

UNITED NATIONS

**Office of Internal Oversight Services
UNHCR Audit Service**

Assignment AR2006/166/04
Audit Report R07/R005

9 March 2007

**AUDIT OF UNHCR INFORMATION AND COMMUNICATIONS TECHNOLOGY
MANAGEMENT**

Auditors:

Leonard Gauci
Ottavia Cova



Office of Internal Oversight Services
UNHCR Audit Service

**AUDIT OF UNHCR INFORMATION AND COMMUNICATIONS TECHNOLOGY
MANAGEMENT (AR2006/166/04)**

EXECUTIVE SUMMARY

In June and July 2006, OIOS conducted an audit of UNHCR's Information and Communications Technology Management function at its Headquarters in Geneva. UNHCR's core ICT functions fall under the responsibility of the Division of Information Systems and Telecommunications (DIST). The core application system is MSRP (Management Systems Renewal Project), which is an Enterprise Resource Planning system.

Overall Assessment

- The audit did not reveal major weaknesses. Nonetheless, a number of measures should be taken to strengthen the governance and administrative structure of the overall ICT operations. In OIOS' opinion, the implementation of the recommendations set out in the report would bring the management of ICT more in line with best practices and would demonstrate management's commitment to ensuring proper control in this area. OIOS was pleased to note that *the Director of DIST has accepted the recommendations made and is in the process of implementing them.*

Audit Findings and Recommendations

- An ICT Governance Board was set up in May 2006, dealing with ICT initiatives. In OIOS' view, its roles and responsibilities should be extended to include the oversight and coordination of all ICT strategic and policy matters in UNHCR. There should be a mechanism for monitoring and reporting to the Board the actual costs and results of each project against the approved budgets and plans.
- There are still ICT matters in UNHCR that do not fall under the mandate of DIST. OIOS recommended that DIST be assigned full responsibility for all ICT products and services. This would avoid duplication and inefficiency and make it easier to implement consistent ICT policies and methodologies.
- UNHCR should clarify its position with regard to the application of ICT-related instructions issued by the UN Secretariat, and take the initiative to establish a framework for exchanging information and know-how. For instance, DIST could consider adopting a methodology for the development of new systems already in use in the UN and apply this on a consistent basis.
- UNHCR should develop and implement an Information Management strategy. This will define mission-critical information and identify any businesses processes that need to be modified in order to take full advantage of the facilities afforded to UNHCR by its automated systems.

- DIST should carry out a post-implementation review of MSRP to evaluate the investment made and ensure that users take full advantage of the facilities offered by the system. Lessons learned can be applied to on-going and future projects.
- The budgeting process for DIST should be reviewed and linked to funding. DIST is already using the UN International Computing Centre's hosting services and should look at other areas where outsourcing may be advantageous, as well as opportunities for synergy within the UN system. There are no service agreements between DIST and the various user units in UNHCR. Linking funding to service agreements should bring about more accountability and transparency in the use of funds for ICT services and products.
- DIST does not have the autonomy to use training funds for its staff with ICT functions, including those in field locations, and there are no established criteria for the allocation of such funds. DIST should be assigned a budget for training staff with ICT functions to meet the obligations contracted in service agreements, and should be allowed to apply the funds in line with a set of criteria approved by the ICT Governance Board. With regard to user training in IT skills, the Board has approved a business case for training that leads to European Computer Driving Licence certification and this should be implemented without delay.
- The working group entrusted with developing a security policy for UNHCR should conduct a risk analysis and all policies and procedures and documentation should be compiled in a controlled security manual. This group should review the existing audit trails and security reports for improvement and implement a policy for their review. OIOS recommended the appointment of a Chief Information Security Officer to be the first point of contact for all matters related to computer security. In OIOS' opinion, this is an opportune time to evaluate the effectiveness of the system's security features and those of the network infrastructure by conducting penetration tests.
- UNHCR does not have a comprehensive business continuity plan. OIOS recommended that the High Commissioner sets up a task force to deal with all matters relating to business continuity planning, including the categorization of mission-critical systems and data, and to draw up a project plan for its implementation.
- DIST was not aware of all the systems and databases that have been developed by end-users and run on stand-alone PCs. This may result in duplication of systems and waste of effort while reports presented to management for decision-making may contain inaccurate data. An electronic register that would record details of all the ICT applications should be set up. DIST should periodically provide users with guidelines that will highlight the risks related to end user computing and provide guidance on safeguards and best practices to mitigate these risks.

March 2007

TABLE OF CONTENTS

CHAPTER	Paragraphs
I. INTRODUCTION	1 – 3
II. AUDIT OBJECTIVES	4
III. AUDIT SCOPE AND METHODOLOGY	5 – 6
IV. AUDIT FINDINGS AND RECOMMENDATIONS	
A. Governance	7 - 20
B. Planning and Organization	21 - 29
C. Financial Management and Human Resources	30 – 37
D. Implementation and maintenance of systems	38 - 43
E. IT Security and Safety	44 - 64
F. Management and Procurement of IT Assets	65 - 69
V. ACKNOWLEDGEMENT	70

I. INTRODUCTION

1. During June and July 2006, OIOS conducted an audit of UNHCR's Information and Communications Technology Management at its Headquarters in Geneva. The audit was conducted in accordance with the International Standards for the Professional Practice of Internal Auditing.

