United Nations E/C.16/2020/4

Economic and Social Council

Distr.: General
20 January 2020

Original: English

Committee of Experts on Public Administration
Nineteenth session
30 March–3 April 2020
Item 7 of the provisional agenda*
Government and public sector workforce of the future

Government and public sector workforce management in the digital era

Note by the Secretariat

The Secretariat has the honour to transmit to the Committee of Experts on Public Administration the paper prepared by Committee members Ora-orn Poocharoen, Upma Chawdhry and Regina Silvia Pacheco, in collaboration with Emmanuelle d'Achon, Bridget Katsriku, Ma Hezu, Joan Mendez, Linus Toussaint Mendjana, Gregorio Montero, Gowher Rizvi and Abdelhak Saihi.

* E/C.16/2020/1.

20-00827 (E) 280120

Government and public sector workforce management in the digital era

Summary

At its eighteenth session, the Committee of Experts on Public Administration discussed the new roles of the public sector and potential paradigm shifts in public administration. The Committee emphasized the importance of building new capacities for the public sector in order to achieve the 2030 Agenda for Sustainable Development. The present paper continues the discussion by further highlighting how digital technology is transforming governments, government-citizen relations and public management.

The present paper notes that it is important to have insight into factors affecting the future of government and the public sector workforce because they are key drivers in the realization of the Sustainable Development Goals. The paper reflects on new possibilities, potential pitfalls and ways forward in preparing for the government of the future, with reference in particular to digital technology.

I. Government and technology: opportunities and challenges

1. A new scientific and technological revolution is gaining momentum. The widespread diffusion of information, biological, new-material and alternative-energy technologies has brought about a green, intelligent and ubiquitous technological revolution. Artificial intelligence, big data, cloud computing and blockchain are gaining ground, providing tremendous convenience while bringing challenges as well as opportunities.

2. The need for openness, technology adoption and adaptiveness of both governments and the public sector workforce is higher than ever. Governments should embrace new science and technology, train the public sector workforce, change mindsets and improve technology skills. It is especially important to build capacity in digital skills and data and enhance cyberliteracy among public sector employees.

3. Governments should carefully design sound public policies to successfully adopt technology for the betterment of society and prepare institutions for the future. A key challenge in this digital era is the definition of property rights. Some examples of products of the twenty-first century with unclear property rights and areas of debate include consumer data, whether consensual or not, personal data, digital privacy, Internet neutrality, publicly deployed artificially intelligent algorithms, information curated on public or private clouds, the architecture of the Internet and the reuse of online information, which require essential normative judgments. Defining and redefining these property rights is not easy, yet it is the responsibility of governments to do so and will continue to be so in the future as new technologies emerge and are applied in various ways.

Digital tools for service delivery

4. Artificial intelligence is being used to reshape government services. It consists of computing machines capable of learning, adapting, reasoning, mimicking and predicting human behaviour or thought processes. The National Health Service in the United Kingdom of Great Britain and Northern Ireland uses chatbots to assist patients with non-threatening health issues to optimize the time spent with the doctor. Cities such as Pittsburgh, United States of America,[1] and Singapore[2] employ smart traffic lights to reduce aggregate commuting time and cost. The Netherlands,[3] as well as the cities of Chicago and New York in the United States,[4] use data from emergency calls to predict crime and optimize security deployment through predictive policing. The Australian Taxation Office[5] and the United States Citizenship and Immigration Services[6] make use of chatbots to answer questions from the citizenry. The Netherlands uses artificial intelligence in debt-related alternative dispute resolution processes.[7]

[1] Dietmar P.F. Möller and others, “Cyber-physical smart traffic light system”, May 2015.

[2] Ashim Kumar Debnath and others, “Sustainable urban transport: smart technology initiatives in Singapore”, *Transportation Research Record*, vol. 2243, No. 1 (January 2011).

[3] Wim Hardyns and Anneleen Rummens, “Predictive policing as a new tool for law enforcement? Recent developments and challenges”, *European Journal on Criminal Policy and Research*, vol. 24, No. 3 (September 2018).

