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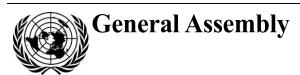
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**Financial reports and audited financial statements, and
reports of the Board of Auditors**

Ninth annual progress report of the Board of Auditors on the implementation of the United Nations enterprise resource planning system

Note by the Secretary-General

The Secretary-General has the honour to transmit to the General Assembly a letter dated 21 July 2020 from the Chair of the Board of Auditors transmitting the report of the Board on the progress in the implementation of the enterprise resource planning system (Umoja).

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Letter of transmittal

Letter dated 21 July 2020 from the Chair of the Board of Auditors addressed to the President of the General Assembly

I have the honour to transmit to you the ninth report of the Board of Auditors on the implementation of the enterprise resource planning system.

(*Signed*) Kay **Scheller**
President of the German Federal Court of Auditors
Chair of the Board of Auditors

Ninth annual progress report of the Board of Auditors on the implementation of the United Nations enterprise resource planning system

Summary

1. In July 2006, by its resolution 60/283, the General Assembly endorsed the Secretary-General's proposal to implement an enterprise resource planning system (Umoja) across the United Nations Secretariat to replace ageing legacy systems such as the Integrated Management Information System. Umoja is central to the modernization of the business administration of the United Nations. The complex, high-value project is aimed at modernizing a wide range of business processes and systems that are crucial to the efficient and effective management of the Organization.

2. In December 2011, in its resolution 66/246, the General Assembly requested the Advisory Committee on Administrative and Budgetary Questions to request the Board of Auditors to conduct a comprehensive audit of the implementation of the Umoja project and to report annually to the Assembly starting at the main part of its sixty-seventh session.

3. In a series of reports since 2012 (A/67/164, A/68/151, A/69/158, A/70/158, A/71/180, A/72/157, A/73/169 and A/74/153), the Board has submitted information on the progress made in the implementation of the Umoja project. The original timeline and budget approved in 2008 envisaged deploying Umoja by the end of 2012 at a cost of $248.3 million. The implementation plans, however, have been substantially revised on several occasions, and the deployment of full functionality is currently scheduled to be completed by the end of 2020. The current approved budget for the project up to the end of 2020 was $565.3 million, and the total expenditure up to 31 December 2019 was $520.1 million.

4. Umoja was being implemented in different parts of the Organization (clusters), with functionalities split into three phases:

    (a) **Umoja Foundation**. Comprising mainly existing core finance and procurement processes, this phase was fully deployed across peacekeeping operations from November 2013, in special political missions from March 2014 and across the remaining Secretariat entities in two clusters, from June and November 2015;

    (b) **Umoja Extension 1 (UE1)**. Comprising mainly existing core payroll and human resources management processes, this functionality was deployed across Secretariat entities and peacekeeping operations in two clusters, from June and November 2015. Most non-peacekeeping Secretariat entities therefore received Umoja Foundation and UE1 functionality at the same time (Umoja Integration);

    (c) **Umoja Extension 2 (UE2)**. Comprising processes with significant scope for transformation and value addition to the Organization, such as strategic planning and budget formulation; fundraising, implementing partner management, supply chain management (SCM), and programme and project management. This phase is currently scheduled to be deployed by the end of 2020. It is expected that the deployment of this phase would result in significant quantitative and qualitative benefits from Umoja.

5. This is the Board's ninth annual review of progress of the implementation of Umoja. The report covers mainly progress in the scheduled deployment of the remaining functionalities, the status and operation of the deployed functionalities, the mainstreaming of Umoja and the costs and benefits of Umoja. In addition, the present

report contains the results of the examination of application controls in the areas of human resources and delegation of authority.

Key findings

Project governance

6.   The Board noted that, in 2019, the Management Committee had been provided with an update on Umoja on three occasions (February, September and December 2019) and that the Steering Committee had met only on two occasions (June and December 2019). The Board is of the view that the governance committees should play a more proactive leadership role, given the complex and challenging environment for UE2 implementation and the approaching timelines for Umoja deployment.

Project planning and monitoring

7.   Shortcomings continued to be noticed in the utilization of the project management tool. The Board noted that it was difficult to identify the specific constraints and causes of problems in individual projects owing to a lack of clear documentation of baseline scheduled dates, the identification of critical paths of tasks and comparison with the actual dates of completion of tasks.

Status of Umoja Extension 2 deployment

8.   The functionalities under UE2, which had been scheduled for deployment during 2019, consisted of six projects. The process-wise, functionality-wise and entity-wise coverage of scope achieved as part of the deployment under UE2 during 2019 indicated that there was a material risk that the full implementation of UE2 would not be achieved by the end of 2020.

Risk assessment and mitigation

9.   The Secretary-General, in his eleventh progress report on the enterprise resource planning project (A/74/478), identified various risks for the project and their mitigation measures. The Board highlighted some potential additional risk factors affecting the implementation of Umoja, which continued to be areas of concern. The Administration maintained a risk register and the Board noted there were additional open risks at the end of December 2019.

Application controls

10.   The functionality for verification of eligibility of employees for payments under defined employee entitlements and for validation of calculation of the payment amounts was deployed as a part of the Foundation and UE1 phases of the Umoja project. The Board noticed gaps in application controls over data entry and modification for employee master data fields such as name, date of birth, date of joining the Organization and date of separation from the Organization, and for recording details of beneficiaries nominated by employees.

11.   New delegation of authority architecture was implemented from 1 January 2019 as part of the implementation of management reforms. Formal delegations were to be recorded through the delegation of authority portal. The security liaison officers were to grant Umoja user roles through the user access portal in line with the delegated authorities.

12. The Board noticed that there was no common interface/link between the delegation of authority portal and the Umoja user access portal and that there was no standard mapping of the levels and types of delegated authorities with particular types/ combinations of Umoja user roles. In the absence of standard mapping of delegated authorities with Umoja user roles, effective monitoring would be difficult across levels.

13. The Board also noticed that there were cases in which the monetary limit, validity period and subdelegation options exercised by the delegator were not appropriately captured in Umoja. Furthermore, the Board noticed cases in which deprovisioning of roles in Umoja was not carried out, namely, cases in which the delegated authority was rescinded and cases of separation.

Status of support functionalities for Umoja

14. The Secretary-General, in his eleventh progress report, stated that an updated governance model had been created to gather requirements and build, validate and certify reusable data models. These certified reusable data models will be available for use throughout the Organization under the umbrella name "UNBI Certified Layer." The Board noted that 21 requests for business intelligence reports and data models from different departments were received during 2019, 5 of which were completed, 4 were yet to be taken up, 1 has been kept on hold and the remaining 11 were in progress. Furthermore, delegation of authority was still in an early stage of development.

15. The Board noted that the first-call resolution rate for incidents increased to 58 per cent in 2019, compared with 56 per cent in 2018. However, the data regarding resolution of incidents and service requests for tiers 2 and 3 could not be easily tracked in the system owing to group classification issues. The Board also noted that tickets for incidents and requests for service that were outstanding remained, on average, open for a long period of time.

16. The Board noted that there was no comprehensive training plan for the total number of training courses for UE2 functionalities and no schedule indicating how many of those courses were to be hosted on iLearn Umoja in 2020. Furthermore, there was no qualitative or quantitative indicator for assessing the effectiveness of the training imparted.

Umoja business case

17. The Board noted that the benefits realization plan was yet to be presented to the Umoja Steering Committee and that the Benefits Working Group was yet to be formed. It was therefore difficult to achieve the timelines for the measurement of benefits realization set in the draft benefits realization plan.

18. The Secretary-General, in his eleventh progress report, estimated the total cost of ownership of Umoja at $1.429 billion. The Board noticed various errors in the calculations and estimates of the direct and indirect cost components and the training and maintenance cost components of the total cost of ownership.

Mainstreaming plan

19. The General Assembly, in its resolution 73/279, requested the Secretary-General to provide a detailed plan for the mainstreaming of the Umoja team into the Secretariat, including measures to ensure a sustainable business model of the Umoja project. The mainstreaming plan is yet to be finalized. The Board noted that the current scheduled date for the implementation of all UE2 projects is 31 December 2020 and is of the view that it is important for the mainstreaming plan to be finalized and presented along with the next progress report of the Secretary-General. The Board continues to be of

the view that the plan should incorporate provisions to cater to important requirements of continuous production support, continuous improvements in the enterprise resource planning solution, the development of the requisite capacity and skills to carry out these activities in the post-mainstreaming organizational units and support for Umoja stabilization for UE2 solutions. The mainstreaming planning process should incorporate the aspect of bringing synergies with the already mainstreamed functions to implement a robust, nimble and effective post-mainstreamed Umoja support structure.

Overall conclusion

20. The Board noted that Umoja remained a key enabler for modernization and reforms in the administration of the United Nations. The implementation of the Umoja Foundation and UE1 phases has seen significant benefits, and the complete deployment of all UE2 functionality has the potential to contribute further quantitative and qualitative benefits to the Organization. The Board appreciates the efforts of the Administration towards multiple deployments in a challenging technical landscape and in the face of competing demands on resources. The Board also noted that the project was working within the approved budget during the year 2019.

21. The Board, however, notes that the Administration needs to take further steps to mitigate the risks to the complete implementation of the project, in accordance with the approved timeline, and also to achieve the intended outcomes of the project. The Administration also needs to continue its efforts to strengthen the skilled resource base to meet the project deliverables and provide the level of production support required for the stabilization of UE2 and continuous improvements. There is also a need to address the issues flagged in the functioning of deployed solutions and the implementation of delegation of authority in Umoja user access provisioning.

Recommendations

22. The Board has made recommendations throughout the report. The main recommendations are as follows:

(a) **The Board reiterates the recommendation that the governance committees engage more closely and regularly with the implementation of the Umoja project, in particular the changes necessitated while deploying UE2 subprojects and overcoming the hurdles in adhering to the project timelines, in order to enable a concerted decision to guide project deployment;**

(b) **The Board reiterates the recommendation that the Administration prepare project plans clearly defining individual tasks, their interdependencies, critical path and detailed task-wise time schedule and monitor them for assistance in the completion of projects in accordance with the schedule;**

(c) **The Board recommends that the Administration continuously review the risks to achieving the full deployment of Umoja by 31 December 2020 and implement timely and appropriate mitigation strategies;**

(d) **The Board recommends that the Administration update the risk register at the time of identification of all of the anticipated risks, plan appropriate mitigation strategies and monitor the mitigation measures, keeping the risk register as the central document for management of risks;**

(e) **The Board recommends that the Administration explore preparing a standard mapping of Umoja user roles with the function and type of authority delegated under the new delegation of authority architecture, which require a particular Umoja role to effectively carry out the delegated functions;**

(f)   The Board recommends that the Administration complement the existing user access provisioning mechanism with measures to grant Umoja roles requiring delegation of authority, in order to address the disconnect between delegations of authority and Umoja roles in the case of rescinded delegations and reflect the validity period and the approved threshold for delegations and the need for user roles with global and all-entity rights;

(g)   The Board recommends that the Administration continue to take action to link data from other key systems with HANA (High Performance Analytic Appliance) to enrich the capabilities of business intelligence reporting and develop dashboards for monitoring of delegation of authority, in a time-bound manner, with due consideration for information security and data protection;

(h)   The Board reiterates the recommendation that the Administration prepare a comprehensive training plan for the total number of training courses to be hosted on iLearn Umoja for UE2 functionalities and make all training material available on iLearn Umoja;

(i)   The Board reiterates the recommendation that the Administration prioritize the preparation and putting in motion of the Umoja mainstreaming plan. The Board also recommends that the mainstreaming plan be presented to the General Assembly in the next progress report of the Secretary-General on the enterprise resource planning project.

Follow-up of previous recommendations

23.   Of the 45 pending recommendations from the Board's previous reports, 8 (18 per cent) have been fully implemented and 37 (82 per cent) are under implementation. A more detailed commentary on the individual recommendations, together with details of the action taken by the Administration, is provided in the annex.

I. Background

1. Umoja is an enterprise resource planning system that is aimed at modernizing a wide range of business processes spanning the United Nations administrative and support functions and systems that are essential to the efficient and effective functioning of the Organization. It is being used throughout the entire Secretariat, which includes Headquarters, offices away from Headquarters, international tribunals, field missions, some funds and programmes and institutionally linked entities of the United Nations, which have many different business models and funding and accountability structures. As a single global solution for the Secretariat, Umoja is intended to offer real-time visibility of detailed data on all the administrative operations that it supports, irrespective of where they are being conducted in the world. Umoja represents a significant investment by the United Nations. The project proposal was approved by the General Assembly in December 2008, in its resolution 63/262. The high-level aims of Umoja set out in the first progress report of the Secretary-General (A/64/380) included the following:

(a) To support management reform and accountability;

(b) To improve the direction of resources;

(c) To achieve more efficient and effective working practices through improved systems and processes.

2. The approved project budget for Umoja up to the end of 2019 was $565.3 million. As at 31 December 2019, the Administration had spent $520.1 million. The General Assembly, in its resolution 74/263, endorsed the recommendations contained in the report of the Advisory Committee on Administrative and Budgetary Questions on the eleventh progress report on the enterprise resource planning project (A/74/7/Add.17), including the recommendation that the Assembly request the Secretary-General to ensure full implementation of the Umoja project by 31 December 2020.

A. Deployment strategy

3. The Administration originally planned to deploy Umoja throughout the Secretariat in two phases by the end of 2012. The deployment plans were significantly revised subsequently, and current deployment plans are based on a phased implementation of Umoja functionalities.

4. The Umoja business processes to be implemented have been arranged into three main functional groupings:

(a) Umoja Foundation: finance processes (funds management and financial accounting), supply chain, project management and sales and distribution. Umoja Foundation was essential to support International Public Sector Accounting Standards (IPSAS) requirements. The Umoja Foundation phase was completed in November 2015;

(b) Umoja Extension 1 (UE1): human resources management processes, such as organizational and position management, personnel administration, entitlements, benefits and time management. Payroll, travel initiation, travel expenses and online booking were included in this phase. This phase was completed in June 2018;

(c) Umoja Extension 2 (UE2): comprising processes with significant scope for transformation and value addition to the Organization, such as strategic planning and budget formulation, fundraising, implementing partner management, supply chain management (SCM), and programme and project management. This phase

comprises the more strategic functions and processes and is currently scheduled to be deployed by the end of 2020.

