

KEY POINTS

- A government can modernize and upgrade talent within its civil services by investing in technology, but major reforms are difficult to realize in the short term, especially for those countries with a large public sector.
- The adoption of technology can help accelerate government efforts in modernizing the civil service, especially: data integration and advanced analytics solutions, modern human resources systems, and online e-learning hubs.
- Governments in the Asia-Pacific can look to peer countries for good examples of technology solutions that address specific civil service modernization needs. For example, Government of Singapore civil servants can take online courses and have records of course completion attached to their employee profiles via a single web platform.
- In addition to considering cost and system quality issues, governments must also consider other factors such as data security, IT infrastructure, and legal issues before choosing a technology solution or modernization strategy.

Using Technology to Improve Civil Service Talent

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INTRODUCTION AND CONTEXT

Governments in Asia and the Pacific have launched ambitious initiatives to improve service delivery by modernizing civil service systems and investing more in equipping their civil service personnel. Governments are also increasingly investing in technology solutions to accelerate civil service modernization initiatives. This brief provides an overview of ways in which technology can support these reforms and gives examples of technology applications that are used in Asia and the Pacific. However, it comes with an important caveat: while technology can serve a vital function, civil service reform is highly complex, and requires a holistic mix of interventions that includes appropriate policies and business processes, activities to build capacity, effective management, and consistent supervision.¹

The experience of Indonesia offers useful insights into the myriad complexities associated with civil service modernization and highlights how difficult major reforms are to realize in the short term, especially for those countries with a large public sector.² In 2014, the Government of Indonesia passed its landmark Civil Service Reform Law, which President Joko Widodo expanded in 2017 through a presidential declaration. Together, these measures made the promotions system of Indonesia's civil service merit-based and standardized the evaluation criteria for entrance and promotions. Separately, in 2013, Indonesia's National Civil Service Agency (BKN) introduced a computer-assisted entrance exam for civil servant applicants, eliminating the use of

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¹ For additional context, see Rahemtulla, H & Carrasco, B. Asian Development Bank. *Southeast Asia needs high-performing public sector to beat COVID-19*. Retrieved from <https://blogs.adb.org/blog/southeast-asia-needs-high-performing-public-sector-beat-covid-19>.

² For more information about Indonesia's civil service, see Asian Development Bank. (26 January 2021). *A Diagnostic Study of the Civil Service in Indonesia*. Retrieved 28 January 2021, from <https://www.adb.org/publications/diagnostic-study-civil-service-indonesia>.

paper assessments. The government also adopted a “One Data” standard, which requires sensitive government data, including information about civil servants, to be interoperable and easily exchangeable across different government information systems to better track performance.

Despite these initiatives, Indonesia has made slow progress in improving talent within its civil service. Implementation of the reforms within the government’s 32 line ministries and more than 600 distinct national, regional, and local government units has been inconsistent, and many resisted them outright. In 2018, BKN found that the majority of central and regional government units had “low” levels of professionalism. The government still has far to go to address several other long-standing structural challenges, too—such as increasing gender parity in government leadership positions, reducing corruption, and removing service delivery inequities.

Indonesia is not the only country faced with such challenges. Rather, their experience is emblematic of the challenges and complexities encountered by many other Asian countries when implementing large-scale civil service reforms. As the OECD points out in *Government at a Glance Southeast Asia 2019*:³

Delegating responsibilities—for example on remuneration, recruitment, performance assessment or dismissal—empowers and enables public managers to better adapt working conditions to their organisations’ needs and to individual employees’ merits. Under appropriate framework conditions and minimum standards, delegation could lead to a better alignment of human resources (HR) planning and business strategy. **However, without some degree of central oversight, arrangements may instead lead to uneven pay scales, limited opportunities for government-wide strategic HR planning and mobility, and risk nepotism and political interference in staffing decisions. Delegating human resources management (HRM) also requires developing the accompanying HRM competencies at the level where decisions are to be taken** (*emphasis added*).