[4] Craig D. Uchida, “A national discussion on predictive policing: defining our terms and mapping successful implementation strategies”, May 2010.

[5] Toby Walsh, “Australia’s AI future”, *Journal and Proceedings of the Royal Society of New South Wales*, vol. 52, No. 471/472 (June 2019).

[6] Lara Piccolo, Martino Mensio and Harith Alani, “Chasing the chatbots: directions for interaction and design research”, in Svetlana S. Bodrunova, ed., *Internet Science*, vol. 11193 (Cham, Switzerland, Springer, 2018).

[7] Gijs Van Til, “The Netherlands”, in Matthias Speilkamp, ed., *Automating Society: Taking Stock of Automated Decision-Making in the EU*, 1st ed. (Berlin, Algorithm Watch, 2019).

5. A unique digital identity for citizens is used by governments in many parts of the world. It is designed to digitally deliver services, authenticate identity to eliminate waste and fraud, curtail red tape and improve service quality, efficiency and ease of doing business. The "Once-only" initiative of the European Union, for example, involves an integrated database designed to give individuals and businesses seamless access to services.[8] "Jan Dhan-Aadhaar-Mobile" is an initiative in India that integrates bank account, social security and mobile phone numbers with the aim of preventing waste and fraud.[9] Unique identifiers for businesses in New Zealand allow for digital invoicing across businesses.[10]

Innovations and regulatory sandboxes

6. Cloud computing facilitates the on-demand availability of computing services from remote, sometimes distributed, facilities that may be either publicly or privately operated. One significant advantage of cloud computing is the possibility of integrating databases maintained by different government agencies and thus contributing to breaking down silos in public administration. The integration of databases can provide efficiencies through savings in administrative staff, eliminate duplication and promote evidence-based decision-making. Network upgrade costs and fixed infrastructure costs can also be minimized. It can lead to predictive analytics and better design of public policies, including real-time management of disaster-related data.

7. Government innovation accelerators, incubators and labs, as well as regulatory sandboxes, allow for greater experimentation and launch pads for innovation in both the government and the private sector. Incentives in public administration, as they are currently set up, are designed to reduce wasted resources in terms of both time and money. Response downtime should be minimized. This requires the creation of public administration incentive structures to create experimental space and innovation. Accelerators and regulatory sandboxes are responses to these needs in public administration.

8. An example is the Global Financial Innovation Network,[11] a regulatory sandbox of financial regulators comprising a network of around 50 organizations committed to supporting financial innovation in the interests of consumers. The need for the sandbox emerged from the fact that financial businesses are cross-national and differences in regulations across countries require massive adjustments to infrastructure and software configurations with significant costs mostly borne by the people. This financial regulatory sandbox aims to allow companies to experiment with joint regulation. However, without proper oversight, it is likely to increase regulatory capture by businesses and industry leaders.

9. Other examples of regulatory sandboxes come from the "Kokeilun Paikka" project in Finland, which crowdsources ideas for addressing public policy challenges.[12] The Government posts what it thinks are important areas of innovation

[8] Robert Krimmer and others, "Exploring and demonstrating the once-only principle: a European perspective", paper presented at the eighteenth Annual International Conference on Digital Government Research, June 2017.

[9] Saibal Ghosh, "Financial inclusion, biometric identification and mobile: unlocking the JAM trinity", *International Journal of Development Issues*, vol. 16, No. 2 (2017).

[10] Statistics New Zealand, *Linking Methodology Used By Statistics New Zealand in the Integrated Data Infrastructure Project* (Wellington, 2014).

[11] Oxford Analytica, "Rising global fintech collaboration will fuel adoption", *Emerald Expert Briefings* (Emerald Publishing, 2018).

