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**Financial reports and audited financial statements,
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Eighth 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 24 July 2019 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).

* [A/74/150](#).



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Letter of transmittal

Letter dated 24 July 2019 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 eighth 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

Eighth 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](#) and [A/73/169](#)), 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 2019. The current approved budget for the project up to the end of 2019 was \$543.7 million, and the total expenditure up to 31 December 2018 was \$490.6 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 2019. 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 eighth annual review of progress of the implementation of Umoja. The report covers mainly progress in this deployment of functionalities, the scheduled deployment of the remaining functionalities, the status and operation of the deployed functionalities, the mainstreaming of the Umoja solution and the costs and

benefits of Umoja. In addition, the present report contains the results of the IT audit of some significant application controls in the area of payment processing.

Key findings

Project governance

6. The Board noted that, in 2018, the Management Committee had been provided an update on Umoja on two occasions (May and July 2018) and that the Steering Committee met only on three occasions (April, July and August 2018). 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 were noticed in the utilization of the project management tool. Project plans were not prepared with clear task-wise timelines after the identification of sequential dependency of tasks. The critical path of project implementation was also not defined. The project plans only indicated target dates for the achievement of milestones, and the project was implemented on a best effort basis with reference to those milestones. This adversely affected the monitoring of project progress. 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 2018, consisted of six projects. The process-wise, functionality-wise and entity-wise coverage of scope achieved as part of the deployment under UE2 during 2018 was limited, resulting in a significant quantum of work remaining to be implemented. The Board noted that the deployment of 17 processes of UE2 was complete by December 2018. In addition, the deployment of 53 processes was in progress, whereas deployment of 32 was not started. The Board also noted that, for the completion of the project and the achievement of its intended objectives, all the functionalities need to be completed and appropriately integrated. The Board is of the view that, taking into consideration the quantum of work, which was yet to be implemented, there is a material risk that the full implementation of UE2 will not be achieved by the end of 2019.

Risk assessment and mitigation

9. The Secretary-General, in his tenth progress report on the enterprise resource planning project ([A/73/389](#)), identified various risks and their mitigation measures for the UE2 phase of the project. In addition, an independent consultant engaged by the Secretariat highlighted risks relating to business readiness for the implementation of the UE2 phase. The Administration informed the Board that various measures were being put in place to mitigate those risks. The Board noted that there were potential additional risk factors affecting the implementation of Umoja, which included mainly a lack of finalization of a clear mainstreaming plan, vacancies in the Umoja project team and risks relating to a change in SAP licensing terms in case of charges for indirect data access by third-party applications.

Application controls and data quality issues

10. The functionality for processing vendor payments has been deployed as a part of the Foundation and UE1 phases of the Umoja project. The Office of Internal Oversight Services (OIOS) had earlier carried out an audit of vendor payment processing at Headquarters and highlighted the need for strengthening controls at various stages of payment processing. The Board noted that many of the concerns highlighted in the OIOS report persist. The Board also noted some significant issues regarding the implementation of this functionality.

11. The Board noticed gaps in application controls over invoices with the system allowing users to disable the three-way matching process while creating a purchase order, defeating the purpose of ensuring that there was a clear trail from the procurement of goods/service to their delivery and the raising of the invoice. The system allowed invoices to be raised through a file upload process, which did not have application controls to carry out the three-way matching process. Application control for detecting duplicate invoices, being an optional check, was not exercised for all vendors. Moreover, the Board could not find the audit trail for modifications in the baseline date and payment terms.

12. Weaknesses in application controls over vendor payments included the non-automation of the execution of daily payment proposals, the lack of a bank balance sufficiency check within the system and the non-review of role provisioning for users having access to execute payment runs.

13. The issues in the maintenance of master data included the existence of multiple vendors against the same bank account, including staff and commercial vendors sharing the same bank account number and weaknesses in the system of updating the email details of vendors.

Status of support functionalities for Umoja

14. While the upgrade of the database to SAP HANA (High Performance Analytic Appliance) and integration between SAP BW (Business Warehouse) and SAP HANA were achieved, the capability of the new semantic layers in HANA to combine analytical models from different SAP products and across pillars to create more complex visualizations and business intelligence reports has not yet been leveraged. Management dashboards for the visualization of data across functional pillars were at the design/development phases and not deployed. Furthermore, business intelligence reports for two UE2 projects were under development, and work had not commenced for developing business intelligence reports for the remaining UE2 projects.

15. The Board noticed that first-call resolution rates for service requests increased slightly during 2018, whereas the rate declined marginally for incidents. In addition, no metrics/targets had been adopted for the period to achieve first-call resolution and for the overall first-call resolution rate. The Board also noted that the deployment of new functionalities under UE2 projects is likely to result in increased challenges for the development of support capabilities at the first two tiers for the new UE2 functionalities, with a likely increase in incidents and requests for service during 2019, necessitating a strategy to equip the first two tiers of production support.

16. The Board noted that the conversion and migration of existing training material on Umoja Foundation and UE1 from Inspira to the new iLearn Umoja platform was yet to be undertaken. In addition, of the six UE2 projects, the training courses covered three: budgeting, fundraising and donor relationship management and SCM. Training materials in respect of the remaining three UE2 projects were yet to be made available on the iLearn platform. The Board is of the view that, taking into consideration the scheduled deployment of all UE2 projects by the end of 2019, it would be important

to plan and implement a robust training plan and comprehensive training material to aid business readiness.

Umoja business case

17. The estimates for benefits realization were not updated during 2018. The benefits realization plan was under preparation, and the organizational unit designated to monitor the realization of benefits was yet to commence its work.

18. The Secretary-General, in his tenth progress report on the enterprise resource planning project, estimated a direct cost of \$543,741,600, which was at the same level as reported in his ninth progress report. The Board noted that there were significant risks to the completion of UE2 by the scheduled date of December 2019, which may result in a need to review the estimations of direct costs. Moreover, an intended change in assumptions regarding mainstreaming may have an impact on project costs.

19. The Secretary-General, in his tenth progress report on the enterprise resource planning project, estimated an indirect cost at \$127,034,077, including the cost of personnel associated with Umoja deployments for the period 2013–2018. In addition, indirect costs estimated for 2019–2023 were estimated at \$19,000,000. The Board noticed issues in the calculation of indirect costs, including different post-related standard costs used for the computation of indirect costs and for the computation of direct costs for posts at the same level, inconsistencies in the application of standard costs by different process owners and some computational errors.

20. The Secretary-General, in his tenth progress report on the enterprise resource planning project, also estimated training costs for the period 2013–2018 at \$77,849,752. The Board noticed that training costs from 2019 onwards had not been included in the total cost of ownership calculation.

21. The Secretary-General, in his tenth progress report on the enterprise resource planning project, estimated maintenance cost for the period 2016–2019 at \$118,600,000 and \$528,000,000 for 2020–2030. The Board noticed that maintenance costs for the period 2016–2019 had been calculated on the basis of estimates for maintenance costs for those four years and that those estimates had not been revised to capture actual maintenance costs incurred during 2016–2018. Furthermore, given that the Administration was considering a review of the mainstreaming plan, the estimates for 2020–2030 would also need to be reviewed, in view of changes in the assumptions underlying the calculations.

Mainstreaming plan

22. 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, in the context of his next progress report on the enterprise resource planning project. The Administration reported that it would propose a mainstreaming plan that would include a “lift and shift” of the entire project team, most of its general temporary assistance personnel and a limited number of contractors to an entity that is most appropriately placed to manage that team. The Board noted that the current scheduled date for the implementation of all UE2 projects is 31 December 2019 and is of the view that it is important for the mainstreaming plan to be finalized at the earliest. The plan should incorporate provisions to cater to important requirements of continuous production support, continuous improvements in the enterprise resource planning solution, developing requisite capacity and skills to carry out these activities in the post-mainstreaming organizational units and support for Umoja stabilization for UE2 solutions. The Board is also 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.

Overall conclusion

23. Umoja is 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 UE2 functionality has the potential to contribute further quantitative and qualitative benefits to the Organization. The Board noted the efforts of the Administration to deploy the UE2 functionalities in a challenging technical landscape in the face of competing demands on resources for enabling the implementation of the Secretary-General's reforms and continuous improvements. The Board also noted that the project was working within the approved budget during the year 2018 and making efforts to build the capacity within the project team to minimize the need for dependency on outside consultants.

24. The Board, however, notes that the Administration needs to take further steps to mitigate the risks to the implementation of the project in accordance with the schedule and needs to address identified gaps in the business readiness for UE2. In order for the benefits of Umoja to be fully realized, it is important to develop and operationalize the intralinkages and interlinkages among the existing and upcoming functionalities. 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 of Umoja Foundation and UE1.

25. The Administration should also take steps for the timely implementation of the benefits realization plan and for reviewing the calculations of various elements of the total cost of ownership to enable Member States to draw assurances from the total costs and the benefits being derived from the investment made in the project.

Recommendations

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

(a) **The governance committees should 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;**

(b) **The Administration should prepare project plans clearly defining individual tasks, their interdependencies, critical path and detailed task-wise time schedule and monitor them for assisting project completion in accordance with the schedule;**

(c) **The Administration should 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;**

(d) **The Administration should take steps to assess the impact, including the financial impact, of interfaces to be integrated with Umoja;**

(e) **The Administration should review the business requirement for raising invoices through the file upload process, restrict the types of accounts payable**

that can be raised and limit the number of users who can use this process to ensure that the full benefits of the Umoja three-way matching functionality are realized;

(f) The Administration should automate the execution of the main payment proposal in Umoja, minimize the exceptions for which the execution of ad hoc payment proposals may be required and review the master data for banking details to identify and correct cases, where necessary, of multiple vendors associated with the same bank account;

(g) The Administration should leverage the improved capability to deliver enriched business intelligence reports, which can combine data across functional pillars and applications;

(h) The Administration should define and adopt target timelines for processes that have stabilized to achieve first-call resolution for incidents and requests for services;

(i) The Administration should prepare a plan to converge all training material on one common platform and prepare and deploy a comprehensive training plan and material for ensuing UE2 functionalities;

(j) The Administration should finalize a plan for Umoja benefits realization as a priority and the division responsible should commence work on the measurement of benefits realization for all project phases that have been implemented;

(k) The Administration should reassess the estimates for indirect costs by considering a uniform standard cost across all process owners, avoiding computational errors and considering a correct baseline for continuous improvements;

(l) The Administration should prioritize the preparation and putting in motion of the Umoja mainstreaming plan. The plan should identify a robust, nimble and effective post-mainstreaming Umoja support structure and cater to the needs for UE2 stabilization, production support, continuous improvements and the development of the skills necessary to carry out these responsibilities.

