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Status of implementation of the Information and Communications Technology Strategy for the United Nations

Report of the Secretary-General

Summary

The information and communications technology (ICT) strategy (A/69/517) is a five-year road map designed to ensure that information and communications technology supports the core work of the United Nations in the areas of peace and security, human rights, international law, humanitarian affairs and sustainable development.

Establishing standards and architecture, developing a policy framework and instituting governance have been instrumental to the implementation of the ICT strategy. These are being enhanced in line with reform initiatives.

The consolidation of the Information and Communications Technology Division of the former Department of Field Support into the Office of Information and Communications Technology of the former Department of Management ensures that important cross-cutting programmes, as well as those that support personnel in field missions and comprise field technologies, can be undertaken in a more holistic manner. Key initiatives continue, as do efforts to harmonize applications.

The ICT strategy has modernized the way in which technology is used and established capacity and capability in frontier technologies, such as artificial intelligence, machine learning, natural language processing, computer vision, and blockchain. The Secretariat has been effective in advancing its information security plan, with some areas moving from a historically reactive mode to a more proactive mode. Challenges, however, continue, with threats escalating.

The present report is the fifth and final progress report on the implementation of the ICT strategy. It provides a comprehensive update of the status of key initiatives and commitments contained in the strategy, as well as an update on the status of the recommendations of the Board of Auditors.

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I. Introduction

1. The information and communications (ICT) strategy (see A/69/517), endorsed by the General Assembly in its resolution 69/262, established a common vision for ICT delivery in the United Nations through modernization, transformation and innovation, founded on a framework of improved governance and an effective balance between central leadership and operational freedom. This balance is central to the Secretary-General's management reforms (see A/72/492); it is addressed through enhanced governance. Delegation of authority will clarify the balance of operational freedom and operational control when implemented and is critical to ensuring accountability related to ICT, in particular in information security.

2. The five-year plan to simplify and optimize technology offerings as a precursor to transforming the way the United Nations uses technology, from a utility to a strategic enabler, was established to:

(a) Create an environment where interoperability allows information to flow effectively throughout the Organization, facilitating coherent and integrated mandate implementation;

(b) Ensure that ICT is leveraged as a critical operational and strategic enabler for the work of the United Nations;

(c) Protect the Organization from the rapidly escalating cybersecurity threats.

3. Implementation of the strategy has allowed the Office of Information and Communications Technology to undertake efforts related to technology innovation and the implementation of advanced and emerging technologies.

II. Status of implementation of the recommendations of the Board of Auditors

4. During the reporting period from the endorsement of the ICT strategy, on 29 December 2014, to the present, the implementation of the strategy has been audited by the Board of Auditors. The Board's first annual progress report (A/72/151) was issued in July 2017 and its second annual progress report (A/73/160) was issued in July 2018.

5. In undertaking the annual audit in the Secretariat, the Board identified a lack of coherence in ICT globally, identifying it as an impediment to the implementation of the ICT strategy.

6. The Board has made 50 recommendations since its first audit in 2012 (A/67/651). As at 31 December 2018 (see A/73/160), 36 recommendations had been accepted, and 1 had been partially accepted by the Administration. Of the 50 recommendations, 10 were assessed by the Board as fully implemented and 1 had been overtaken by events. A total of 39 outstanding recommendations are being implemented.

7. During the 2019 audit (18 February–15 March 2019), the Administration requested that the Board close eight recommendations and that four recommendations from 2012 and 2015 be marked as overtaken by events. There are five duplicate recommendations: three for governance and two related to duplicate applications.

8. The Office of Information and Communications Technology is working with United Nations entities to continue the progress made. Subject to the decision of the Board, with respect to recommendations that have been presented as addressed by the Secretariat, it is expected that the majority of the recommendations for which the Office is responsible will be addressed when the ICT strategy is fully implemented.

III. Information and communications technology strategy implementation: end state

9. The ICT strategy set out a five-year plan to simplify and optimize basic technology facilities as a precursor to transforming the way in which the United Nations uses technology to meet three main objectives:

(a) Ensuring that ICT is leveraged and used as a strategic enabler for the work of the Organization;

(b) Creating an environment that allows information to flow effectively through the Organization, facilitating mandate implementation that is coherent and integrated;

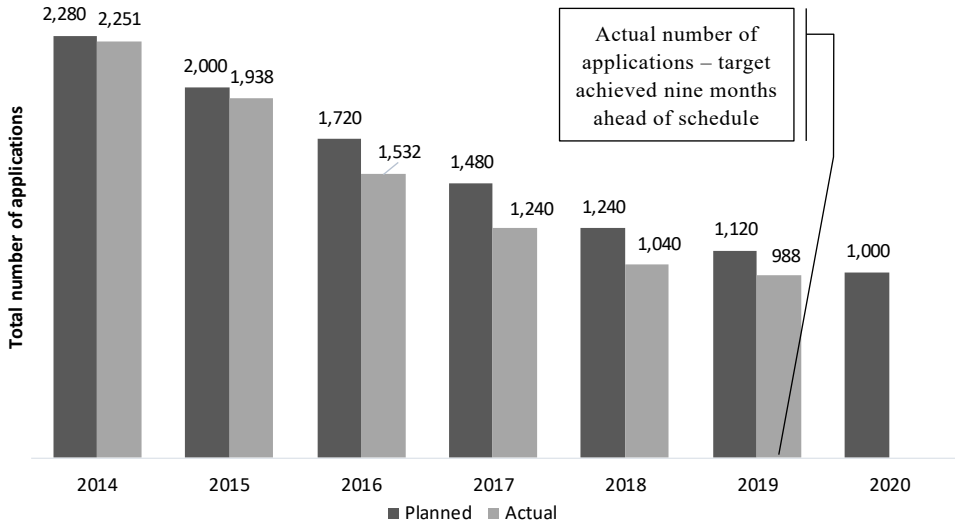
(c) Protecting the United Nations from cybersecurity threats.