2. UNHCR's core ICT functions fall under the responsibility of the Division of Information Systems and Telecommunications (DIST). The Director of DIST who is the Chief Information Officer (CIO) reports to the Deputy High Commissioner. In 2002 UNHCR started to implement MSRP (Management Systems Renewal Project) which is an Enterprise Resource Planning system. The implementation of the Human Resources/Global Payroll modules in 2007 will complete the core aspects of this project.

3. A draft of this report was shared with the Director of DIST in November 2006. The comments, which were received in January and March 2007, are reflected in this final report. *The Director of DIST has accepted most of the audit recommendations made and is in the process of implementing them.*

II. AUDIT OBJECTIVES

4. The main objectives of the audit were to:

- Assess UNHCR's ICT governance and organizational structure
- Determine requirements for the successful implementation of UNHCR's ICT strategy
- Assess UNHCR's practices and plans for ICT against the global ICT strategy of the UN Secretariat
- Identify areas of ICT that require the attention of UNHCR's management to bring them in line with best practice

III. AUDIT SCOPE AND METHODOLOGY

5. The audit addressed the general management of ICT in UNHCR and focused on the relevant areas of Information Technology controls that fall under the responsibility of DIST. It did not examine the IT controls over individual application systems or the functionality aspects of such systems.

6. The audit was conducted in accordance with ISACAs' (Information Systems Audit and Control Association) Information Systems Auditing Standards, guidelines and procedures. OIOS obtained an understanding of the computer environment at UNHCR by using a structured questionnaire. Tailored audit programmes covering the audit objectives were developed on the basis of the completed questionnaire. During the audit, OIOS analysed applicable data and reviewed the available documents and other relevant records. Interviews were held with selected managers and staff.

IV. AUDIT FINDINGS AND RECOMMENDATIONS

A. Governance

(a) ICT governance

7. OIOS welcomes the establishment of the Information and Communications Technology (ICT) Governance Board¹ and sees this as an important step in strengthening UNHCR's governance structure over ICT. In particular OIOS notes that while ultimate responsibility remains with the High Commissioner, Board meetings are chaired by the Deputy High Commissioner who will be accountable for all decisions, and will decide where consensus cannot be reached². This is a critical aspect of governance which in OIOS' experience with other organizations that when it was absent or not properly enforced has led to the failing of similar bodies.

8. OIOS notes that the terms of reference of the Board are focussed on the coordination of ICT investments and projects. During its first three meetings, the Board mainly dealt with the review and assessment of proposed ICT projects. While this is an important element of ICT governance, the ICT Governance Board also has an important role to play in the formulation and implementation of ICT policies. DIST would be expected to take the lead in the initiation of projects such as developing and implementing an information management strategy, security policies and business continuity plans, but these projects require an input from all user departments. If this is lacking, it is not likely that such policies will be effective. The ICT Governance Board is therefore the right forum for coordinating these matters.

9. Business owners groups provide an important forum where users can express their requirements with regard to their systems. They also help to coordinate ICT matters in particular with respect to security and system modifications. For MSRP, there are two such groups, one for the Finance and Supply Chain modules and another for HR/Global Payroll. Discussions with management indicate that the former is largely focussed on Headquarters and field operations are not sufficiently involved. With the implementation of MSRP, it is important that the business owners formally take over the ownership of an application once this has been delivered and they are satisfied it meets their requirements. There should be a mechanism that clearly defines the ownership of all the systems and data, and identifies the parties and their respective responsibilities to such systems and data. These details should be recorded on an electronic register as discussed under Section F of this report.

10. The Department of International Protection Services and the Division of Operational Support operate non-MSRP systems. Both the Directors of DIPS and DOS are represented on the ICT Governance Board. This is a welcome move towards improving governance over ICT within the whole of UNHCR. There is still a risk however that an ICT project is initiated by one of these entities without DIST being given the opportunity to review the technical specifications for compatibility with existing systems and application of appropriate methodologies for project management and delivery. DIST indicated that this had led to incompatibility of systems in the past. Furthermore, neither DIPS nor DOS has a business owners group, and there is room for more synergy; for example with DIPS and DOS adopting the change control procedures operated by DIST.

¹ ADM-01-01 and IOM/FOM 57/2006 of 28 June 2006

² *ibid.* para. 8

Recommendation:

- The UNHCR's ICT Governance Board should:
 - (a) Extend its role and terms of reference from the approval of business cases for ICT initiatives to include the oversight and coordination of all ICT strategic and policy matters throughout UNHCR; and
 - (b) Ensure that the ownership of systems and data is clearly defined and reflected in the electronic register (Rec. 01).