[12] Stavros Valsamidis, "Best practices for frugal and sustainable innovation", in Alexandros Theodoridis, Athanasios Ragkos and Michail Salampasis, eds., *Innovative Approaches and Applications for Sustainable Rural Development* (Cham, Switzerland, Springer, 2017).

and people submit their experimental proposals, which are screened and are adopted for trial upon acceptance. Another example is the United States Digital Service, which hires leading digital experts for 6 to 48 months' duration and disperses them to information and communications technology departments of public sector agencies to bring in fresh perspectives and developments from the private sector. A leading bank in Thailand is currently testing the use of blockchain to authenticate letters of guarantee issued by the bank.[13]

E-participation and citizen-centric services

10. Smart and citizen-centric government is another approach that utilizes information and communications technologies that aims to deliver seamless citizen experiences and enhance quality of life in areas such as mobility and security. Originally, the notion of citizen-centric services evolved from a few aspects of city management with a focus on deriving efficiencies and resource optimization to the fundamental redesign of government services to enhance citizen experience. The drivers of this evolution are the increased proliferation of the Internet of things, data-enabled devices and the exponential reduction in the cost of generating, transmitting, storing and processing electronic data. The increased quality of citizen experience with government services increases social trust and the legitimacy of government and public administration.

11. Multiple airports have developed smart solutions either to streamline passenger experience, for example at Helsinki, or to improve air quality, as in the case of Heathrow, United Kingdom.[14] Hundreds of universities are moving towards smart student experience, adopting dashboard approaches for university-related services. Smart initiatives are being undertaken to integrate multi-city economic regions, to enhance rural economies and to address the challenges of urbanization. Norway has adopted a universal design plan to ensure access to city infrastructure for people with disabilities.[15]

12. The standardization of design guidelines for government applications to ensure uniform accessibility to digital or routine services is under way in many countries. It includes initiatives like "Moments of life" in Singapore[16] and the standardized design system guidelines in the United Kingdom.[17] Denmark has a similar platform, and Australia and Canada are working on the standardization of consumer-centric design considerations. The co-creation of the national budget in Portugal lets citizens submit proposals, which are voted on electronically.[18]

13. By way of example, as of September 2019, the number of social security card holders in China reached 1.3 billion, covering 93.1 per cent of the country's population. In most cities above the municipal level, the cardholders have access to the 102 service items. In April 2018, the first electronic social security card was issued. More than 45.6 million electronic social security cards have been issued, which can be used across the country. The city of Nanning integrates the electronic social security card into the construction of a "smart city". Cardholders can identify and access information on public services such as parks, libraries and museums by

[13] Avril Parkin, "Distributed ledger technology: beyond the hype", *Journal of Digital Banking*, vol. 2, No. 2 (Autumn/Fall 2017).

[14] Rana Sen, Miguel Eiras Antunes and Mahesh Kelkar, *Government Trends 2020: What Are the Most Transformational Trends in Government Today* (Deloitte Insights, 2019).

[15] Ibid.

[16] Karen Johnston, "A comparison of two smart cities: Singapore and Atlanta", *Journal of Comparative Urban Law and Policy*, vol. 3, No. 1 (2019).

[17] Available at www.gov.uk/guidance/government-design-principles.

[18] Olga Fedotova, Leonor Teixeira and Helena Alvelos, "E-participation in Portugal: evaluation of government electronic platforms", *Procedia Technology*, vol. 5 (2012).

providing the Quick Response Code of their electronic social security card. With the help of online authentication, password verification, face recognition, risk control and other authentication methods, cardholders need not worry about the unauthorized capture or fraudulent use of personal information.

14. In the future, the popularization of electronic social security cards is expected to lead to the establishment of application services that manage access to social security, both online and offline, in an all-round way. In this diversified and integrated system, social security cardholders are expected to have access to services that are both more extensive and more reflective of their needs.

Meeting the multiple challenges ahead

15. There are many challenges for initiatives in artificial intelligence, digital identity, cloud computing, sandbox approaches and citizen-centric government. Some common concerns include those relating to data security and privacy; increased exposure to cyber-risks; resource constraints related to the funding of systems redesign; delays in the adoption of proposals owing to multiple rounds of collaboration, voting and consultation; and hurdles related to cross-agency collaboration.