Follow-up of previous recommendations

27. Of the 31 pending recommendations from the Board's previous reports, 8 (26 per cent) have been fully implemented and 23 (74 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 2018 was \$516.7 million. As at 31 December 2018, the Administration had spent \$490.6 million. The General Assembly, in its resolution [73/279](#), requested the Administration to complete the full implementation of the Umoja project by the end of 2019.

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 2019.

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 seven 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 that Umoja stabilization may 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. The present progress report covers project governance, management and monitoring; the deployment of UE2 functionalities and the status and functioning of deployed functionalities; the reorganization of the project team and the mainstreaming of Umoja; and the estimation of the costs and benefits of the Umoja solution.

II. Project governance and management

A. Project governance

14. 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.

15. The Board noted that 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. 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 team, headed by the project director, was responsible for the day-to-day management of the project.

16. The Board noticed that the Management Committee had been provided an update on Umoja on only two occasions in 2018, in May and July. The Steering Committee, which had expected to meet on a monthly basis, met only on three occasions in 2018, in April, July and August. The Board noted that the governance committees did not meet to discuss the implementation of Umoja after August 2018, although all the scheduled UE2 deployments for 2018 were planned for September 2018 onwards. The Board also noted that the updates presented to the governance committees did not have details of scheduled timelines of and dependencies among project activities, which could have assisted the governance committees in addressing specific constraints/bottlenecks.

17. 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). Those reforms brought in large-scale structural and functional changes, in particular in Headquarters departments and Umoja, given that the enterprise resource planning system had a

significant role in implementing those changes. At the same time, there were multiple planned parallel deployments of UE2, involving the same set of business process owners, affected by the Secretary-General's reforms. 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.

18. The Administration stated that scheduling conflicts for key principals had made it very difficult to schedule meetings, and meetings have not been called to resolve any conflicts because they had been pre-empted in preparatory meetings and in the meetings of process owners occasionally called by the project director. At the working level, the project management office held regular project status meetings with the project managers and process owner representatives/business readiness managers to monitor progress, identify/mitigate risks and resolve issues for ongoing support and new projects. The deployment team also had held regular meetings with the focal points from all the entities throughout the Secretariat to communicate and keep them abreast of the project status and deployment activities. The Administration also stated that the Steering Committee and the Management Committee would be actively engaged to support and manage project implementation, given that successful completion would require the executive sponsorship and support of both governance committees.

19. The Board, while appreciating the efforts made by the Umoja project team at various levels, 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.

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.

21. The Administration, while accepting the recommendation, stated that the leadership had demonstrated effectiveness by the level of accomplishments achieved during 2018, including the synergy with various reform streams, notwithstanding a reduced number of formal meetings held during the period.

B. Project planning and monitoring

22. The General Assembly, in its resolutions [72/262](#) and [73/279](#), reiterated the need for strict project planning and management in order to ensure that Umoja remains on track without further disruption and delay. In addition, 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.

23. The Board noticed that the 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 waterfall¹ and agile² methodologies, depending on the nature of the project under implementation. It also stated that weekly meetings

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.

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.

24. The Board noticed the following shortcomings in the utilization of the project management tool:

(a) Inter-task dependencies in projects were not appropriately defined. Some tasks indicated a scheduling conflict because they were without reference to the details of dependent predecessor and successor tasks and their effect on individual tasks in the project. This needed resolution;

(b) With the weaknesses in defining inter-task dependencies, the critical path for the project also remained unidentified, which led to difficulties in estimating the overall time requirement for the projects;

(c) The documents for 2018 did not indicate a clear timeline by which the entire project was scheduled to be completed, given that they did not list the remaining tasks required to achieve full implementation of the UE2 project and the estimates of task-wise time required for completion;

(d) Dependencies among the design, build and test phases of software development had not been reflected in the planning tool, which resulted in the tool reflecting a sequencing of those phases that was not feasible;

(e) The provisions of the project planning tool for estimating resource costs and quantum of allocation of work to personnel were not utilized. There were various project tasks, which had not been allocated to any personnel;

(f) A risk register was maintained to recognize and record risk factors, which required mitigation measures to be adopted, and to escalate material risks to appropriate senior management levels and governance committees. The risk register, however, was not updated at periodic intervals during the second half of 2018.

25. The Board also 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 path of tasks and comparisons with the actual dates of completion of tasks.

26. The Administration stated that the project had managed its timelines and costs remarkably since mid-2016 to date. Notwithstanding the aggressive schedules, the breadth of functionality, the technical complexities of multiple solutions and a concurrent downsizing and reorganization of resources, the project has been under budget and on time to date. The adaptation of conventional project management tools and the utilization of milestone delivery targets have proven to be an effective means for managing both the timelines and the costs of the project. The conscious decision to selectively use some of the functionality available in conventional project management tools, complemented by alternative project management methods such as milestone management, has resulted in effective and controlled project management without the heavy resource demands required by strictly using conventional tools

27. The Board recognizes the challenging environment faced by the project and its complexities and notes the progress made. The Board, however, is of the view that, in a scenario in which the Administration itself is pointing out challenges in aggressive scheduling, breadth of functionality and technical complexities of multiple

solutions, putting in place a robust and comprehensive project planning and monitoring mechanism is important.

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.**

C. Umoja Extension 2 deployment

29. The Secretary-General, in his ninth progress report on the enterprise resource planning project (A/72/397) had 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) had indicated progress made under individual solutions and had revised the deployment schedule, with all UE2 solutions scheduled to be deployed by December 2019. The Board noted that the General Assembly, in its resolution 73/279, had requested the Secretary-General to achieve the project's objectives and complete its implementation by December 2019. Table 1 indicates the shift in deployment schedule of the UE2 solutions.

Table 1
Schedule of deployment of functionalities under Umoja Extension 2

<i>Umoja Extension 2 solution</i>	<i>Scheduled deployment (ninth progress report of the Secretary-General on the enterprise resource planning project)</i>	<i>Scheduled deployment (tenth progress report of the Secretary-General on the enterprise resource planning project)</i>
<i>Strategic planning, budget formulation and performance management</i>		
Strategic planning and budget formulation	September 2018	Starting from September 2018 From the second quarter of 2019
Performance management		
<i>Supply chain management</i>		
Software development	End of 2018	Full deployment to last through the end of 2019
Phased implementation	2018 and 2019	
Force management ^a	December 2018	
Fundraising and donor relationship management	September 2018	Starting from September 2018
Implementing partner management	September 2018	Deployment of first release in December 2018
Conference and event management	December 2018	Fourth quarter of 2018
Reimbursements and payments to troop- and police-contributing countries	December 2018	Deployment in modules starting from December 2018

^a Force management was considered a separate project in the ninth progress report of the Secretary-General and was merged with the supply chain management (SCM) project in his tenth progress report.

Status of Umoja Extension 2 solutions

30. The Board examined the implementation of the six UE2 solutions. Those solutions, targeted towards key processes and activities of the Secretariat and associated entities, comprised multiple processes. The status of implementation of these processes as of December 2018 is presented in table 2.

Table 2

Status of Umoja Extension 2 processes

<i>Umoja Extension 2 project</i>	<i>Processes</i>	<i>Completed</i>	<i>In progress</i>	<i>Yet to Start</i>	<i>Functionality entity coverage</i>
Strategic planning, budget formulation and performance management	24	4	16	4	Partial
Supply chain management	30	11	3	16	Partial
Implementing partners	10	–	10	–	Partial
Fundraising and donor relationships	17	2	8	7	Partial
Reimbursements and payments to troop- and police-contributing countries	5	–	5	–	Partial
Conference and events management	16	–	11	5	Partial

31. Those solutions and the key processes pending development and deployment are briefly summarized below.

Strategic planning, budget formulation and performance management

32. 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 (PPM). The Board noticed that SMA and BPC had been partially developed and deployed. The initial deployment of PPM had been planned for the first quarter of 2019, with further deployment considered for the fourth quarter of 2019. The processes pending deployment include core processes relating to budget formulation, programme execution and performance, project management and strategic management. In addition, performance dashboards for the visualization of aggregated data across entities from SMA, BPC and the enterprise core component (ECC) were under development and planned for subsequent deployment. The Administration stated that, in view of the rigid submission timelines as set by the legislative bodies and in order to prepare for the budgeting process, in which the use of SMA and BPC is mandatory, those two had been prioritized over PPM.

Supply chain management

33. 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 sub-project 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 service named integrated business planning (IBP) to meet the needs of the demand planning and supply network planning sub-project. The Board noticed that TM and EM were partially developed and deployed, while the contract for IBP remained under

negotiation in February 2019, when the audit was carried out. The processes pending deployment include core processes relating to transportation management and track-and-trace functionalities, demand planning and supply network planning and low value acquisitions through purchasing cards. The Administration stated that the TM-EM plan had been baselined following the conclusion of a technical assessment and functional fit-gap assessments undertaken in the fourth quarter of 2017 and the first quarter of 2018.

34. The Administration reported that core transportation management and track-and-trace processes were delivered through release 1 functionality, including fully enabling the track-and-trace functionalities. Release 2 is scheduled for 2019 to further enrich functionality and increase the scope of deployment of the project.

Implementing partners

35. This project is intended to cover the life cycle of use of implementing partners and to enhance interaction with the grantees by providing them a portal and tools to request funds from the Secretariat, record the progress of the implementation of projects and submit performance details. The deployment had two distinct functionalities to be implemented in phases: the full life cycle of managing the implementing partner agreement until closure, including all payments, and reporting in the first phase, and the application, assessment and selection of implementing partners in the second phase. The first phase was intended to replace the existing implementing partner component of the Umoja grants management functionality deployed in the Foundation phase. The solution architecture for this project included a SAP product: grantor management (GM), for life cycle management of the implementing partner. The Board noted that GM had been partially developed and deployed. The processes pending deployment included the maintenance of the classification of grantee profiles, automated filtering to support the assessment of applications and the selection of grantee, evaluation and performance monitoring of grantees and improvements in the closure of the grantee agreement. The Administration stated that the objective to deploy functionality for the first deployment as a minimum viable product had been achieved and that the second phase would address the remaining requirements that were not fully mature and harmonized, given that the Organization seeks to incrementally introduce those changes.