11. *DIST agreed with the recommendation. The electronic register will be included in DIST's Strategic Plan for the coming biennium. DIST stated that the scope and timing of project to implement would this be defined by June 2007. OIOS will close the recommendation once the role and terms of reference of the ICT Governance Board are extended.*

12. OIOS noted that the discussions at the first three ICT Governance Board meetings strongly indicated the need for pre-screening to review business cases to make sure that the scope of projects is properly defined, the benefits are clearly set out and all the cost elements have been captured. OIOS recommended setting up a task force for reviewing the business case for ICT initiatives on a project-by-project basis to ensure the accuracy of the functional aspects prior to the business case being presented to the ICT Governance Board. *OIOS was pleased to note that DIST Client Managers work with units preparing business cases for projects to ensure robust submissions reach ICT Governance Board.*

13. The ICT Board's terms of reference state that it is the responsibility of the business units to prepare the business case outlining how the project supports the organization's strategic objectives, the costs/benefits, the resource requirements and the funding sources.³ It is not yet clear what will happen after the business case for the project has been approved, and whether there will be regular up-dates on the actual costs vis-à-vis the approved budgeted amount. It is important that the Governance Board is kept informed if the final product does not meet the original objectives or if cost overruns are incurred.

Recommendation:

The UNHCR's ICT Governance Board should request that the Chief Information Officer establishes a mechanism for monitoring and reporting to the Board the actual costs and results of each project against the approved budgets and plans (Rec. 02).

14. *DIST agreed with the recommendation and stated that there is a proposal to create a Project Management Officer in DIST to monitor expenditure on projects, technical issues and report on return-on-investment. This will be included in DIST's Strategic Plan for the coming biennium. OIOS will close the recommendation on confirmation that a mechanism has been established to monitor and report to the Board on the actual costs and results of the approved projects.*

³ *ibid.* para. 6

15. The current regulatory definition of the term “UN Secretariat”⁴ includes UNHCR. However UNHCR has operated independently of the ICT governance structures set at the UN Secretariat level, such as the Information and Communications Technology Board. A number of official documents⁵ have been issued by the UN Secretariat with the aim of ensuring coherent and coordinated global management ICT initiatives across departments and duty stations. The UNHCR Electronic Mail Policy issued in June 2006 clarifies how the Secretary-General’s Bulletin on the “Use of Information and Communication Technology Resources and Data”⁶, applies to e-mail and related services and facilities. Other than this, UNHCR has not followed the instructions set out in these documents and neither has there been an approach on the Secretariat’s part requesting UNHCR do so. The lack of coordination on ICT matters can lead to divergent policies, while failure to take advantage of the investment already made to develop strategies and policies could result in a waste of resources.

16. In OIOS’ view, UNHCR should clarify its position with regard to compliance with ICT regulations and rules issued by the UN Secretariat. If UNHCR remains outside the UN Secretariat’s ICT governance structure, OIOS still sees plenty of opportunity for benefits to be gained through close cooperation between it and the UN Secretariat. For example, the UN’s Information Technology Services Division (ITSD) has specialized units for the undertaking of ICT risk analysis that would form the basis for security and business continuity plans. Earlier this year, this Division obtained ISO 27000 certification covering the network systems at UN Headquarters and is now providing training and guidance to ICT offices in duty stations to help them achieve certification. On its part, UNHCR can provide advice based on its experience in implementing a global ERP system. The two parties should also collaborate towards the establishment of a common chart of accounts in compliance with International Public Sector Accounting Standards.

Recommendation:

- The UNHCR’s Deputy High Commissioner, as Chairperson of the ICT Governance Board should liaise with the Chairman of the Secretariat’s Information and Communications Technology Board and clarify UNHCR’s position with regard to the application of ICT-related instructions issued by the Secretariat and seek to establish a framework through which both parties will benefit through the exchange information and know-how (Rec. 03).

17. *DIST agreed with the recommendation. UNHCR is clarifying its position vis-à-vis ICT-related instructions issued by the Secretariat. As a programme of the Secretary-General, UNHCR (the DHC) cooperation with the Secretariat takes place through the High Level Committee on Management (HLCM) ICT Network. OIOS will close this recommendation on confirmation that UNHCR’s position with regard to the application of ICT-related instructions issued by the Secretariat is clarified and a framework, at the Director level, is established for the exchange of information.*

⁴ ST/SGB/2002/11

⁵ These include: GA Document A/55/780 “Information Technology in the Secretariat: a plan of action”, GA Document A/57/620 “Information and Communication Technology Strategy”, ST/SGB/2003/17 “Information and Communications Technology Board”, ST/SGB/2004/15 “Use of Information and communication technology resources and data” and ST/AI/2005/10 “Information and communication technology initiatives”.

⁶ ST/SGB/2004/15 of 29 November 2004

(b) The role of the Division of Information Systems and Telecommunications

18. Over the past four years, UNHCR's ICT resources have been focused on the implementation of MSRP. With the rolling out of the HR/Global Payroll modules, the role of DIST will shift from that of developing, project managing and implementing core systems to that of a service provider. The latter role will be aimed at maintaining and running systems that will allow users easy access to data that is complete, up-to-date and reliable. DIST also has the responsibility for ensuring that the investment made in the new systems is exploited to the full. The current structure and the ICT roles and responsibilities within DIST will need to be redefined. Some posts will no longer be required and there will be a need to re-allocate and re-train some staff.

19. Unless DIST has full responsibility for all ICT products and services within UNHCR, it will be difficult to coordinate ICT matters, including the funding of ICT resources. This may lead to duplication, inefficient provision of services to users, failure to anticipate the needs of UNHCR, and possibly a lack of accountability and transparency. On the other hand, full responsibility for all ICT products and services within UNHCR will make it easier for DIST to adopt a client-oriented approach. It will also give UNHCR the opportunity to rationalize the budgeting and funding of ICT resources.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications should be assigned full responsibility for all ICT products and services within UNHCR (Rec. 04).