B. Previous comments by the Board and scope of the report

5.   In its resolution 66/246, the General Assembly requested the Advisory Committee on Administrative and Budgetary Questions to request the Board of Auditors to conduct a comprehensive audit of the implementation of the Umoja project and to report annually to the Assembly starting at the main part of its sixty-seventh session. In that connection, the Board has submitted eight progress reports to date, as summarized below.

6.   In its first report (A/67/164), the Board noted that it could not provide any assurance that the project would be delivered on time, within cost and to specification. It also noted that many of the problems encountered were avoidable and pointed to weak project governance and management, as well as wider and deeper weaknesses in United Nations governance and management of business transformation.

7.   In its second report (A/68/151), the Board noted that the project was on a sounder footing. Owing, however, to the challenges identified and the continuing legacy of past project problems and decisions, which would take some time to resolve, the Board stated that it was not yet in a position to provide assurance that the enterprise resource planning project would deliver its full functionality within the existing forecasts of time or cost or deliver the envisaged qualitative and quantitative benefits that would represent an optimal return on investment.

8.   In its third report (A/69/158), the Board noted that the initial roll-out of Umoja Foundation had indicated the need to introduce change more effectively in the future. The Board also noted that resolving those issues would require concerted effort throughout the Organization and that, hence, the Organization needed to develop an achievable, fully funded and independently assured deployment plan that reflected the diversity and complexity of the United Nations.

9.   In its fourth report (A/70/158), the Board noted that, in order to achieve the aggressive implementation timetable for clusters 3 and 4, some key project activities, such as testing routines and data conversion exercises, had been curtailed. The Board also noted that weaknesses in preparing staff for the changes that Umoja would introduce and gaps in post-implementation support arrangements posed further risks to the implementation strategy, and that the Administration had not developed adequate contingency plans to mitigate those known risks. The Board further noted that significant challenges had been encountered with previous deployments of Umoja owing to a lack of organizational readiness, and there was a high risk that similar problems would emerge in 2015.

10.   In its fifth report (A/71/180), the Board, while acknowledging that it was common for problems to be experienced in the implementation of major enterprise resource planning systems, determined that the decision to prioritize adherence to the deployment schedule above the need to ensure organizational readiness had increased the scale of the problems encountered. The Board stressed the need to demonstrate the ability to control the growing costs of the project and realize the financial and service delivery benefits that had been promised in order to present a viable business case that provided justification for further investment by the Member States.

11.   In its sixth report (A/72/157), the Board stressed that there was a need to assess the total cost of ownership of Umoja, including both direct and indirect costs, and in so doing to take steps to account for the training costs in terms of staff time and travel. The Board noted the need to refine the benefits realization calculation by reviewing

the original business case for its continuing validity and applicability. The Board also noted that the implementation of Umoja Integration globally across more than 40,000 staff in 400 locations was a significant achievement, given the project's complexity and difficult start.

12. In its seventh report (A/73/169), the Board noted the need for better precision in estimating the total cost of ownership and benefits realization. Noting the deployment of the Umoja solution, the Board pointed to the likely extension of UE2 modules into 2019 and noted that Umoja stabilization might require more time after the deployment of functionalities. The Board highlighted concerns relating to user problem resolution, change request management, user access provisioning, controls for the segregation of duties, application controls and data quality.

13. In its eighth report (A/74/153), the Board noted the need for improved project planning and monitoring, highlighted the risk that the project would not be completed by the end of 2019 and emphasized that the achievement of all inter- and intra-application integration was important for the project to achieve its full potential. The Board highlighted various risks for the project and also noted that application controls in the area of vendor payment processing needed to be strengthened. In addition, the Board highlighted concerns relating to continuous improvements, change request management, business intelligence, the need for improved accuracy in estimating the total cost of ownership and the need for finalization of the mainstreaming plan as a priority.

14. The present progress report covers project governance, management and monitoring; the deployment of UE2 functionalities and the status and functioning of deployed functionalities; application controls related to employee entitlements, payroll processing and delegation of authority; the mainstreaming of Umoja; and the estimation of the costs and benefits of the Umoja solution.

II. Project governance and management

A. Project governance

15. The General Assembly, in its resolution 72/262, requested the Secretary-General to closely monitor the overall timeline for the complete implementation of Umoja by identifying and managing key risks to the achievement of the project's objectives and full implementation. It also requested the Secretary-General to implement the project within the approved timeline and budget, through strict project planning and management to ensure that the Umoja project is completed without further delay.

16. The Management Committee, chaired by the Chef de Cabinet and consisting of other senior members of management, was to review the status of implementation of the project periodically, consider change management processes requiring strategic direction and ensure that the findings and recommendations of the Board are effectively fed into the executive management processes.

17. The Umoja Steering Committee, headed by the Under-Secretary-General for Management Strategy, Policy and Compliance (designated project owner) and consisting of various business process owners, was to oversee the strategic and operational management of the project on a monthly basis. The Umoja project management office was responsible for the day-to-day management of the project.

18. In its previous reports, the Board has highlighted the lack of adequate engagement by the governance committees with the progress of the Umoja project and with overcoming the hurdles preventing its completion. Even in 2019, the Board noticed that the Management Committee had been provided with an update on Umoja

on only three occasions, in February, September and December. The Steering Committee, which had expected to meet on a monthly basis, met on only two occasions in 2019, in June and December.

19.   The Board also noted that the governance committees were in charge of ensuring the effective and timely implementation of the project. Therefore, details of the hurdles faced by the project team in maintaining the timelines and in the management of the inter- and intra-dependencies among different project activities should have been presented to and discussed in the committees. The Board noted that the proposal to extend the project timeline beyond 2019 was neither discussed in the Steering Committee nor reported to the Management Committee prior to its inclusion in the eleventh progress report of the Secretary-General on the enterprise resource planning project.

20.   The Board noted considerable overlap between the schedule for UE2 deployment (September 2018 onwards) and the preparation for the Secretary-General's reforms (implemented from 1 January 2019). In this scenario, there was a need for the active engagement of heads of business units and senior managers through the governance committees, which would also have served as a structured platform for coordination among all stakeholders to deal with the complex challenges and to act on the emergent risks to the implementation of the project.

21.   The Administration stated that, owing to the focus on the reforms and the work of the Fifth Committee, scheduling the Steering Committee meetings had been difficult, with multiple cancellations, and that members had been kept abreast of developments through written updates, in addition to the briefings to the Management Committee. The Administration also stated that the Steering Committee had deliberated on some of the major constraints and issues related to the UE2 projects. The Administration further stated that the draft progress report had been sent for review and approval by the governance committees before its final submission to the General Assembly.

22.   The Board was not provided with any documents regarding review of the draft progress report by the governance committees. The Board continues to be of the view that the governance committees should play a more proactive leadership role, given the complex and challenging environment for UE2 implementation and the approaching timelines for Umoja deployment. The Board also considers that it is important to adhere to the established processes for managing change.

23.   **The Board reiterates the recommendation that the governance committees engage more closely and regularly with the implementation of the Umoja project, in particular the changes necessitated while deploying UE2 subprojects and overcoming the hurdles in adhering to the project timelines, in order to enable a concerted decision to guide project deployment.**

24.   The Administration accepted the recommendation and stated that it was already being implemented. The Administration further stated that the Umoja Steering Committee had already met twice in 2020, in February and April. It will continue to meet on a quarterly basis, as decided by the Steering Committee.

B.   Project planning and monitoring

25.   The General Assembly, in its resolutions 72/262, 73/279 and 74/263, reiterated the need for strict project planning and management in order to ensure that Umoja remained on track without further disruption and delay. The Board noted that, in view of the challenging environment, complex processes involved and tight timeline for

UE2 deployment, it was important to have a robust project planning and monitoring system in place.

26.   The Board noticed that the Umoja project management office used project management software tools to prepare activity/milestone-wise plans for each project within Umoja. The Office stated that it followed waterfall[1] and agile[2] methodologies, depending on the nature of the project under implementation. It also stated that weekly meetings had been held with each project manager to monitor the progress of implementation and that biweekly meetings had been held with all project managers to review cross-functional tasks, exceptions, risks and issues for monitoring. It further stated that the process owner or designated representative had approved the testing readiness review and the operational readiness review before the project reached the stage of go-live in the production environment of Umoja in order to ensure quality control.

27.   In its eighth report (A/74/153), the Board commented on various shortcomings in the utilization of the project management tool, which included, among others, a lack of appropriate definition of inter-task dependencies in projects, the fact that dependencies among the design, build and test phases of software development had not been reflected in the planning tool, and the fact that the critical path for the project remained unidentified, which led to difficulties in estimating the overall time requirement for the projects.

28.   The Administration stated that the Umoja project management office had enriched the 2019 and 2020 project plans in the project management tool on the basis of the recommendations set out in the eighth report of the Board. The consolidated 2019 project plans that were submitted clearly showed over 2,000 lines of major tasks and milestones that were indicated as scheduled and tracked. Those project plans also had baseline start and finish dates, the "critical" field was enabled in the Microsoft Project view, and the predecessor and successor tasks were defined, when appropriate. The Administration further stated that detailed tracking of dependencies between individual tasks across the subprojects would prove unmanageable and divert resources from the design and deployment of the subprojects.

29.   The Board noted that the revised project plans furnished for 2019 were materially different from the project plans previously furnished: the lists of tasks and milestones were different. The Board noted that some of the tasks that had previously been included in the 2019 plan were now included in the 2020 plan, while others were excluded from both the 2019 and the 2020 plans. The Board did not notice any formal amendment to exclude such activities.

30.   The Board recognizes the complexities involved in the planning and development of different parts of the project. However, in the present scenario, it was difficult to identify the specific constraints and causes of problems in individual projects owing to a lack of clear documentation of baseline scheduled dates, the identification of critical path of tasks and comparison of the scheduled and actual dates of completion of tasks.

31.   **The Board reiterates the recommendation that the Administration prepare project plans clearly defining individual tasks, their interdependencies, critical**

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[1] Project implementation is carried out in a single iteration of phases: planning, development and testing.

[2] Project implementation is carried out with iterations of tasks relating to planning, development and testing phases. It is termed "agile" because it attempts to create a minimum viable product at the end of each iteration, without always waiting for the completion of the entire functionality of the software in one go.

path and detailed task-wise time schedule and monitor them for assistance in the completion of projects in accordance with the schedule.

32.   The Administration stated that the recommendation had been partially met. Project plans include interdependencies and critical path elements. Defining individual tasks and creating a detailed time schedule would cause an administrative burden in the form of the continuous updating and monitoring of project resources that are already tracked using the SAP Solution Manager tool. In 2020, the Umoja team has also made Microsoft Project plans viewable through Project Online and has provided Umoja team members with the licence required to view plans at any time and from any device, along with the latest updates to key high-level tasks, activities and milestones.

C.   Umoja Extension 2 deployment

33.   The Secretary-General, in his ninth progress report on the enterprise resource planning project (A/72/397), indicated the planned schedule for the deployment of functionalities under the UE2 phase, which indicated completion of nearly all UE2 functions and processes (except SCM) by December 2018. The Secretary-General, in his tenth progress report (A/73/389), indicated progress made under individual solutions and revised the deployment schedule, with all UE2 solutions scheduled to be deployed by December 2019. The Secretary-General, in his eleventh progress report (A/74/478), further revised the deployment schedule, with all UE2 solutions scheduled to be deployed by December 2020. The Board noted that the General Assembly, in its resolution 74/263, had endorsed the recommendations contained in the report of the Advisory Committee on Administrative and Budgetary Questions on the eleventh progress report on the enterprise resource planning project (A/74/7/Add.17), including the recommendation that the Assembly request the Secretary-General to ensure full implementation of the Umoja project by 31 December 2020.

Status of Umoja Extension 2 solutions

34.   The Board examined the implementation of the six UE2 solutions. Those solutions, targeted towards key activities of the Secretariat and associated entities, comprised multiple processes. The Board assessed the status of implementation of those processes, including their entity coverage, as at December 2019. The solutions and the key processes pending development and deployment are briefly summarized below.

Strategic planning, budget formulation and performance management

35.   Strategic planning, budget formulation and performance management (SPPM) is designed to support the full programme management life cycle, covering strategic planning, resource planning, programme execution and performance management. The solution architecture for this project includes three applications: the strategic management application (SMA), business planning and consolidation (BPC) and portfolio and project management/project system (PPM/PS).

36.   As the Secretary-General stated in his ninth progress report on the enterprise resource planning project, software development for SMA and BPC commenced in 2017 and was expected to be completed by May 2018, in time for integrated testing and deployment by September 2018. In his tenth progress report, the Secretary-General reiterated that deployment of that functionality was scheduled to start from September 2018, with the initial roll-out focused on budget planning for the peacekeeping budget for 2019/20, the regular budget for 2020 and the voluntary

contribution-funded activities for 2019. In his eleventh progress report, the Secretary-General stated that partial deployment had been completed for the peacekeeping budget and the regular budget during 2019.

37. The Board was informed that SMA and BPC, being mandatory for the budgetary process, had been prioritized over PPM. The Board noticed that SMA and BPC had been partially developed and deployed during 2019. The processes pending deployment include core processes relating to budget formulation for extrabudgetary funds, programme execution and performance, project management and strategic management. The initial deployment of PPM was planned for the first quarter of 2019 and has now been rescheduled to the fourth quarter of 2020.

38. The Board conducted a detailed review of the status of the budget formulation functionality deployed up to December 2019. A summary of the review is presented in box 1 below.

Box 1
Budget formulation

This functionality was intended to replace disparate existing budgeting systems with an integrated end-to-end solution covering all funding sources: assessed budgets (regular budget and peacekeeping), voluntary contributions and cost recovery. To facilitate budget planning for the procurement of materials and services, integration with the UE2 SCM subproject was planned. Likewise, to plan for personnel costs, the procurement of major equipment and self-sustenance requirements at peacekeeping missions, integration at master-data level with the UE2 uniformed capabilities management subproject was planned.