Fundraising and donor relationship

36. This project will provide the functionality to register and maintain donor profiles and interact with donors throughout the life cycle, from the appeal for funds to the signing of the grant agreement. The solution architecture for this project included a Siebel-based³ customer relationship management (CRM) module. The Board noticed that the solution had been partially developed and deployed. The processes pending deployment included core processes relating to the maintenance of donor profiles, the recording of responses from donors to donor programmes, the creation of donor-specific contribution proposals, the matching of donor contributions to the utilization of the grants created, performance reporting to donors, the creation and launch of donor appeals and the formulation and signing of agreements with donors. The Administration stated that the initial deployment had focused on the need to standardize the fundraising processes in the Secretariat.

Reimbursements and payments to troop- and police-contributing countries

37. This project covers processes to determine the force requirements in the form of Statement of Unit Requirements planning documents prepared by military and

³ Siebel is a software solution provider.

police planners; draft the memorandums of understanding; perform the arrival inspection and routine verification of contingent-owned equipment; report on troop strength; process claims relating to contingent-owned equipment; process personnel payments; 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. The Board noticed that the new module for creating standard annex templates and Statement of Unit Requirement had been deployed. The modules, however, needed to replace the government claims management system and the two Microsoft Access-based databases have not yet been deployed. All five processes of the project were in progress. The Administration stated that the scope for 2018 focused on enhancements to existing inspection and verification report modules and the new SUR module, given that these are prerequisites for the introduction of additional functionality with the modules for memorandum of understanding management and contingent-owned equipment calculations, claims and payments scheduled for deployment during 2019.

Conference and event management

38. The 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. The Administration reported that this software was already in use at most Secretariat entities in Geneva and many other Secretariat and non-Secretariat entities globally. This solution was intended to be deployed at other entities during 2019. In order to enable the raising of requests to book conference rooms online, a web portal named One-Stop Shop had been deployed during 2018 at Headquarters, with planned deployment at other entities during 2019. Against the requests received from this web portal, conference rooms are allotted using an existing software named e-Meets. One-Stop Shop and e-Meets together have been named g-Meets. The deployment of five processes had not yet commenced. The processes pending deployment included event planning, room reservation, resource allocation, document services and planning for non-calendar conferences.

39. The above summarization indicated that most processes are presently under implementation, with a few processes yet to commence. In addition, deployment to date has been limited to a few entities.

Inter- and intra-solution linkages

40. 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 can be achieved only after the deployment of PPM. The Board also noticed that the process required for the integration of BPC with the existing ECC is yet to be deployed. Furthermore, the budget formulation functionality of this project is expected to integrate with supply chain demand planning and forecasting, and the strategic planning and performance management functionalities are to integrate with fundraising and donor relationship (FDR) and the implementing partners projects. These linkages are yet to be established. The Administration reported that integration among SMA, BPC and the existing Umoja solution was under way and that interfaces of ECC master data and exchange rates had been

deployed. Furthermore, programmatic dashboards for the visualization of aggregated data across entities from SMA, BPC and ECC were under development and scheduled for subsequent deployment;

(b) With regard to SCM, TM, EM, and IBP were to be integrated with one another and 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 to be delivered through IBP is expected to be integrated 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. 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;

(e) With regard to reimbursements and payments to troop- and police-contributing countries (RAPS), it was important to have it integrated among the various Siebel-based modules and the Umoja solution. Given that three of the Siebel-based modules were yet to be deployed, such integration was yet not achieved. The first quarterly payment through the yet-to-be-developed external interfaces between Siebel and Umoja was scheduled for the second quarter of 2019;

(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. The Administration reported that related discussions for the reimbursement of funded participants had begun.

41. The Board was informed that those integration opportunities were identified by the Administration and are not part of the normal scope of an enterprise resource planning system. Taking note of that information, the Board is of the opinion that, for the completion of the project and the achievement of its intended objectives, all the functionalities need to be completed and appropriately integrated. Given the inter-project linkages, the objective realization of this project is contingent upon the completion of and integration with other relevant UE2 projects.

D. Risk management

Risks to completion arising from the present status of the project

42. In the context of the present deployment status of UE2, the Board noted 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. Some of the significant outstanding activities include the following:

- (a) Coverage of business processes that are not currently deployed at all;
- (b) Coverage of applications that do not have the intended functionalities, for example, the lack of programmatic dashboards with a drill-down feature from strategy to granular goals in SMA under the SPPM project;
- (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.

43. The Board noted that, given the status of UE2 processes as at 31 December 2018, quantum of work remaining to be completed for achieving the full functionalities intended and seamless deployment in all entities, there is a material risk that the implementation of the full scope (process-wise, application functionality-wise and entity-wise) of Umoja may not be achieved by 31 December 2019.

44. Furthermore, with regard to the Siebel-based solutions for RAPS and FDR, the Administration itself has identified the risk of further delay because of the mandatory upgrade of the Siebel platform during 2019, during which time no development or integration can be carried out. The Administration reported that such an upgrade may take up to six months to complete.

45. The Administration accepted the observations on the status of the UE2 projects.

Risk assessment, mitigation strategies and emerging risks

46. 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.

47. The Secretary-General, in his tenth progress report on the enterprise resource planning project, identified the following risk factors and possible mitigation measures for the UE2 phase of the project:

- (a) Coverage, in terms of volume, scope, functions in interdependent work streams and many users who would not have used Umoja earlier, necessitated an effective change management programme, including training and post-deployment support;

- (b) The Secretariat was the only SAP customer for some of the UE2 solutions, increasing implementation risks. The project would attempt to mitigate those risks through a combination of proofs of concept, extensive testing in close collaboration with the software vendor and a phased implementation;

- (c) Process owners were under pressure to support UE2 development and deployment concurrently with a demand for continuous improvements in and support for functionality already deployed. The Board noticed that an average annual expenditure of \$18.74 million was estimated by the relevant process owners out of their budgets for this purpose during 2017–2018;

- (d) UE2 significantly increases the technical complexity of Umoja because of the addition of several new SAP products to the Umoja architecture, expanding the scope of non-SAP products, increasing the complexity of integration and the diversity of user interfaces and accessing Umoja in different ways by different user groups on the basis of functionality. The Administration stated that, in order to mitigate the associated risks, the project had invested heavily in training its staff on the new products, added temporary capacity by hiring contractors, conducted multiple expert

reviews of the entire architecture of Umoja and upgraded some of the SAP software to improve integration. It also stated that investment in training had obviated the need for a system integrator for UE2 solutions;

(e) UE2 solutions are being developed concurrently to meet aggressive timelines. Many must be integrated for end-to-end process automation. For example, fundraising needs strategic planning and budget formulation to build the substantive content for appeals, event management for managing campaigns and financial accounting and grants management for recording the contribution agreements. Managing interdependencies requires interim approaches to integration. The Board noted that the work towards the required integration was yet to begin;

(f) Ongoing negotiations with the software vendor presented risks relating to the timely deployment of SCM software. The Board noted that, as of February 2019, the status of some negotiations was fluid and the implementation plan for IBP and related products for demand planning (DP) and supply network planning (SNP) functionalities were likely to be significantly affected. The Board noted that the IBP and related products were to be installed in the cloud, which was to be integrated with ECC-suppliers relations module (SRM) to achieve the intended functionalities for DP and SNP.

48. The Secretariat had engaged the services of an independent consultant to evaluate the risks associated with business readiness for the implementation of the UE2 phase, which submitted its report in August 2018. The risks identified in that study included the absence of a formal change management document, a suboptimal communications strategy, a lack of consistency of the organizational alignment, insufficient training, a lack of consistency in the executive leadership's vision and resistance from stakeholders to the adoption of new business processes. The Administration reported that the action being taken to mitigate these risks include updating UE2 communication and branding to focus on the benefits of Umoja and linking the message to the reform agenda and modernization of the United Nations, a focus on functionality critical to the reform agenda, the establishment of the new Business Transformation and Accountability Division to gradually take on the leadership of various aspects of UE2 projects, the mobilization of mid-level business managers as pioneers for transformational change by the creation of extended business teams, the augmentation of training plans and the updating of resource requirements.

49. The Board noted that there was a need for a detailed roll-out plan covering these identified risks to ensure that the Organization was ready for significant business transformation through Umoja. The Board also noted that there were additional risk factors, as detailed below, affecting the implementation of Umoja, which should also be considered for mitigation:

(a) It is being contemplated that the upgrading of ECC will be implemented after the period 2019–2020. A deferred upgrade of ECC carries the risk of the need for additional work to customize forms, reports, interfaces, conversions, enhancements and workflows with other SAP applications and with non-SAP systems. The Administration stated that the upgrade of ECC was deferred after a careful review of its potential impact. The upgrade was not previously doable because it would have diverted attention and important resources away from UE2 development initiatives and would therefore have affected the timely implementation of UE2, as mandated by the General Assembly. The decision to defer was in consideration of the fact that the deferral would not result in significant additional work if done after the deployment of UE2 solutions, given that most UE2 development is not in ECC. The upgrade is also expected to be more beneficial as a post-implementation initiative after development has stabilized;

(b) The Board was informed that the mainstreaming plan of Umoja is yet to be finalized. The absence of a clear, comprehensive and time-bound mainstreaming plan may affect the smooth transition of Umoja from project mode to operational mode and may also affect the effectiveness of the delivery of post-migration development, stabilization and continuous improvement support;

(c) The Board noticed that there were a number of vacancies in the Umoja project team. The availability of the skills required for the project team, especially in the areas of CRM, GM, travel-finance integration and BPC planning, as well as having PPM specialists, was a risk to the project. The Board was informed that the Administration had opted to mitigate that risk by training its existing staff to meet the skills gap, carrying out reprofiled recruitment and retaining consultants to complement the staff;

(d) Umoja interfaces with many other non-SAP systems. Apart from the risks relating to the integration of these systems, a change in SAP licensing terms to specify charges for indirect data access by third-party applications (non-SAP) may pose significant financial risks. There were 21 non-SAP systems integrated with Umoja, and the planning and implementation of 25 interfaces was under way. SAP has clarified that static read data will now be included in a customer's underlying software licence, and there was a risk of resultant licensing issues owing to the indirect use of SAP products. The Administration stated that it was yet to review the existing contracts with SAP to ensure that no liability would arise owing to indirect access charges and assured that it would examine the implications of such access;

(e) The Administration had identified a few risks and captured the same in the change management tool. Among those risks, 22 risks, assumptions, issues and dependencies were identified between August 2013 and October 2017 but remained unresolved. The Board noted that those risks included 7 significant⁴ and 13 high-impact risks in the areas of project management, development coordination, production support and technology solution and solution adoption. The Administration stated that those risks remained unmitigated owing to the high prioritization of mitigation action for more integral risks.