20. *DIST agreed with the recommendation. This is being implemented through the office of the DHC, the CIO, the ICT GB and is reflected in current ORB procedures. Appropriate doctrine continues to be disseminated to the Organisation in the form of IOM/FOMs (policies) and memoranda on important issues pertaining to this. OIOS will close this recommendation on confirmation that full responsibility has been assigned to DIST.*

B. Planning and Organization

(a) Information Management strategy

21. UNHCR does not have an Information Management (IM) strategy. The Joint Inspection Unit, in their 2002 report⁷ listed their observations concerning Information Management within the United Nations System Organizations, noting that:

- Managing information resources effectively is not only a major organizational challenge but also provides an opportunity for enhancing efficiency.
- The first step towards effective management of information resources is to develop an organization-wide information management strategy.
- The information management strategy is distinct from an information technology strategy in the sense that information technology are tools for an effective information management process; the information-management strategy should focus on identifying mission-critical information as well as system(s) required for effective

⁷ JIU/REP/2002/9 Managing Information In The United Nations System Organizations: Management Information Systems

information management.

- Many organizations developed various IM systems without due regard to their integration into an organization-wide system designed to facilitate improved management.
- In view of the fact that implementation of projects for IM systems, in particular ERP systems, is a resource-intensive undertaking, effective project management is critical to successful development and introduction of such systems.
- Many UN system organizations have failed to meet the necessary and sufficient prior conditions required for cost-effective implementation of an ERP system, including streamlining existing work processes, putting a management structure in place and establishing an operational plan, as well as identification of requirements and in-depth review of functionality that ERP applications provide.

22. Although ideally an IM strategy should have been formulated before embarking on the development of different information systems to capitalize on the efficiencies afforded by the new systems and infrastructure, an IM strategy would define the role of ICT in information management and clarify, for example, the linkages between MSRP and other systems. In addition, the IM strategy would be a key reference for governance and oversight.

23. On the other hand, the absence of an IM Strategy could defeat the objective of consolidated and integrated data management systems. There is a risk that management and users will push for modifications to the system to accommodate existing processes. This would result in inefficiencies and would invalidate the investment made in MSRP.

24. The responsibilities called for by this task are wider in scope than those that fall within the duties of the CIO, and should be directed by the ICT Governance Board. The Board can appoint a working group to prepare a detailed work plan with timelines, benchmarks and resources for developing and implementing an IM strategy. The strategy would include a definition of mission-critical information, and the identification of any business processes that need to be changed in order to take full advantage of the facilities afforded by UNHCR. While OIOS is pleased to note that the ICT Governance Board has already tasked the Director of DOS to constitute an Extranet Task Force to help guide and integrate the development of information management initiatives, the ICT Governance Board should ensure that UNHCR's ICT strategy is updated to reflect the conclusions deriving from the IM Strategy.

Recommendation:

- The UNHCR's ICT Governance Board should establish a working group to draw up a detailed work plan with timelines, benchmarks and resources required to develop and implement an overall Information Management strategy. The ICT strategy should be updated to support the objectives defined in the IM Strategy (Rec. 05).

25. *DIST agreed with the recommendation. The DHC has assigned the Director of External Relations to prepare TORs and chair a task force that will develop and implement an organisationwide Information Management strategy. DIST will be an important member of this task force. OIOS will close this recommendation once the Information Management strategy has been established.*

(b) Post-implementation review of MSRP

26. UNHCR has heavily invested in the implementation of MSRP. While labour cost-savings will materialize over a period of time, the efficiencies gained through the streamlining of processes should be immediately visible in a number of areas: for example, the ability to track funds through UNHCR and accurately report on expenditure and facilitate decision-making, and to increase the speed and accuracy with which goods can be purchased and tracked from supplier to beneficiary.

27. Once the HR/Global Payroll modules are implemented during 2007, DIST should carry out a post-implementation review (PIR) to evaluate the investment made in MSRP, assess the benefits – both to UNHCR staff and the recipients of UNHCR’s services – and compare the original claimed benefits and costs to actual ones. Also, if the information is available, such a review can determine with some accuracy the real cost of the MSRP project, including the true cost of user time in terms of business disruption, training, learning curves and the rise in IT support immediately following implementation. The review would also help to identify lessons learned, which in turn can be applied to on-going projects such as the Treasury Management System.

28. Apart from the accountability aspect, it is important that any problems are immediately addressed, otherwise users may not take full advantage of the features offered by the system. A typical risk area is that of report generation, where users may end up creating their own spreadsheets to calculate data, with the inefficiencies and risks to the reliability of the data that this brings with it, when the system provides the facilities to extract the reports in question. The best way to address these risks is to conduct a User Satisfaction Survey specific to MSRP to assess the system’s “functional fit”. This would help to assess users’ preparedness and their level of acceptance of the system, ascertain the extent to which users are utilizing the functionalities provided by the various modules of the system and consequently the extent to which UNHCR is gaining from the investment made.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications with the Business Owners should carry out a post-implementation review of the MSRP project to evaluate the investment made and identify any aspects that need to be addressed to ensure that users take full advantage of the facilities afforded by the system. Preferably the Deputy High Commissioner, as the chairperson of the ICT Governance Board, should initiate and sponsor the review. The review should also determine what went well and what did not, and any lessons learned should be applied to on-going and future ICT initiatives (Rec. 06).