The blueprint technical document for the budget formulation functionality, prepared in May 2017, defined planning models to support the budget planning process, that is, data structures in which users could enter and review data at a sufficient level of detail. Under each planning model, it was intended that various forms, reports, interfaces, conversions, enhancements and workflows, known as "FRICEW" objects, would be developed, so as to fulfil the business requirements for each budget planning process. The planning included FRICEW objects in each of the following areas (models): position planning, materials and services planning, military and police units planning, voluntary contributions planning, cost recovery planning, travel planning and summary planning. The Board noted, from the workplans of 2019, that it was not until December 2019 that all FRICEW objects intended to be covered as part of the budget formulation functionality were developed and deployed. Gaps were seen in the planning modules concerning position planning, materials and services planning and military and police units planning.

Since the core business list of FRICEW objects was deployed at regular budget entities for the budget period 2020 and at peacekeeping entities for the budget period 2020–2021, the Administration continued to use a limited set of existing cost sheets for those budget periods.

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39. The Administration stated that FRICEW object counting represented an indicative list and should not be construed as an approved list of objects to be deployed. It added that not all FRICEW objects were of equal complexity or importance and that they represented a wish list rather than a previously defined list

of requirements in any of the initial scope documents for Umoja. For example, cost recovery should use standard forms already deployed and does not require its own model and planning forms in BPC. In addition, core functionality for travel has already been deployed in 2020. The Administration also asserted that the FRICEW objects already deployed constituted the core functionality and that there was no intention to further customize them. Integration with other subprojects, such as uniformed capabilities management and SCM, would be taken up after those functionalities had stabilized.

40. The Board noted the response of the Administration. The Board also noted that a list of 42 deployed FRICEW objects had been provided during the audit, of which only 30 were found to be available in the BPC tool. The Board was not provided with any formal documented assessment for grading those FRICEW objects on the dimensions of complexity, importance or development effort.

41. The Board also noticed that the blueprint document prepared in 2017 documented the business requirements, which were also listed in detail in the workplan for the year 2019, but that only the business-approved core objects were deployed in 2019. The Board is of the view that consideration of these requirements as a wish list at this late stage of the project points to uncertainty regarding actual business requirements and the subsequent design, development and deployment of solutions to address them.

42. The Board is of the view that, taking into consideration the estimated effort involved in the build, test and deployment activities for the remaining work, there is a risk that deployment of the core functionality under budget formulation may not be achieved by December 2020. The Board is also of the view that the integration of BPC with SMA and PPM, and of SPPM with the uniformed capabilities management and SCM subprojects, is a key requirement for full benefits realization. The remaining functionality in scope for the budget formulation solution should therefore be clearly documented to enable the eventual use of BPC as an integrated budget planning tool, in place of the disparate arrangements that continue to be used.

Supply chain management

43. SCM is intended to provide an integrated solution for planning and fulfilling the Organization's demand for goods and services. The solution is also intended to cover four broad functional areas: demand planning, supply network planning, transport planning and management, and track-and-trace capability, managed and implemented under two subproject streams. The solution architecture for transport planning and management and track-and-trace included two SAP products (Transportation Management (TM) and Event Management (EM)). SAP offered a cloud-based subscription service named Integrated Business Planning (IBP) to meet the needs of the demand planning and supply network planning subprojects.

44. The Board noticed that, following the initial deployment in January 2019, as part of release 2 of Transportation Management, TM and EM were further developed and deployed by the end of 2019. Release 2 expanded the coverage of the solution to 37 United Nations entities, providing transportation management solution coverage for all products procured by the Organization and additional functionalities to support transportation operations. The contract for IBP was finalized in September 2019 and deployment was scheduled to commence from the third quarter of 2020. The processes pending deployment include core processes relating to demand planning and supply network planning.

45. The Board noted that the functionality for transportation management and track-and-trace processes could potentially be expanded to further entities, subject to the identification of suitable use cases. The Board also noted that, in view of the

significant data enrichment and business transformation to be undertaken to successfully implement demand planning and supply network planning, the full deployment of those functionalities and their proper adoption was likely to be completed significantly later than December 2020.

Implementing partners

46. This subproject is intended to cover the life cycle of the use of implementing partners and to enhance interaction with grantees by providing them with a portal and tools to request funds from the Secretariat, record the progress of the implementation of projects and submit performance details. The solution architecture for this project included a SAP product: Grantor Management (GM), for implementing partner life cycle management.

47. The Board noticed that GM had been partially developed and deployed during 2019. The processes pending deployment included the maintenance of the classification of grantee profiles, the screening and registration of applicants, capacity assessment of applicants, evaluation and performance monitoring of grantees and improvements in the closure of the grantee agreement. The Administration stated that the objective of deploying functionality as a minimum viable product in the first deployment had been achieved and that the subsequent scheduled deployments would address the remaining requirements, given that the Organization was seeking to incrementally introduce those changes. It further added that all the processes had been deployed with varying levels of maturity, depending on the requirements submitted and the features that the standard solution provided for as a baseline product. That approach is also in line with SAP recommendations for the gradual implementation of the Customer Relationship Management (CRM) product in conjunction with a pilot deployment, allowing for the opportunity to stabilize and continuously improve the product on the basis of user feedback.

48. The Board conducted a detailed review of the deployment status of the implementing partners subproject up to December 2019. A summary of the review is presented in box 2 below.

Box 2
Implementing partners

This subproject was intended to assess the suitability of implementing partners, select them, and manage and evaluate their work. It was intended to be integrated with SPPM to link grantor programmes to the high-level strategy of the Secretariat entity, and with performance management to link the evaluation and monitoring of grantor programmes.

The blueprint design document for this subproject defined the detailed functionalities intended for deployment under the subproject. The deployment status of each functionality was as follows:

Functionality	Deployment status (December 2019)
Creation of grantor programme	Deployed
Identification of potential grantees	Not deployed
Screening and registration	Not deployed
Receipt of applications	Deployed
Assessment of applications and selection of grantee	Not deployed
Negotiations with selected grantee	Deployed
Signing of grantor agreement	Deployed
Budget for grantor agreement	Deployed
Fund certification	Deployed
Agreement life cycle management	Partially deployed
Closure of grantor agreement	Partially deployed

The Board noted that some of the Secretariat entities that were heavily funded through extrabudgetary resources continued to use their own legacy applications while also entering data into the GM application for the purpose of fund certification, payments and expense reporting. The requirement for this transitional arrangement has also been recognized by the Umoja project for the creation of a mechanism for data-sharing between the legacy systems and GM, until such time as the specific requirements are addressed.

49. The Board noticed that functionalities, including those for identifying, assessing and selecting grantees, the definition of flexible project logical frameworks reflecting detailed agreement clauses, audit and inspection, and recovery of inadmissible expenditure from grantees, were yet to be deployed. The Board also noticed that the integration of the implementing partners subproject with SPPM had not yet been achieved.

50. The Administration stated that the full core functionality was planned to be completed by the end of 2020. It further stated that the refund process had already been deployed, and that campaign management for the identification of potential grantees was not a requirement for the Secretariat; rather, the entities' websites, which advertise the call for proposals, redirected implementing partners to the Implementing Partner Management application, where they could log in and submit applications and follow up on claims. The Administration also stated that Grantor Management was not designed to be a project management tool. Flexible project logical frameworks and integration with SPPM are part of the integrated requirements pertaining to continuous improvements.

51. The Board noted that campaign management was a previously identified business requirement that had been formally documented but was no longer a business requirement. This descoping of campaign management for the identification of potential grantees was not formally documented. The Board also noted that the

process of recoveries from implementing partners had not been deployed. That process was different from the refund process, which had been deployed.

52. The Board is of the view that, considering the effort involved in the build, test and deployment activities for the remaining work, there is a material risk that the deployment of the core functionality under this subproject may not be achieved by December 2020. Furthermore, the remaining functionalities for the implementing partners subproject should be clearly documented to enable the eventual use of GM as an integrated enterprise solution for grants management.

Fundraising and donor relationship

53. This subproject was intended to provide a holistic view of resource mobilization efforts across the Organization and enhance the planning for implementation by providing better funding and cash flow forecasts and by monitoring the revenue pipeline. The functionality was to capture information with regard to donors' areas of interest (both thematic and geographical areas), the historical trend of contribution amounts and types of contributions, all of which will be used to better forecast prospective contributions and help resource mobilization officers to analyse and prioritize resource mobilization efforts.

54. The solution architecture for this project included a Siebel-based[3] CRM module. The subproject was intended to be integrated with the SPPM subproject for linkage with higher-level strategies for resource mobilization, with the existing grants management module in Umoja and with Umoja business intelligence for the purpose of extracting data on the utilization of donor contributions and reporting to donors.

55. The Board noticed that the solution had been partially developed and deployed in September 2018. However, there was no further deployment during 2019 owing to low user adoption of the earlier deployment. The Board also noticed that:

(a) The process owners for processes intended to be covered under this subproject had not been identified. The Administration stated that the Controller had always been the process owner for the fundraising project;

(b) The blueprint design document for the overall functionality to be deployed under this subproject had not been prepared. Only the functional specification document, limited to the scope of functionality deployed under release 1, had been prepared;

(c) User entities were to sign off on their business and user readiness when release 1 had been deployed. However, only representatives of the Office of Programme Planning, Finance and Budget had signed off during the deployment, and not the representatives of the seven user entities[4] in which release 1 had been deployed;

(d) A working group was intended to be constituted during 2020 to identify business requirements, following which a workplan would be prepared.

56. The processes pending deployment included core processes relating to the creation and launch of donor appeals and the formulation and signing of agreements with donors.

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[3] Siebel is a software solution provider.
[4] The Department of Economic and Social Affairs, the Economic Commission for Africa, the Economic Commission for Latin America and the Caribbean, the Mine Action Service, the United Nations Conference on Trade and Development, the United Nations Environment Programme and the United Nations Office on Drugs and Crime.

57. The Administration stated that user adoption of release 1 of this subproject in September 2018 was low and, as a result, further development and deployment work had been put on hold until an Organization-wide resource mobilization plan/strategy had been defined and a suitable process owner had been identified. The Administration also stated that it planned to resolve issues related to the lack of a global resource mobilization strategy and the pending identification of a suitable business lead during 2020, and deployment was scheduled for the fourth quarter of 2020. Furthermore, the Controller has always been the process owner for the fundraising project, as reiterated by the Management Committee. An extended business team was established for the phase 1 deployment, with representatives of the various entities that have fundraising activities, and the standard Umoja process for all projects includes only the process owner sign-off during the operational readiness review.

58. The Board noted that:

(a) No documentation was provided indicating the appointment of a process owner for fundraising and donor relationship (FDR) by the management committee, although the Administration stressed that the Controller had always been the process owner for the fundraising project. Furthermore, the Secretary-General stated, in his eleventh progress report on the enterprise resource planning project, that the non-availability of a suitable, dedicated business lead, among other factors, might delay the deployment of the solution to the Secretariat entities;

(b) Lack of adequate engagement with the end user entities could be an important reason for low user adoption. The Secretary-General also stated, in his eleventh progress report, that additional efforts were being planned and would have to be prioritized in order to strengthen the business engagement and user adoption for the successful deployment of the solution;

(c) Release 1 for this subproject was simplified to reduce the complexity of change management, in the absence of a Secretariat-wide resource mobilization or donor relations strategy. The solution in its present form may not, therefore, hold sufficient business value for the end user entities.

59. In view of the pending issues that need to be resolved in order to resume development and deployment work under this subproject, there is a material risk that deployment of the overall functionality as originally intended may not be achieved by December 2020. Furthermore, the Board is also of the view that enhanced engagement with representative user entities involved in fundraising and donor relationship management would be helpful for identifying an Organization-wide resource mobilization plan and increasing user adoption.

Uniformed capabilities management

60. This project covers processes to determine the unit requirements of peacekeeping missions and special political missions, in the form of Statement of Unit Requirements planning documents prepared by military and police planners; prepare the memorandums of understanding between the United Nations and troop- and police-contributing countries; perform the arrival inspection and routine verification of contingent-owned equipment; report on troop strength; calculate and process claims relating to contingent-owned equipment and troop cost reimbursements; and disburse payments. The solution architecture for this project included the development of new Siebel-based modules, three of which were to replace the existing government claims management system and two Microsoft Access-based databases.

61. The new module for creating standard annex templates, Statement of Unit Requirements and enhancements to the inspection and verification report modules for

contingent-owned equipment had been deployed by the end of 2018. The Board noticed that the new modules (memorandum of understanding and calculation and claims modules) to replace the legacy government claims management system were deployed in August 2019. Work related to development and deployment to replace the two Microsoft Access-based databases for troop strength reporting and personnel payment calculations was scheduled to be completed by the fourth quarter of 2020, following the implementation of the recommendations of the 2020 Working Group on Contingent-Owned Equipment in the third quarter.

Conference and event management

62.   This project covers the life cycle of conferences and events, from planning to implementation and post-implementation evaluation, including calendar and non-calendar conferences and meetings, off-site conferences and meetings and special events. The project is intended to provide a global enterprise approach with standardized processes. The solution architecture for this project included an open source software (Indico) for participant management and two legacy systems developed and maintained by the Department for General Assembly and Conference Management, named gMeets (for meeting management) and gDoc (for meeting documentation).

63.   The Board was informed that those software applications were already in use at some Secretariat entities. The solutions were intended to be fully deployed at all entities by the end of 2019. However, owing to the delay in the ongoing work to upgrade Indico and gDoc during 2019, the full deployment was rescheduled to the end of 2020.

64.   The Board noted that most processes were under implementation, with a few processes yet to commence. In addition, deployment to date has been limited to a few entities.

65.   The Administration stated that all conference and event management processes were complete in accordance with the solutions provided by Indico; those products covered the full scope of conference and event management processes. The Board noted that the business requirements to execute these processes were met through stand-alone IT applications, even prior to the commencement of the Umoja project. Indico, gMeets and gDoc have been formally identified as the IT applications that will execute those processes as part of an enterprise software, through appropriate integration. None of the three IT applications were integrated with Umoja. Furthermore, Indico and gDoc were in fact to be integrated after their respective upgrades, which were to be completed by the end of 2020.