10. The key issue hampering effective, efficient and secure ICT, as highlighted by the Board of Auditors in its report (A/67/651) and subsequently in the ICT strategy, was a highly fragmented ICT landscape. When the ICT strategy was proposed, 70 ICT units were located in various departments, offices and field missions. With the consolidation of those key ICT units, stronger governance arrangements and participative ICT activities, a significant portion of the fragmentation has been addressed. The consolidation of the Information and Communications Technology Division of the former Department of Field Support into the Office of Information and Communications Technology represents a paradigm shift towards a more coherent ICT pillar.

11. Transforming the United Nations into a data-driven organization was a key tenet of the ICT strategy. Accordingly, data warehouse technology was further improved, supporting the storage of data in both programmatic and administrative areas and providing common datasets for use in dashboards and more sophisticated predictive analytics.

12. Prior to the endorsement of the ICT strategy, there were 2,340 applications in use across the Secretariat, resulting in inefficiencies, duplication, interoperability issues and compromised information security. A five-year target to reduce the number of applications to 1,000 was reached nine months ahead of schedule. By 1 March 2019, the number of applications had been reduced to 988.

Figure I
Planned/actual number of applications in accordance with application strategy



13. When the ICT strategy was proposed, approximately 131 help desks were in operation across the Secretariat. These were consolidated into four locations, operating as one Unite Service Desk that provided services 24/7, with faster response and resolution times and higher user satisfaction.

14. When the ICT strategy was presented, over 80 data centres and server rooms housed the Organization's information assets; and no cloud services were in place. Today, the Enterprise Data Centres in Valencia and Brindisi are the main data centres for the Secretariat and facilitate disaster recovery. A cloud contract has been established and a significant number of end-user ICT services are being provided using cloud services under contracts that have been negotiated directly with the vendors in order to preserve the confidentiality and privacy of data owned by the United Nations.

15. The United Nations is under constant and escalating cyberattacks. In 2018, 710 million malicious web connections were blocked; each month, on average, four distributed denial of service attacks were successfully mitigated, and approximately 4,000 emails containing malicious code were blocked daily. The threats that the Organization faces are growing both in scale and complexity. To empower all authorized users, including non-staff and non-Secretariat personnel to protect the Organization, the online information security awareness course was established and has been completed by more than 86,000 personnel. The programme is also made available to all agencies, funds and programmes. The United Nations International Computing Centre, the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), the Office of the United Nations High Commissioner for Refugees (UNHCR) and the United Nations Children's Fund (UNICEF) are among those that have adopted the programme.

16. Innovation is a core component of the ICT strategy. Following rationalization efforts, the innovation agenda has been advanced in support of the work of the United Nations and various entities, helping them modernize their operation.

17. The Office established the enterprise delivery framework, transforming the disparate ICT organizations into a coherent enterprise structure. The Enterprise Data Centres, the Unite Service Desk and Enterprise Application Centres provide a full range of ICT services through a set of structured organizational units. The Regional Technology Centres link the Office of Information and Communications Technology to the ICT units of offices, departments and the field missions.

18. It is critical for the Organization to be at the forefront of the technology and data-driven revolution that the world is experiencing. The Secretariat will continue to build on the improvements achieved through the implementation of the ICT strategy to harness technology, innovation, data and partnerships to deliver the digital and data services that will enable the Organization to fulfil its mandates and ensure that the United Nations is able to leverage the most current means available.

IV. Management reform: information and communications technology

19. The integrated Office of Information and Communications Technology became operational on 1 January 2019, in accordance with General Assembly resolution 72/266 B.

20. In the consolidated Office of Information and Communications Technology, the specific requirements and modalities for reporting are being reconstituted and will be communicated to ensure visibility of ICT across the Secretariat as an important mechanism to guide and refine the continued implementation of the current ICT strategy, as well as the formulation of an ICT strategy for the future.

21. The Office of Information and Communications Technology has established close partnerships with the Department of Operational Support, the Department of Management Strategy, Policy and Compliance and other departments to improve the delivery of programmes through innovative technology solutions.

22. Innovative solutions are being directed to meet both the administrative and substantive needs of the Organization. Smart solutions are connecting people, data and information in quicker and simpler ways. Email, files and Umoja and Inspira profiles are accessible globally.

23. Enhancements to the ICT landscape have led to improved operations and service delivery, providing better support to staff members' daily work. For example, the One United Nations global wide area network unified 594 locations and provides greater consistency in bandwidth across duty stations.

