity of general public

☐ Demographic and social factors (e.g. age, language, literacy, area of residence)

☐ Protection of sensitive information on labour dispute or labour administration

☐ High resource demand for monitoring of social media activity

☐ Other (please describe)

36. Of the barriers identified above, please specify the most significant one for your institution.

The End

Appendix 2. Respondents who returned the questionnaire

Europe and Central Asia	
Austria	- Arbeitsmarktservice Österreich - Federal Ministry of Labour, Social Affairs and Consumer Protection - Ministry of Social Affairs and Consumer Protection
Azerbaijan	- The Ministry of Labour and Social Protection of Population
Belgium	- Federal Public Service Employment, Labour and Social Dialogue – General Directorate Surveillance of Well-being at Work
Bosna and Herzegovina	- Ministry of Civil Affairs
Bulgaria	- General Labour Inspectorate Executive Agency - Ministry for Labour and Social Policy
Cyprus	- Labour Department of the Ministry of Labour, Welfare and Social Insurance - Labour Inspection Department of the Ministry of Labour, Welfare and Social Insurance - Labour Relations Department of the Ministry of Labour, Welfare and Social Insurance
Czech Republic	- Employment Office of the Czech Republic - State Labour Inspection Office - Ministry of Labour and Social Affairs
Denmark	- Agency for Labour Market and Recruitment - Ministry of Employment - The National Board of Industrial Injuries - Working Environment Authority

Estonia	- Ministry of Social Affairs[31]
Finland	- Ministry of Employment and the Economy - Regional State Administrative Agencies and Occupational Safety and Health
France	- Direction Generale du Travail
Georgia	- Ministry of Labour, Health and Social Affairs
Germany	- Federal Ministry of Labour and Social Affairs
Greece	- Greek Labour Inspectorate
Hungary	- Ministry for National Economy
Iceland	- Directorate of Labour
Ireland	- National Employment Rights Authority - Health and Safety Authority
Italy	- Ministry of Labour and Social Policy
Kazakhstan	- Ministry of Health Care and Social Development
Latvia	- Ministry of Welfare - State Employment Agency - State Labour Inspectorate
Lithuania	- Labour Exchange - State Labour Inspectorate - The Ministry of Social Security - The State Social Insurance Fund Board
Luxembourg	- Administration de l'Inspection du Travail et des Mines
Malta	- Occupational Health and Safety Authority

[31] The Ministry of Social Affairs of Estonia did not complete the survey. Instead, it submitted a

qualitative description of its ICT use based on the questions asked in the survey.

Norway	- Ministry of Labour and Social Affairs
Territory under the Palestinian Authority	- Ministry of Labour
Poland	- Ministry of Labour and Social Policy - Public Employment Services
Portugal	- Authority of Working Conditions
Romania	- Ministry of Labour, Family, Social Protection and Elderly
Russian Federation	- Ministry of Labour and Social Protection
Serbia	- Ministry of Labour, Employment, Veteran and Social Affairs
Slovakia	- Ministry of Labour, Social Affairs and Family - National Labour Inspectorate
Slovenia	- Labour Inspectorate
Spain	- Ministry Of Employment And Social Security
United Kingdom	- Health and Safety Executive
Uzbekistan	- Ministry of Labour and Social Security
Asia and the Pacific	
Australia	- Department of Employment
Brunei Darussalam	- Department of Labour
China	- Ministry of Human Resources and Social Security
Japan	- Labour Standards Inspection Office
Republic of Korea	- Ministry of Employment and Labor
LAO PDR	- Ministry of Labour and Social Welfare

Myanmar	- Ministry of Labour, Employment and Social Security
New Zealand	- Ministry of Business, Innovation and Employment
Pakistan	- Ministry of Overseas Pakistanis & Human Resource Development - Directorate General Labour Welfare, Labour and Human Resource Department, Government of Punjab
Philippines	- Department of Labour and Employment
Sri Lanka	- Ministry of Labour
Arab States	
Bahrain	- Ministry of Labour
Iraq	- Ministry of Labour and Social Affair
Qatar	- Ministry of Labour and Social Affairs
Saudi Arabia	- Ministry of Labour
Oman	- Ministry of Manpower
Syrian Arab Republic	- Ministry of Labour
Kuwait	- Public Authority for Labour Force
United Arab Emirates	- Ministry of Labour
Americas	
Argentina	- Ministerio de Trabajo, Empleo y Seguridad Social
Bahamas	- Department of Labour
Barbados	- Ministry of Labour
Brazil	- Ministerio do Trabalho e Emprego
Colombia	- Ministerio del Trabajo
Costa Rica	- Ministerio de Trabajo y Seguridad Social
Cuba	- Ministerio de Trabajo y Seguridad Social