Inter- and intra-solution linkages

66.   The Board noticed that functionalities of the six solutions had both intra- and inter-solution linkages. Some important linkages and their present status are as follows:

        (a)   With regard to SPPM, integration among SMA, BPC, PPM and the existing Umoja solution is essential. The Board noted that the full integration of all three components of SPPM could be achieved only after the deployment of PPM. The Board also noticed that the process required for the integration of BPC with the existing enterprise core component (ECC) for extrabudgetary funds was yet to be deployed. Furthermore, the budget formulation functionality of the project may potentially integrate with other UE2 subprojects: supply chain demand planning and forecasting, uniformed capabilities management, FDR and the implementing partners subprojects. Those linkages are yet to be established. Dashboards for visualization of aggregated data for programmes and monitoring outcomes across entities from SMA have been deployed, while those related to PPM were yet to be deployed;

(b)   With regard to SCM, TM, EM, and IBP were to be integrated with the existing Umoja solution. The Board noticed that the integration of TM and EM with the existing Umoja ECC had been achieved. The demand planning functionality of the project is to be delivered through IBP. The Board noted that the project reported the completion of the first two sprints of phase 1 of the implementation by the end of 2019. IBP may also integrate with SPPM for the linkage of long-term demand planning with budgeting, which is possible only after the deployment of IBP;

(c)   With regard to implementing partners, integration between GM and the existing Umoja solution is essential and has been achieved for the purpose of the creation of the commitment of funds for budget execution, the certification of funds prior to the release of advances, and for making payments to grantees and expense reporting. The project solution also contemplates links with SPPM to link grantor programmes to the high-level strategy of the Secretariat entity and with performance management to link the evaluation and monitoring of grantor programmes, which can be established only after the deployment of the individual functionalities;

(d)   With regard to FDR, the Siebel-based solution needs to be integrated with the existing Umoja solution. The Board noticed that integration had been achieved for exchanging the master data of donors and employees. On the other hand, integration for the purpose of creating a grant upon the signing of agreements is yet to be achieved. The project is also expected to link with SPPM for linking the high-level strategy of the Secretariat entity to the donor programme, with performance management for linking the evaluation and monitoring of donor programmes and with Umoja business intelligence for the purpose of extracting data on the utilization of donor contributions and reporting to donors, which are yet to be achieved;

(e)   With regard to uniformed capabilities management, it was important to have it integrated among the various Siebel-based modules and the Umoja solution. Two of the Siebel-based modules were yet to be deployed and are being delivered as part of the 2020 workplan. The Board noticed that the integration of Siebel with the Umoja ECC had been achieved. The first quarterly payment through the external interface developed between Siebel and Umoja was achieved during the third quarter of 2019. Integration with SCM was yet to be achieved;

(f)   With regard to conference and event management, the required interface between Indico and Umoja had not been achieved, and no development work had commenced on that interface. Work for integrating the cost recovery functionality by the Department for General Assembly and Conference Management for the use of gMeets and gDoc with Umoja had not commenced. The Administration stated that the integration of Umoja with Indico, gMeets and gDoc would be considered as part of the 2021 continuous improvement programme. Workshops are currently taking place at which all potential interfaces are being identified and prioritized for the 2021 workplan.

67.   The Administration stated that the implementation of UE2 had moved the Organization into areas not traditionally within the scope of enterprise resource planning, especially within a public sector environment. The possibilities for leveraging further integration potential may, therefore, be clear only once the solutions themselves have been built and deployed. The Administration will definitely pursue such integration wherever feasible and cost-effective, but this was never part of the original scope and can therefore only be considered on the basis of the availability of resources for design and delivery.

68.   The Board noted that the business blueprint documents for each UE2 subproject and the ninth progress report of the Secretary-General on the enterprise resource planning project clearly provided that the full benefits of implementing Umoja would be realized only with the achievement of integration across UE2 subprojects.

Furthermore, the ninth progress report even included specific references to the need for synchronized deployments of different UE2 subprojects, in order to leverage the benefits of the intended integration. The Board is therefore of the opinion that, for the achievement of the optimal benefits of the Umoja project, in particular of UE2, all the functionalities need to be completed and their intra- and interlinkages established.

D. Risk management

Risks to completion arising from the present status of the project

69.   In the context of the present deployment status of UE2, the Board noted once again that, going forward, the deployed solution under UE2 projects would need further iterations of software design, build and test phases to achieve their full intended functionality. As commented by the Board in its eighth report, some of the significant outstanding activities are as follows:

(a)   Coverage of business processes that are not currently deployed at all;

(b)   Coverage of applications that do not have the intended functionalities;

(c)   Identified integration of individual applications to enrich functioning and achieve the optimal benefits of the enterprise resource planning system;

(d)   Standardization, along with meeting individual requirements prior to their deployment, in entities in which the solutions are yet to be deployed.

70.   The Board noted that, given the status of development and deployment of UE2 processes as at 31 December 2019, the quantum of work remaining to be completed for achieving the full functionalities intended and seamless deployment in all entities, there was a risk that the implementation of the full scope of Umoja might not be achieved by 31 December 2020.

71.   Furthermore, with regard to the FDR subproject, the Administration itself has identified the risk of delay, given that the definition of an Organization-wide resource mobilization strategy and the identification of a suitable process owner, which ought to have been in place when the business case for the subproject was defined (in the eleventh progress report of the Secretary-General on the enterprise resource planning project), are yet to be firmed up.

Risk assessment, mitigation strategies and emerging risks

72.   The General Assembly, in its resolution 72/262, requested the Secretary-General to identify and proactively manage current and emerging key risks to the achievement of the project's objectives and full implementation and reiterated the importance of applying lessons learned from previous deployments to ensure smoother deployments in future and avoid extensive stabilization efforts.

73.   The Secretary-General, in his eleventh progress report on the enterprise resource planning project, identified risk factors relating to the increased technical complexity of Umoja due to UE2 solutions, technical infrastructure upgrades and the launch of Umoja Mobile; the end of life of the servers supporting the current Umoja SAP system landscape; and the continuous strain on the process owner teams supporting multiple aspects of Umoja owing to overlapping responsibilities for supporting the current functionality, triaging production support requests and supporting UE2 deployments. Along with these risk factors, the progress report also contained a list of possible mitigation measures.

74.   In its eighth report, the Board highlighted some additional risk factors, which were related to the deferred upgrade of ECC carrying the risk of the need for

additional work to customize forms, reports, interfaces, conversions, enhancements and upgrades; the lack of finalization of the Umoja mainstreaming plan; and a number of vacancies in the Umoja project team. The Board noted that these risks continue to require consideration for mitigation.

75. The Board noted that the Umoja project management office maintained a risk register using a tool called "rapport" for the identification and recording of potential and emerging key risks to the achievement of the project's objectives and full implementation. The Board noted that the key risks identified and recorded as open at the end of 2019 included, among others:

(a) Demand for tier-3 production support resources that exceeded the available capacity in the project team;

(b) Delay in the recruitment of qualified candidates for the newest SAP technology areas and technical integration (in view of the number of cancellations and recirculations during 2019);

(c) Possible delay in the deployment of the cost recovery planning model for the budget formulation functionality, if business units were not sufficiently responsive;

(d) Delay in the upgrade of ECC from the existing enhancement package (5) to the latest enhancement package (8) if SAP did not resolve the compatibility issues for custom modifications made to the human resources module for the United Nations in enhancement package 5. If the compatibility issues are not resolved by SAP, there may be a significant cost impact in replicating the custom modifications to the human resources module for the upgraded enhancement package (8);

(e) Delay in the deployment of the full functionality under the UE2 FDR subproject, due to lack of responsiveness from end user entities;

(f) Delay in the deployment of the functionality related to demand planning and supply network planning under the UE2 SCM subproject, due to the pending adoption of consistent best practices in buying for consumption versus inventory safety stock levels and the definition of minimum and maximum inventory levels.

76. The Board also noticed that, during 2019, the details of some risks had been entered into the risk register only after their successful resolution, for the purpose of the record. The Board noted that the central maintenance of an updated risk register is a vital internal control to assist in better planning for the mitigation of anticipated risks. This approach potentially precluded the identification of all the risks to the project, which is the purpose of the risk register.

77. **The Board recommends that the Administration continuously review the risks to achieving the full deployment of Umoja by 31 December 2020 and implement timely and appropriate mitigation strategies.**

78. The Administration accepted the recommendation.

79. **The Board recommends that the Administration update the risk register at the time of identification of all the anticipated risks, plan appropriate mitigation strategies and monitor the mitigation measures, keeping the risk register as the central document for the management of risks.**

III. Licence management

80. The Board was informed that the list of SAP products procured under the licence agreement entered into with SAP had been added in the form of an appendix and that any amendments to the list or termination of SAP products were also to be reflected

in the appendix. The payments for the SAP products consist of a one-time licence fee and a recurring annual product support for large enterprises (PSLE) fee.

81. The Board reviewed the United Nations-SAP licence agreement (excluding the SAP IBP product, for which a separate licence agreement exists) and noticed that, as at December 2019, there were 17 appendices to the licence agreement. Four of those appendices were terminated during the period 2014–2015. Total licence fees for the remaining 13 appendices were $22.4 million and the annual PSLE fee was $4.1 million.

82. The Board noticed the following risk areas during the review of the licence agreement:

(a) The Administration had communicated (in August 2017) the decision to terminate the use of the products listed in appendix 7 to the licence agreement with SAP. While no PSLE payments were made during 2018 and 2019, SAP continued to send invoices for PSLE payments for appendix 7 products during that period, owing to the absence of a formal amendment to reflect the termination;

(b) Annual PSLE payments of $200,570 were made for products listed in three of the appendices, namely appendix 2, appendix 6 and appendix 9. The Board noted that products listed in appendices 2 and 6 were not in use. Furthermore, the Board could not find a rationale for continuing with the use of the products listed in appendix 9 after the introduction of SAP Fiori in 2018;

(c) Annual PSLE payments were made for three products listed in appendix 5[5] that have not been used. The PSLE payments attributable to those three products could not be quantified, since they were part of the overall PSLE payment of $169,915 for all the products listed in appendix 5;

(d) There was a perpetual licence for the SAP Resource and Portfolio Management (RPM) (appendix 1, 2010) product. According to the available SAP documentation, there was a defined upgrade path from SAP RPM to SAP PPM. The Board noted that the reasons for the fresh procurement of SAP PPM as part of appendices 15 and 17, with payment of a licence fee of $624,375 and incurrence of liability for a recurring annual PSLE fee of $106,143, were not clear;

(e) In the annual SAP audit report dated 22 March 2019, it was indicated that several product licences were significantly underutilized. A review by the Administration was pending to verify whether the licensed level for the licence metrics under the existing appendices was justified in view of the current and future use of those products.

83. The Board, in its eighth progress report, recommended that the Administration take steps to assess the impact, including the financial impact, of interfaces to non-SAP solutions to be integrated with Umoja, in view of the revised pricing model for indirect data access introduced by SAP in April 2018. The revised outcome-based pricing model for enterprise resource planning accounts for indirect/digital access to data in SAP Enterprise Resource Planning (ERP) by non-SAP products/solutions, on the basis of the measurement of specified document types created within SAP ERP by non-SAP products through interfaces. The Board was informed that each interface with non-SAP software had been reviewed for compliance with the SAP indirect access guide and that no financial implications were identified.

84. The Administration stated that:

(a) The review of the appendices to the licence agreement to determine the appropriate course of action was ongoing;

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[5] SAP for Retail, SAP for Professional Services and SAP Interaction Centre Management.

(b)   Several rounds of negotiations were conducted regarding the purchase of SAP PPM, and a credit for SAP RPM was part of the negotiation. A request was even made to convert the current RPM licence to PPM. However, the SAP offer to convert the licence was conditional on the purchase of IBP at a much higher price, which was not accepted. When the appendices were finalized and signed, the United Nations received a 91 per cent discount on the fee to be paid;

(c)   The ongoing metrics and usage monitoring that the enterprise resource planning team implemented as part of its regular workplan year-round had served to continuously rightsize the usage and licensing portfolio of the enterprise resource planning system. The most recent audit by SAP confirmed the compliance of the enterprise resource planning project without any indication of possible risk or shortfall. As far as the project was concerned, the audits by SAP were final and sufficient proof;

(d)   Further additions or possible modification and/or possible discontinuation of specific SAP licences/products needed to be carefully reviewed in their totality and not on a piecemeal basis, with the related technological road maps and cost implications simultaneously considered. Relative to the totality of the licensed portfolio, the SAP licences/products not used or minimally used were marginal, as was any possible cumulative saving, which could otherwise best be addressed once the enterprise resource planning project was at an advanced stage of implementation, as would be the case at the United Nations by the end of 2020;

(e)   SAP could not unilaterally modify the terms of the licence agreement. Therefore, any change in the SAP pricing model or commercial positions, in the past, present or future, would have no impact on the United Nations until such time as new terms or a new contractual agreement were entered into by the United Nations and SAP following negotiation.

85.   The response of the Administration does not explain the rationale for the fresh procurement of SAP PPM in a scenario in which PSLE payments for SAP RPM (appendix 1) had been made and the vendor was obligated to support the product upgrade to SAP PPM in accordance with the defined upgrade path. Furthermore, there is potential for generating savings in the annual PSLE payments by identifying appendices and products that were previously procured in a context of high uncertainty but are now not required.

86.   The Board also takes note of the response of the Administration regarding indirect access. The Board is of the view that there remains a risk that the definition of "use" of SAP software in the licence agreement may affect the licence cost within the framework of the existing licence agreement under the revised pricing model.

87.   **The Board recommends that the Administration establish a mechanism for the regular review of appendices to the licence agreement to identify the ones that are not required and explore formally amending/terminating them, and continue to review financial risks on account of indirect data access.**

88.   The Administration stated that further additions or possible modification and/or possible discontinuation of specific SAP licences/products needed to be carefully reviewed in their totality and not on a piecemeal basis, with the related technological road maps and cost implications simultaneously considered. Relative to the totality of the licensed portfolio, the SAP licences/products not used or minimally used were marginal, as was any possible cumulative saving, which could otherwise best be addressed once the enterprise resource planning project was at an advanced stage of implementation, as would be the case at the United Nations by the end of 2020. It further added that the project reconfirmed that the Organization is not in a position of risk with respect to capacity or access under the licensing agreement with SAP,

whether on account of "external" or third-party access, or internal access. The ongoing metrics and usage monitoring that the enterprise resource planning team implements as part of its regular workplan year-round serve to manage the above-mentioned steps, such as usage and access, in accordance with validated operational requirements that comply with the terms of the SAP licensing agreement.