29. *DIST agreed with the recommendation. The review will be included in DIST’s Strategic Plan for the coming biennium. The overall plan would be that the Business Owners execute the evaluation with input from DIST with a view to completing the review in 2008. OIOS will close this recommendation on the completion of the evaluation.*

C. Financial Management and Human Resources

(a) Funding of ICT resources and Service Agreements

30. With the MSRP project nearing completion, the budgeting process for DIST should be reviewed. In the opinion of the CIO, there should be a three-tier costing structure, namely, operational costs to incorporate the costs necessary to keep things going as they are; fixed costs, such as contracted costs for hosting and other services; and the costs of investing in ICT initiatives. OIOS agrees with this structure in principle. Investment in new systems is now covered by the procedures set by the ICT Governance Board. DIST should continue to seek ways of optimizing the fixed ICT costs through the outsourcing of certain services, in particular within the UN Common System. OIOS notes that the UN International Computing Centre (ICC) is used for hosting services and UNHCR has recently entered into a contract for VSAT. Additionally other areas, such as the outsourcing of the provision of help desk services may be advantageous.

31. It is also important that the budgeting and funding aspects are directly based on the ICT strategy and on service agreements between DIST and the user units. At present there does not seem to be a proper link between the budgeting and funding processes. Therefore with operational costs, OIOS sees scope for conducting a study to determine the criteria and the funding each unit should contribute towards the maintenance of existing systems. Criteria may include the number of workstations and users.

32. The CIO told OIOS that DIST will be nominating a number of product managers to be responsible for seeing that the particular product or service will continue to support user requirements but as yet there are no service delivery or service level agreements between DIST and UNHCR's various user units/sections. Unless the standard of all services expected of DIST are clearly defined and formalized in a service catalogue between DIST and the individual user units (with any additional services being defined in a bilateral agreement), there is a risk that the roles and responsibilities of both the providers and users of ICT services will not be properly understood. This may lead to a lack of accountability and situations where users expect and demand certain services that DIST is unable to deliver or arrange to be outsourced in time. On the other hand, a move towards activity-based budgeting and the linking of funding to service agreements should bring about more accountability and transparency in the use of funds for ICT services and products.

Recommendations:

- The UNHCR Division of Information Systems and Telecommunications should conduct a study to determine the criteria and the amount of contribution each unit should make towards its operational costs (Rec. 07).

- The UNHCR Division of Information Systems and Telecommunications should identify all those ICT services that it is mandated to provide to each user unit and have these services and respective responsibilities defined in a service catalogue, a copy of which should be made available on the intranet. Any services additional to those in the catalogue should address the resource implications and be defined in a bilateral service agreement between DIST and the user unit concerned (Rec. 08).

33. *DIST agreed with the recommendations stating that these principles will be included in DIST's Strategic Plan for the coming biennium. OIOS will close these recommendations on confirmation that appropriate principles have been established for the provision of ICT services to user units and subsequent funding of the services.*

(b) Training

34. DIST does not have the autonomy to use training funds to ensure that staff in ICT functions have the necessary skills. ICT training funds should be used for specific and well-targeted actions, but at this stage there is no established criteria for the allocation of training funds. Examples of such criteria may include: evidence of demand, direct application of acquired knowledge/skills, duration, cost and willingness to cost share. Management could set up a points system based on these criteria and utilize the training funds accordingly. This use of criteria would also show more transparency in the allocation of funds.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications should be assigned a budget for training DIST staff in ICT functions to enable it to meet the ICT strategy objectives and the obligations contracted in service agreements. DIST should have full autonomy in the use of these training funds, based on a set of criteria approved by the ICT Governance Board (Rec. 09).

35. *DIST agreed with the recommendation. DIST elaborated that a training budget is being included in DIST's Strategic Plan for the coming biennium. DIST will work closely with Budget and Staff Development Section to devise criteria. OIOS will close this recommendation on confirmation that a budget for training staff in ICT functions has been made available to DIST.*

36. In addition to technical staff, system users should also be provided with a basic level of training in the use of IT systems. This would help them better utilize the facilities afforded by the systems and appreciate the risks and measures that should be taken with regard to computer security. It would make users more self-sufficient to a certain degree and reduce the demand on DIST's resources. These objectives can be achieved through a UNHCR-wide training programme under which users of IT systems will participate and obtain the European Computer Driving Licence (ECDL) certification.

37. OIOS is pleased to note that in October 2006 the ICT Governance Board approved a business case for improving the basic IT skills of UNHCR staff through training that leads to ECDL certification. OIOS recommended that this issue be followed up and a consistent plan for

funding and implementation be established. *DIST indicated that it would be on the agenda of the Governance Board during spring 2007.*

D. Implementation and maintenance of systems

(a) Methodologies for ICT projects

38. DIST does not consistently follow a standard methodology for the development of new systems or projects. These methodologies are important to ensure that major ICT initiatives are thoroughly planned, adequately staffed, and managed by suitably experienced project managers. Without a proper methodology there is a risk that the project will not be substantively aligned with UNHCR's goals and objectives. There is also a risk that a staff member in a field office who has implemented a computer-based application will depart without leaving sufficient documentation to enable continued maintenance of the system.

