

Prepared for:
U.S. Agency for International Development
Health Insurance Organization, Egypt

Contract Number:
263-0170-C-00-3042-00

TRAINING EVALUATION REPORT

Deliverable 22

USAID Project Number: 263-0170
[Develop a Detailed and Updated Management Information System for the Egyptian
Health Insurance Organization, Cost Recovery Program]

Prepared by:
The MAXIMUS, Chemonics, Arabsoft Project Team

Date:
March 20, 1997

March 20, 1997

Mr. Carl Abdou Rahmaan
Project Officer
USAID/Egypt
106 Kasr El Aini Street, 7th Floor
Cairo Center Building
Cairo, Egypt

Ref: Project Number 263-0170-C-00-3042-00

Dear Mr. Abdou Rahmaan:

MAXIMUS is pleased to submit Deliverable 22, Training Evaluation Report. This report reviews and discusses training delivered, from the beginning of the project through December 31, 1996, to Health Insurance Organization (HIO) employees as part of the HIO Management Information System (MIS) Project.

This document addresses the project's efforts and progress in the design and implementation of training for HIO staff as technicians, end users, and management users of the HIO management information system. It itemizes and describes the MIS-related training delivered to HIO staff. The report evaluates the performance of HIO employees in key roles, and includes a series of conclusions and recommendations, to HIO, to help ensure the success of subsequent training efforts. Finally, the report describes the training of trainers strategy used by the project to build a human resources foundation on which HIO can assume full responsibility for, and succeed with the MIS in the long term.

Also included in this report is a summary of findings from follow-up testing conducted for Cairo Branch end users. The results, though overall highly encouraging, point to some specific problems that need to be addressed.

Should you have any questions about the content of this report or wish to discuss any of the issues, please feel free to contact me directly.

Sincerely,

A. Felix Meyer, III
Chief of Party

cc: Dr. Hassan Abdel Fattah, HIO Chairman
General Faisal Taie, HIO

March 20, 1997

Dr. Hassan Abdel Fattah
Chairman
Health Insurance Organization
Heliopolis
Cairo, Egypt

Dear Dr. Abdel Fattah:

MAXIMUS is pleased to submit Deliverable 22, Training Evaluation Report. This report reviews and discusses training delivered, from the beginning of the project through December 31, 1996, to Health Insurance Organization (HIO) employees as part of the HIO Management Information System (MIS) Project.

This document addresses the project's efforts and progress in the design and implementation of training for HIO staff as technicians, end users, and management users of the HIO management information system. It itemizes and describes the MIS-related training delivered to HIO staff. The report evaluates the performance of HIO employees in key roles, and includes a series of conclusions and recommendations, to HIO, to help ensure the success of subsequent training efforts. Finally, the report describes the training of trainers strategy used by the project to build a human resources foundation on which HIO can assume full responsibility for, and succeed with the MIS in the long term.

Also included in this report is a summary of findings from follow-up testing conducted for Cairo Branch end users. The results, though overall highly encouraging, point to some specific problems that need to be addressed.

Should you have any questions about the content of this report or wish to discuss any of the issues, please feel free to contact me directly.