IV. Application controls

A. Employee master data

89. The functionalities for the maintenance of employee master data, for configuring business rules for employee entitlements and for payroll processing have been deployed as part of the Foundation and UE1 phases of the Umoja project. The Board was informed that the following internal controls had been adopted for employee master data:

(a)   Human resources partners who are granted access to edit staff members' master data cannot edit their own records;

(b)   Payroll processors do not have access to update employee master data, ensuring the segregation of responsibilities between human resources and payroll;

(c)   Changes to employee master data submitted by staff members through employee self-service that are critical for payroll processing go through an approval process.

90.   The Board, however, noticed the following deficiencies in application controls for data entry and modification in employee master data:

(a)   The "first name" and "last name" fields could be left blank or filled in with special characters instead of letters;

(b)   The "date of birth" field could be filled in with a date that resulted in the age of the employee being indicated as under 18 years or with a future date;

(c)   The "date of joining" field could be filled in with a date that resulted in the age of the employee being indicated as over 65 years (retirement age). The nature of employment was not a mandatory record in the "remarks" field;

(d)   The "date of leaving" field could be filled in with a date that resulted in the age of the employee being indicated as under 65 years (retirement age) without mandating the recording of the reason for separation in the "remarks" field;

(e)   The recording of beneficiary nomination details by employees (for the payment of all dues in the event of the death of the employee) was incomplete in Umoja. Nomination details had been recorded for 10,134 active employees out of a total of 45,940, and for 540 retired employees out of a total of 14,972.

(f)   The names of nominated beneficiaries and the percentage of benefits that would go to each nominee were required to be specified, with the sum of each percentage share totalling 100. However, there were no validation controls to ensure that this was the case.

91.   The Administration stated that:

(a)   The names of employees were entered in Umoja on the basis of the machine-readable representation of the name in the passport, which led to the insertion of either blanks or special characters in the "first name"/"last name" fields;

(b)   The feasibility of including a warning message when the date of birth is outside a certain range would be explored;

(c)   The system of record for all beneficiary information was the official status file, even if the beneficiary details were recorded in Umoja. This required a form to be printed, physically signed in the presence of a witness and placed in the staff member's official status file. Any beneficiary that had not changed since before Umoja went live remained valid in the staff member's official status file.

92.   The Board is of the view that the incompleteness and errors in data fields in the employee master data indicate the need to improve the due diligence exercised for cross-verification with employee documentation at the time of data entry by human resources partners, as well as the need to improve the effectiveness of input validation controls in Umoja. The Board is also of the view that accurate, error-free and complete recording of nomination details in Umoja for employee beneficiaries is critical to the human resources function, to ensure timely and correct payment of all dues to each of the nominated beneficiaries. The completeness of records in Umoja would significantly reduce the scope for manual errors in this critical function.

93.   **The Board recommends that the Administration take steps to incorporate validation controls for all important fields in employee master data, where technically feasible.**

B.   Delegation of authority

94.   As part of the management reforms, a new delegation of authority framework for the purposes of decentralizing decision-making, aligning authorities with responsibilities, strengthening accountability and delegating to managers the necessary managerial authority over human, financial and physical resources to allow for effective mandate delivery was put in place under the Secretary-General's bulletin on the delegation of authority in the administration of the Staff Regulations and Rules and the Financial Regulations and Rules (ST/SGB/2019/2), dated 17 December 2018. The existing delegations and subdelegations of authority under the Staff Regulations and Rules and the Financial Regulations and Rules issued to any official of the United Nations were rescinded with effect from 1 January 2019. All further delegations of authority, including any limitations, were to be issued and managed through an online portal. There was a transition period for the full implementation of the delegation of authority framework from 1 January to 30 June 2019; thereafter, the new delegations of authority were to be effective from 1 July 2019.

95.   The Secretary-General, in his eleventh progress report on the enterprise resource planning project, stated that Umoja had been one of the key enablers of the new system of delegation of authority introduced by him on 1 January 2019. To implement the new delegation of authority and accompanying accountability framework, the project has supported: (a) the mapping of Umoja roles through specific delegated authority; (b) the development of new management dashboards; and (c) the extraction of data from Umoja to support the monitoring of delegation of authority by the Business Transformation and Accountability Division in the Department of Management Strategy, Policy and Compliance.

96.   The Board noticed that a delegation of authority portal was in operation. In the portal, the delegator enters, among others, the details of the delegatee, the nature of the delegation, the validity of the delegation/subdelegation and the threshold for the subdelegation, which are then accepted or rejected by the delegatee. After delegation of authority is performed in the portal, the provisioning of roles for implementing the delegation of authority is done through the standard user access provisioning process in Umoja by the security liaison officers.

97. The Board reviewed the delegations made in the delegation of authority portal with the user role assignment in Umoja; the issues noticed are described in the paragraphs below.

Mapping of user roles

98. The delegation of authority portal and the Umoja user access portal were on two different platforms and no interface/link existed between them. Delegations in the delegation of authority portal were by role titles in the functional areas concerned. Accepted delegations were entered in Umoja through the provision of different types of Umoja user roles. The Board noted that there was no standard mapping of role titles or type and level of delegated authority with a particular combination of Umoja user roles.

99. The Board noted that, in the three lines of defence model, entities at the first line of defence are to routinely check the alignment between delegations of authority and Umoja user roles themselves, with the Business Transformation and Accountability Division having a monitoring role as the second line of defence. In the absence of standard mapping of delegated authorities with Umoja user roles, effective monitoring of such alignment across levels would be difficult.

100. The Administration stated that the Business Transformation and Accountability Division had started monitoring the alignment of subdelegations in the portal with Umoja roles that required a subdelegation, in consultation with the Umoja security team, as needed. In Umoja, there are business intelligence reports that show which enterprise roles a user has. Since the enterprise roles related to delegation of authority are known, they can be searched to see which users have which roles related to delegation of authority. The Administration also stated that it was incorrect to link delegation of authority to Umoja user roles, given that the delegation of authority granted might not translate into Umoja system access related to that delegation of authority.

101. The Board noticed that the business intelligence reports helped in reviewing the number of users having a role in Umoja. The Board also noted that a significant number of delegations of authority required provision of a related Umoja user role to carry out the delegated functions, which included different transaction user roles. The lack of standard mapping of the type and level of delegated authority, requiring the provision of user access in Umoja to carry out the delegated function with a particular Umoja role or combination of Umoja user roles, needed the attention of the Administration to identify corrective action.

Provisioning of user roles

102. The Board noted the following issues in the provisioning of user roles in Umoja:

(a) After roles were provisioned in Umoja, there was no feedback mechanism from Umoja to the delegation of authority portal about the status of such provisioning, and it was difficult to ascertain whether all the delegations accepted in the portal had been correctly implemented in Umoja. The Administration stated that there was no integration between the delegation of authority portal and the user access portal, and there was no requirement for such integration. A feasibility study would have to be conducted to see whether the delegation of authority portal could be integrated with the user access portal. The Board noted that a feedback mechanism could come from the integration of the system or could be planned and implemented as a separate monitoring system;

(b) There were some pre-existing delegations recorded in the delegation of authority portal as at 31 December 2018. Although those delegations were rescinded

in the portal, the Board noticed that there were cases in which the Umoja roles were not deprovisioned. Furthermore, the Board did not notice any mechanism for reconciling the status of rescinded delegations with the user roles concerned in Umoja. The Administration stated that responsibility for deprovisioning user access in conjunction with rescinded delegations of authority resided with the business and should be executed by the security liaison officers, who are provided with an additional layer of support through the security liaison officer quarterly access validation report, which shows inactive and separated users whose access should be revoked. The Board noted that the functioning of that existing mechanism needed to be reviewed, given that instances of access by inactive and separated users continued to be noticed;

(c)   The monetary ceilings of the delegated authorities were entered in the delegation of authority portal and was to be specified in Umoja in the "approved threshold" field. The Board noticed that this field was not mandatory. There were cases in which no threshold amount regarding the delegation of authority was entered in Umoja. Moreover, there were cases in which the threshold figure for delegation was wrongly entered in the "comments" column at the time of granting user access. Those instances weakened the internal controls within Umoja over the monetary ceilings of the authorities delegated to individual users. The Administration stated that it would give due consideration to enforcing the "validity" and "approved threshold" fields in the user access provisioning application;

(d)   Delegations granted in the portal had validity dates. However, the "start date" and "end date" fields were not mandatory in the user access portal. The Board noticed cases in which validity dates were not entered in Umoja. The Board also noticed cases in which, even when the delegations expired in the delegation of authority portal, the roles continued to be provisioned in the user access portal. The Administration stated that it would give due consideration to enforcing the "validity" and "approved threshold" fields in the user access portal. It is the responsibility of the business/security liaison officer to ensure that the relevant roles in the delegation of authority are promptly reprovisioned.

103. The Board requested details of purchase orders and work orders approved by a user during a given period of time for the cases in which mismatches in the validity periods and threshold limits were noticed. The Board was informed that no log for purchase documents could be generated and that standard function modules needed to be leveraged through custom developments in order to compile related data across different tables using a globally unique identifier as a reference, given that SAP had no standard reports on purchase documents.

104. The Board noted that, in view of the lack of availability of information/details through custom/standard reports, there was a risk that transactions that were beyond the permissible limits and validity period would remain undetected.

Suspension and deprovisioning of user roles

105. Heads of entity, portal administrators and security liaison officers in the various entities were responsible for ensuring that subdelegations and any related Umoja roles were issued and revoked on the basis of staff movements within and between entities.

106. The Board also noticed that there were 366 types of enterprise roles having access to entities at the global level and 196 types of enterprise roles having access to all entities. Users with those roles had access to perform the functions of the roles across all the entities. The Board noticed that there were 19,921 users who had been assigned global/all roles, which meant that they could gain access to information or execute transactions in respect of all entities. There is a need to review those roles to

assess the requirement for the functions, given the higher perceived risk levels associated with them.

107. The Board noticed that the deprovisioning of user roles in the case of transfer/separation of staff from service/post/duty station was not automated and had to be done manually, which carried an inherent risk of allowing the user to access Umoja if there was a delay in the deprovisioning or non-provisioning of user roles by the entity. In some cases, staff members who had separated in 2019 continued to be categorized as communication data users (users who can perform dialogue-free communication between systems) or as dialogue users (users who can access the roles originally assigned). The Board noted that allowing separated users to have access to their user role privileges carried the risk of their accessing information and executing transactions after separation.

108. The Board also noticed that the delegation of authority portal provided the delegator with the facility to revoke, suspend and restore the delegation of authority. However, the Board did not notice the availability of the facility of revocation or suspension in the user access portal. All such changes were to be effected by way of a new transaction and processed through provisioning/deprovisioning of user access, which carried with it the risk of user privileges being granted without the appropriate delegation of authority. The Administration stated that responsibility for deprovisioning user access in conjunction with rescinded delegations of authority resided with the business and should be executed by the security liaison officers, who are provided with an additional layer of support through the security liaison officer quarterly access validation report, which shows inactive and separated users whose access should be revoked. The Board noted that the functioning of that existing mechanism needed to be reviewed, given that instances of access by inactive and separated users continued to be noticed.

C. Data quality and other issues

Quality issues in data related to user access provisioning in Umoja

109. A review of the data related to user access provisioning available in Umoja was carried out and the following observations were made:

(a)   There were 294,219 user role requests (records) in the data. Each role request had a start date and end date that determined the validity of the role. The end date was blank in the case of 253,172 records. The start date was blank in the case of 220,268 records. Furthermore, both the start date and the end date were blank in 212,952 cases. Given that each role was assigned to a user on the basis of his/her assignment, the absence of a start date and an end date signified that the user would be able to continue to gain access to the roles assigned, even after the completion of the assignment, until the role was deprovisioned;

(b)   In 41,047 records, data was entered in the "end date" column. In 6,293 of those cases, the end date was entered as 31.12.9999, which implied that the role assigned to the user did not have any end date. Similarly, in 4,121 cases, the end date was entered as 31.12.2999. Furthermore, in 13 cases, the year 1999 was entered as the end date for the role requests entered in 2017 and 2018, which implied that there was no validation check in the system to prevent the entry of an end date that was earlier than the date of the request for the role;

(c)   Similarly, in 41 cases, the start date that was entered fell within the range of the years 2026 to 2999 and, in 28 cases, it fell within the range of the years 1900 to 1999;

(d) Of the 294,219 role requests that were available in Umoja, in only 1,117 cases had the threshold amount for the procurement roles been entered in the threshold column;

(e) In 1,252 cases, the business area for which the user role had been extended was not captured in the data; therefore, the entities for which the enterprise role had been assigned could not be ascertained. The Administration stated that the business area was irrelevant for almost all Umoja roles; rather, when it was necessary to specify the entity, the "entity" field of the role derivation was used. The Board noted that the user needed to be given access only for the units required. Providing access to all the units for almost all Umoja roles permits the user to perform transactions for all the units, which may be risky and is not required.

110. Given that the validity period and threshold amount are vital for users in exercising their roles and authorities, it is essential that there should be validation control of those data. Furthermore, the data already captured in Umoja for user access provisioning may be reviewed.

Segregation of duties conflicts

111. The Board was informed that the segregation of duties matrix was embedded in Umoja to avoid the provisioning of roles with segregation of duties conflicts. The segregation of duties mapping in Umoja provided for four levels of risk: high, medium, low and redundant. The system restricted user access provisioning in cases of a combination of two or more user roles falling within the high-risk category. In the case of other conflicts, the system alerted the security liaison officer about a segregation of duties conflict. Role provisioning was allowed by the system after a justification for the provisioning was entered in the system by the security liaison officer.

112. The Board noticed that the system identified 4,382 role requests with segregation of duties conflicts at various risk levels. Details are given in table 1.

Table 1
Risk levels of role requests with segregation of duties conflicts

Risk level	Low	Medium	High	Redundant	Total
Number of user access provisioning requests	1 093	1 622	1 290	377	4 382

113. The action taken on those segregation of duties conflicts was as follows: role requests were changed, deleted or kept pending. Details are given in table 2.