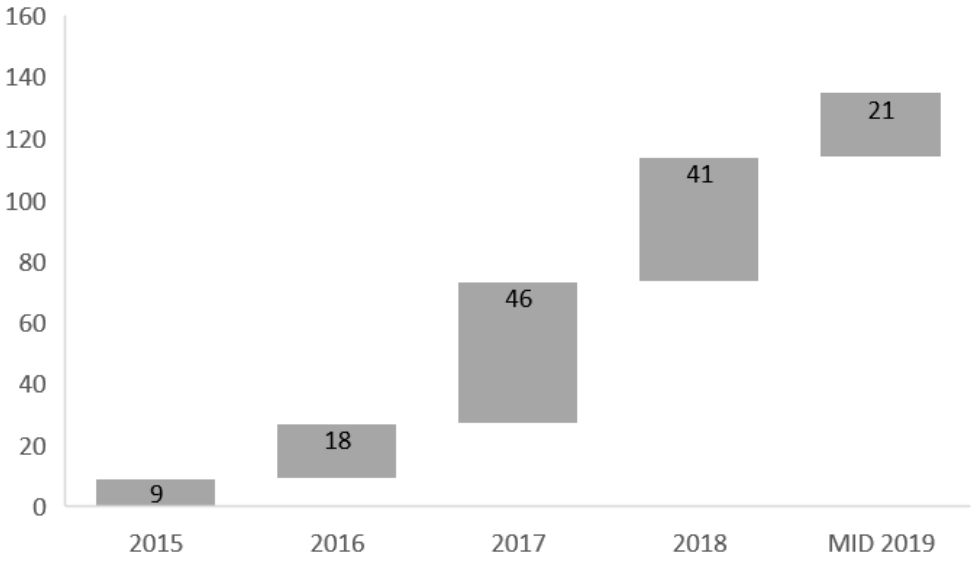
V. New approach to governance

24. In the second annual progress report of the Board of Auditors on the implementation of the information and communications technology strategy (A/73/160), the Board recommends that appropriate processes and practices of the governance framework be followed so that the business goals of the Organization are met through the implementation of the ICT strategy.

25. In addition, the Secretary-General, in his report on shifting the management paradigm in the United Nations (A/72/492), stated that the strategic, policy, governance and oversight role of the Chief Information Technology Officer would focus on the development of Secretariat-wide information and communications technology governance, strategy, policy and standards and effective enterprise data management to support executive decision-making, quality assurance and the monitoring of support and accountability mechanisms.

26. The standardization of technology is an important means to effect technical control and strengthen governance in the United Nations, as was recommended by the Board of Auditors in its report on the handling of information and communications technology affairs in the Secretariat (A/67/651).

Figure II
New standards established by the Architecture Review Board



27. The ICT governance framework for the Secretariat is designed to be an effective structure, including fast and easy processes and proper communication and awareness, in line with the United Nations management reform. The ICT governance framework is multidimensional, given the different nature and scale of technology, information and data. While being client-oriented, governance is also a mechanism in the global effort for harmonization. Rather than being mainly established on cost, the added value for the Organization, for its mandates and for the Member States will be the primary consideration when providing guidance and technology advice.

28. The current proliferation of governance bodies is being consolidated into a single mechanism that would cover ICT in general, but also the oversight of enterprise systems that are no longer in the project implementation phase, as well as the technical aspects of making available structured data to relevant users in support of mandate delivery. The governance body would be co-chaired by the Department of Operational Support and the Department of Management, Strategy, Policy and Compliance, with both supported by the Office of Information and Communications Technology as the lead on technical aspects of applications and technology.

29. Accountability mechanisms exist at various levels, such as the senior leadership compacts, and will be strengthened further. The United Nations ICT governance framework will hold senior leadership ultimately accountable for compliance with the ICT norms for optimal efficiency and effectiveness.

VI. Information and communications technology strategy: key issues

30. The General Assembly, in section I of its resolution 72/262 C, requested that the Secretary-General ensure that all Secretariat entities comply with the provisions of the Secretary-General's bulletin on the organization of the Office of Information and Communications Technology (ST/SGB/2016/11). Furthermore, the General Assembly decided that budgets and projects from all funding sources for all ICT initiatives and operations of the Secretariat were to be reviewed by the Office of Information and Communications Technology within existing governance structures before their submission to the Office of Programme Planning, Budget and Accounts. The Secretary-General's bulletin is therefore being revised to reflect the changes approved by the General Assembly in resolution 72/266 B. Moreover, and in line with the identification by the Board of Auditors of the need for technical authority for the United Nations, progress has been made in establishing policies, procedures and governance structures, while recognizing the need to establish a balance between central control and operational freedom.

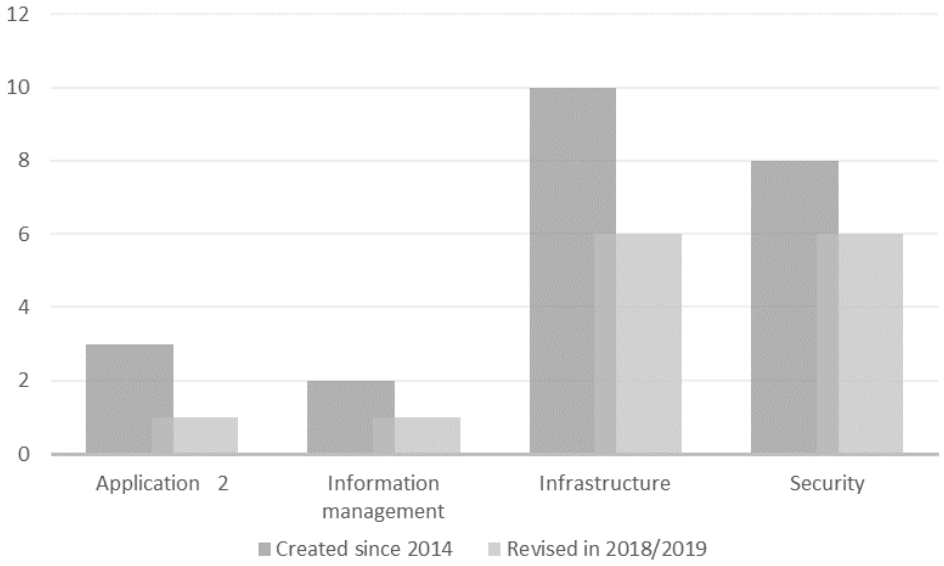
31. The Advisory Committee on Administrative and Budgetary Questions requested further information on measures taken to ensure the protection and confidentiality of the data contained in Umoja (see A/72/7/Add.51, para. 16). The Office has defined generic information security control objectives, provided general guidance and set institutional policy in protecting personal and other sensitive data in Umoja.