Sincerely,

A. Felix Meyer, III
Chief of Party

TABLE OF CONTENTS

Section	Page
1	INTRODUCTION 1-1
1.1	Project-Sponsored MIS Training 1-2
1.2	Types of HIO Staff Receiving Project-Sponsored MIS Training 1-3
1.3	MIS Training Implementation as of December 31, 1996 1-4
1.4	MIS Training Follow-Up 1-6
1.5	MIS Training in 1997 1-7
2	TRAINING EVALUATION 2-1
2.1	Project-Sponsored MIS Training, by Trainee Type, as of December 31, 1996 2-1
2.1.1	MIS Technicians 2-1
2.1.1.1	HIO MIS Center Technicians 2-2
2.1.1.2	Cairo Branch MIS Center Technicians 2-2
2.1.1.3	Northwest Delta Branch (NWDB) MIS Center Technicians 2-2
2.1.1.4	East Delta Branch MIS Center Technicians 2-3
2.1.1.5	Facility (polyclinic and hospital) Technicians 2-3
2.1.2	MIS Application End Users 2-3
2.1.2.1	Cairo Branch End-User Training 2-4
2.1.2.2	Northwest Delta Branch End-User Training 2-4
2.1.2.3	East Delta Branch End-User Training 2-4
2.1.2.4	Canal Branch End-User Training 2-4
2.1.3	MIS Application Management Users 2-5
2.2	Training Materials Development, Training Sites, and Training Delivery Constraints 2-5
2.2.1	Training Materials Development 2-5
2.2.2	Training Sites 2-9
2.2.3	Training Delivery Constraints and the Training Materials Development Process 2-9
2.3	Training of Trainers 2-10
2.4	MIS Training Summary and Follow-Up 2-11
2.4.1	HIO MIS Center Technician Training 2-11
2.4.2	Branch Technician Training 2-12
2.4.3	Facility Technician Training 2-12
2.4.4	Management-User Training 2-12
2.4.5	End-User Training 2-13
2.5	Project-Sponsored MIS Training for 1997 2-13
2.6	Conclusions and Recommendations 2-14
2.6.1	Conclusions 2-15
2.6.2	Recommendations 2-15

TABLE OF CONTENTS (continued)

Section	Page
APPENDIX A: MIS TRAINING CURRICULA AND TRAINEES: SUMMARY EXHIBITS	A-1
APPENDIX B: CAIRO BRANCH MIS END-USER FOLLOW-UP TESTING: SUMMARY OF FINDINGS	B-1
B.1 Purpose of Follow-Up Visits	B-1
B.2 Results of Follow-Up Testing in Cairo Branch	B-2
B.2.1 Findings	B-2
B.2.2 Recommendations	B-3
B.3 Revised Training Curricula	B-5

LIST OF EXHIBITS

Exhibit	Title	Page
2-1	Breakdown of HIO MIS Project Training Manuals and Materials	2-7
2-2	MIS Software Application/End-User Training Manual Matrix	2-7
2-3	Extent of the Project Training Effort for HIO MIS Technicians, End Users, and Managers: Minimum Number of Persons to be Trained at each Site Type by Branch, and at the HIO MIS Center	2-14
A-1	Core MIS Curricula Received by HIO MIS Center (Al Ahram) Technical Trainees, by Provider	A-1
A-2	Original Group of HIO Personnel Who Completed Technician Training for HIO MIS Center Technician Positions, by Name, Status, and Rating, as of December 31, 1996	A-2
A-3	Branch Technician Training Courses by Provider	A-4
A-4	Project-Sponsored MIS Training for HIO Branch Technicians by Branch, Name, Status, and Rating, as of December 31, 1996	A-5
A-5	Training Curricula for Facility Technicians (Computer Operators) by Course Name and Provider	A-8
A-6	Project-Sponsored MIS Training for Facility Technicians by Branch and by Facility Type: Numbers who had Completed Training as of December 31, 1996	A-9
A-7	HIO Management-User Curricula by Type of Manager	A-10
A-8	HIO Headquarters Managers Attending the Medical Quality Assurance and Management Modules Orientation Workshop, by Name and Status, as of December 31, 1996	A-11

1 INTRODUCTION

The MAXIMUS-Chemonics-Arabsoft project team is tasked with the development of a detailed and updated management information system (MIS) for the Egyptian Health Insurance Organization (HIO). This effort is being undertaken in cooperation with the HIO MIS Center, and is one part of the USAID-funded Cost Recovery for Health Project.