Table 2
Action taken on role requests with segregation of duties conflicts

Risk level	Low			Medium			High			Redundant		
Action taken	Changed	Deleted	Pending	Changed	Deleted	Pending	Changed	Deleted	Pending	Changed	Deleted	Pending
Number of cases	1 014	11	68	1 136	134	352	920	26	344	169	46	162

114. The Board noticed that there were 926 user access provisioning requests across all risk levels that were pending action. Of those requests, 597 had been pending for a period of one to two years, 321 had been pending for a period of six months to one year and the remaining 8 had been pending for a period of 20 days to six months. Given that user access provisioning requests pertain to the day-to-day activities of the

Organization, and the requests referred to above have been identified by the system as presenting a segregation of duties conflict, the pending cases need to be reviewed in a time-bound manner.

115. The Administration stated that user access provisioning requests that were not approved were not provisioned in the Umoja system. It therefore presents no risk to the Umoja system to have requests pending with segregation of duties risks because such requests are not provisioned in the system. The Board noted that user access provisioning requests were related to the day-to-day activities of the Organization and that any undue delay in the acceptance of such requests might delay or affect the attainment of the objective for which the role was requested.

116. **The Board recommends that the Administration explore preparing a standard mapping of Umoja user roles with the function and type of authority delegated under the new delegation of authority architecture, which require a particular Umoja role to effectively carry out the delegated functions.**

117. The Administration stated that a robust mechanism for Umoja user access provisioning already existed. Umoja security liaison officers are required to check for accepted delegations, if required, before approving access to Umoja roles. To facilitate that process, the Business Transformation and Accountability Division has provided read-only access to the delegation of authority portal for security liaison officers.

118. The Board noted that there was no standard mapping mechanism to determine which Umoja user role was to be given in the case of a specific role title or type and level of delegated authority. In the absence of a standard guide identifying the delegated roles that need Umoja user access and the related Umoja user role/combination of roles that would help in carrying out the delegated authority, it is difficult to review and monitor the Umoja role provisioning for delegated authorities, which also creates a risk of different user roles/combinations being granted by different security liaison officers for the same type and level of delegations.

119. **The Board recommends that the Administration complement the existing user access provisioning mechanism with measures to grant Umoja roles requiring delegation of authority, in order to address the disconnect between delegations of authority and Umoja roles in the case of rescinded delegations and reflect the validity period and approved threshold for delegations and the need for user roles with global and all-entity rights.**

120. **The Board recommends that the Administration put in place a strong internal control mechanism to ensure the deprovisioning of user roles in Umoja at the time of separation of staff and appropriate updating of the user roles in Umoja when they leave their functions.**

V. Support functionalities

A. Business intelligence

121. An important qualitative benefit of Umoja is the timely availability of relevant information to stakeholders. Business intelligence reporting is envisaged as a key vehicle for that information flow.

122. The Secretary-General, in his eleventh progress report on the enterprise resource planning project, stated that an updated governance model had been created to gather requirements and build, validate and certify reusable data models. Those certified reusable data models will be available for use throughout the Organization under the

umbrella name "UNBI Certified Layer". The Secretary-General also stated in the report that, since May 2019, the collection, prioritization and scoping of business intelligence and reporting requirements had been mainstreamed to the Business Transformation and Accountability Division, which works with the Umoja process owners to consolidate and process requests before passing them to the Umoja team for implementation.

123. The Secretary-General further stated in the report that an upgrade of the underlying hardware and software (HANA) had now made it possible to provide real-time data updates for reporting. New data models are also available, enabling the creation of critical tools. It is expected that key data from systems such as Inspira (e-Performance, e-Recruiting and Training) and information from other entities that are not part of Umoja will be brought into HANA to enrich the existing data models and provide additional capabilities for reporting. The newer modules of Umoja, such as the strategic management application, are also using embedded reporting capabilities to improve the ease of access to relevant information in the appropriate business context.

124. The Board was informed that 21 requests for business intelligence reports and data models from different departments were received during 2019, 5 of which were completed, 4 were yet to be taken up, 1 had been kept on hold and the remaining 11 were in progress. Inspira data is provisioned to Umoja via HR Insight for staffing reports and further integration will be based on the priorities set by the United Nations business intelligence (UNBI) project.

125. In its eighth report, the Board highlighted that the upgrading of the database to SAP HANA and the integration between SAP Business Warehouse (BW) and SAP HANA would enable the extraction of data from various SAP modules/applications into HANA, which could then be combined, using the semantic layers, to create analytical models within each functional pillar or across pillars in accordance with business requirements.

126. The Board also noticed that:

(a)   It was mentioned in the eleventh progress report of the Secretary-General that Umoja had enabled the new system of delegation of authority by supporting the development of new management dashboards. However, the delegation of authority dashboard was still at an early stage of development;

(b)   A performance monitoring dashboard that was to be launched in peacekeeping missions in the fourth quarter of 2019 to provide a 360-degree view of programmes or frameworks and performance monitoring, as mentioned in the eleventh progress report, was not available in the management dashboards of Umoja.

127. **The Board recommends that the Administration continue to take action to link data from other key systems with HANA to enrich the capabilities of business intelligence reporting and develop dashboards for monitoring of delegation of authority, in a time-bound manner and with due consideration for information security and data protection.**

128. The Administration accepted the recommendation.

B. Production support

129. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that a three-tier production support model had been designed to achieve self-sufficiency in each location and to provide expertise for the early resolution of incidents and fulfilment of service requests. It was stated that the first

tier of support operated locally through local process experts; the second tier through the Umoja Support Centre in Brindisi, Italy, and the Unite Service Desk operating from Bangkok, Geneva, Nairobi and New York; and the third tier through the Umoja project team. Each tier escalates incidents and requests, as needed.

130. The Board was informed that 17,818 incidents and 33,908 requests for service had been recorded during 2019. The Board noticed that:

(a)   The first call resolution rate for incidents improved slightly to 58 per cent in 2019, compared with 56 per cent in 2018;

(b)   The number of requests for service was high: 33,908 in 2019, compared with 26,533 in 2018. The Board was informed that requests for new roles of staff members on account of delegation of authority, in accordance with the management reforms, accounted for the increase;

(c)   Data regarding the resolution of incidents and service requests for tiers 2 and 3 could not be readily tracked in the system owing to group classification issues. The Board was informed that a request to add a "tier" field that would enable classification of groups by tiers was submitted. The "tier" field would be made available in the system for release in the second quarter of 2020;

(d)   Tickets for incidents and requests for service that were outstanding were found to remain open for substantially longer periods of time in almost all categories, namely human resources, travel, finance, user administration, IT and communications. The Board was informed that tickets that had been open for a significant number of days were, in general, associated with change requests that were reprioritized and managed by Umoja tier-3 teams and, given that the change request portfolio was updated on an ongoing basis, low-urgency/low-impact requests might be placed at the bottom of the list for several years. The assessment of those tickets, however, required a granular analysis by the tier-3 teams responsible for change requests. This indicated that some of the outstanding requests remained open for a significant number of days without due resolution.

131. The Board noted that the maintenance of the database of incidents and service requests needed to be improved. Furthermore, there is a need for a strategy to equip and strengthen production support for the closure of requests and resolution of incidents within the target resolution time and also to deal with upcoming challenges after the deployment of all UE2 functionalities.

132. **The Board recommends that the Administration ensure that the resolution of incidents and service requests for all tiers can be easily monitored in the system and take necessary action so that all requests are closed within the target resolution time.**

C.   Continuous improvements monitoring programme

133. The Secretary-General, in his eleventh progress report on the enterprise resource planning project, stated that a programme for monitoring continuous improvements had been created to ensure that Umoja benefits were directly correlated with the degree at which the system performed at its best, and to ensure that the critical administrative functions of the Organization supported by Umoja processes could be optimally executed. The monitoring approach is aimed at providing continuous insight on key operational questions, such as the number of activities executed, the number of users involved, the number of tasks needed to complete an activity, the duration and volume of tasks for the activity and performance trends for the activity, on the basis of analysis of related user data.

134. It was also stated that, for 43 of the 51 workflows monitored in 2018 and 2019, the number of transactions plateaued at an annual rate of approximately 3.7 million completed transactions. Of the 41 workflows monitored in the past three years, 22 processes are at or near peak efficiency, showing a stable trend over the past years, and they have sustained a duration within the optimum range at less than two days, while 16 workflows have shown improved performance.

135. The Board noticed that, even though the number of workflows monitored for continuous improvements was reported to have increased to 51 in 2019, compared with 43 in 2018, there were some inconsistencies, as detailed below:

(a) A process entitled "No name" having only two transactions in the year was included in the list of 51 processes;

(b) Some processes, namely, release and purchase order approval (PD), were found to be repeated multiple times (twice and four times, respectively);

(c) There was a decrease in the speed of 11 workflow processes in 2019.

136. The Administration stated that the monitoring report had been developed by a team in the Financial Information Operations Service, and parts of that team had been transitioned into the Business Transformation and Accountability Division, where they took on new responsibilities. The report, subsequent analysis and downstream action have not therefore been operationalized to the extent envisioned in the form of actionable information. It is to be determined whether the report will be continued or will evolve into a different format to be driven by process owners directly, through the process improvement advisory group of the Department of Operational Support or any other mechanism that they deem suitable.

137. **The Board recommends that the Administration put in place a clear governance structure for the continuous improvement monitoring programme, with clearly defined responsibilities, and continue working on identifying critical business processes and including them in the programme.**

D. Training

138. The General Assembly, in its resolution 73/279, reaffirmed the importance of effective and high-quality training for the successful implementation of Umoja and requested the Secretary-General to continue to ensure that senior managers adopted a comprehensive and sustained approach to training and capacity development in their work units and make certain that all users were properly trained before the deployment of any functionality of the project.

139. The Secretary-General, in his eleventh progress report on the enterprise resource planning project, stated that iLearn Umoja, the online learning platform launched with a web portal in September 2018, focused heavily on continuous self-learning and easily accessible self-contained and modular training courses and learning materials, including bite-sized videos and a user guide. As at 31 July 2019, there were 59 published UE2 courses across six thematic areas and 1,602 enrolments. It was also stated that 90 per cent of the enrolments covering foundation, UE1 and UE2 courses were for computer-based learning, compared with 74 per cent during the previous year, showing an encouraging trend for self-learning. A survey methodology was launched, beginning in May 2019, requiring learners to complete a two-minute survey after they completed each course. It was stated that, as at 31 July 2019, 702 participants had completed the survey; 79 per cent had agreed that the course fulfilled the stated learning objectives, 73 per cent had agreed that the course was effective in teaching new skills/concepts and 78 per cent would recommend iLearn Umoja to colleagues.

140. In that connection, the Board was informed that there were 28,372 enrolments in various Umoja courses in 2019, which included 2,104 for live classroom courses, 26,018 for self-paced learning and 235 for virtual classrooms, while 15 enrolments were for blended learning activities.

141. In its eighth report, the Board highlighted that the conversion and migration of existing training material on Umoja Foundation and UE1 from Inspira to the new iLearn Umoja platform was still to be undertaken. The Board noticed that there was no time-bound plan for the migration of existing training material on Foundation and UE1 to iLearn Umoja. Furthermore, there was no comprehensive training plan for the total number of training courses for UE2 functionalities and no time frame for them to be hosted on iLearn Umoja in 2020.

142. The Board also noted that, although the survey capturing learners' feedback could be used to calculate an indicative value, it was not a qualitative or quantitative indicator for assessing the effectiveness of the training imparted. The Administration stated that, when designing and delivering Umoja courses, the training teams were encouraged to use both quantitative and qualitative indicators to collect learners' feedback.

143. **The Board reiterates the recommendation that the Administration prepare a comprehensive training plan for the total number of training courses to be hosted on iLearn Umoja for UE2 functionalities and make available all training material on iLearn Umoja.**

144. **The Board recommends that the Administration take action to develop and use tools to assess whether the learner can use Umoja functionalities effectively after the training programme.**

145. The Administration, while accepting the recommendations, stated that it planned to complete the development of a new human resources blended programme by the end of 2021. The conversion, migration or redesign of training material for other pillars is subject to the outcome of the ongoing discussion about the realignment of roles, responsibilities and resources. Furthermore, the UE2 training plan has been prepared on the basis of the 2020 workplan and is being monitored for completion by the end of 2020. In order to help United Nations staff to learn Umoja functionalities for performing business transactions, Umoja training courses will be further improved by applying e-learning technologies and assigning mentors to staff for better knowledge transfer.

VI. Umoja business case

A. Benefits realization

146. The General Assembly, in its resolution 73/279, reiterated the request to the Secretary-General, in developing realistic benefits realization plans for implementing entities, to use a common methodology and provide details on both qualitative and quantitative benefits, and the assumptions and processes underlying the benefits process, and to report thereon to the Assembly at the main part of its seventy-fourth session.

147. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that the Umoja benefits realization plan was under preparation. He also stated that the Business Transformation and Accountability Division of the Department of Management Strategy, Policy and Compliance had been designated as the coordinating unit responsible for monitoring the process of benefits realization, engaging stakeholders from the various units and divisions, and

continuous monitoring. In his eleventh progress report, he stated that the recent release of the benefits management framework under "United to Reform" provided an opportunity for the Umoja project to quickly review the benefits realization plan, to enhance and align it with the new framework and to transfer it to the Business Transformation and Accountability Division for implementation.

148. The Board recommended in its eighth report that the Umoja benefits realization plan be finalized as a priority and that the division responsible commence work on the measurement of benefits realization for all project phases that had been implemented. The Board noticed that the benefits realization plan was yet to be presented to the Umoja Steering Committee and that the Benefits Working Group[6] was yet to be formed.

149. **The Board recommends that the Benefits Working Group be constituted to commence work on benefits realization for all phases at the earliest and that the timelines for the benefits realization plan be reviewed to assess whether UE2 benefits can be evaluated as planned in the given timelines.**

150. The Administration, while accepting the recommendations, replied that the benefits realization plan had been prepared and signed off by the project director. It will also be presented to the Steering Committee and to the Fifth Committee.

B. Total cost of ownership

151. The total cost of ownership is a comprehensive assessment of IT and other costs across enterprise boundaries over time. For IT, the total cost of ownership includes hardware and software acquisition, management and support, communications, end-user expenses, the opportunity cost of downtime, training and other productivity losses.