32. These efforts are complemented by those of the Umoja project team, which supports the user access provisioning process. This process provisions and deprovisions enterprise roles and workflows for Umoja functional end users and is undertaken in collaboration with functional process experts who define the business functions and the level of access required. This approach is aimed at establishing the most efficient and secure model for the provision of access and role assignment. The Umoja team also seeks to proactively prevent inappropriate combination of enterprise roles, to support the appropriate segregation of duties in the Organization.

33. The General Assembly requested that the Secretary-General establish Secretariat-wide central control over information security under the authority of the Chief Information Technology Officer and that clear delegation of authority and accountability mechanisms for all aspects of information security management be implemented and enforced, and further that specific performance measures be included in senior managers' compacts. Performance measures have been included in senior managers' compacts to cover core elements of the ICT strategy, including information security.

34. The General Assembly, in resolution 71/272 B, requested that the Secretary-General ensure that all Secretariat entities report to the Chief Information Technology Officer on all issues relating to ICT activities, resource management, standards, security, architecture, policies and guidance.

Figure III
Policies established since the inception of the strategy, by functional area



35. The General Assembly requested that further information and proposals be provided on the application management strategy, with an emphasis on application development policies and guidelines that clarify, inter alia, the functions and areas that are to be covered centrally by the Enterprise Application Centres and those which can be addressed at the local level.

36. The application management strategy was developed and the supporting application rationalization project launched. The project has been conducted within existing ICT resources through the established application governance mechanism. All applications have been categorized by business functions to facilitate the development of application road maps. The Office of Information and Communications Technology coordinates the application rationalization tasks with application owners (business and technical) and departmental focal points.

37. The General Assembly also requested further information on legacy systems, as well as a plan for accelerating the standardization and consolidation of legacy systems and websites. The objective established in relation to reduction of applications has been reached and further rationalization of applications will be addressed in the context of a future strategy for ICT. Through strengthened governance and review by the Office of Information and Communications Technology of ICT investment

proposals, the work done to harmonize applications will be preserved and expanded upon.

38. In addition to the enterprise agreements with cloud service providers that contain legal means to protect the privileged nature of data and information owned by the Organization, the Office of Information and Communications Technology has documented the protection and confidentiality requirements for the deployment and operations of cloud computing services. The requirements are contained in the United Nations cloud computing technical procedure document signed by the Chief of Information and Communications Technology in April 2018. The Office enforces the policies documented in the United Nations Cloud Computing Technical Procedure through a provisioning process that ensures that cloud services comply with United Nations ICT policies on governance, security of information and risk assessment and mitigation

39. The enterprise agreements include provisions whereby cloud service providers recognize and acknowledge the entitlement of the United Nations to unique privileges and immunities, including the inviolability of its data and immunity from search, requisition, expropriation and any form of interference, whether by executive, administrative, judicial or legislative action. These provisions apply wherever the data is located, but the United Nations has contractual agreements with cloud service providers to further protect its data at specific locations.

40. The Office has been engaging with the Office of Counter-Terrorism, providing technical expertise in adopting, maintaining and further developing a system (goTravel) that is being offered to Member States' passenger information units with the goal of providing capacity-building support in collecting data from air carriers, analysing such data to detect terrorists travelling through the standard commercial air transport system and establishing intelligence packages for law enforcement action.

41. The Sendai Framework voluntary commitments system was developed for the United Nations Office for Disaster Risk Reduction to support the development of partnerships at all levels to implement the Framework. The online system records and monitors voluntary commitments to implement disaster risk reduction measures by public organizations, academic institutions, civil society and the private sector.

42. The electronic travel advisory (eTA) mobile application was developed for the Department of Safety and Security to offer security awareness to all personnel of the United Nations System at their duty stations and when on travel. The mobile application is particularly useful to United Nations personnel working in the field on peacekeeping or humanitarian operations. Information provided by the application includes travel advisories, emergency contact numbers, security warning and alerts. As at June 2019, the eTA system has been launched in more than 70 countries.

43. The Office of Information and Communications Technology is engaged with the Office of Supply Chain Management in the Department of Operational Support to optimize the acquisition process for ICT products and services within the new integrated end-to-end supply chain management approach. The Offices collaborate in the implementation of the supply chain strategic demand and source planning, as well as forecasting using the category management approach to analyse and identify appropriate sourcing plans for information technology goods and services.