The HIO MIS Project represents a functionally-integrated approach to management information systems. As of December 31, 1996, the project is scheduled to support full implementation of the HIO MIS at:

- o the HIO MIS Center (Al Ahram Street in Heliopolis);
- o HIO Headquarters (Roxy);
- o four HIO branch offices (Cairo, Northwest Delta, East Delta, and Canal); and
 - . 63 polyclinics,
 - . 16 hospitals, and
 - . 6 drug stores within those branches.

Project implementation at these sites is scheduled for completion by January 20, 1998.

Two key objectives to the long-term success of the HIO MIS are the ability of HIO personnel to use the MIS in their daily work, and to maintain and enhance the MIS after the project has ended. To achieve these objectives, the HIO MIS Project developed a comprehensive training strategy to meet the needs of new users as the MIS is implemented, and to ensure the HIO's ability to sustain the MIS in the long term.

The primary purposes of this Training Evaluation Report, which covers the period June 1, 1993 to December 31, 1996, are to:

- o identify HIO staff members who completed project-sponsored technician training for positions at the HIO MIS Center and at the four branch MIS Centers (Cairo, Northwest Delta, East Delta and Canal); and
- o report on:
 - . the status of each of the above MIS Center or branch technicians who had completed their project-sponsored technical training by December 31, 1996;

- . the progress of project-sponsored facility (polyclinic and hospital) technician training as of December 31, 1996;
- . the progress of project-sponsored end-user training as of December 31, 1996;
- . the progress of project-sponsored management-user training as of December 31, 1996; and
- . project-sponsored MIS training scheduled to be conducted in 1997.

1.1 Project-Sponsored MIS Training

The strategic objective of the project's training initiative is to diffuse the MIS innovations developed by the project among HIO staff. Diffusion of an innovation goes far beyond dissemination of information. It is concerned with the spread of the use of the innovation — in this case the spread of the use of MIS skills by HIO technicians, end users, and management users. Thus, the project is committed to providing competency-based MIS knowledge and skills training to targeted HIO MIS staff members in order that they may perform specific MIS job responsibilities. This Training Evaluation Report limits itself to assessing how successful the project has been in diffusing this knowledge and these skills to HIO personnel, and to identifying nontraining issues which have impacted the project-sponsored MIS training effort.

Project-sponsored MIS training includes all training designed and/or conducted under project auspices. Training providers for the HIO MIS Project include:

- o vendors;
- o the MAXIMUS-Chemonics-Arabsoft Technical Support Group (TSG);
- o project managers; and
- o the HIO MIS Center and HIO branch TSGs, who deliver training under the direction and monitoring of the contractor TSG.

The project contracts with vendors, such as NCR and Oracle, for certain types of technical training. The MAXIMUS-Chemonics-Arabsoft TSG is the main provider of branch technician training. Branch technicians receive both formal classroom and on-the-job training. In the classroom, technicians are trained to competence on the MIS applications. Formal training of trainers (TOT) is also conducted to introduce branch technicians (who will themselves be training other HIO personnel) to training concepts, methods, tools, management, and trainee follow-up. The contractor TSG supports formal classroom training with on-the-job training for branch technician-trainers.

The contractor TSG designs all end-user, management-user, and TOT training curricula and materials. It conducts TOT courses, as well as end-user and management-user training. The contractor TSG supports and monitors HIO TSG trainers at the MIS Center and four branches. Finally, it designs and implements follow-up testing of end users in order to identify additional training interventions required to bring end users up to competency in the application with which they work.

HIO MIS technical personnel at the MIS Center and branches constitute the central focus of the project's training effort, and hence of this report, because they are essential to the operation of the MIS, to the training of end users, and to the orientation and training of management MIS users.

. **Types of HIO Staff Receiving Project-Sponsored MIS Training**

People working at HIO who have something to do with MIS fall into three categories: technicians, end users, and management users. Technicians are those who design and write applications; install, operate, and maintain hardware; construct and maintain databases; develop training curricula; train and support staff; and implement and support the MIS. End users are those who enter data, perform inquiries, and generate reports using the various MIS applications. Management users are those individuals who receive and use the products of the system (i.e., the reports various applications produce) to make decisions. All three categories of personnel are essential to the system and all three categories require training to perform their MIS functions correctly.