Driving change, particularly an ambitious one, takes time. The adoption of technology, while not a panacea, can help accelerate government efforts in modernizing the civil service. However, some solutions will work better for some countries than for others. Countries in the Asia and Pacific region have varying levels of civil service professionalism, IT infrastructure, and differing legal and governance structures, among other issues. Countries in the Asia and Pacific region each also manage their civil services (and use data to make decisions about how to manage the civil service) differently, too. For example, as of 2018:

- While Brunei Darussalam, Malaysia, the Philippines, and Viet Nam collected and aggregated civil servant employee performance data up to a central decision-making authority level, equivalent types of data in Thailand, Singapore, Cambodia, Indonesia, and the Lao People’s Democratic Republic (Lao PDR) were collected and analyzed only at the ministry level;
- Singapore, Thailand, and the Philippines made routine use of performance data for HR decisions, but performance data were not routinely used for HR decisions in the Lao PDR or Cambodia;
- The Philippines, Thailand, Australia, and New Zealand permitted civil service collective bargaining while most other countries in the Asia and Pacific region, including Japan, the Republic of Korea, Viet Nam, and Singapore did not;
- Brunei Darussalam, the Philippines, Singapore, Thailand, Australia, the Republic of Korea, Japan, and New Zealand proactively shared data about civil service human resource management with the public online, Indonesia and Cambodia made data available to the public but only by request, and other countries in the region, including Viet Nam and Malaysia, made no data publicly available at all (footnote 3).

The challenges associated with implementing civil service reforms have also been exacerbated by the coronavirus disease (COVID-19) pandemic. Many governments that had allocated resources to reform their civil services in 2020 redirected those resources to other priorities, especially to the health sector, or postponed or canceled civil service reform activities planned that year. The Government of Indonesia canceled a planned Asian Development Bank (ADB) loan, co-developed between government and ADB personnel to modernize Indonesia’s civil service as a result of the coronavirus disease (COVID-19), for example.⁴ Strict quarantine policies adopted in many countries also delayed meetings and/or made other activities impossible. For example, in many countries where local law requires that civil service examinations take place in person, quarantine policies forced many governments to cancel or delay those examinations.

At the same time, the coronavirus disease (COVID-19) has also accelerated technology adoption by many government ministries. For example, officials increasingly moved to online platforms to host meetings and rapidly deployed new technologies to address new health challenges posed by the coronavirus disease (COVID-19). In October 2020, ADB’s Martina Merten, Susann Roth, and Fazilah Shaik Allaudin outlined many new technological innovations adopted by countries around the world to respond to the coronavirus disease (COVID-19) in a paper entitled *Public*

³ OECD and ADB. 2019. *Government at a Glance Southeast Asia 2019*. Paris: OECD Publishing. <https://doi.org/10.1787/9789264305915-en>.

⁴ Many of the recommendations included in this ADB Brief are derivative of insights surfaced during initial scoping conversations with Government of Indonesia and ADB personnel in preparation for that loan.

*Health Innovations for COVID-19: Finding, Trusting, and Scaling Innovation.*⁵

For many governments, the year 2021 starts as 2020 ended, with countries in Asia using a hybrid of in-person and digital methods to conduct business. As policymakers return to discussions about civil service reforms in this new year, many will be more open to adopting technologies to support civil service modernization activities. This brief overviews some of the technology solutions that can be among the most useful. They include:

- (i) **Data integration and advanced analytics solutions** are valuable to decision-making authorities, especially to assist in allocating resources, hiring, promotions, and monitoring and evaluation of human resources (HR) systems. Advanced integration and analytics solutions can also uncover evidence of corruption, waste, bias, and discrimination in the civil service, as well as forecast civil service hiring and skills needs.
- (ii) **Modern HR systems** make it easier to consolidate, standardize, and evaluate civil servant performance, as well as track a civil servant's professional track record from date of application to date of departure. A modern HR system can also serve as a repository for employee biographic information and records of performance evaluations, training reports, disciplinary actions, promotions, awards, and other data.
- (iii) **Online e-learning hubs**, including applications that governments can use to design (or to license) training courses for civil servants and generate records and certificates of training completion. Effective online e-learning hubs serve as single clearinghouses for information and give civil servants easy access to relevant courses they can take and self-enroll in.

The next section describes some of these technologies in greater detail, but this is not an all-inclusive list. In addition to these solutions, many other technologies can assist in government efforts to modernize their civil services (e.g., computer-assisted entrance examinations). Policymakers should consider all available technology options and decide in which areas to invest based on country needs and capabilities.