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.

51. The Board recommends that the Administration take steps to assess the impact (including financial impact) of interfaces to be integrated with Umoja.

52. The Board recommends that the Administration review the identified business readiness gaps and take steps to address these gaps in a timely manner.

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.

⁴ Pertaining mainly to pressure on skilled resources to support concurrent UE2 projects with ongoing production support, lack of dedicated resources for business intelligence development, challenges in mainstreaming Umoja resources, business consolidation and planning resource planning and portfolio and project management functional specification productivity, demand for resources dedicated to production support/stabilization exceeding available capacity, a lack of sufficient resources from the business and the fragmentation of the information and communications technology structure and resources, putting at risk the full realization of Umoja benefits.

54. The Administration accepted the recommendations.

E. Reorganization of the Umoja project team

55. The General Assembly, in its resolution [73/279](#), reiterated its request to the Secretary-General to continue to strengthen in-house capacity and expertise on the enterprise resource planning system and to ensure the transfer of knowledge from consultants to programme and project staff, ensuring that knowledge acquired is maintained within the Organization and reducing dependency on and resource requirements for contractual services, which represent a large proportion of project costs.

56. The Board noticed that the reorganization of the project team had been carried out during the period 2016–2018 with the objective of reducing dependence on contractual services, converting a top-heavy pyramid organizational structure to a more balanced one, deploying functionalities relating to the UE2 phase that involve new technologies, preparing for the mainstreaming of the project and creating skills within the Organization for handling production support and continuous improvements for the project life up to 2030.

57. The Board noted that the activities to be carried out during the year 2018 to achieve those objectives included specialized technical training for the project team members, knowledge transfer from external contractors, the abolishment of posts either by elimination or the redistribution of work and the creation of new posts based on a requirement for the deployment of remaining UE2 functionalities.

58. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that the reorganization of the project team and the technical SAP training had ensured self-sufficiency in supporting existing functionalities and capacity to build and deploy UE2 functionalities without a systems integrator (contractual service).

59. The Board noticed that the interface of the solution adopted for the UE2 projects of FDR, RAPS and conference and event management with Umoja would require the involvement of members of the project team with SAP knowledge. In addition, significant specialized training of members of the project team and the engagement of external consultants/experts would continue to be required for the full implementation of the remaining three UE2 projects,⁵ the deployment of interfaces required between UE2 project functionalities and the existing Umoja ECC and between UE2 projects and tier-3 production support,⁶ and continuous improvements in the deployed functionalities for the Umoja Foundation, UE1 and UE2 phases. The Board also noticed that the total number of person-days spent on technical SAP training was equivalent to four full-time equivalents, of 72 posts for the project team during the year 2018. The technical training was also necessary to build capacity among project team members who had been reprofiled from their earlier responsibilities in Umoja Foundation and UE1 to their new responsibilities for the UE2 phase.

60. Of the 72 posts for the Umoja project team, however, 16 were vacant as of January 2019. The Board was informed that 11 of those vacant posts corresponded to new reprofiled posts established by the General Assembly for 2019. The identified areas of functioning for those vacancies included financial accounting; CRM, as part of GM deployment; logistics execution and business object processing framework, as

⁵ Strategic planning, budget formulation and performance management, SCM and implementing partner management.

⁶ Production support by the Umoja project team.

part of TM; and DP and SNP, as part of IBP. The Board noted that there would be a need to fill those vacancies in time to avoid any potential impact on the pace of work in the relevant areas of functioning. Moreover, there would be a need for capacity-building interventions necessary to fully equip the new incumbents to work on the ongoing processes and solutions.

61. The Board also noted that the responsibilities for tier-3 production support for deployed functionalities and roles for future deployments were combined for some project staff, which resulted in competing demands on their time from both work streams. Those competing demands were identified in the workplan for 2019 as a challenge to be addressed. The Administration stated that they were necessary in cases in which staff were responsible for functions needed by multiple UE2 solutions and in which the project had to adapt to the evolving needs of the different UE2 projects.

62. The Board noticed that SAP experts were engaged for application architecture review, product assessment, fit-gap assessment and process performance optimization for SAP products. The Board was informed that, owing to the absence of a system integrator with the requisite experience, senior Umoja project team members, in collaboration with those qualified experts of individual SAP modules, were assessing the need and determining viable options for decision-making on system architecture, product selection and process engineering.

63. The Board is of the view that the requirement of various levels of training for complementing and supplementing the capacity of the project team members, vacancies in the project team and the combination of responsibilities for tier-3 production support and future deployments did place additional pressure on the work of the project team. The Board also noted that the Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that a slower deployment without a systems integrator for implementation obviated the need for the time-consuming and expensive transfer of knowledge and expertise later.

64. The Administration stated that the project was self-sufficient for SPPM, and EM, and specialized training may be required only for IBP. The SPPM project involved a unique combination of SAP technologies that no systems integrator would likely have been able to provide. For GM, even SAP had not been able to mobilize a team for rapid deployment because they did not have prior experience of a grantor and grantee deployment such as the United Nations. Even for IBP, SAP did not have a single public sector deployment. The United Nations had no choice but to train its personnel to be the most productive approach to sustainable solution development and maintenance, and there was evidence to show that SAP could not do it faster or cheaper.

65. The Administration also stated that the new recruits would not require a longer learning curve because the requirements included in job openings related to reprofiled posts, which ensures that new recruits have the skill sets needed for the posts, noting that the new posts are often filled with existing staff on temporary appointments who have already proved themselves to be technically competent. In addition, no constraints were anticipated in deployment or support owing to vacancies and skills gaps in relation to financial accounting, CRM or TM/EM. The challenge was that some areas were affected more by UE2 projects than others, causing pressure on available resources to concurrently support multiple solutions.

66. The Administration further stated that role delineation could not be effected for some personnel because they were responsible for functions that are needed by multiple UE2 solutions, and the project had to adapt to the evolving needs of the different UE2 projects. In addition, the interdependencies and the concurrent deployments did add pressure, which was the only reason that may have led to some delays.

67. The Board appreciates the efforts made by the Administration to develop the in-house capacity of the project team and notes the uniqueness of the solutions and interfaces being planned and deployed as part of UE2 and the progress achieved in the reprofiling and restructuring of project posts and staff. The Board, however, is also of the view that the parallel objectives of building in-house capacity and multiple concurrent deployments to implement the project in accordance with the schedule would necessarily entail extra pressure on the resources, given that continuous training for various project team members did consume significant time. Similarly, in the absence of the assignment of responsibilities for delineated roles to separate staff, there would be pressure on available resources to concurrently support existing solutions and work on new deployments.

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.

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.

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.

71. The Administration accepted the recommendations.

III. Application controls and data quality issues: payment processing

72. The Foundation and UE1 phases of the Umoja project have been fully deployed. The Board selected the functionality for processing vendor payments deployed in the Umoja Foundation and UE1 phases to test the implementation of that functionality.

73. The Board noted that the Internal Audit Division of the Office of Internal Oversight Services (OIOS) had conducted an audit (report 2019/001) of vendor payment processing at Headquarters, covering the period from 1 January 2016 to 31 March 2018, to review the accuracy and timeliness of vendor payments. OIOS highlighted that, while there were controls over prior approval of invoices for payments, there was a need to strengthen procedures for the detection and prevention of fraud and duplicate vendor payments and the updating and maintenance of vendor bank records. OIOS had made the following important recommendations:

- (a) Strengthen controls to prevent the processing of duplicate invoices;
- (b) Develop and implement procedures to prevent and detect fraud relating to vendor payments;
- (c) Review and take appropriate action on identified cases of potential engagement of staff in business transactions with the Organization;
- (d) Strengthen controls to ensure the accurate capturing of information in the data fields in Umoja;
- (e) Identify and correct cases of multiple vendors mapped to the same bank account and review and implement controls to mitigate the risks associated with workarounds introduced to facilitate bank payments.

74. The Board assessed few important application controls at different stages of payment processing by analysing data up to 31 December 2018 and noticed significant issues, including the persistence of some of the areas of concern highlighted in the OIOS report. Details are given below.

Application controls over invoices

75. The Financial Rules and Regulations of the United Nations require approving officers to ensure, prior to making payments, that payments are due and that necessary goods and services have been received in accordance with the underlying purchase orders (PO)/work orders (WO) and the corresponding goods received note (GRN)/service entry sheet (SES). This is facilitated by the SAP three-way matching functionality in Umoja to match the corresponding PO/WO, GRN/SES and the invoice.

76. The Board noticed the following deficiencies in the application controls relating to the process of raising and approving invoices:

(a) Users could disable the three-way matching process while creating a PO, defeating the purpose of ensuring that there was a clear trail from procurement to the delivery of goods/services and the raising of the invoice. Cases noticed by the Board relating to disabling the three-way matching process included the creation of POs after the invoice dates, disabling the check for GRN in the system whereby invoices could be created without GRN and the editing of the over-delivery tolerance limit in POs. The Administration stated that, as part of the creation of a PO, the flag for goods receipts and confirmation-based goods receipt (necessary for three-way matching controls) was automatically set. The only business process that required the flag to be removed related to end beneficiary POs (given that only payments, not receipts, are required in this process). It also stated that it would conduct fraud risk assessments of vendor payments and implement procedures to improve the monitoring of fraud cases to ensure the prevention and detection of fraud;

(b) Users could raise invoices through a file upload process. There were no application controls to match the details of the invoices raised against any PO/WO and in accordance with GRN/SES in the file upload process. Users could raise invoices of any type and any baseline date (date from which the due date for payment is computed) and payment terms. A total of 196 invoices of value greater than \$10,000 and amounting to \$21 million had been processed using that file upload process during 2018. The Board noted that that method of processing invoices was prone to a material risk of error/fraud;

(c) There was an application control in place to detect duplicate invoices under a single vendor. The Board noticed that that was an optional check and was not exercised for all vendors. This resulted in the weakening of available controls over the risk of duplicate invoices;

(d) Users in the accounts payable sections were permitted to modify the baseline date and payment term in the invoices. The Board noticed 8,072 cases in which payment terms in the invoice were different from the terms in the PO. In 6,563 of those cases, payment terms were advanced from “30 days due” to “pay immediately”. The Administration stated that allowing changes to baseline date and to payment terms was a business requirement to provide for instances in which the payment date needed to be brought forward. The Board, while noting the requirement explained by the Administration, is of the view that, as a control measure, all changes in the payment terms should be carried out after following a due process, and the reasons for such modifications should be captured to generate an audit trail for the modifications.