44. Today, the majority of ICT procurement in the Secretariat is undertaken through systems contracts established by the Office of Supply Chain Management of the Department of Operational Support. Utilizing systems contracts provides a more streamlined process for all entities and ensures that the United Nations benefits from the economies of scale that the size of its requirements afford. In addition to financial benefits, systems contracts allow procurement teams to quickly and efficiently order

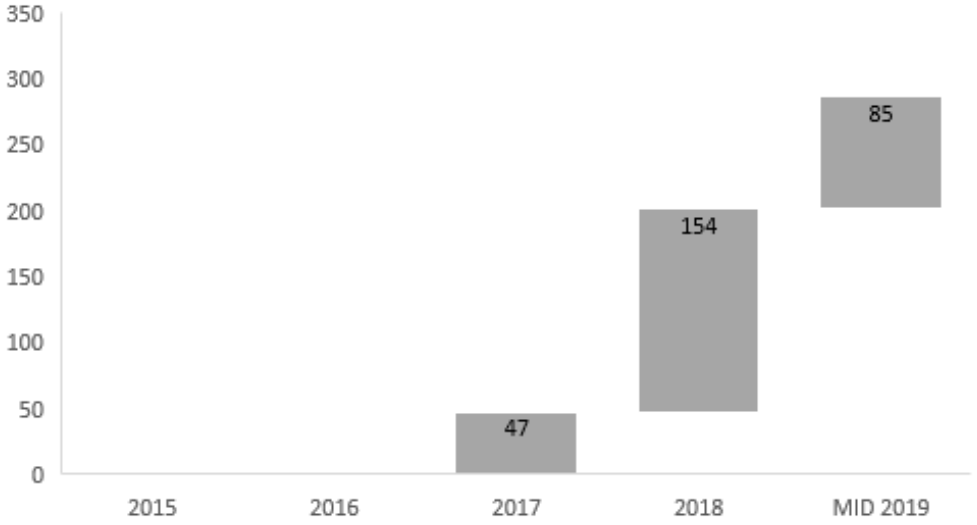
from the procurement catalogue in Umoja, which greatly streamlines the acquisition process. Furthermore, systems contracts allow the Organization to better maintain and implement ICT standards by encouraging the same type of equipment to be purchased across the United Nations, thereby providing and supporting harmonization.

45. The economy of scale approach was also used in 2017 as part of the cloud services enterprise agreements negotiations with positive results. By combining the requirements across the Secretariat and committing to at least 50,000 users, more efficient and cost-effective cloud-based services are available to support rapidly growing needs across the Secretariat.

Information and communications technologies technical clearance process

46. The Office of Information and Communications Technology has established a technical clearance process for ICT purchases in accordance with the role of the Chief Information Technology Officer to ensure that ICT procurement is aligned with the ICT strategy and road map and ensure compliance with ICT standards and security policies.

Figure IV
Technical clearances related to information and communications technologies procurement



Global information and communications technologies assets management

47. The management of ICT assets is the responsibility of United Nations entities in accordance with the accountability framework for monitoring the exercise of delegated decision-making authority. Key performance indicators will be used to ensure that each entity is complying with the applicable legal and policy framework of internal controls.

48. Acquisition of ICT assets and equipment and their replacements is presented by United Nations entities individually in the context of their respective budget submissions and in the context of ICT governance, standards and architecture.

49. Analyses conducted by the Office of Information and Communications Technology have resulted in more comprehensive information on resource utilization related to ICT, which in turn will improve transparency on the use of resources. The ICT strategy has strengthened the ability of the Secretariat to report on ICT resources and forms the basis for ongoing harmonization efforts related to ICT assets.

VII. Modernization and transformation: update on key initiatives

A. Umoja

50. The Unite Service Desk provides effective and efficient tier 1 support to Umoja on a 24/7 basis. In 2018, the Unite Service Desk handled 21,477 Umoja-related service requests.

51. The Office of Information and Communications Technology team has been trained in various modules and business processes, achieving an expert level of knowledge. In 2018, the team assumed production maintenance responsibilities in Umoja for some key areas. The Office provides ongoing maintenance and support for application programme interfaces for legacy applications and support to key extrabudgetary funds management dashboards.

52. In 2018, the Office of Information and Communications Technology database administrators were formally trained and embedded in the Umoja team to learn skills in in-memory data warehousing and other administration activities.

53. In collaboration with the Umoja team, and as part of Umoja Extension 2, the Office of Information and Communications Technology designed an integrated solution to replace various outdated stand-alone systems in support of the contingent-owned equipment management process. Also as part of Umoja Extension 2, the Office of Information and Communications Technology, together with the Umoja team, designed an integrated solution to support the fundraising process.

B. Enterprise applications

54. The Office of Information and Communications Technology ported the electronic fuel management solution and electronic rations management solution to mobile platforms. The mobile applications offer a better user experience: a larger display, fewer screens to complete fuel or rations delivery, better quality photographs as evidence supporting fuel and rations transactions and more advanced data validation rules to avoid errors. The deployment of the mobile release started with the United Nations Assistance Mission in Afghanistan.

55. The user interface of the service management solution, including iNeed and Unite self-service, was revamped, modernized and mobile enabled following a survey of user satisfaction. Additional features such as dashboards for service agents were added to improve work efficiency. Regarding process automation, 24 categories of staff movements in the Secretariat were standardized for the first time and implemented in iNeed.