39. DIST stated that it is in the process of developing procedures to ensure that both UNHCR and user needs are properly defined and incorporated into the systems' designs. However there are no procedures to ensure that appropriate security and control features are incorporated in system design and that applications potentially vulnerable to fraudulent programme coding or data manipulation incorporate special security features and edit checks. The quality of system design, programming and documentation is not subject to quality assurance testing.

40. The UN Secretariat has adopted the Prince II methodology for all ICT project high-level evaluation. This methodology addresses the UN Secretary-General's four return indicators for ICT projects, namely: (a) service improvement through quicker access to information and/or higher quality services; (b) process streamlining by eliminating duplication and having the potential for redeployment of resources; (c) leveraging past investments by extending the life of current systems; and (d) a strong enabler in the decision making process. Once an ICT project has received the approval of the Project Review Committee, ITSD and DPKO's Communications and Information Technology Service have been using Rational Rose as a software development tool to ensure uniform architectural compliance.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications should adopt a methodology for the implementation of new systems and apply this on a consistent basis. This methodology should include procedures aimed at ensuring that appropriate security and control features are incorporated within the system design as well as quality assurance testing (Rec. 10).

41. *DIST agreed with the recommendation and considered it implemented, as processes are aligned and consistent with the ICT GB process/methodology established by UNHCR.* OIOS appreciates the efforts made to create a common methodology and considers them a good starting point for methodology implementation. However, OIOS considers that the current methodology documentation is still not fully complete and further work is required as outlined in the recommendation above.

(b) Change control

42. DIST maintains four separate system environments; one for development, two for testing, and the live (production) environment. After modifications have been tested and approved, the programme is transferred to the second test environment (referred to as support/test) to await transfer to production. A programme that has been tested and approved may remain in the support/test environment for up to a month before being transferred to the live environment while matters such as user training are finalized.

43. OIOS pointed out that with several moves between the environments there is a risk of unauthorized modifications being made to a programme before its transfer to production. *DIST, however, is convinced that their procedures with technical and functional sign-offs to different environments mitigates such risk*

E. IT Security and Safety(a) Information systems risk analysis and security policy

44. The report of the UN Board of Auditors (BOA) to the General Assembly for the period ended 31 December 2005⁸, includes a section titled "Information and communication technology fraud prevention and management". OIOS has taken note of the contents of this section and UNHCR's responses and therefore will not repeat the BOA's recommendations here. While the review undertaken by OIOS was at a high level and did not include detailed testing, we would like to draw management's attention to other matters concerning IT security. OIOS believes that the implementation of the respective recommendations will bring UNHCR more in line with best practices and reduce the risk of fraud through unauthorized access to its systems and data.

45. In response to the BOA's recommendations, UNHCR stated that DIST has formed a working group to develop an information security policy. In OIOS' opinion, the development of a security policy should be preceded by an information systems risk analysis to ensure all risk areas are addressed. This is particularly important where applications are linked through a network, since a fraudster could gain access to an important system via a minor one. The analysis would also prevent an overstatement of controls that would reduce efficiency unnecessarily. This risk analysis would be useful when developing business continuity plans. The UN Secretariat's ITSD has conducted ICT Security Risk Assessments at all Offices away from headquarters. DIST may wish to take advantage of the experience gained through these reviews and request ITSD to conduct a similar one at UNHCR.

46. The security policy will need to be supported by detailed procedures and instructions covering all aspects of computer security within UNHCR. These should be grouped in a security manual. Given UNHCR's operational and IT environments, it will not be practical to maintain close supervision over all users and it is important that staff are made aware of good practices with regard to computer security so that they will exercise self-discipline. Copies of the manual and its distribution should be controlled so as not to compromise security. A copy of the security policy and selected procedures should be made accessible to all staff over the intranet. Periodically, DIST should issue reminders to staff on the need to adhere to the security policy and procedures.

⁸ A/AC.96/1025 of 13 September 2006

Recommendations:

- The UNHCR Division of Information Systems and Telecommunications should undertake an information systems risk analysis and consider requesting the UN Secretariat's Information Technology Services Division to perform an ICT Security Risk Assessment of its core application systems. The results of the risk analysis would serve as the basis for formulating a comprehensive security policy and procedures (Rec. 11).
- The UNHCR Division of Information Systems and Telecommunications should group all documentation related to computer security in a security manual. Ownership and circulation of the manuals should be controlled. The security policy and those aspects of the manual that do not compromise the control over security should be made available over the intranet. Reminders to staff on the need to adhere to the security policy and procedures should be issued at least once a year (Rec. 12).

47. *DIST agreed with the recommendations. DIST stated that UNHCR would conduct a risk analysis/quality assurance exercise. It is still to be determined whether it will be performed with in-house resources or through UN ITSD. DIST also informed OIOS that the security manual is under preparation. One of the first deliverables was the implementation of password security procedures (IOM/FOM/86/2006). OIOS welcomes the work already done by DIST and will record the recommendations as implemented on confirmation that a risk analysis has been conducted and the security manual is complete.*

(b) Security administration

48. The administration of security over UNHCR's automated systems is currently fragmented and not sufficiently independent. This function calls for coordination and should be detached from those of systems development and computer operations. OIOS is pleased to note that in June 2006 the Deputy High Commissioner circulated an Electronic Mail Policy to all staff members.⁹ In the event of breaches of the standards of acceptable use, the policy refers to the Staff Rules. OIOS, however, would like to see specific reference to the responsibility for monitoring compliance with the policy and the steps to be taken in the event of non-compliance.