152. In the tenth progress report of the Secretary-General on the enterprise resource planning project, the estimated total cost of ownership of the project was revised upwards from $1.402 billion in 2017 to $1.414 billion in 2018. In the eleventh progress report, the estimated total cost of ownership increased from $1.414 billion in 2018 to $1.429 billion in 2019. Details are given in table 3.

Table 3
Total cost of ownership

Cost category	Tenth progress report of the Secretary-General on the enterprise resource planning project		Eleventh progress report of the Secretary-General on the enterprise resource planning project	
	Period	*Amount (United States dollars)*	*Period*	*Amount (United States dollars)*
Direct costs (Umoja)	2008–2019	543 741 600	2008–2020	566 385 611
Indirect costs	2013–2018	127 034 077	2013–2019	144 150 496
			2020–2030	38 693 696
	2019–2023	19 000 000		
Training costs	2013–2018	77 849 752	2013–2019	83 195 065
			2020–2030	4 221 044
Maintenance costs	2016–2019	118 600 000	2016–2019	79 349 102
	2020–2030	528 000 000	2020–2030	513 771 016
Total	**2008–2030**	**1 414 225 429**	**2008-2030**	**1 429 766 030**

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[6] The Benefits Working Group of the Business Transformation and Accountability Division of the Department of Management Strategy, Policy and Compliance has been identified as the unit responsible for identifying, assessing and monitoring benefits realization.

153. The Board noted that, in the eleventh progress report of the Secretary-General on the enterprise resource planning project, it was stated that the total cost had been updated, taking into account the Board's observations to the extent feasible.

154. The Board noted that there was scope for refinement in the estimate of the total cost of ownership, as indicated below.

Direct costs

155. Direct costs relate to costs regarding posts, other staff costs (general temporary assistance posts), consultants and experts, travel of staff (technical Umoja), contractual services, general operating expenses, supplies and material. In his eleventh progress report on the enterprise resource planning project, the Secretary-General stated that direct costs were estimated at $566.385 million for the period 2008–2020, on the basis of the addition of the projected resource requirement of $35.378 million for 2020 (after adjusting the unused balance of $12.734 million for 2019) for the implementation of the Umoja project in all respects by December 2020.

156. The Board was informed that steady-state (post-stabilization) technical support for Umoja would require a dedicated team with skills to support all the technologies and functionalities that comprised Umoja. The thinking, therefore, has been that 72 posts will be retained as a specialized team to support Umoja. However, the resource requirements of $22.644 million for 2020 were included in the direct costs calculations and no cost estimate for those posts after 2020 was included in any part of the total cost of ownership calculations.

157. The Administration stated that the figures for 2021 and 2022 were only preliminary internal estimates of potential costs, given that the project has been preparing and updating its estimates over a multi-year horizon, even though it was required only to submit annual resource plans in each progress report. The resources for the Umoja team, even though it is not a project, will be included in the programme budget, with a share allocated to other budgetary sources depending on what the General Assembly decides. The Administration further stated that the estimated costs of the team were included in the annual maintenance cost calculation, which might be re-evaluated in the light of new developments.

158. The Board noted, however, that the projected maintenance cost for the period 2020–2030 was based on extrapolation at the rate of 8 per cent of the projected maintenance budget for 2020, which did not include any direct costs relating to the Umoja team. Therefore, the estimated cost of the Umoja project team post-2020 has not been included in the calculation of the total cost of ownership.

Indirect costs

159. Indirect costs relate to costs incurred by departments to facilitate operational readiness, including activities such as the cleansing and enrichment of data, user testing and deployment coordination. In his eleventh progress report on the enterprise resource planning project, the Secretary-General reported indirect costs of $144.150 million for the period 2013–2019; the costs estimated for the period 2020–2030 were $38.693 million.

160. The indirect cost estimate was based on the standard costs applied to staff according to their roles in the deployment, whereby each role was assigned an indicative grade/level and representative full-time equivalent person-months for the estimated amount of time spent in the deployment. The Board noticed that there was an error in the application of the common standard costs affecting the computation of the indirect costs of continuous improvements for 2019, which were understated by

$339,500. As a result, the projected indirect costs for the period 2020–2030 were understated by $1.79 million.

161. The Administration acknowledged the computational errors in the calculation pertaining to continuous improvements.

Training costs

162. In the eleventh progress report of the Secretary-General on the enterprise resource planning project, the Administration computed the training costs for the period 2013–2019 at $83.195 million and the estimated training costs for the period 2020–2030 at $4.221 million.

163. The Board noticed that the projected training cost adopted a 15 per cent decay model, on the basis of which enrolments in instructor-led courses would fall, while enrolments in computer-based and blended learning would increase at a rate of 15 per cent during the period 2020–2030.

164. The Board noticed that the estimated training costs of $4.221 million were calculated on the basis of average cost per month instead of average cost per year, which resulted in underestimation by $77.423 million. Furthermore, the projected training costs did not include the estimated costs of training-related travel.

165. The Administration stated that the project had reviewed the assumptions and parameters of the training table, taking the aforementioned error into consideration, and that its parameters had been refined (type of instruction, decay model applied), with annual training-related travel added, and had been reviewed by the Director. The Administration also stated that the travel training cost had been conservatively estimated at 40 per cent of the cost of instructor-led training. Accordingly, a revised training estimate was provided with a total cost of $28.44 million for the period 2020–2030.

166. The Board noticed that the Administration had changed the assumptions underlying the preparation of the estimates for the eleventh progress report and had estimated higher decay rates in the instructor-led method, the blended method and the computer-based method, and also in the estimated monthly cost for all three types of training.

167. The Board noted that, even with the revised methodology being used as the basis for the calculation of estimated training costs, the total cost of ownership was underestimated by $24.22 million.

Maintenance costs

168. In the eleventh progress report of the Secretary-General on the enterprise resource planning project, the Administration reported that the actual maintenance costs of Umoja for the period 2016–2019 were $79.349 million and that the projected maintenance costs for the period 2020–2030 were $513.771 million. The estimate was based on the projected budget for 2020 of $30.865 million, with further extrapolation at the rate of 8 per cent for the period 2021–2030.

169. The Board noticed that the detailed estimate of projected costs for 2020 included provision for organic growth relating to SAP licences of $1 million. However, the Board was informed that the Administration had been able to control such organic growth, and the additional budget provision for that purpose was not necessary.

170. The Board also noticed that the detailed estimate of projected maintenance costs for 2020 included $86,700 in 2020 towards additional licences resulting from the SAP audit, which was based on a budget provision of $85,000 for 2019. The Board was,

however, informed that there had been no payment towards additional licences during 2019 resulting from the SAP audit.

171. The Board noted that the inclusion of those estimates in the calculation of projected maintenance costs had resulted in an overstatement of the total cost of ownership.

172. **The Board recommends that the Administration take steps to correct the calculation and estimation errors in different components of the direct and indirect costs and accordingly revisit the amount of the total cost of ownership to be presented to the General Assembly in the next progress report.**

VII. Mainstreaming plan

173. The General Assembly, in its resolution 73/279, requested the Secretary-General to achieve the project's objectives and full implementation of the project by December 2019, and also requested the Secretary-General to provide a detailed plan for the mainstreaming of the Umoja team into the Secretariat, including measures to ensure a sustainable business model of the Umoja project, in the context of his next progress report on the enterprise resource planning project.

174. The Advisory Committee on Administrative and Budgetary Questions, in its report on the eleventh progress report on the enterprise resource planning project (A/74/7/Add.17), noted that the eleventh progress report of the Secretary-General did not provide a detailed mainstreaming plan as requested by the General Assembly, and recommended that the Assembly request the Secretary-General to include in his twelfth progress report a detailed plan for the mainstreaming of the Umoja team into the Secretariat to ensure a sustainable business model of the Umoja solution. The Assembly, in its resolution 74/263, endorsed that recommendation.

175. The Board was informed that:

(a) The Administration proposed to present the mainstreaming plan in the twelfth progress report instead of the eleventh progress report for the following reasons:

(i) The changes introduced as part of the management reform with effect from 1 January 2019 had offered new opportunities for the Umoja steady-state support model;

(ii) Both the Department of Management Strategy, Policy and Compliance and the Department of Operational Support offered institutional capacity for the steady-state functions that was worth evaluating and pursuing;

(b) The primary consideration for the mainstreaming plan would be to ensure that the core Umoja project team had the right capacity to design, build and maintain the solution and to be the de facto systems integrator. The team was expected to be "lifted and shifted" to organizational units, as appropriate;

(c) The number of regular posts proposed for mainstreaming by the end of 2020 was 72. The number of general temporary assistance posts proposed for retention by the end of 2020 was estimated to be 23. The number of contractors proposed for retention by the end of 2020 was estimated to be 25;

(d) The main organizational units into which the mainstreaming of regular posts, general temporary assistance and contractors is being considered include the following:

(i)   The Business Transformation and Accountability Division in the Department of Management Strategy, Policy and Compliance: consultation and evaluation are ongoing to adjust the existing resource base of Umoja and the Division (especially personnel), in order to gradually mainstream functions starting from 2020;

(ii)   The Office of Information and Communications Technology: evaluation is ongoing regarding the future status of support for infrastructure and hardware maintenance, and to determine whether any of the contractual or general temporary assistance resources from Umoja will need to transition to the Office or whether the current working relationship between Umoja and the Office can be preserved.

176.   The Board highlighted its opinion on the mainstreaming plan in its eighth report and continues to be of the opinion that it is important for the mainstreaming plan to be finalized and presented to the General Assembly at the earliest opportunity. The Board also continues to be of the view that the mainstreaming planning process should incorporate the aspect of bringing synergies with the already mainstreamed functions to implement a robust, nimble and effective post-mainstreamed Umoja support structure.

177.   **The Board reiterates the recommendation that the Administration prioritize the preparation and putting in motion of the Umoja mainstreaming plan. The Board also recommends that the mainstreaming plan be presented to the General Assembly in the next progress report of the Secretary-General on the enterprise resource planning project.**

178.   **The Board also reiterates the recommendations that the mainstreaming plan should identify a robust, nimble and effective post-mainstreaming Umoja support structure and cater to the needs of UE2 stabilization, production support, continuous improvements and the development of the skills necessary to carry out these responsibilities.**

VIII.   Acknowledgement

179.   The Board wishes to express its appreciation for the cooperation and assistance extended to its staff by the Under-Secretary-General for Management Strategy, Policy and Compliance and the project director, together with the members of their staff.

(*Signed*) Kay **Scheller**
President of the German Federal Court of Auditors
Chair of the Board of Auditors

(*Signed*) Rajiv **Mehrishi**
Comptroller and Auditor General of India
(Lead Auditor)

(*Signed*) Jorge **Bermúdez**
Comptroller General of the Republic of Chile

Annex

Status of implementation of recommendations up to the year ended 31 December 2018