56. Unite Apps, which collects data on applications of the Secretariat, is being replaced by Unite Appstore, using up-to-date technology and adding features for the ICT community to share applications and source codes. Web services allowing applications to access enterprise data are also being made available by Unite Appstore, as are ICT policies and standards applicable to the Secretariat. Once fully deployed, the Unite Appstore will facilitate Secretariat-wide collaboration in application development, allow reuse, avoid application duplicates and ultimately save costs for the Organization.

57. The Office of Information and Communications Technology is deploying third-party software to support communications and collaboration through several integrated tools, including chat, voice, video and virtual meeting functionalities, as well as file sharing, instant messaging, threaded conversation, discussion channels, event streaming and whiteboarding, with full integration with other cloud-based

products. Together, these products provide a robust virtual collaboration environment that is accessible over computers, phones and tablets.

C. Operational support

58. The Operations Support Division is responsible for all ICT operations across the Secretariat. During the implementation of the ICT strategy key improvements have been made to solidify and optimize operations.

59. The One United Nations wide area network, which unified United Nations Secretariat locations under a single standard, is fully operational. The Network Operations Centre, established more than 10 years ago to monitor and escalate 24/7 ICT incidents in the peacekeeping missions, has been expanded to monitor all network resources worldwide.

60. The Enterprise Data Centres continue to deliver services in the areas of hosting, connectivity and monitoring. With the endorsement and implementation of the hybrid cloud computing services, the Centres' service offering has been significantly diversified. By adopting a cloud strategy based on automation and orchestration, the impact will go beyond technology architecture to benefit the United Nations strategically and substantively. Major systems continue to be assessed and moved in to the enterprise hosting. New applications are delivered following the "cloud first, but not cloud always" model, intended to recognize the diverse needs of the United Nations Secretariat.

61. The Unite Service Desk continues to pursue continuous improvement of support activities for enterprise applications and services. Working as one virtual entity, the five hubs serve as the single point of contact for service requests, problems or enquiries for all key enterprise ICT applications. Notably, the resolution time and user satisfaction both improved from 2017 to 2018.

Figure V
Service requests resolution time in hours

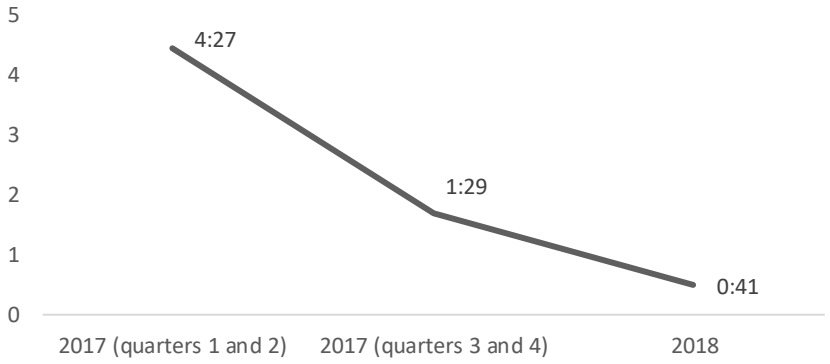
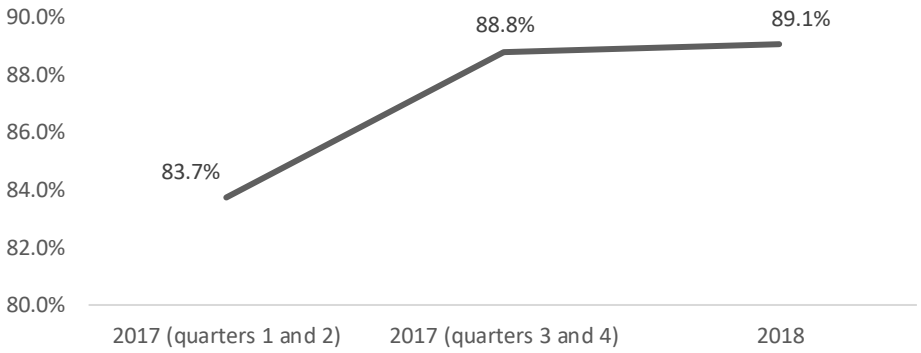


Figure VI
Results of survey on user satisfaction



62. For videoconferencing, a global videoconference booking and management system was implemented that keeps track of all videoconferences held by UNHQ, the United Nations Office at Geneva and Global Service Centre conference hubs. It is important to note that reliance on videoconferencing services continues to grow. With the state of videoconferencing equipment in the Secretariat, and especially in the main hubs, ageing equipment poses a significant risk to the operations of the Secretariat. A plan for the replacement of a considerable amount of equipment that is obsolete or in need of upgrade is being formulated and will require additional investment, which will be presented in due course.

63. An assessment of audiovisual and multimedia facilities and associated infrastructure conducted by the Regional Technology Centres and the Global Engineering and Conferencing Section has shown that the infrastructure needs significant updating. This was confirmed in the Board of Auditors findings and recommendations. The Section is actively assisting regional centres with the preparation of technology assessments and requirements analysis.

64. The Regional Technology Centres oversee mechanisms that ensure compliance with information security, ICT policies, standards and work methods. They also coordinate the delivery of technological solutions regionally. Priority projects in the centres' ongoing programmes of work include:

(a) Setting up the appropriate global infrastructure to consolidate email messaging domains, migrating all mailboxes to the cloud and hosting therein; and supporting the implementation of additional cloud-based productivity tools, which also support chat, voice and video communications. All Secretariat entities have been moved to the new cloud-based services;

(b) Continuing to secure the digital work environment to make it safe for staff, through initiatives such as mobile device management and the standardization of Wi-Fi protocols;

(c) Providing ongoing operational support for the implementation and monitoring of information security policies, including the 10-point action plan to strengthen information security across the Secretariat, approved by the Under-Secretary-General for Management on 7 March 2013.