Application controls over vendor payments

77. A payment proposal (F110) is to be executed in Umoja on a daily basis to identify approved invoices that, on the basis of the baseline date and payment terms, were due for payment on a T+2-day basis (current date plus two business days). The execution of the subsequent payment run generates payment lists, which, after approval in Umoja, are transmitted to banks for effecting payments. The Secretariat utilizes access to the SWIFT⁷ network to transmit payment from its cash section as secure files to banks.

78. The Board noticed the following deficiencies in the application controls over the payment runs, integration between Umoja and SWIFT for vendor payments and the application controls within Umoja for various SWIFT message formats:⁸

(a) The daily payment proposal was not automatically executed by the system. It had to be manually executed by a designated officer at a predetermined time. This scenario results in the system becoming dependent on manual action and the resultant vulnerability to manual errors;

(b) There is no bank balance sufficiency check within the system. The users executing payment runs are required to manually verify the cash balances. In case of insufficient balance, they either modify the bank accounts from which payments are made or initiate action to replenish the bank balance through United Nations Treasury operations;

(c) There is no functionality in Umoja to specify the purpose of payment data field for SWIFT FIN⁹ payment messages, which is a mandatory regulatory requirement in several countries for processing payments. As a result, after the payment is generated in Umoja, designated users from the cash section use a workaround to ensure that the payment is not loaded to the SWIFT network. They separately log in to the SWIFT Alliance to gain access to the individual payment proposal, enter the required purpose of payment field and authorize the payment into the SWIFT network. This manual intervention resulted in the risk of failed payments, in case the workaround was not completed on time;

(d) There was no functionality in Umoja to support message type MT 299 and MT 999, which are free message formats used for sending/receiving information for which no other message type has been defined. For these message formats, the designated users in the cash section therefore have to log in to SWIFT Alliance. This resulted in reduced visibility within Umoja for communication with banks using these message types, with the potential for risks associated with manual interventions;

(e) There was no functionality in Umoja to support message type MT 192 and MT 292, which are used for requests for cancellation. For these message formats used for bank communication, the designated users in the cash section therefore have to log in to the Alliance access server only. This resulted in reduced visibility within Umoja for communication with banks using these message types, with associated risks of the non-capturing of audit trails for cancellations requests;

⁷ Society for Worldwide Interbank Financial Telecommunication (SWIFT) is an organization that provides a secure network that allows more than 10,000 financial institutions in 212 countries to send and receive information about financial transactions to one another.

⁸ The SWIFT message format is a communication message having a predefined structured data format, which enables electronic data interchange (i.e., seamless exchange of electronic data between sender and receiver on the SWIFT network). The convention for SWIFT message format nomenclature is MT (message type), followed by a three-digit code.

⁹ SWIFT FIN messages are loaded to the SWIFT server and queued for authorization. The cash section uses a web application named SWIFT Alliance to authorize SWIFT FIN messages for onward transmission to banks through the SWIFT network.

(f) Role provisioning had not been reviewed to disable users who were no longer required to have access to execute payment runs. The Board was informed that there were 34 users with a hub cashiers role, which provides access to run a global F110. In addition, there were 177 users with local cashier access and 281 users with bank signatory access. In a scenario in which the payment run is carried out centrally by the United Nations Treasury, access provisioning to such a large number of users needed review.

Maintenance of master data

79. The United Nations Treasury was responsible for updating master data relating to banking details for vendors, and there was no prescribed procedure for updating them. As a result, bank account details for vendors were being updated on the basis of unilateral emails and other correspondence received from vendors, without sufficient verification, until June 2018. In July 2018, a new banking details maintenance guide was prescribed and standard procedures for updating master data for banking details was established.

80. The Board noticed the following deficiencies in the application controls over the maintenance and updating of master data:

(a) Users in the master data maintenance team were allowed to create multiple vendors against the same bank account. Users in the cash section could modify a vendor's bank account details without verifying whether the new bank account was already present in the master data and associated with a different vendor. The Board noticed that, in 9,775 cases (3.4 per cent), the same bank account number had been associated with more than one vendor. There were cases in which the same vendor had been listed with active status as both a United Nations Global Marketplace¹⁰ vendor and a non-Global Marketplace vendor. The Board also noticed that, in 504 cases, vendors and employees had the same bank account numbers and that, in 30 of those cases, the bank account number was same for an employee and for a commercial vendor. The Administration stated that the assignment of the same bank account to multiple vendors could arise in instances such as transactions of the same vendor with different United Nations system entities (with different vendor IDs) and in which a staff member and a consultant share the same bank account if they are life partners;

(b) Updates to the master data for banking details classified as sensitive, including bank account holder name and bank account number, required dual approval. Other banking details, however, that were not classified as sensitive, such as currency, did not require dual approval and could be updated by a single user;

(c) The new banking details maintenance guide (July 2018) prescribed that changes to bank account details were to be notified to the vendor by email. It was also prescribed that a cooling-off period of 24 hours before payments could be made to the new bank account. In this scenario, it was important that the change in email account of vendors also be subject to a strict due diligence process. The Board was informed that, for vendors registered in the United Nations Global Marketplace, the vendor updates the email address in the Global Marketplace, which is automatically replicated in Umoja. For other vendors, changes are performed by the master data management team on the basis of the request raised by United Nations personnel who vetted the changes. The Board, however, noticed instances in which the email address of vendors had been changed daily during a period of one month and had even been changed multiple times during a day in some cases. The process of updating the

¹⁰ United Nations Global Marketplace is the common procurement portal of the United Nations system of organizations.

master banking data was therefore open to risks arising out of weaknesses in the maintenance of email master details;

(d) Access to a custom transaction code (T-code) had been provisioned to 3,706 users, which permitted them to extract the vendor master data from Umoja and download the results in Microsoft Excel format. This T-code was designed to permit users to compare vendor master data in Umoja with the master data in ProGen, a legacy software application in use prior to Umoja, in order to ensure the correctness and completeness of data migrated to Umoja. Given that the master data contained details such as bank account and passport number, there is a risk of access to this sensitive data by unauthorized personnel. The Administration stated that the user access provisioning would be reviewed and restricted to designated users only;

(e) An exercise to identify duplicate records of vendors was carried out by the Administration. After identification, one of the records was marked for deletion. It was important that the deleted records contained a reference to the active vendor record so that the buyers using SRM were aware of which record was duplicate and which was valid. The Board noticed that there was no separate field available in which reference to the active record of the same vendor could be entered. There was, however, no standard description of the referencing and there were instances in which the references were either not entered or were referenced incorrectly. The Board also noticed instances in which reference was made to that record being replaced, but both the records continued to exist, and there were delays in the deletion of the record after it had been identified as a duplicate. Moreover, no reference was made in the active vendor record about the duplicate record deleted. The Board noted that those weaknesses affected the integrity and quality of master data.

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.

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.

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.

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.

85. The Administration accepted the recommendations.

IV. Support functionalities for Umoja

A. Business intelligence

86. 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. The Board, in its seventh progress report on the implementation of the United enterprise resource planning system, noted the non-fulfilment of the perceived needs of users by the standard reports in business intelligence and delays in work relating to the enrichment of semantic layers.

87. The Secretary-General, in his tenth progress report on the enterprise resources planning project, had stated that the hardware and software supporting business intelligence had been upgraded, given that UE2 needs additional capabilities and that, prior to the upgrade, the architecture of the data warehouse supporting business intelligence had been overhauled to build new “semantic layers” (non-technical views of Umoja data to enable users to leverage data better for more sophisticated analysis and reporting) for each functional pillar and then across pillars to enable better management of the business intelligence environment. He also reported that the redesign of the semantic layers was expected to temporarily necessitate the slowing down of enhancements to current business intelligence reports when the underlying infrastructure is being re-engineered. He also stated that management dashboards would be rolled out in 2018 in all departments and offices. These highly visual and interactive dashboards would leverage Umoja data to provide managers with a comprehensive view of their human and financial resources and related information.

88. The Board noticed that the upgrading of the database to SAP HANA and the integration between SAP BW (Business Warehouse) and SAP HANA had been achieved. This would enable the extraction of data from various SAP modules/applications into HANA, which can then be combined, using the semantic layers, to create analytical models within each functional pillar or across pillars in accordance with business requirements.

89. The Board, however, noted that the capability of the new semantic layers in HANA to combine analytical models from different SAP products and across pillars to create more complex visualizations and business intelligence reports had not yet been leveraged. In addition, management dashboards for the visualization of data across functional pillars were at the design/development phases and not deployed.

90. The Board also noted that business intelligence reports for GM and PPM were at the development/test phases and that work relating to the development of business intelligence reports for strategy planning and budget formulation, BPC and the two Siebel platform-based UE2 projects (i.e., FDR and RAPS) had not yet commenced.

91. The Administration stated that management dashboards that would create summary visualizations for senior managers by combining analytical models across functional pillars were under development and would be deployed during 2019. It was also stated that the SMA and BPC applications had embedded reporting capabilities that were more likely to be used, rather than HANA-based reporting, and that, for the two UE2 projects on the Siebel platform, the associated reports would be part of the solution on that platform and not on HANA.

92. The Board noted that the development of business intelligence reports and dashboards using the visualization of data across functional pillars leveraging the Umoja Foundation and UE1 module was yet to be achieved. In addition, the plan to integrate the upgraded business intelligence functionality with the individual reporting capabilities of UE2 modules under deployment was not clear.

B. Production support

93. 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.

94. The Secretary-General stated that Umoja-related incidents had been declining steadily, with quicker resolution at the local level and the integrated service desks. The Umoja production support approach has relied on strengthening the role of local process experts to increase access to local support and reduce tickets and to progressively strengthen the capacity of the lower tiers in order to reduce escalation to higher tiers. The Administration reported that the first-call resolution rate had increased to 65 per cent, enabling a significant shift in focus from production support to continuous improvements for the first half of 2018.

95. The Board noticed the status of first-call resolution rates for the year 2018 (see table 3).

Table 3
Status of first-call resolution rate

<i>Nature of case</i>	<i>Number of cases in 2018</i>	<i>First-call resolution rate in 2018 (percentage)</i>	<i>First-call resolution rate in 2017 (percentage)</i>
Incidents	20 911	56	57
Requests for service	26 533	25	22

96. Table 3 indicates that first-call resolution rates for service requests in 2018 had improved slightly, although the rates for incidents had marginally declined, compared with the statistics in 2017.