DATA INTEGRATION AND ADVANCED ANALYTICS

Data fragmentation is one the biggest barriers to effective decision-making within many governments' civil services. Government agencies tend to use many different types of information systems for a variety of bespoke purposes: a government agency may use one system to administer payroll, another to maintain personnel records, a third to track employee training certifications, and a fourth to manage expenditures and

other financial disbursements, for example. Compounding the complexity are agencies or subnational units within a government using their own versions of each system.

Government agencies also use systems that are customized to their specific mandate. For example, the ministries of health of many ADB-supported countries, including Bangladesh, Timor-Leste, and Sri Lanka, use the District Health Information System 2.0 (DHIS 2.0) to track indicators reported by health facilities such as the number of hospital admissions and deaths for specific diseases, consumption of essential health commodities, and numbers of births attended by skilled professionals.

Consolidating data from disparate information systems through data integration and advanced analytics can give decision-makers a fresh insight into ways they can better manage the civil service and improve the delivery of services. For example, by combining HR information (such as the number of health professionals in a given health district) with programmatic data (such as the morbidity and mortality rate for a given disease) as well as financial and payroll data, a decision-maker could calculate the total service delivery cost and human resources burden to every health district in the country for treating a specific disease. These analyses could help determine where to increase (or reduce) hiring and identify the health cadres most in need of specialized training—for example, where there is a sufficient number of HR personnel but a high rate of untreated morbidity.

Data integration and advanced analytics can also reveal evidence of waste, fraud, discrimination, and bias in the civil service. For example, integrating payroll data with HR data (such as performance reviews) could help auditors find evidence of ghost employees. Aggregated information pertaining to performance evaluations together with biographic details (such as race or gender indicators) could disclose evidence of bias or discrimination in the hiring or promotions processes. Furthermore, data pertaining to training, education, and other personnel information from across disparate systems of various government agencies can help identify areas in which certain skills are in excess and/or lacking; such data are valuable for forecasting skills needs as well.

While decision-makers in the region aspire to better use data to inform their decisions and civil service management, many governments have in the past struggled to succeed in implementing complex data integration projects. One reason is that data integration requires solving very complex information technology challenges. Information systems and other relevant sources of information (such as static Excel files and surveys) differ in a variety of ways: (i) the type of software and database used (one system may use a relational database while another may be nonrelational); (ii) the frequency of reporting (some systems may be updated in real time, and others hourly, weekly, monthly, or annually in the case of surveys); (iii) the level of granularity

⁵ Merten, M., Roth, S., & Allaudin, F. (October 2020). *Public Health Innovations for Covid-19*. Asian Development Bank. Retrieved from <https://www.adb.org/sites/default/files/publication/648131/sdwp-70-public-health-inovations-covid-19.pdf>.

(one system may report data at the individual level and another only aggregate statistics); (iv) the language used (some systems use English, others the local language, and still others a hybrid); nonstandard indicator nomenclature (for example, a position may be referred to as “job” in one system, “position” in a second, “cargo” in a third, or “role” in a fourth); (v) nonstandard units of measurements (one system may use United States Dollars, while another uses a local currency; and one system may use scaled indicators by population and another unscaled), and; (vi) inconsistent metrics used across government ministries. For example, performance metrics are not standardized across ministries in Cambodia, Indonesia, and the Lao PDR.

Another constraint on effective data-driven decision-making is that many off-the-shelf data analytics tools are not built to allow decision-makers to easily aggregate and disaggregate indicators, combine indicators from different systems, or assess the data quality of indicators. These factors limit the utility of many analytics tools and undermine the decision-makers’ confidence in the quality of data they use.

Many large firms and startups have since 2010 built data integration solutions and advanced analytics software to help governments and institutions address these challenges. The associated costs for this type of work have also lowered significantly in recent years.

MODERN HUMAN RESOURCES SYSTEMS

Many top-of-the-line cloud-based HR systems built by large companies (and increasingly, startups) allow managers to track their employees’ professional journey, from date of application to date of separation.

The modern HR system typically enables administrators to streamline applications for positions and programs by advertising opportunities online and allowing HR personnel to manage applications from the back-end; administer and standardize a 360-degree feedback process and store the results; serve as a repository for records of training participation and certificates of completion; store records of disciplinary action and awards; and act as a single source of employee records, keeping employee biographical information current for managers to use as reference when individuals are promoted, transferred, or terminated.

Among other benefits, modern HR systems can help managers design processes that are quicker and more efficient; standardize criteria for evaluations, promotions, and hiring; identify staffing gaps rapidly and perform needs analyses; and easily plan for long-term needs. Taken together, these efficiencies can improve employee morale and government service delivery.