16. Other challenges related to the use of big data, artificial intelligence and digital identity include the paucity of property rights and guidelines for conflict resolution, as well as the ethical boundaries of their application. Some contentious issues relate to whether constitutional guarantees of privacy and property rights extend to personal data, and whether data and/or personal identifiers can be collected and mined without informed prior consent.

17. The prioritization of governance goals by algorithms, accountability dilemmas related to the "black box" nature of algorithm-making and erroneous conclusions in the case of inaccurate data inputs are other areas of concern. For example, resource optimization algorithms in public administration that employ artificial intelligence may neglect important sociohistorical contexts while at the same time not revealing their inherent limitations. Some police services could employ artificial intelligence systems to generate crime maps and allocate resources without sufficient consideration of community needs and contexts. While intended to address an optimization problem, the use of artificial intelligence could at the same time end up exacerbating other social problems, such as the excessive use of force against minorities in targeted districts.

18. Governments face many challenges in using these technologies. Standard features of cloud computing, such as "pay-as-you-go" arrangements, do not necessarily align with traditional government processes where clients of cloud computing pay for as much bandwidth, computing power, level of security or degree of assistance as they require. In addition, cloud computing vendors use different protocols, which makes it difficult for government agencies to switch from one vendor to another. As a result, the integration of government databases is still a distant reality, although it is seen as potentially a core benefit of cloud computing in government.

19. Despite challenges, some recent positive developments in data and artificial intelligence ethics are noteworthy. The European Union General Data Protection Regulation, which came into force in 2018, is the most comprehensive regulation regarding data privacy and limitations of usage.[19] In addition, there have been some suggestions to reconsider the nature of personal data, which can be treated and traded

[19] Paul Voigt and Axel von dem Bussche, *The EU General Data Protection Regulation (GDPR): A Practical Guide*, 1st ed. (Cham, Switzerland, Springer International Publishing, 2017).

as a product. Other prominent initiatives include the New York City Automated Decision Systems Task Force, which examined racial bias in predictive policing algorithms. Australia is also undergoing policy consultations regarding the implementation of such a framework, which includes the establishment of an independent regulatory body that gives primacy to human rights.

20. In sum, there are plenty of policy and project trials and errors relating to technology adoption in the public sector. Governments will need to have strong capacity to develop, manage, regulate and make use of technology to its fullest potential for the greater good. To that end, systematically sharing good practices and lessons learned and highlighting how such technologies can contribute to enabling progress towards the 2030 Agenda for Sustainable Development can be highly beneficial.

II. New modalities of human resources management in the public sector workforce

21. The 2030 Agenda is the consensus of the international community, which reflects the aspirations and ambitions of the people of current generations as well as future generations for a sustainable, inclusive and prosperous society. To achieve the Sustainable Development Goals, Governments of different countries are asked to be more accountable and responsive to people's needs by undertaking concrete actions to translate the ambitious Goals and targets into tangible outcomes. Governments certainly play a dominant role in eliminating poverty, fighting pollution, achieving gender equality and many other areas, while participation from enterprises and the public is encouraged and welcomed.

22. Many countries and international organizations have taken a people-centred approach. For example, the International Labour Organization adopted its Centenary Declaration for the Future of Work in June 2019 (A/73/918, annex), in which it called upon all member States to heed national circumstances to further develop a human-centred approach to the future of work. This includes the future of work in the public sector.

Focusing on people

23. The public sector comprises the general government sector plus all public corporations, including the central bank, according to the *OECD Economic Outlook* of the Organization for Economic Cooperation and Development. The definition of the public sector can vary according to the context of the public sector environment of a country. A homogeneous public sector environment, comprising mainly civil servants, lends itself to a definition which considers the status of employees. Alternatively, in some countries there are employees on contract in the civil service and other State-owned agencies who are subject to terms and conditions of employment under fixed-term contracts. This definition broadens the scope of the people who work for the public sector, who in the present paper are called "the public sector workforce".