Ecuador	- Ministry of Labour
El Salvador	- Ministry of Labour and Social Welfare
Guatemala	- Ministerio de Trabajo y Previsión Social
Guyana	- Ministry of Labour Human Service & Social Security (Labour Department)
Honduras	- Department of Labour and Social Security
Jamaica	- Ministry of Labour and Social Security
Panama	- Ministry of Labour and Workforce Development
Trinidad and Tobago	- Ministry of Labour and Small and Micro Enterprise Development
Africa	
Algeria	- Ministère du Travail de l'Emploi et de la Sécurité Sociale
Burkina Faso	- Ministère de la Fonction Publique du Travail et de la Sécurité Sociale
Mali	- Ministère du Travail, de la Fonction Publique et de la Réforme de l'Etat
Mauritania	- Ministère de la Fonction Publique, du Travail et de la Modernisation de l'Administration
Morocco	- Ministère de l'Emploi et des Affaires Sociales
Mozambique	- Ministry of Labour
Niger	- Ministère de l'Emploi, du Travail et de la Sécurité Sociale
Nigeria	- Federal Ministry of Labour and Productivity
South Africa	- Department of Labour
Uganda	- Ministry of Gender, Labour and Social Development
Zambia	- Ministry of Labour and Social Security
Zimbabwe	- Ministry of Public Service, Labour and Social Welfare

Appendix 3. Foreign-language versions of dedicated websites of responding labour administration systems

Country and responding institution	Website language version
Australia – Department of Employment	Thai, German, Chinese, Vietnamese, Arabic, Greek, French
Cyprus – Labour Department	English, Turkish
Cyprus – Department of Labour Inspection	English
Cyprus – Labour Relations Department	English
Czech Republic – Employment Office of the Czech Republic	English, German, French, Spanish, Russian, Ukrainian, Moldavian, Bulgarian, Mongolian
Czech Republic – State Labour Inspection Office	Variable language options for documents
Czech Republic – Ministry of Labour and Social Affairs	Partial English
Denmark – Ministry of Employment	English
Denmark – Danish Working Environment Authority	English, Polish, German, Lithuanian, Greenland
Ministry of Employment and the Economy	English, Finnish, Swedish
Finland – Regional State Administrative Agencies/Occupational Safety and Health	Swedish, English, Estonian, Russian
Russia – Federal Ministry of Labour and Social Affairs	English
Iceland – Directorate of Labour	English
Ireland – National Employment Rights Authority	Various
Latvia – The Ministry of Welfare of the Republic of Latvia	Latvian, English, Russian

Country and responding institution	Website language version
Lithuania – Lithuanian Labour Exchange under the Ministry of Social Security and Labour, State Labour Inspectorate of the Republic of Lithuania under the Ministry of Social Security and Labour, The Ministry of Social Security of the Republic of Lithuania	English
Norway – Ministry of Labour and Social Affairs	English
Poland – Ministry of Labour and Social Policy	English
Qatar – Ministry of Labour and Social Affairs	English
Spain – Ministry of Employment and Social Security	English version of main pages and some secondary pages
UK – Health and Safety Executive	English and 23 other languages for some sections
Republic of Korea – Ministry of Employment and Labour	English
New Zealand – Ministry of Business, Innovation and Employment	Factsheets and some types of their downloadable documents such as reports are usually in multiple languages
Uzbekistan – Ministry of Labour and Social Welfare	English
Myanmar – Ministry of Labour, Employment and Social Security	English
Hungary – Ministry for National Economy	English
Romania – Ministry of Labour, Family, Social Protection and Elderly	English
Colombia – Ministry of Labour	English
Azerbaijan – The Ministry of Labour and Social Protection of	English

Country and responding institution	Website language version
Population	