The civil services of most ADB-supported governments already have an HR system in place, albeit with varying levels of sophistication and utility. Often, these agencies use different systems for different HR purposes.

For example, Indonesia’s National Civil Service Agency (BKN) administers several different systems, including the National Civil Service Information System (NCSIS), which contains information on civil servants’ biographical and qualifications such as education and work experience; the e-KINERJA system which BKN uses to administer 360-degree performance reviews of civil servants; and the Online Civil Servant Application (or SSCN) and the Computer-Assisted Test Platform which BKN used in 2019 to match the competencies and qualifications of more than 5 million registrations for 150,000 available civil service positions, as well as to administer computer-based testing for eligible candidates.

BKN uses these systems to manage the government’s 4.2 million civil service employees across 87 central- and regional-level government units. However, these systems are not easily interoperable despite initiatives to introduce the “One Data” sharing standards. Different government agencies also manage their own systems for training and certification purposes, which are also not integrated or interoperable with other BKN systems.

The government is now conducting an assessment of HR systems used by all of its government agencies with the vision of potentially creating either one consolidated modern HR system and/or redoubling efforts to make existing systems interoperable.

A modern HR system can significantly improve administrators’ ability to manage and track the performance of civil servants. Implementing one should be incorporated into civil service modernization plans. However, the HR system that is most appropriate to a particular country will vary—the financial and switching costs for countries that are using a highly fragmented information system and multiple HR systems are different from those that have only a single system in place or those that are using a very rudimentary HR system.

ONLINE E-LEARNING HUBS

Increasingly, ADB-supported countries are using online learning applications to upskill their civil servants. Governments can develop online course content themselves, including by contracting local firms to develop bespoke content, use licensed educational content developed by multinational or local education providers, or work with education-as-a-service (EaaS) firms. EaaS models enable ministries to build and customize online courses with little- to no-programming experience required. Typically, the EaaS firm provides the software platform and the government agency provides the course content.

Online learning can also be a highly scalable, measurable, and quick way to introduce civil servants to new regulations, policies, and procedures. By developing a comprehensive list of courses and making them available to civil servants, online learning portals can be effective vehicles for civil servants to self-assess their skills and voluntarily enroll in courses that will equip them in areas where they need improvement. Given the proliferation of online

learning companies, costs to develop and deploy content have also decreased considerably in the past decade.

Despite its benefits, online learning presents new challenges, which are often more pronounced for lower-income countries and countries with a lower level of digital adoption or technological fluency.

When deciding whether and how to use online learning to upskill civil servants, decision-makers should consider several factors in addition to the quality of online course content: (i) connectivity (do certain parts of the country have access to the internet or unreliable access?); (ii) computer resources (do certain parts of the country have the computers and/or mobile devices needed to support online learning applications?); (iii) technological fluency (do civil servants in all parts of the country have the technological fluency required to successfully complete the courses); and (iv) proctoring (by law or regulation, many countries require that examinations take place in person or at pre-approved testing facilities to prevent cheating).

Two ADB-member countries that utilize technology well for online learning are Singapore and Malaysia. Since 2018, Singapore's Civil Service College, which is part of the government's Public Service Division, has worked with multinational online learning providers like Udemy and Coursera to provide online courses for Singapore civil servants via the digital portal LEARN, accessible at learn.gov.sg. In addition to the online courses that are available to Singapore civil servants, Singaporean government agencies can also purchase additional subscriptions to make more specialized, premium courses available to their civil servants. Many of the courses are focused on building future-ready competencies. Via LEARN, Singaporean civil servants can also self-assess their skills by taking surveys and online tests and then subsequently enroll themselves in relevant courses. Upon completion of a course, a record is stored in the civil servant's employee profile.