97. The Board also noticed that no metrics/targets had been adopted for timelines to achieve first-call resolution and for the overall first-call resolution rate. In addition, the deployment of new functionalities under the UE2 projects is likely to result in increased challenges in the development of support capabilities at the first two tiers for the new UE2 functionalities, with a likely increase in the incidents and requests for service during 2019, necessitating a strategy to equip the first two tiers of production support.

98. The Administration stated that differentiated targets would be necessary for the mature processes under the Umoja Foundation and UE1 phases and for the new processes being deployed as part of UE2, given that some experience and time would be required before benchmarks could be established for incidents/requests relating to UE2 processes.

C. Continuous improvements

99. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that a programme for monitoring continuous improvements had been created to ensure the sustained realization of Umoja benefits and to ensure that critical administrative functions of the Organization supported by the Umoja processes could be optimally executed. The monitoring approach 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 user data relating to the activities.

100. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that a comparative analysis of performance measures based on Umoja workflow data over two years, using the average duration to complete a workflow, reflected performance improvements in almost all workflows. A total of 6 of 10 workflows with an increase in volume of more than 25 per cent showed

increased speed; 24 workflows in all areas decreased in duration. Overall, of 41 workflows, 16 were at optimal performance, 8 were approaching optimal performance and 17 showed potential for improvement through process re-engineering.

101. The Board noted that the monitoring was carried out for the Umoja Foundation and UE1 phases and that the number of workflows being monitored for continuous improvements had increased to 43 in 2018, compared with 41 in 2017. In addition, workflows relating to accounts receivable approval, accounts payable approval, travel expense approval, earmarked fund approval and general ledger document approval had been identified by the Administration as having potential for improvement.

102. The Board also noted that the monitoring was limited to the workflows defined by SAP. Those workflows included mainly human resource processes along with some finance-, procurement- and budget-related approvals. The Board is of the view that identifying and monitoring additional critical workflows relating to grants and procurement, among other things, would be important for a comprehensive understanding and review of performance measures. It would also assist in identifying areas of focus to improve the efficiency in the critical processes for the Organization.

103. The Administration stated that SAP had defined a limited number of workflows and that there were numerous business processes in which transactions were processed in successive steps, but that SAP treats them as discrete and unrelated transactions. In such cases, additional mechanisms would have to be developed to measure performance and evaluate efficiency.

D. Change management

104. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that, on the basis of identification of areas for improvement by users and through the continuous improvements monitoring programme, new requirements for changes to the deployed functionalities of Umoja had emerged. The Secretary-General also stated that, since September 2017, the Umoja team had completed 403 requests for changes, which were a combination of process improvements requested by the business, as well as changes that had incrementally improved the usability of the Umoja solution. The Secretary-General further stated that, in order to improve the management of Umoja software development, the SAP integrated monitoring tool for change requests (change request management) (ChaRM), would be deployed by December 2018.

105. The Board noticed that the ChaRM tool was deployed in December 2018 and that seven minor change requests were recorded during that month. Its usage by various business process owners was expected to increase during 2019. The Board also noticed that, during 2018, a tool named “rapport” was used to record 162 change requests from business process owners. Of those 162 change requests, 117 had been approved for introduction into the production environment. Of those 117 requests, 76 were in production and the remaining 41 were under various stages of introduction to production.

E. Training

106. The General Assembly, in its resolutions [71/272](#) and [72/262](#), requested the Secretary-General to ensure that all users were properly trained before the deployment of any functionality of the project and to adopt appropriate qualitative and quantitative indicators of achievement to assess the effectiveness of the training received.

107. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that the existing training programmes for the Umoja Foundation and UE1 phases were tracked on the existing enterprise learning management system, Inspira. For the UE2 phase, the training strategy had been revised to focus on continuous self-learning, with self-contained and modularized training courses for staff to learn “just in time” to effectively deliver their work using Umoja and not depend on the availability of trainers. It was stated that the task-oriented learning enabled trainees to partake in individual courses on how to perform specific tasks in Umoja on a new online learning platform, “iLearn Umoja”, which had been launched with a web portal in September 2018.

108. The Board was informed that there were 20,947 course enrolments in various Umoja courses in 2018, which included 3,041 for live classroom courses, 17,581 for self-paced learning and 262 for virtual classrooms.

109. A review of the feedback received from the UE2 learners indicated that 75 per cent of them had rated the courses as excellent/very good/good. The Board was informed that a course assessment was not mandatory for task-oriented learners taking individual courses on how to perform specific tasks in Umoja. Nevertheless, for expert learners who need to develop Umoja-specific competencies to perform their duties, there was a provision to complete business scenario-based case studies and pass assessments to enable them to acquire necessary certification within each thematic area. The Administration also stated that training surveys would continue to be enhanced in order to measure the effectiveness of the training.

110. The Board noted 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. In addition, of the six UE2 projects, the training courses covered only three: budgeting, FDR and SCM. Training material with respect to the remaining three UE2 projects were yet to be made available on the iLearn platform. The Board is of the view that, taking into consideration the scheduled deployment of all UE2 projects by the end of 2019, it would be important to plan and implement a robust training plan and comprehensive training material to aid in business readiness and user adoption.

111. The Administration reported that it would try to accelerate the conversion of the Umoja Foundation and UE1 content to the iLearn platform but were not yet in a position to indicate a definitive timeline.

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.

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.

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.

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.

116. The Administration accepted the recommendations.

V. Umoja business case

A. Benefits realization

117. The General Assembly, in its resolution [71/272](#), noted that the Umoja project represented one of the largest and highest-cost business transformation initiatives undertaken by the Organization. It requested the Secretary-General to submit an updated business case for the Umoja project, including an analysis of the direct and indirect costs and benefits. It also noted that insufficient progress had been made in the development of a benefits realization plan and requested the Secretary-General to accelerate the development of such a plan, taking fully into account all the relevant recommendations of the Board of Auditors.

118. The General Assembly, in its resolution [73/279](#), reiterated the request to the Secretary-General to develop 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.

119. The Secretary-General, in his tenth progress report on the enterprise resource planning project, stated that the Umoja benefits realization plan was under preparation, with reference to a value life cycle management methodology developed by SAP for its customers. 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.

120. The Board noticed that the Business Transformation and Accountability Division had been constituted by February 2019. The Benefits Working Group of the Division was yet to be tasked with identifying, assessing and baselining the qualitative benefits of UE2. The Board also noticed that a draft benefits realization plan was under preparation.

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.

122. The Administration accepted the recommendations.

B. Total cost of ownership

123. 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 and the opportunity cost of downtime, training and other productivity losses. The need to assess the total cost of ownership is that the purchase price is not a good indicator of long-term costs. This is most relevant for enterprise resource planning implementation, in which subsequent costs such as software licence costs, implementation costs, training costs, support costs and maintenance costs would be substantial. Total cost of ownership attempts to combine all the different categories of costs and use it for making decisions.

124. The Secretary-General, in his ninth progress report on the enterprise resource planning project, reported the total cost of ownership of Umoja assuming a useful life

of 15 years (until 2030) at \$1,402.15 million in 2017. In his tenth progress report, he updated the total cost of ownership to \$1,414.22 million. Details are given in table 4.

Table 4
Total cost of ownership

Cost category	<i>Ninth progress report of the Secretary-General on the enterprise resource planning project</i>		<i>Tenth progress report of the Secretary-General on the enterprise resource planning project</i>	
	Period	Amount (United States dollars)	Period	Amount (United States dollars)
Direct costs (Umoja)	2008–2019	543 741 600	2008–2019	543 741 600
Indirect costs	2013–2017	100 471 729	2013–2018	127 034 077
	2018–2019	32 000 000	2019–2023	19 000 000
Training costs	2013–2017	64 331 994	2013–2018	77 849 752
	2018–2019	15 000 000		
Maintenance costs	2016–2019	118 600 000	2016–2019	118 600 000
	2020–2030	528 000 000	2020–2030	528 000 000
Total	2008–2030	1 402 145 273	2008–2030	1 414 225 429

125. The Board noted that, in the tenth progress report of the Secretary-General on the enterprise resources planning project, it was stated that the total cost had been updated, taking into account the Board's observations to the extent feasible, relating to the likelihood of continuous improvements after 2019 that might involve further indirect costs, the inclusion of training costs from 2020 onwards and the fact that the estimate of annual maintenance costs from 2020 onwards would change because of the need to acquire new software licences, given that usage would increase over time.

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

Direct costs

127. 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. The Secretary-General, in his ninth progress report on the enterprise resource planning project, estimated a direct cost of \$543,741,600 over the project implementation, which the Board noted had been calculated on the basis that project implementation in all respects (i.e., full functionality and post-implementation activities, including stabilization) would be completed by December 2019. No change was reported in direct costs in his tenth progress report.

128. The Board noticed that, in accordance with the tenth progress report of the Secretary-General on the enterprise resource planning project, the plan was to mainstream Umoja after full implementation, with technical roles transferred to the Office of Information and Communications Technology, non-technical roles to business process owners and the mainstreamed Umoja office to take care of activities such as continuous improvements going forward. The Administration reported that the current thinking was that, given the technical complexities of UE2 and the amount of deployment remaining to be done, it would not be practical to split the project team into a technical team and a business-leaning process experts team in the near future and that the current team (Umoja) would remain as is, even if the project ceases to

exist and that it might be two or three years before any change to the team structure could be contemplated. The intended change in assumptions regarding mainstreaming may have an impact on project costs.

129. The Board also noted that there were significant risks to the completion of UE2 by the scheduled date of December 2019, which may result in a need to review the estimations of direct costs. The Administration informed the Board that the enterprise resource planning project would continue to prepare for the issuance of an updated report to the General Assembly on the Umoja business case and the enterprise resource planning programme budget of work, for issuance in September 2019, as the Assembly has requested. The exact calculations in support of the programme of work budget will then be firm and available.

130. The Board noted that the General Assembly, in its resolution [73/279](#), had requested the Secretary-General to achieve the project's objectives and full implementation of the project by December 2019 and that new management thinking was yet to be approved by the Assembly. In addition, and taking into consideration the information provided by the Administration and the status of deployment of UE2 projects, the Board is of the view that there were significant risks to the completion of the project at the direct cost levels presented in the tenth progress report of the Secretary-General on the enterprise resource planning project.