D. Business intelligence and advanced analytics

65. As Umoja matures and management reform strengthens the Organization's ability to institute analytics tools such as dashboards, covering finance, human

resources, travel and procurement data, efforts will continue to build effective tools for senior managers that support data-driven decision-making. Under the ICT strategy, the conditions and necessary access to data have been established to allow offices and departments to use enterprise solutions and refine them as dictated by their specific needs.

66. Business intelligence and analytics capacity have been expanded to address the requirement related to a broader set of clients. For example, the Office continues its support of the Department of Political and Peacebuilding Affairs for publishing monthly and annual security council statistics. The statistics are enriched by using dynamic charts to display data on the number and nature of the meetings.

67. There is a growing demand for advanced analytics across United Nations Secretariat entities. For example, in support of the Economic Commission for Latin America and the Caribbean, text analytics applications are being implemented that automatically review documents and identify text in the documents that relate to the Sustainable Development Goals. This application will be available in Spanish and will initially examine a repository of 40,000 documents and will be further expanded.

E. Data management and data governance

68. The management reform has mandated the Office of Information and Communications Technology to support clients across the Secretariat in data and information management. To enable effective performance and innovation, there is a need to see data as a strategic asset and value producer. The Office initiated work on a data strategy that will provide an overarching framework for data-driven decision making at the United Nations Secretariat. This will be implemented in a consultative and collaborative process during which the most appropriate levels of delegation will be determined. The data strategy will enable a culture of cooperation, increase data literacy and provide good data governance.

69. The Office started to address the need for a central repository of data sources that shows where and how the data can be accessed. This organization-wide data catalogue will enable self-service discovery of data from any source. It also provides a means to register, annotate, discover, understand and consume data sources. Data, including underlying data in readily consumable structured data formats, will be readily available to relevant users while observing all the organization's rules and policies around data privacy, information security and data quality.

F. Information management

70. The Secretary-General has called on the Office of Information and Communications Technology to provide relevant and effective information governance in response to the Secretariat's recognition of the value of and great demand for information and data, which flow through every work process, impact every decision, and hold potential for insight and innovation by providing relevant and effective governance.

71. In 2019, the Office of Information and Communications Technology has been working to redesign the Secretariat's approach to information governance by incorporating an information management component into governance mechanisms and into an approach that is suited to the Organization's dynamic information environment and built to deliver a range of outcomes to the global Secretariat.

72. The Office of Information and Communications Technology seeks to balance operational and compliance objectives. It proposes that all business areas need to

prioritize information management activity and investment on the basis of value and risk. A key goal is to integrate information governance seamlessly into information systems by integrating information management policies, standards, procedures and guidelines into enterprise information systems: in 2019, the Office has focused on delivering a governance framework for the United Nations cloud-based productivity platform.

G. Information security and disaster recovery

73. The global cybersecurity environment is continually shifting and presents an unprecedented level of threat to the Organization. In addition to common and often automated threats, the United Nations is continuously subjected to highly targeted and sophisticated cyberattack campaigns aimed at gaining persistent access to systems and data or visibly disrupting operations.

74. The increased interconnectedness and interdependence of systems and data calls for a risk management approach that recognizes cybersecurity risks as cross-cutting and collective issues that cannot be mitigated or accepted in isolation through a fragmented approach of delegation.

75. The institutional consolidation of ICT functions, together with the accelerated deployment of common, cloud-based technology solutions, creates an opportunity to implement the strategic principles formulated in the Organization's information security policy directive for an identity-based, data-centric information security risk management strategy.

76. The established practices for end-user awareness will be enhanced through the introduction of regular exercises that sensitize users to common attack methods, train them in the appropriate response, and identify areas that require strengthening. To strengthen the protection of digital identities, strong authentication mechanisms will be introduced comprehensively, and policies adjusted to balance risks with end-user convenience.

77. Recent incidents demonstrate the Organization's susceptibility to attacks designed to establish a broad, external long-term hidden presence in the Organization's systems and networks. New technologies will be deployed to address these specific risks, building on ongoing efforts to segment networks and protect privileged accounts.

78. The Organization has consolidated its vulnerability management programme and regularly performs assessments of new systems and applications prior to their deployment. In addition, it maintains a "hall of fame" where security researchers can report detected vulnerabilities in United Nations websites and information technology systems: in exchange for treating these reports confidentially, the researchers are then publicly acknowledged after the vulnerability has been mitigated. The Office also regularly circulates advisories to notify focal points about publicly disclosed vulnerabilities and security updates for commonly used systems. To extend the vulnerability management programme, a schedule for regular assessments of the Secretariat's infrastructure will be implemented to proactively identify and mitigate weaknesses.

79. The Office of Information and Communications Technology also made significant progress in the areas of detection and response and established an initial threat management capability that leverages the analysis of incident details to develop early detection signatures. These efforts have significantly reduced the dwell time between a security incident and its detection, thereby limiting the impact of any breaches that occur.

80. The functions of incident management and threat management will be performed by a virtual cybersecurity operations centre in which specially trained analysts actively monitor the Organization's environments, to detect and respond to incidents in a timely manner.