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
1	2013	A/68/151	16	The Board recommends that the Administration design, communicate and implement a plan within each business area to exploit the defined benefits of up-to-date and consolidated data from the ERP system, including how it intends to realize both qualitative and quantitative benefits of improved information	The Umoja benefits realization plan was finalized and signed off by the Umoja project director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	Given that the benefits realization plan is yet to be presented to the Umoja Steering Committee, the recommendation is considered to be under implementation		X		
2	2013	A/68/151	26	The Board recommends that the Administration design a robust methodology which clearly defines: (a) the current status of operational performance in each business unit regarding time, cost, quality; (b) the level of future performance to be achieved post-implementation; (c) the approach and investment involved to achieve the future performance target; and (d) how the benefit achieved will be measured and reported	The Umoja benefits realization plan was finalized and signed off by the Umoja director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	Given that the benefits realization plan is yet to be presented to the Umoja Steering Committee, the recommendation is considered to be under implementation		X		
3	2016	A/71/180	Summary, 23 (c)	The Board recommends that the Administration ensure business units are supported in the application of the new methodology developed to identify and realize the benefits from improved ways of working; this should include providing access to skills and capability in operational improvement, and holding business areas to account for delivering the expected benefits	The Umoja benefits realization plan was finalized and signed off by the Umoja director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	Given that the benefits realization plan is yet to be presented to the Umoja Steering Committee, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
4	2016	A/71/180	Summary, 23 (e)	The Board recommends that the Office of Information and Communications Technology and process owners develop detailed mainstreaming plans and seek approval for the required funding at the seventy-first session of the General Assembly	Partially implemented. The Office of Information and Communications Technology has completed the mainstreaming of the IT-related components of Umoja (hardware, tier-1 support, etc.) and each business area is currently adding capacity (testing, tier-2B support, etc.). A new funding model will be presented in the twelfth progress report of the Secretary-General on the enterprise resource planning project and was already partially explained in the eleventh progress report	Given that the recommendation has been partially implemented, it is considered to be under implementation			X	
5	2017	A/72/157	42	The Board recommends that the Administration, in consultation with the users of reports, prepare a comprehensive plan for the configuration of business intelligence reporting with the objective of incorporating frequently used reports into the standard corporate reports	Since May 2019, the collection, prioritization and scoping of business intelligence and reporting requirements have been mainstreamed into the Business Transformation and Accountability Division	In view of the action taken, the recommendation is considered to have been implemented	X			
6	2017	A/72/157	71	The Board also recommends that the updated benefits realization plan, after approval by the General Assembly, be frozen to serve as the baseline for the monitoring of the future benefits realization that will arise from the use of Umoja	The Umoja benefits realization plan was finalized and signed off by the Umoja director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	Given that the benefits realization plan is yet to be presented to the Umoja Steering Committee, the recommendation is considered to be under implementation		X		
7	2017	A/72/157	80	The Board recommends that the results of the e-procurement pilot be expeditiously analysed and taken into account when implementing e-tendering for all applicable items	Fully implemented. Following the completion of internal review and approval, the Procurement Division and the Office of Legal Affairs are currently	Given that action is under way, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					finalizing terms and conditions. This is expected to be completed by mid-February 2020. This recommendation is for the Department of Operational Support to implement					
8	2018	A/73/169	38	The Board recommends that: (a) The Administration should develop an Umoja benefits realization plan, with an emphasis on improvements resulting from Umoja-based business processes and monitoring of the processes to leverage further benefits realization; (b) The Administration should maintain adequate documentation supporting the computation of quantitative figures for benefits realization; (c) The Administration should identify a coordinating division/unit as a primary process owner of benefits realization responsible for (i) monitoring the process of benefits realization, (ii) engaging stakeholders of the various units and divisions, and (iii) continuous monitoring	The Umoja benefits realization plan was finalized and signed off by the Umoja director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	Given that the benefits realization plan is yet to be presented to the Umoja Steering Committee, the recommendation is considered to be under implementation		X		
9	2018	A/73/169	57	The Board recommends that the Administration complete the clean-up exercise in time for the annual time certification exercise	The Administration stated that the recommendation had been partially implemented	Given that action is under way, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
10	2018	A/73/169	61	The Board recommends that the Administration analyse the negative balances identified by the Board for each type of leave quota and rectify the Umoja human capital management module through change request(s), as applicable	The Administration stated that the recommendation had been partially implemented	Given that action is under way, the recommendation is considered to be under implementation		X		
11	2018	A/73/169	71	The Board recommends that asset classes be reviewed to ensure that similar equipment is categorized under the same asset classes	The Administration stated that discussions were ongoing with the business regarding the impact of this change. A request for change is being drafted	Given that action is under way, the recommendation is considered to be under implementation		X		
12	2018	A/73/169	85	The Board recommends that the Administration ensure that properly documented reviews of user access provisioning are mandatorily carried out by security liaison officers with a frequency to be determined by Umoja process owners	In accordance with the terms of reference of the Umoja security liaison office, security liaison officers carry out reviews of user access. A clean-up exercise was undertaken	Separated/retired/inactive employees were found to have Umoja access. The recommendation is therefore considered to be under implementation		X		
13	2018	A/73/169	86	The Board also recommends that the Administration take measures to ensure that continuing access to Umoja by all separated and retired employees be terminated and that a policy be put in place to regulate continued access by separated employees to self-service requirements, as needed	A clean-up exercise was conducted, followed by the issuance of the security liaison officer quarterly access validation guide	There were cases in which separated and retired employees had Umoja access. The recommendation is therefore considered to be under implementation		X		
14	2018	A/73/169	94	The Board recommends that Administration ensure that only one unique user account is assigned to each staff member	The Administration requests that this recommendation be closed on the basis that a clean-up exercise was executed in which all known duplicate IDs were deactivated. After a careful review of the root cause, it was determined that Umoja can only "react" to duplicate	In view of the action taken, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					IDs through regular monitoring. After a Unite ID is created, it is sent to SAP Identity Management, at which point it is too late to prevent the generation of a duplicate ID in Umoja					
15	2018	A/73/169	95	The Board also recommends that one of the two user accounts currently assigned to some staff members be immediately deactivated	The Administration requests that this recommendation be closed on the basis that a clean-up exercise was executed in which all known duplicate IDs were deactivated. After a careful review of the root cause, it was determined that Umoja can only "react" to duplicate IDs through regular monitoring. After a Unite ID is created, it is sent to IDM, at which point it is too late to prevent the generation of a duplicate ID in Umoja	In view of the action taken, the recommendation is considered to have been implemented	X			
16	2018	A/73/169	109	The Board recommends that: (a) Umoja process owners should deprovision already assigned conflicting roles; (b) The segregation of duties rules should be automated by the Umoja process owners in the user access provisioning application; (c) A standard procedure be laid down for the periodic review of any documented conflicts overridden by appropriate business heads. The ability to override segregation of duties should be documented and controlled by means of periodic reviews	(a) A Umoja user access deprovisioning clean-up exercise has been undertaken; (b) The segregation of duties rules have been automated. Any request raised in the user access provisioning application will check for conflicts against the rules table. In case of conflict, the request can be saved only if a comment justifying the approval is entered. The comments are recorded in the request; (c) A new report is being developed that security liaison officers can use for	Given that action has been taken, the recommendations in subparagraphs (a) and (b) are considered to have been implemented. Regarding (c), given that action is under way, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					the periodic review of segregation of duties violations					
17	2018	A/73/169	117	The Board recommends that all the actionable items of the report on the disaster recovery exercise should be completed at the earliest opportunity and a repeat exercise of the updated disaster recovery plan should be conducted after hardware migration to ensure the disaster recovery preparedness of Umoja	Partially implemented. All except two of the lessons learned from the disaster recovery exercise conducted in 2017 have been implemented. The remaining two are complete but need to be finalized closer to the beginning of the actual disaster recovery exercise. The exercise will be conducted in coordination with business areas and is expected to take place in the second quarter of 2020	The recommendation is considered to be under implementation		X		
18	2018	A/73/169	150	The Board recommends that work related to the enrichment of the semantic layers of various modules should be prioritized in tandem with UE2 developments and accomplished expeditiously	All work in the Umoja project is prioritized on the basis of the UE2 deliverables. The BI semantic layer programme has been transferred to the Business Transformation and Accountability Division as part of the management reform. A new process for prioritization, development and roll-out has been established. Demonstrations can be given on the way in which visualizations and standard reports are now deployed. With regard to UE2 development, the SMA dashboard is an example of how UE2 functionality is being deployed against the new HANA semantic layer	In view of the action taken, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
19	2018	A/73/169	158	The Board recommends that the Administration prescribe a first-call resolution rate and an action plan to achieve the same within a reasonable time frame	The Administration stated that the recommendation had been partially implemented	The action recommended is yet to be taken and the recommendation is considered to be under implementation		X		
20	2018	A/73/169	164	The Board recommends that change requests pending for more than one year should be reviewed by the Change Control Board within a reasonable time frame	As part of the SAP change request management (ChaRM) migration project, under which the Change Control Board stopped using the Jira-based Change Control Board request project, all open Change Control Board requests, regardless of age, were systematically reviewed by the Umoja functional leads along with their business counterparts. On the basis of this review, ChaRM requests for change were created. The CCBREQ project has been decommissioned	In view of the action taken, the recommendation is considered to have been implemented	X			
21	2018	A/73/169	166	The Board recommends that on initial review, a priority should be attached to every change request and a likely target date for implementation should be established	With the implementation of ChaRM, the fields for "priority" and "due by" (the date by which the change should be in production) are filled in by the requestor, who is normally a functional business counterpart. In addition, the new process has a "change manager" whose responsibility, on initial review of the change request, is to ensure that the "due by" date is achievable, considering the complexity of the development and the workload of the development team, and also the priority from the business perspective. As the ChaRM project has matured	In view of the action taken, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					with the change management aspects of the implementation of the new system, the Change Control Board now also takes note of the "priority" and the "due by" date and questions the change manager when it has concerns					
22	2018	A/73/169	168	The Board recommends that operationally imperative change requests and those directly relatable to potential for benefits realization, as long as they do not impact UE2 project deliverables, should be prioritized to ensure continuous improvements to the Umoja system	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
23	2018	A/73/169	173	The Board recommends that the Umoja transition plan for mainstreaming should continue to factor in the potential impact of the Secretary-General's reforms, the timelines of UE2 deployment and the requirements for continuous improvements in various modules	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
24	2019	A/74/153	20	The Board recommends that the governance committees stay engaged with project developments, regularly review and monitor the key issues related to project implementation and play a proactive leadership role in steering the project to its completion	Fully implemented	Given that a similar issue continued to be noticed, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
25	2019	A/74/153	28	The Board recommends that the Administration prepare project plans clearly defining individual tasks, their interdependencies, critical path and detailed task-wise time schedule and monitor them for assistance in the completion of projects in accordance with the schedule	Fully implemented	Given that a similar issue continued to be noticed, the recommendation is considered to be under implementation		X		
26	2019	A/74/153	50	The Board recommends that the Administration continuously review the risks to achieving the full deployment of Umoja (process-wise, application functionality-wise, entity-wise and their envisaged integration) by 31 December 2019 and implement appropriate mitigation strategies	No reply received	Given that the project was not completed by 31 December 2019 and the General Assembly extended the completion time to 31 December 2020, and given that similar issues were noticed during the present audit, the recommendation is considered to be under implementation		X		
27	2019	A/74/153	51	The Board recommends that the Administration take steps to assess the impact (including financial impact) of interfaces to be integrated with Umoja	Said impact has been assessed for the 21 live non-SAP systems interfaced with Umoja. SAP confirms, in accordance with the annual licence audit, that Umoja does not violate any licence agreement. Each interface has been individually assessed and licensing impact was thus stipulated as being covered with existing licences	The assessment is yet to be completed, as highlighted in the present report. The recommendation is considered to be under implementation		X		
28	2019	A/74/153	52	The Board recommends that the Administration review the identified business readiness gaps and take steps to address these gaps in a timely manner	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
29	2019	A/74/153	53	The Board recommends that the Administration identify risks associated with the installation of IBP in the cloud with respect to data, hosting and legal jurisdiction for applicable laws, as a priority, complete the ongoing negotiations and take the required action in a timely manner to deploy SCM according to the scheduled timeline	Fully implemented	In view of the action taken, the recommendation is considered to have been implemented	X			
30	2019	A/74/153	68	The Board recommends that the Administration take suitable steps to fill the vacant positions early and provide appropriate training to the new recruits to help to address the complexities of project implementation	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
31	2019	A/74/153	69	The Board recommends that the Administration continue to provide the levels of capacity-building support to the project team personnel required to achieve the objective of reducing dependency on consultants, to the extent possible	The Umoja project is confident that its multi-year strategic plan will continue to successfully advance towards achieving the goal of an end-state organization, as mandated by the General Assembly: a team with optimal autonomous capacity and a sustainable cost structure. The financial outcome of the autonomous capacity and sustainable cost structure is reflected in the significant reduction in expenditure compared with 2015–2016, while the UE2 subprojects are still being deployed. In 2019, the expenditure trend was progressing downwards as planned, with contractual	Given that there are important positions vacant in the project team, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					expenditure continuing its progressive reduction. For 2020, the project continues with its multi-tiered plans to allow a further drawdown as in 2017–2019, with contractual expenditure being reduced further					
32	2019	A/74/153	70	The Board recommends that the Administration plan and schedule the training to optimize the available time of the project team and plan for the separation of roles delineated for tier-3 production support and roles for future deployment, in order to ease the pressure on the available resources	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
33	2019	A/74/153	81	The Board recommends that the Administration review the business requirement for raising invoices through the file upload process, restrict the types of accounts payable and limit the number of users under this process to ensure that the full benefits of the Umoja three-way matching functionality are realized	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
34	2019	A/74/153	82	The Board recommends that the Administration automate the execution of the main payment proposal in Umoja and minimize the exceptions for which the execution of an ad hoc payment proposal may be required	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
35	2019	A/74/153	83	The Board recommends that the Administration review the master data for banking details to identify and correct cases, where necessary, of multiple vendors associated with the same bank account	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
36	2019	A/74/153	84	The Board recommends that the Administration take measures to minimize the manual interventions in the Umoja-SWIFT interface to ensure the seamless transfer of structured message formats	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
37	2019	A/74/153	112	The Board recommends that the Administration leverage the improved capability to deliver enriched business intelligence reports, which are able to combine data across functional pillars and applications	The BI semantic layer programme has been transferred to the Business Transformation and Accountability Division as part of the management reform. A new process for prioritization, development and roll-out has been established. Demonstrations can be given on the way in which visualizations and standard reports are now deployed	In view of the action taken, the recommendation is considered to have been implemented	X			
38	2019	A/74/153	113	The Board recommends that the Administration define and adopt target timelines for processes that have stabilized to achieve first-call resolution and for the overall first-call resolution rate for incidents and requests for services	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
39	2019	A/74/153	114	The Board recommends that the Administration identify critical transactions not included under the continuous improvements monitoring programme and implement appropriate measures to monitor their performance	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
40	2019	A/74/153	115	The Board recommends that the Administration prepare a plan to converge all training material on one common platform. The Board also recommends that the Administration prepare and deploy a comprehensive training plan and material for ensuing UE2 functionalities	The Administration stated that the recommendation had been partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
41	2019	A/74/153	121	The Board recommends that Umoja benefits realization plan be finalized as a priority and that the division responsible commence work on the measurement of benefits realization for all project phases that have been implemented	The Umoja benefits realization plan was finalized and signed off by the Umoja project director in 2019 and shared with the Business Transformation and Accountability Division in January 2020	The action is pending, given that work on benefits realization is yet to be commenced by the Business Transformation and Accountability Division. The recommendation is considered to be under implementation		X		
42	2019	A/74/153	144	The Board recommends that estimates for indirect costs need to be reassessed by considering a uniform standard cost across all process owners, avoiding computational errors and considering the right baseline for continuous improvements	All costs were standardized in the indirect cost calculations, as presented in the eleventh progress report on the enterprise resource planning project. Owing to an oversight, there was an error in a single cell in a Microsoft Excel sheet, which has been corrected and will be reflected as such in the twelfth progress report	The action is yet to be completed, as indicated by the errors noted in the present report. The recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2020)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
43	2019	A/74/153	145	The Board recommends that the Administration work out and include training costs for the period 2019–2030 in the total costs of ownership	The training costs for the period 2019–2030 were presented in the eleventh progress report on the enterprise resource planning project. Furthermore, the training costs are being revised in accordance with the audit observation on training	The action is yet to be completed, as indicated by the errors noted in the present report. The recommendation is considered to be under implementation		X		
44	2019	A/74/153	146	The Board recommends that the Administration prepare a comprehensive estimate of maintenance costs covering all object heads of expenditure for the period up to 2030 to present a full picture of total cost of ownership to the General Assembly	The maintenance costs for the period 2020–2030 were derived from a detailed estimate of costs for 2020 followed by extrapolation based on an expected growth rate of 8 per cent	The action is yet to be completed, as indicated by the errors noted in the present report. The recommendation is considered to be under implementation		X		
45	2019	A/74/153	156	The Board recommends that the Administration prioritize the preparation and putting in motion of the Umoja mainstreaming plan. The Board also recommends that the plan should identify a robust, nimble and effective post-mainstreaming Umoja support structure and cater to the needs of UE2 stabilization, production support, continuous improvements and the development of the skills necessary to carry out these responsibilities	Partially implemented	Given that the Administration has stated that the recommendation is partially implemented, it is considered to be under implementation		X		
Total							**8**	**37**		
Percentage							**18**	**82**		