24. The public sector workforce comprises civil servants employed in ministries, departments, State-owned agencies and statutory or autonomous bodies, as well as public service organizations such as education, electricity, emergency services, fire services, gas and oil, health care, infrastructure, law enforcement, police service, postal service, public transit, social services and waste management organizations. It can also include local government officials and semi-volunteers conducting public services. It may also include contract employees, politicians, political appointees and the body of public committees, consultants and advisers that are part of public policy

processes. In the present paper, it is argued that it is necessary to broaden the scope from a focus on civil servants alone to the entire public sector workforce to build strong institutions in the public sector and achieve Sustainable Development Goal 16.

25. Owing to the changing workforce demographics, ageing populations and the increase in the population of digital natives, freelancers are likely to constitute the new labour landscape in the future. The new workplace will be characterized by the increased use of technology, such as artificial intelligence, augmented reality, the Internet of things and robotics. There is high growth in jobs relating to the development and deployment of new technologies, such as for computer scientists, engineers, information technology administrators and data analysts and scientists. Such changes will also inevitably be reflected in the public sector workforce. There may be an increasing number of short-term contracts in the public sector similar to the "gig economy". The population of digital nomads is also increasing. It would not be surprising for the public sector to commit more to remote work in the future. This could reshape the public sector workforce and the concept of workers' unions, as well as relationships between citizens and public services.

26. Much of the need to change stems from the citizens' expectations of the public sector to deliver efficient and effective services that are customer-centric, responsive and timely. Additionally, citizens expect an integrative approach to public services. Moreover, service delivery in the public sector must be value-driven with a focus on citizen-centric outcomes and not work processes. Citizens want a multi-channelled approach to service delivery consistent with their specific needs at specific times. Thus, governments need to be more and more agile with their human resources management policies and more innovative in recruiting and in retaining and rewarding in particular the higher-performing employees.

27. In some countries, owing to the shortage of competencies in the public sector as far as new technologies are concerned, governments have recently allowed the recruitment of specialized staff from the private sector on short-term contracts to be more responsive to new needs in the public service and to fulfil certain tasks. This is a change from the previous practice of recruitment of civil servants on a regular and permanent status. The purpose is to allow more flexibility in recruitment possibilities and go further to also open up high-level managing positions to non-civil servants.

Digital tools for the future public sector workforce

28. Regular recruitment is declining in governments as other modes are increasingly preferred. Contractual appointments are encouraged. Consultants and advisers are coming in on specific assignments with specified tenures. Governments have introduced lateral induction at senior levels on an experimental basis. The reduction of human resources at senior levels is also being resorted to more than in the past. Appointments of service-oriented staff, such as cleaning, typing and security staff, are increasingly being outsourced to agencies.

29. Overall, digital transformation is being witnessed on a large scale in human resources management practices. Consequently, private and public sector organizations are modernizing their human resources systems through the adoption of cloud and digital technologies. Human resources professionals must acquire and improve digital literacy and skills to adjust to the rapidly changing conditions of electronic and digital human resources management. The transformation of human resources processes encompasses the digitization of employee records and the development of a human resources management system which can be integrated with other organizational data, such as payroll, e-learning, performance management and reward systems. Such developments clearly call for integrated human resources management information systems.

30. New human resources management practices also include e-recruitment through the use of web-based tools. Vacancies are displayed on the website for potential employees. Applications received through a web portal are shortlisted according to educational and other competencies required for the jobs. For instance, an e-recruitment tool has been utilized in the Ministry of Public Administration of Trinidad and Tobago in respect of the recruitment of contract personnel. Despite a few early software challenges, the time it takes to sift through numerous paper-based applications for the preparation of the shortlist of potential candidates has been considerably reduced. Another example comes from Ghana, where certain public sector jobs, such as lift operation, teaching of crafts and other functions, are reserved for people with disabilities. This approach encourages inclusive job-sharing so that no one is left behind. Such policies can be effective by advertising job vacancies online, in particular to the targeted groups.

31. E-recruitment assessment tools can also be incorporated in the recruitment process to facilitate online assessment of candidates' suitability. Since 2018, the Ghana Civil Service has employed e-recruitment tools to recruit suitable applicants. This process not only has reduced the drudgery of human resources officers shortlisting thousands of applications, but also has led to the recruitment of the most qualified and has promoted meritocracy in human resources.