81. The implementation of the cloud computing initiative will not only provide a highly scalable environment but also increase resilience, in particular in the case of local disruptions. However, as services are no longer, or to a much lesser degree provided locally, the Organization will need to reinforce the capacity and stability of local network connectivity, and ensure that multiple, independent paths are available to access applications and data, including through the increased use of mobile devices.

VIII. Innovation: leveraging technology innovation

A. Leveraging emerging technologies to build innovative tools and solutions

82. The Office of Information and Communications Technology has harnessed frontier technologies to develop tools and solutions, including a platform for conversational artificial intelligence that allows human conversation as an interface to IT systems, unpersonned aerial vehicles that provide real-time information on the local situation and support efforts to protect personnel in missions.

83. The Office has set up United Nations Technology Innovation Labs, which function as a start-up environment and create a platform for collaborative problem solving, mainly for the benefit of Member States, between United Nations resources and the private sector, academia and civil society.

84. The Office of Information and Communications Technology is exploring ways of leveraging new technologies for global challenges. As part of phase two of the ICT strategy, which has a focus on innovation, capacity has been built into a number of key technologies, such as artificial intelligence, machine learning, computer vision and augmented reality. Technologies have been developed as repurposable components that can be applied to support the mandates of Secretariat entities. To date, frontier technologies have been applied to predicting civil unrest, identifying correlations between individual sustainable development goals, identifying objects and people in large datasets, automatically classifying documents and establishing conversational systems that are driven by artificial intelligence.

B. Catalysing new partnerships in innovation

85. Partnerships have proven to be an effective mechanism that allow the Office of Information and Communications Technology to support the work of United Nations entities in advancing their mandates.

86. An example is the fifth international Partnership for Technology in Peacekeeping symposium, which was held in Nur-Sultan, in cooperation with the Government of the Republic of Kazakhstan. The symposium included a wide range of peacekeeping partners and was focused on the use of technology to meet operational requirements.

87. The Office of Information and Communications Technology continues to leverage its Unite Ideas public engagement platform to solve challenges in innovative ways with individuals, academic groups and the private sector. It has launched challenges on climate information, circular economy, ethical supply chain, internal displacement, armed conflict and cybersecurity. Unite Ideas has generated over

75 open-source software solutions. The platform was adopted by the High-level Committee on Management as a standard crowdsourcing platform available to United Nations agencies funds and programmes. Unite Ideas is also open to Member States to post challenges.

IX. Optimization: global sourcing and global assets management

88. The Secretary-General has instituted a delegation of authority framework to align authority and responsibility. The framework for the delegation of procurement authority brings decision-making authority closer to the point of delivery, while ensuring that decisions made are supported by streamlined and simplified processes and greater accountability.

89. In the light of the foundational nature of certain ICT goods and services and the risks involved, the procurement of strategic ICT goods and services will continue to be conducted through central operational support to ensure the most cost-effective use of resources and economies of scale, as well as benefit from technical expertise for the procurement of high-risk, high-value and complex requirements.

90. The Office of Information and Communications Technology is engaged with the Office of Supply Chain Management in the Department of Operational Support in providing the ICT goods and services that all clients and entities need, in an efficient, agile and responsive manner so that they may fulfil their mandates.

91. The below captures key ICT procurement timelines:

(a) The award of the contract for the provision of fully managed services, task order services and integrated workforce services is expected to be completed in the third quarter of 2019;

(b) The solicitation process for application services is also expected to be completed by the third quarter of 2019;

(c) The solicitation process for on-demand cloud computing platforms was further delayed due to the negotiations with the supplier and expected to be finalized in the third quarter of 2019.

92. The Office of Information and Communications Technology is working on the plan to transition from current service providers to the new contractual modality and achieve its goal of optimal utilization of ICT resources.

X. Conclusion

93. The ICT strategy was designed to overcome the fragmentation of ICT, to leverage technology as a strategic enabler for the work of the Organization and to protect it from growing cybersecurity threats. Significant improvements made to the ICT landscape throughout the Secretariat during implementation of the strategy indicate that a major step has been taken towards the goal of coherent, reliable and efficient ICT in the United Nations.

94. Since the ICT strategy, we have seen strengthened governance policies and guidelines, architecture, standards and investment choices that allow the United Nations to utilize ICT as a powerful tool to fulfil its mandates. Operations have been solidified and new structures established to make core ICT services more effective, efficient and resilient. The application landscape has been improved and simplified, with over 1,000 redundant or obsolete applications decommissioned. Information security has been strengthened across the Secretariat in the areas of: prevention;

incident detection and response; and governance, risk and compliance. The United Nations' information security programme continues to be maintained and refined.

95. Challenges, however, remain. The most critical issues include keeping up with ICT equipment replacement cycles and the growing reliance on and complexity of technology that prevents effective delivery of ICT across the Organization. Additionally, variation in compliance with ICT policy directives continues to compromise information security and hamper interoperability.

96. Despite these challenges, the progress made in modernizing and transforming ICT across the Secretariat has created a foundation for innovative solutions and analytics, frontier technologies and cybersecurity to enable the core work of the United Nations. The consolidation and integration of ICT as part of the Secretary-General's management reform better aligns the capabilities, knowledge and experience available within the Secretariat to jointly serve the enable the Organization.

XI. Action to be taken

97. The General Assembly is requested to take note of the present report.