49. A person who is sufficiently independent of day-to-day IT operations should be designated as Chief Information Security Officer (CISO). This person would be responsible for the overall monitoring of compliance with the security policy and procedures. His or her duties would include keeping all security-related documentation up-to-date, performing periodic or cyclical reviews of access rights to ensure they conform with the policy, reviewing security reports and informing the CIO of any security breaches or unauthorized attempts to access data.

50. Given the nature and size of UNHCR's computer environment, the CISO will need to be supported by focal points within each business unit. Each of these units should designate two staff members as a Security Liaison Officer (SLO) and an alternate. The SLO will be the first point of

⁹ ADM-01-01 and IOM/FOM 57/2006 of 28 June 2006

contact for users for all matters that relate to computer security. Only those matters that cannot be resolved by the SLO would be escalated to the CISO. The SLOs would also be responsible for reviewing the security reports concerning their business unit and to take appropriate follow-up action. *DIST proposed involving Inspector General's Office as a coordinator, in line of best practices to further separate execution from oversight.*

Recommendations:

- The UNHCR Division of Information Systems and Telecommunications should assign a person who is independent of systems development and maintenance as Chief Information Security Officer (Rec. 13).
- The UNHCR Division of Information Systems and Telecommunications, through the ICT Governance Board and possibly in cooperation with Inspector General's Office, should request each business unit to designate a Security Liaison Officer and an alternate who will be the first point of contact for all matters related to computer security within the unit. Details of these persons should be kept up-to-date on the intranet (Rec. 14).

51. *DIST agreed with the recommendations. A proposal to appoint an Information Security Officer will be submitted to ORB in March 2007 as part of the 2008 Headquarters Plan of DIST. Implementation of the recommendation concerning the Security Liaison Officers is contingent on the appointment of the Information Security Officer. OIOS takes note of the positive steps taken and will keep the recommendations open pending confirmation that a Chief Information Security Officer has been assigned and Security focal points have been designated.*

(c) Audit trails and security reports

52. OIOS reviewed a DIST document titled "Application Security Strategy; Management Systems Renewal Project" dated 16 April 2003. The objective of this document is limited to the activities involved in the use and application of security software within the MSRP system and does not cover other areas such as databases, file servers or networks. Even within the MSRP system, the document does not make reference to security violation reports and audit trails. It does not specify the persons who will be responsible for seeing that the policies and procedures within the strategy are applied.

53. In the case of ERP systems in particular, the focus should be on having in-built security features to prevent any attempt at unauthorized access to systems and data. However it is still advisable to have a robust system based on audit trails and security reports for detecting such attempts. If this is absent, there will be a risk that successful unauthorized attempts at data access will remain undetected.

54. It is unclear whether the current audit trails and security violation reports are adequate. These reports should not merely serve as events logs, but should provide enough detail to trace the origin of the violation. To be feasible for control purposes, these reports should be designed to record exceptions. For example, the report that would show unsuccessful login attempts and needs to be designed in a way so that only instances of repeated failed access attempts are reported for investigation.

55. There is a need for formal procedures covering the generation, review and follow-up action on audit trails and security reports. At present, audit trails are normally reviewed on an exceptions basis. Reports relating to security violation are not printed and reviewed as standard practice, and the analysis of the audit trail information and the security violation information is not taking place.

56. DIST should therefore implement a clear policy covering on-line access to security reports, the frequency of their generation and their distribution, as well as responsibility for their review and follow-up action. These tasks would be assigned to the Chief Information Security Officer and the Security Liaison Officers.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications working group that has been entrusted with developing a security policy for UNHCR should, in cooperation with business units and possibly with the Inspector General's Office:
 - (a) Review the existing audit trails and security reports for adequacy and make recommendations for improvement; and
 - (b) Implement a policy for the generation and review of security reports and follow-up action (Rec. 15).

57. *DIST agreed with the recommendation. DIST informed OIOS that work on information security policy has already commenced and completion is anticipated by the end of 2007. OIOS takes note of the work done and will keep the recommendation open pending the issuance of the security policy.*

(d) Penetration testing

58. An ERP system such as MSRP has inherent security risks due to the large number of users accessing the system, the large volume of transactions per employee, and the decrease in the paper trail. There are also risks associated with the sharing of information with third parties such as suppliers by the linking of systems. Within certain modules (e.g. accounts payable), the system might allow a user to modify static data temporarily and change it back shortly afterwards with no audit trail.

59. As a result of the above, ERP systems, while bringing about increased efficiencies through the streamlining of business processes and the significant reduction or elimination of manual processes, provide an increased opportunity for fraudsters, especially for insiders. Management therefore needs to implement effective security mechanisms to address the risk of fraud. It will not be able however to obtain assurance regarding the effectiveness of these mechanisms unless they are subject to rigid testing. The best way to evaluate the effectiveness of the system's security features and identify any weaknesses would be by conducting penetration testing by an independent party.