Indirect costs

131. 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. The Secretary-General, in his ninth progress report on the enterprise resource planning project, estimated indirect costs of \$100,471,729 for the period 2013–2017 and \$32,000,000 for 2018–2019.

132. In his tenth progress report on the enterprise resource planning project, the Secretary-General reported the indirect cost at \$127,034,077, including the cost of personnel associated with Umoja deployments for the period 2013–2018. The costs estimated for the period 2019–2023 were \$19,000,000. The indirect cost estimation had been 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 was provided with the list of personnel involved with the Umoja deployment and the indirect cost for the period 2017–2018 amounting to \$37,472,933 of the total indirect costs of \$127,034,077.

133. The Board reviewed the calculations and noticed the following issues:

(a) There was a difference in the post-related standard costs used for the computation of indirect costs vis-à-vis the same level of post-related standard costs used for the computation of direct costs;

(b) There were inconsistencies in the application of standard costs. Different process owners used different standard costs for the same level of posts;

(c) There were computational errors of \$2.12 million.

134. The Board also noticed that the indirect cost estimate for the period 2019–2023 included estimated costs of \$1.2 million annually for continuous improvements, which was less than the amount spent on continuous improvement during 2017 and 2018 (\$2.02 million). This pointed to the need for a review of the projected amount to ensure that they remained realistic.

Training costs

135. The Secretary-General, in his ninth progress report on the enterprise resource planning project, estimated training costs at \$64,331,994 for the period 2013–2017 and \$15,000,000 for 2018–2019. In his tenth progress report, he reported the training cost for 2013–18 at \$77,849,752.

136. The Board noted that the Administration had automated the training cost measurement on the basis of the training details available and that, during the year 2018, had captured information on travel costs as part of training costs. Training costs from 2019 onwards, however, had not been included in the total cost of ownership calculation.

Maintenance costs

137. The Secretary-General, in his ninth progress report on the enterprise resource planning project, indicated that the maintenance costs of Umoja would be \$118,600,000 for the period 2016–2019 and \$528,000,000 for 2020–2030. In his tenth progress report, he reported same levels of maintenance costs.

138. The Board noticed that the maintenance costs for the period 2016–2019 had been calculated on the basis of estimates for maintenance costs for those four years and that the estimates had not been revised to capture actual maintenance costs incurred during 2016–2018.

139. The Board noted that the maintenance costs from 2020 onwards were based on an estimate of annual maintenance costs of Umoja of \$48 million, including \$32 million for maintenance activities, with the remaining \$16 million for post-implementation mainstreaming by the Umoja project office. The estimate of \$48 million was based on annual maintenance costs as projected in the report of the Secretary-General on the status of implementation of the information and communications technology strategy for the United Nations (A/71/400).

140. The Board also noted that the Administration was considering a review of the mainstreaming plan and stated that it might be two or three years before any change to the team structure could be contemplated. The estimates would therefore need a review in view of changes in the assumptions underlying the calculations.

141. The Board also noticed that there was a level of certainty of expenditure under the different objects, considering the 2019 budget projections as a base, which would need to be spent on the Umoja project office. The estimated requirements worked out to \$21.27 million,¹¹ which were higher than the estimated maintenance costs of \$16 million, even after excluding costs for consultants, experts and contractual services. The Board also noticed that the estimate for the period 2020–2030 did not include various hardware costs (i.e., servers and related infrastructure). The Board further noticed that two servers and related infrastructure were replaced at a cost of \$13.52 million during 2018. Considering the industry standards of the life cycle of five years for similar servers, they would be due for replacement in 2020–2030, but related costs were not captured in the estimates for maintenance costs.

142. The Administration stated that costs were, in general, on target for 2019, but could not be used to predetermine the outcome of a programme of work budget formulation process for 2020 or beyond yet to start. The projected cost for the project team could be some \$16 million to \$18 million, depending on the grade structure, and

¹¹ Under the objects of expenditure for 2019, namely, posts (\$12.50 million), staff costs (\$5.71 million), travel (\$0.73 million), general operating expenses (\$2.18 million), supplies and material (\$0.10 million) and furniture and equipment (\$0.15 million).

would become clearer as the mainstreaming proposals are developed for the next progress report.

143. Regarding the costs for upgrading hardware and software, the Administration stated that the budget for ERP2020 would detail the various requirements and costs relative to the post-deployment scenarios materialized by then. This would include the technology road map and related licensing/software road maps beyond 2020, given that the SAP software licensing agreement expires in 2025. It was also reported that the upgrading of ECC was not required at this point in time and could take place after 2020. Any such upgrades would require a complete and detailed mapping of all technical and functional implications, along with infrastructure and hardware, at which point the real cost and related options would be determined.

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.

145. The Board recommends that the Administration work out and include training costs for the period 2019–2030 in the total costs of ownership.

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.

147. The Administration agreed with the recommendation to reassess the indirect costs to remove the inconsistencies in the standards used and stated that it would be updating the indirect cost estimate in the eleventh progress report of the Secretary-General on the enterprise resource planning project. The Administration also reported that the maintenance costs would become clearer as it develops the mainstreaming proposals in the next progress report.

VI. Mainstreaming plan

148. The General Assembly, in its resolution [70/248 A](#), requested the Secretary-General to develop detailed transition plans for the long-term support for and mainstreaming of the Umoja solution to be provided by the Chief Information Technology Officer. In addition, in its resolution [71/272 B](#), the General Assembly reiterated the importance of ensuring a smooth and timely transfer of responsibilities from the Umoja project to corresponding entities within the Secretariat.

149. The Board recommended in its seventh annual progress report on the implementation of the United Nations enterprise resource planning system that the Umoja transition plan for mainstreaming should continue to factor in the potential impact of the reforms of the Secretary-General, the timelines of UE2 deployments and the requirements for continuous improvements in various modules.

150. The Secretary-General, in his report on the status of the information and communications technology strategy for the United Nations ([A/72/755/Rev.1](#)), reported that the mainstreaming of 73 per cent of responsibilities from the Umoja project team to corresponding entities within the Secretariat had been completed. The scheduled dates for completion of the remaining 27 per cent had been indicated to be between 31 December 2018 and 30 September 2019. The Secretary-General, in his tenth progress report on the enterprise resource planning project, did not make a reference to the mainstreaming plans.

151. 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.

152. The Board noticed that all six sub-projects under UE2 of the enterprise resource planning project were at various stages of implementation as at 31 December 2018. The remaining scope of work included significant functionalities to be developed, as well as the deployment of already developed functionalities to a significant number of Secretariat entities.

153. In response to the request for information regarding the status of the mainstreaming plan and the planned dates for the transfer of these responsibilities, the Administration stated that the project team would have to remain as an integrated team until UE2 was fully stabilized and that, in view of the breadth of functionality being deployed in UE2, it might be two or three years before any change to the team structure could be contemplated. It is expected that the core team of staff will be eventually mainstreamed for continuous improvements in and ongoing support for the Umoja solution as a part of the sustainable business model of the Organization. The future project team structure and staffing after 2019, based on the continuing reorganization of functions, would be presented to the General Assembly in the eleventh annual progress report (in September 2019) of the Secretary-General on the enterprise resource planning project. The Secretary-General, in that report, would propose a mainstreaming plan that would include a "lift and shift" of the entire project team, most of its general temporary assistance personnel and a limited number of contractors to an entity that is most appropriately placed to manage that team. The timing of this mainstreaming and the placement of the project team would depend on the Assembly's decision and the progress of the project's workplans.

154. The Administration also stated that Secretariat entities globally did not possess any of the specialized knowledge or skills needed to maintain Umoja and that those skills resided wholly in the current Umoja project team. Accordingly, the mainstreaming plan does not envisage any transfer of knowledge or skills from this team to any other personnel or entity in order to provide sustainable support for the system. The Board was also informed that functions that lend themselves to mainstreaming had already been mainstreamed. These include the entire infrastructure, service desk management (tiers 1 and 2a to the Office of Information and Communications Technology/Department of Operational Support; tier 2b to the process owners), training (learning units and entities), business intelligence report development (the Office and the user community) and process ownership (process owners), user provisioning (business). Supporting applications such as Unite ID (for credentials) and service desk (iNeed) are also under the Office. In addition, the Siebel-based solutions (fundraising and RAPS) are also developed and maintained by the Office.

155. The Board noted that the current scheduled date for the implementation of all UE2 projects is 31 December 2019. The Board is of the view that it is important for the mainstreaming plan to be finalized at the earliest. The plan should incorporate provisions to cater to important requirements of continuous production support, continuous improvements in the enterprise resource planning solution, developing requisite capacity and skills to carry out these activities in the post-mainstreaming organizational units and support for Umoja stabilization for UE2 solutions. The Board is also 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.