32. In this electronic human resources management environment, training and development needs can be met in a timely manner through web-based services. Employees can access training materials and learn at their own pace. Various electronic competency training programmes, including those on supervisory skills, business writing and computer and customer service skills, have been piloted in various ministries and departments in the public service in Trinidad and Tobago. This has met with an increased interest and participatory rate in this mode of training of public officers. It is envisaged that this mode of training will be expanded to other areas, such as human resources management, financial management, policy development and procurement.

33. Furthermore, many governments are now using employee self-service functionality in their integrated human resources information system. Employee self-service enables employees to interact with their human resources data to enquire about, review and carry out human resources transactions in the work environment. Various types of self-service applications, such as interactive voice responses, and the Internet and intranet can also be utilized. Most importantly, the employee self-service system allows for employees to transact remotely on human resources issues. This technology allows for new types of employees to emerge, such as the so-called digital nomads.

34. The adoption of performance management systems has become one of the most important reforms in the public sector both in developing and developed countries. An efficient and effective performance management system cannot be sustained without technological deployment. For example, employee performance evaluation reports can be conducted online through the intranet; employees and their supervisors can establish goals, engage in periodic discussions to determine areas for development or other human resources management interventions and prepare final performance reports. Through technology, new methods are introduced, such as a 360-degree feedback process by peers, subordinates and users who participate in the evaluation of the public servant anonymously. It allows for a fair review of the performance of managers and an impartial and collective way of evaluating their work, to avoid bias and favouritism. Some criticism of the 360-degree review is that it has become more quantitative over time and is losing the essence of qualitative feedback. Governments should regularly review and improve human resources evaluation systems.

35. Monetary incentives in the public sector are a sensitive part of the performance management system, since trade unions in many countries and representatives of the public service personnel want equal treatment for all, regardless of the type and nature of the work performed. For the first time, recent legislation in France has allowed for the distribution of financial incentives by managers in public hospitals in case of a sudden and unexpected increase in workload, such as during epidemics. They can distribute a bonus to their team workers in recognition of the extra work done. This is a pay-for-performance system. However, it is also important to focus on non-financial incentives for public sector workers to better serve the general interest. New technologies can offer opportunities to spend less time on procedures and more quality time with the public. Also, new practices, such as inclusive, collective and nudge management, and the improvement of the quality of life at the workplace can be used to motivate staff.

36. Another example of the future of government from France is the Public Transformation Campus, which brings together different actors or institutions, such as training schools, enabling the public sector workforce to adapt to new methods of work and innovative action; mixing theory, mainly by means of digital technology, with a lot of practice; working closely with users on real projects; and experimenting in real-life situations. There are tailor-made training programmes for public servants involved in organizational transformation to introduce them to new practices on projects that can be replicable in other administrations. There are e-learning courses, massive open online courses and videos, among other things, freely accessible to all civil servants online through digital training platforms using the newest methods and peer-to-peer sessions to share experiences, test feasibility and act.

37. The Campus offers public managers and their teams training in five main fields: innovation methods such as design thinking and experimentation; new ways of management, such as team, lean, remote and change management methods; user-focused approaches involving how to listen to and empathize with users and be user-friendly; project management, whether outcome-oriented or in project mode; and digital technology skills, such as user experience design, data management and algorithms. The goal is to create a community of training specialists, co-developers and coaches in public administration, pulling together their resources and offering training of trainers.

III. Conclusion

38. In conclusion, governments are embracing digital technologies to achieve better governance. New practices enabled by information and communications technology are rapidly reshaping public sector workforce management. There are many challenges that have yet to be overcome, especially regarding data security, privacy and the definition of property rights. These are issues that relate to democracy, human rights and the future of government. It is important to enhance the capacity of governments to navigate successfully in this new digital era. Owing to rapid technological evolution, the future of government and those who work in government will inevitably change to meet the needs of citizens. It should be ensured that no one is left behind and that such technological shifts are geared towards accelerating the achievement of the Sustainable Development Goals.