Recommendation:

- The UNHCR Division of Information Systems and Telecommunications should evaluate the effectiveness of all systems security features and those of the network infrastructure by conducting penetration tests (Rec. 16).

60. *DIST agreed with the recommendation stating that implementation is contingent on the appointment of an Information Security Officer. If this would not be feasible then DIST shall seek external resources, e.g. consultants. OIOS takes note of DIST's response and will keep the recommendation open pending confirmation that penetration tests have been conducted.*

(e) Disaster recovery and business continuity planning

61. UNHCR does not have a formal plan aimed at ensuring that in the event of a major disaster affecting its computer facilities, management would be able to mobilise alternate arrangements for processing data and continue to provide its core services efficiently while the facilities are properly restored. While effective backup procedures and power supply protection provide a measure of insurance against system failures, in the event of a major disaster such as a fire, it is unlikely that the damage will be restricted to the computer equipment but will also affect other areas. Such a plan would also detail the stages to be followed to ensure that UNHCR's critical functions are properly recovered and become operational within acceptable timescales.

62. Business continuity planning is wide in scope and requires input from all user units. An effective business continuity plan will need to be preceded by a risk assessment to define the mission-critical functions and data, the systems supporting them and the impact that their unavailability will have on UNHCR. It also requires coordination with external parties such as the suppliers of hardware, software and communications service and equipment. In the case of UNHCR, this means close coordination with ICC with which it has an agreement for hosting services covering MSRP.

63. The conduct of such an exercise is demanding on resources and OIOS suggests that UNHCR takes advantage of the work that has already been undertaken in this area by other entities within the UN system, especially those like UNDP and UNICEF who have also implemented ERP systems. The UN Secretariat's ITSD is working on a plan for Global Business Continuity while DPKO has consolidated planning for business continuity, utilizing its Headquarters in New York, the UN Logistics Base in Brindisi and the United Nations Office in Geneva as disaster recovery sites.

Recommendation:

- The UNHCR High Commissioner should set up a task force to deal with business continuity matters throughout UNHCR. This task force should:
 - (a) Hold workshops for senior managers to advise and agree upon the categorization of mission-critical systems and data;
 - (b) Seek the advice and collaboration of other UN entities that have already formulated business continuity plans or are at an advanced stage in the process; and
 - (c) Draw up a project plan for the implementation of a business

continuity plan for UNHCR (Rec. 17).

64. *DIST agreed with the recommendation stating that implementation is contingent on the appointment of the Information Security Officer. If this would not be feasible then DIST shall seek external resources, e.g. consultants.* OIOS appreciates the efforts UNHCR has done in producing a Contingency Plan for UNHCR Headquarters in case of a pandemic (avian flu) and considers this a good starting point for a more comprehensive business continuity plan.

F. Management and Procurement of IT Assets

(a) Monitoring end-user developed applications

65. DIST appears to have full visibility of MSRP and other application systems that are used centrally by multiple divisions, and has control over which systems are allowed to run over the networks. However from our discussions it emerged that DIST is not aware of all the systems and databases that are developed by end-users and run on stand-alone PCs. This applies to units/sections at Headquarters and even more so to field offices.

66. If UNHCR is not aware of existing applications there can be duplication of systems and a waste of effort. There is also a risk that reports presented to management for decision-making will contain inaccurate data derived from end-user developed applications such as spreadsheets that have not been subject to quality assurance.

67. Details of all UNHCR's ICT end-user applications, including reference to licence agreements, should be recorded in an electronic register. This exercise will require substantial effort and a designated person within each office should be responsible for updating the register with details of the ICT applications located in that office. Application systems should be categorized by their significance or criticality, and there should be an indicator to show the status of an application, i.e., whether it is in use, being developed or approved but not yet underway. DIST should have a monitoring role to ensure that the register is being kept up-to-date, and should perform checks on the completeness and accuracy of the data. A complete and up-to-date register of ICT applications will provide a basis for control and, in the longer-term, help UNHCR save money through rationalization.

68. DIST should also provide users with guidelines on best practices to safeguard the integrity of data in reports that are generated from user-developed spreadsheets, security of back-up media, and the installation and upgrading of virus-detection software on laptops.

Recommendations:

- The UNHCR Division of Information Systems and Telecommunications should set up an electronic register to record details of all the ICT applications that belong to UNHCR. Each office should appoint a focal point with responsibility for updating the register while DIST should monitor the currency of the register data and perform checks for its completeness and accuracy (Rec. 18).

- The UNHCR Division of Information Systems and Telecommunications should periodically provide users with guidelines that will highlight the risks related to end user computing and provide guidance on safeguards and best practices to mitigate these risks (Rec. 19).

69. *DIST agreed with the recommendations. The electronic register will be included in DIST's Strategic Plan for the coming biennium. For the guidelines DIST elaborated that these would be included in the information security guidelines. OIOS takes note of DIST's response and will keep the recommendations open pending the development and implementation of an electronic register and the dissemination of information security guidelines highlighting the risks associated with developing *ad hoc* systems.*

V. ACKNOWLEDGEMENT

70. I wish to express my appreciation for the assistance and cooperation extended to the auditors by the staff of UNHCR.

Eleanor T. Burns, Acting Chief
UNHCR Audit Service
Office of Internal Oversight Services