The LEARN platform complements the government's private sector initiative, SkillsFuture, which was established in 2016 as part of an initiative to help Singaporeans develop new skills to better compete in new and emerging industries. Through the initiative, the Singaporean government provides its citizens a single web portal to access several programs to accelerate modernization, such as scholarships for Singaporeans to study abroad especially in the fields of science, technology, engineering, and math, as well as incentive programs for highly skilled foreign nationals to relocate to work in Singapore. Singaporeans also have access to and can apply for programs that have been tailored for them. For example, Singaporeans in their 40s and 50s are eligible to apply for the

SkillsFuture Mid-Career Support Package, which is designed to help mid-career professionals make career transitions, especially to new and emerging industries.⁶

Neighboring Malaysia has also rolled out similar job training and economic modernization programs through its TalentCorp initiative. Like SkillsFuture, TalentCorp is a national initiative launched by the Government of Malaysia in 2011 to upskill the country's private sector workforce. While smaller in scale than Singapore's SkillsFuture, the Malaysian government used a similar approach, consolidating all available programs and online learning opportunities into a single unified web platform.⁷ Using that platform, Malaysians can perform self-assessments for skills, apply to enroll in online courses and other training programs to increase their skills in high priority areas, or apply to join other beneficial programs such as scholarships and study-abroad programs, among many others.⁸ The TalentCorp model can be easily adapted to a civil service context.

One of the important lessons from the LEARN, SkillsFuture, and TalentCorps online hubs is that there is significant value to consolidating content into one, easily navigable web portal. All three platforms are designed to be human-centered so that individuals and employers are able to easily find programs that are most relevant to them. The TalentCorp website, for example, has separate sections for recent graduates, mid-career professionals, and employers, with each section containing content tailored to that specific audience. The platforms have all also taken an agency-agnostic approach: regardless of which government agency provides the benefit or subsidy for an online course or another talent management program, an end user can find and learn about *every* opportunity relevant to them across *all* government agencies. These websites also streamline the applications processes for different courses and other programs, thus minimizing friction for end users because they no longer need to navigate through different government agencies to apply for different opportunities.

In contrast, many government agencies in Asia provide online courses and other talent management programs (for both civil servants and the private sector), but they do not consolidate information about these programs in a single website. It is often the case that a government agency (e.g., a Ministry of Education, Ministry of Labor, etc.) would post on their website an announcement of an opportunity funded by them and the post would get buried in many sub-links. Hence, there is a great probability that a civil servant or a private citizen will miss seeing and therefore not know about *all* the opportunities that are available to them.

⁶ While this brief focuses its discussion on SkillsFirst's online platform, SkillsFirst is a comprehensive, whole-of-government initiative that involves significant investment, of which the online platform is just one component. For example, the government provides employers up to 40 percent salary support for up to 6 months for any employee hired as part of the mid-career program in addition to cash subsidies for the employee to use toward training programs.

⁷ See the TalentCorp initiative website at <https://www.talentcorp.com.my/>.

⁸ In addition to providing information to Malay residents, employers can also use the TalentCorp platform to apply for subsidies and other incentive programs provided by the Malaysian government. For example, employers can apply to participate in the Career Comeback Return Program through the TalentCorp website and receive government incentive grants in exchange for hiring Malaysian women back into the workforce after childbirth and childrearing.

When considering the ways to use online learning and web platforms to upskill civil servants, governments in the region should consider using the LEARN, SkillsFuture and TalentCorp models of organizing and communicating via a single web platform the opportunities they offer, including online courses and training programs, scholarships, grants, and other programs

ADDITIONAL CONSIDERATIONS

Introducing new technology can accelerate progress in modernizing a civil service; however, in addition to considering cost and quality, governments must also consider the following factors before choosing a technology solution or modernization strategy:

- **Data security:** Procurement officials should verify that software vendors can meet minimum information security requirements, including the ability to provide multilevel access controls, secure sockets layer (SSL) encryption for data-in-transit, distributed-denial-of-service (DDOS) protection, and web scraping protection, among others. Officials should consult with information technology (IT) security experts to determine minimum security requirements as these will vary by country.
- **IT infrastructure:** Some software, especially advanced data integration and analytics platforms and modern HR systems, may require hardware upgrades. Procurement officials should verify that software providers' solutions are compatible with existing hardware infrastructure, especially with regard to size and speed of government servers, and budget for server and other infrastructure upgrades, if necessary. Procurement officials must ensure that the devices that civil servants use (including computers and/or mobile solutions) are compatible with the selected solution.
- **Capacity building:** Learning a new software will take time, especially if end users are accustomed to a different type of application (and therefore will incur so-called "switching costs") or if they have limited experience with technology. In addition to budgeting for the financial cost to acquire software and services, procurement officials will need to also invest significant resources in training personnel to use the new software and information systems. Technological fluency typically varies significantly across government agencies and administrative units—technologically adept end users tend to more quickly adopt new technology than users with less technology experience. For example, there are often differences in technology adoption levels in urban versus rural areas. These factors should be considered when developing capacity-building budgets and strategies.
- **Sustainability:** It is increasingly common for governments to acquire open source technology solutions or use a hybrid of open source and proprietary solutions. Since 2016, major donor organizations and philanthropies, including the US Agency for International Development and the Bill and Melinda Gates Foundation, have developed the Principles for Digital Development,⁹ which give recommendations regarding the development and acquisition of technologies that use open data standards and open source solutions. These standards have given government more flexibility in choosing and replacing vendors as needed. IT experts can help governments develop a needs assessment to determine the right mix of open source and/or proprietary solutions based on local needs and sustainability concerns.
- **Data Blind Spots:** Competency-based human resources data are very difficult for many IT systems to capture. While skills-based training modules can include simplistic quantitative assessments, for example number of trainings completed or scores received, improving competencies requires deep engagement with line managers and good performance review systems that take into account holistic talent and often include considerable qualitative information.¹⁰ Decision-makers should consider how HR systems (as well as data integration and visualization software) capture, represent, and make accessible competency-based performance data.
- **Data Quality:** In many countries, the quality of data entered into HR systems varies significantly. Data quality may vary by geography, ministry, and information system, among other factors. Policymakers who use data for decision-making must be aware of these issues and calibrate policymaking processes accordingly (e.g. by giving more weight to data for decision-making in systems with high quality, and considering how to augment available evidence for decision-making in systems with low data quality). In addition to adopting new systems and building capacities to enhance data quality – including through improved and standardized data capture processes and routine audits – decision-makers should also consider deploying new decision-support systems gradually, and couple software deployment with appropriate training, supervision, and incentives where possible (e.g. bonuses) to encourage civil servants to capture, record, and utilize higher quality data for decision-making. Governments should also consider working with data quality experts to identify where there are opportunities for systems improvement. The World Health Organization has developed a guide¹¹ for systems administrators to use to evaluate the quality of data stored in health systems. Other organizations have developed similar guides for other types of information systems.¹² Guides like these can provide useful frameworks to identify information systems' strengths, weaknesses, and opportunities for improvements.

⁹ See the Principles for Digital Development, accessible at <https://digitalprinciples.org/>.

¹⁰ For additional information, see the SHRM Competency Model, accessible at <https://shrm.org/learningandcareer/career/pages/shrm-competency-model.aspx>.

¹¹ See World Health Organization resources regarding data quality, accessible at <https://www.who.int/data/data-collection-tools/score>.

¹² For example, see documentation developed by the Human Resources for Health Global Resources Center, accessible at <https://www.hrhresourcecenter.org/index.html>.

- **Legal issues:** Many countries have laws or regulations governing where data can be hosted, often including rules stipulating that data should be stored in servers within the country. Typically, countries also have laws or regulations pertaining to how government data can be processed, stored, exchanged, and accessed, as well as what types of data can be viewed by foreign nationals. Procurement officials should verify whether software providers can comply with country regulations.
- **Governance:** One of the most common reasons large technology projects fail is because project governance issues are not carefully considered in advance of project implementation. Among the concerns to address at the start of any technology project are the following: (i) which agency will “own” the initiative (and do they have the requisite political influence and mandate to execute); (ii) which agencies need to be part of decision-making processes and should sit as members of an interagency technical working group; (iii) how will the software implementers and relevant government agencies ensure technology adoption through training; (iv) what monitoring and evaluation processes will be put in place to measure project progress; and (v) which government agencies should have access to what data and where data will be stored.

CONCLUSION

Technology can help a country advance its civil service modernization agenda, but it will not be a panacea. Change takes time, and human resources systems often need to reform alongside technology system upgrades. Nonetheless, this brief provides countries with a starting point as they consider ways to improve management of their civil services through the use of technology.

This brief, however, is not meant to be comprehensive. While advanced data integration and analytics solutions, modern HR systems, and online learning hubs are useful building blocks for countries intending to begin using technology, many other technologies can help as well. Some of these are online and computer-assisted civil service exam applications and mobile applications to make it easier for citizens to report information to central authorities, for example. Countries should work with experts in civil service reform *and* technology to identify solutions that would be most useful and relevant for their needs.

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