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.**

157. The Administration accepted the recommendation.

VII. Acknowledgement

158. 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 2017

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	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	Management requests that the Board consider closing this recommendation and include references to the development of staff capability in the current year's recommendation under benefits realization	Given that the benefits realization plan is in the draft stage and yet to be approved, 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	This recommendation is currently being considered in the context of the new Administration paradigm of the Secretary-General, implemented on 1 January 2019	The action is pending and 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;	The Administration requests that the Board consider closing this recommendation and include references to providing access to skills and holding business areas to account in the new	Given that the benefits realization plan is yet to be presented, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
4	2016	A/71/180	Summary, 23 (e)	<p>this should include providing access to skills and capability in operational improvement, and holding business areas to account for delivering the expected benefits</p> <p>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</p>	<p>recommendation on the benefits realization plan</p> <p>The Administration requests that the Board consider closing this recommendation, taking into consideration its responses on mainstreaming and reorganization. Functions that lend themselves to mainstreaming have already been mainstreamed. In his eleventh progress report on the enterprise resource planning project, the Secretary-General will propose a mainstreaming plan, the timing of which will depend on the General Assembly's decision and the progress of the project's workplans</p>	<p>Given that the benefits realization plan is yet to be presented, the recommendation is considered to be under implementation</p>		X		
5	2017	A/72/157	42	<p>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</p>	<p>The Administration requests that the Board consider closing this recommendation and issuing a new recommendation or adding to recommendations on business intelligence made during the current year, taking into consideration the Administration's comments therein</p>	<p>The functionality of business intelligence has not been fully leveraged, and the recommendation is therefore considered to be under implementation</p>		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
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 Administration requests that the Board consider closing this recommendation and incorporate it into the Board's new recommendation on the benefits plan	Given that the benefits realization plan is yet to be presented, 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	An assessment of possible platform options and integration opportunities (e.g., with Umoja) is currently being finalized. The main objectives of such an assessment are to ensure that the solution is accessible globally, is complemented by a robust support function and follows the Organization's procurement policies	Given that action is being taken, the recommendation is considered to be under implementation		X		
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;	The recommendation is under implementation. With regard to subparagraph (a) of the recommendation, a draft Umoja benefits realization plan has been developed, taking into consideration the Board's recommendations. The draft will be reviewed by the process owners In the context of the immediate priorities of the new Administration paradigm of the Secretary-General, implemented on 1 January 2019, Umoja will continue to coordinate	The Business Transformation and Accountability Division has been identified as the coordinating division as a process owner of benefits realization. The benefits realization plan, however, is yet to be presented. Therefore, subparagraphs (a) and (b) of the recommendation are considered to be under implementation and subparagraph (c) is considered to have been implemented		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
				(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	until a primary benefits process owner has been confirmed					
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 recommendation is under implementation. The clean-up exercise in time for the annual time certification exercise was completed. Thirteen staff member records that require clean-up are outstanding. OHR will again remind offices to clean up the remaining records	Given that action is under way, the recommendation is considered to be under implementation		X		
10	2018	A/73/169	58	The Board also recommends that the Administration monitor the accuracy of the corrective action put into production to ensure that Umoja system does not allow the limit of uncertified sick leave days that a staff member may take in a year to be exceeded	A defect was detected in December 2017 regarding leave calculations relating to uncertified sick leave not being properly deducted from quotas. The defect was resolved and corrective action put into production on 30 January 2018, after which the issue was corrected and the limit of seven days duly enforced	In view of the action taken, the recommendation is considered to have been implemented	X			
11	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	The recommendation is under implementation. OHR is reviewing the time solution in order to address the issues identified and as a part of	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 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
				Umoja human capital management module through change request(s), as applicable	continuous improvements. Owing to urgent reform priorities, however, a complete review of the time solution has not yet been completed					
12	2018	A/73/169	66	The Board recommends that the Administration review the parked documents of closed budget periods and ensure deletion as part of a data clean-up exercise	The review and clean-up of parked documents is regularly undertaken by the Finance Division and entities are requested to post, delete or change the posting date of parked documents. Dashboards per entity (business area) are sent on the 7th of each month. These dashboards include a section – “parked documents” – showing their status. On the basis of their nature, they are either centrally deleted or process owners need to delete them	In view of the monitoring action taken, the recommendation is considered to have been implemented	X			
13	2018	A/73/169	69	The Board recommends that the Administration ensure that all equipment records be mapped to material numbers and/or a UNSPSC code	A review has been undertaken. It should be noted that the issue identified by the Board was due to cluster 3/cluster 4 data conversion. The business teams had not retrospectively updated the affected records. In addition, for new records since then, equipment procured through the procurement process has product ID and category entries in accordance with standard integration	In view of the action taken by the Administration, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
14	2018	A/73/169	70	The Board also recommends that the Administration review the material master records and rationalize the entries therein	A review has been undertaken and rationalization actioned. Post UE2 SCM phase 1 data conversion, the material master data management team undertook a clean-up exercise and cleaned blocked material IDs and created additional material IDs that were pending in order to rectify the issues. This exercise was completed at the end of 2018	In view of the action taken by the Administration, the recommendation is considered to have been implemented	X			
15	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	A review has been undertaken. The asset class for all materials when procured through SRM is consistent, given that Umoja maps a material to only one asset class. Previously, inconsistencies were noted in converted data and as a result of user error when linking equipment and assets. The process owners continue to review and correct inconsistencies	Given that old inconsistencies persist, the recommendation is considered to be under implementation		X		
16	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	The procedure is documented in the OICT procedure "Access Control for the United Nations Secretariat" (SEC.02.PROC). Two exercises conducted to deprovision accounts not accessed from 31 December 2017 and later on 31 July 2018 resulted in deprovisioning	Given that action is under way and further monitoring and clean-up is needed, the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
					2,809 accounts and 399 user accounts, respectively A new user clean-up exercise is being launched to extract all the user accounts that have not logged into the Umoja production system P1E since 31 September 2018 to comply with the aforementioned OICT procedure					
17	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	This recommendation is under implementation. The Office of Information and Communications Technology has convened a working group	The recommendation is considered to be under implementation		X		
18	2018	A/73/169	90	The Board recommends that the Administration immediately deactivate the firefighter IDs that are not in operation	The identified firefighter IDs have been deactivated	Given that action has been taken, the recommendation is considered to have been implemented	X			
19	2018	A/73/169	91	The Board also recommends that the documentation and submission of incident reports after usage of firefighter IDs be enforced	A new procedure is in place. A new firefighter requesting and logging system (FFREQ) was implemented in May 2018 to systematically track the requesting, reviewing, approving, execution and recording of all Umoja firefighter requests. At this time, only 4 reports are pending	Given that action has been taken, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
20	2018	A/73/169	94	The Board recommends that Administration ensure that only one unique user account is assigned to each staff member	The recommended action has been performed. A regular clean-up procedure to avoid the occurrence of the duplicate accounts is now in place. The system of record of the ID is Unite (EIDMS), which interfaces with Umoja to provide the ID, is supposed to be unique. All known duplicate IDs have been deactivated	The procedure put in place is one of corrective action and not of a preventive nature. Action needs to be taken to prevent the creation of duplicate user accounts or to make inactive old user accounts, whenever a new one is created. The recommendation is considered to be under implementation		X		
21	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 recommended action has been performed	This action has been performed only when such cases are identified. There needs to be a control mechanism to prevent the creation of two user accounts for one individual, which is yet to be done. The recommendation is considered to be under implementation		X		
22	2018	A/73/169	99	The Board recommends that the Administration change the Umoja profile parameter for failed login attempts to a reasonably low number	The parameter has been changed, as recommended, from value 100 to value 10. Said change was applied permanently on 7 April 2018 during the planned maintenance service windows	Given that action has been taken, the recommendation is considered to have been implemented	X			
23	2018	A/73/169	102	The Board recommends that the Administration review the policy regarding inactive users and that Umoja user accounts should be locked after a prescribed period of inactivity	The technical procedure is in place (para. 6.1 of "Access Control for the United Nations Secretariat systems ICT Technical Procedure" (SEC.02.PROC of August 2018))	Given that action has been taken, the recommendation is considered to have been implemented	X			

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
24	2018	A/73/169	109	<p>The Board recommends that:</p> <p>(a) Umoja process owners should deprovision already assigned conflicting roles;</p> <p>(b) The segregation of duties rules should be automated by the Umoja process owners in the user access provisioning application;</p> <p>(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</p>	<p>(a) A Umoja user access deprovisioning (UAP)-clean-up exercise has been undertaken;</p> <p>(b) The segregation of duties rules has been automated. Any request raised in the UAP 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;</p> <p>(c) The UAP application has a segregation of duty conflict management embedded in it. The process owners/BRMs would enter the conflict rules (using Tcode ZSY_SOD_CONFIG), which are then recorded in the SOD table. SOD conflict review is undertaken by the process owners. In addition, user accounts created in Umoja are audited on a yearly basis by SAP, through the SAP Licence Audit report user in respect of provisioning and deprovisioning activity</p>	<p>Given that action has been taken, the recommendation in subparagraphs (a) and (b) are considered to have been implemented. However, as stated at (c), a procedure needs to be put in place for the periodic reviews, and the recommendation is therefore considered to be under implementation</p>		X		
25	2018	A/73/169	117	<p>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</p>	<p>This recommendation is under implementation. The hardware migration to the new Hewlett Packard Enterprise infrastructure has not yet been</p>	<p>The recommendation is considered to be under implementation</p>		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
				repeat exercise of the updated disaster recovery plan should be conducted after hardware migration to ensure the disaster recovery preparedness of Umoja	completed, and the disaster recovery exercise cannot therefore be undertaken until the fourth quarter of 2019					
26	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	This recommendation is under implementation. The Umoja business intelligence team is working with process owners and functional experts on the review of the semantic layers	The recommendation is considered to be under implementation		X		
27	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 requests that the Board consider closing this recommendation, taking into consideration the new recommendation on the first-call resolution rate contained in the current year's recommendation. In addition, the first-call resolution target that is adopted has to have a differentiated target for Umoja Foundation and UE1 processes and for UE2 processes. Experience and time are needed before benchmarks can be established for UE2 solutions in particular and because the roll-outs of UE2 will also be staggered throughout 2019	The action recommended is yet to be taken and the recommendation is considered to be under implementation		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
28	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	Change requests pending for more than one year are being reviewed by the Change Control Board. Some have been closed and the others have been shared with the process owner representatives. Currently, 152 change requests have been pending for review for more than 1 year, 61 of which have a status of “draft” or “on hold”, which the Change Control Board does not review	Given that some cases have been pending for review for more than 1 year, the recommendation is considered to be under implementation		X		
29	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	Implementing the Board’s recommendation, the change control repository (CCBREQ) now has an available field for priority in which the requestor can indicate a priority. The planned year and quarter are available to indicate the desired production date if the requestor chooses to do so. In addition, on the implementation phase of a change request there is a priority field, a planned month when the change should be in production and a date to indicate when the development will be completed in order to plan resources for testing and other non-development activities	The Board noticed that a priority was not attached, and the recommendation is therefore considered to be under implementation		X		
30	2018	A/73/169	168	The Board recommends that operationally imperative change requests and those directly relatable	Change requests, directly relatable to the potential for benefits realization, and that do not have an	There is no separate statistics and monitoring on the number of change requests, which have been		X		

No.	Year	Report	Paragraph	Recommendation	Administration comments on status (February 2019)	Board comments on status	Fully implemented	Under implementation	Not implemented	Overtaken by events
				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	impact on UE2 project deliverables, are prioritized. The functional teams that are focused on UE2 activities, the change requestors, the Change Control Board and the development teams ensure that operationally imperative change requests are given requisite attention and appropriately scheduled to meet the requestors' needs	identified as those with potential for benefits realization. The recommendation is considered to be under implementation				
31	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 requests that the Board consider closing this recommendation, considering their response to mainstreaming and reorganization raised during the current year. Functions that lend themselves to mainstreaming have already been mainstreamed. In the eleventh progress report of the Secretary-General on the enterprise resource planning project, the Secretary-General will propose a mainstreaming plan, the timing of which will depend on the General Assembly's decision and the progress of the project's workplans	Given that the benefits realization plan is yet to be presented, the recommendation is considered to be under implementation		X		
Total							8	23		
Percentage							26	74		