The project's MIS training is carried out in Egypt. Most of the MIS training is conducted at MIS training centers in the HIO branches. Some end-user training is conducted on-site at HIO polyclinics and hospitals. Some technician and management-user training is conducted off-site at training centers of vendors, or, in the case of branch-wide management orientation workshops, at conference centers.

The number of MIS training classes received by an individual is determined by the position for which the person was being trained. Technicians at the HIO MIS Center and at the branch MIS centers receive more training than do individual application end users, or managers requiring orientation or training as management users.

Trainee selection was a variable over which the contractor had limited control. The contractor developed position descriptions for HIO MIS technician and end-user staff, and specified desired prerequisites for the various types of MIS training to be provided. However, HIO had people in place performing manual functions whom the organization wanted trained to perform those same or similar functions as MIS application end users. Similarly, HIO had managers in place at Headquarters and at the branches. Staff assigned for MIS training by HIO thus constituted the target group for the end-user and management-user training efforts. The contractor was able to exert some influence over HIO's assignment of persons to be trained as

HIO MIS Center or branch MIS center technicians. The contractor recommended prerequisites for potential technician trainee selection. After HIO selected candidates based on its own organizational selection criteria and contractor recommendations, the HIO MIS Center Supervisor submitted names of candidates for technician training to the contractor. The contractor had these candidates take standardized English and computer aptitude tests. Once the contractor received the results of the tests, it made its recommendations to HIO and determined whom it would train as technicians at project expense. Thus, HIO and the contractor worked together to select appropriate candidates for training as technicians — individuals and positions crucial to the continued operation and success of the HIO MIS.

. MIS Training Implementation as of December ,

Over the course of the five-year project, a large number of HIO staff need to be trained as end users, technicians, and management users. Numbers to be trained is a function of:

- o the number of MIS applications designed to be in use;
- o the number of terminals to be installed at the sites covered under this contract;
- o the MIS functions to be performed by the technicians at the HIO MIS Center and at the branch MIS centers;
- o the number of shifts to be worked by application end users and technicians at the various HIO sites; and
- o attrition of MIS personnel trained under the project.

The estimated number of different persons to receive MIS training is , . Any one of these persons may receive training in one (e.g., application end user) or many (e.g., technician or manager) MIS training courses. As of December , , the project had completed formal MIS training classes and delivered , person-days of classroom MIS training to HIO technicians, end users, and managers.

As of December , , the project had completed training of a core group of:

- o HIO MIS Center technicians,
- o Cairo Branch technicians,
- o Cairo Branch Statistics technicians,
- o Northwest Delta Branch technicians, and

- o East Delta Branch technicians.

Facility technician training completed as of December 2001, included 100 persons trained as facility computer operators for Cairo Branch facilities, 100 for Northwest Delta Branch facilities, and 100 for East Delta Branch facilities.

All Cairo Branch polyclinic application end users and nearly one-third of Northwest Delta Branch (NDB) polyclinic application end users had completed their training.

All polyclinic managers in Cairo Branch, nearly one-third of the polyclinic managers in the NDB, and managers from six polyclinics in the East Delta Branch had completed one-day management orientations on Orientation to MIS: Introduction to Computers and the HIO MIS, and five one-day orientations on the five basic polyclinic applications. Polyclinic managers and physicians had also completed the project-sponsored International Classification of Diseases (ICD-9) orientation workshop.

As of December 2001, 100 managers from HIO Headquarters (Rohy) had completed an intensive two-day MIS orientation workshop. The workshop covered the Medical Quality Assurance and Management Modules of the HIO MIS.

In May 2001, the project expanded its training efforts to include the design and delivery of a series of training of trainers (TOT) curricula for branch technicians. TOT curricula were developed for:

- o each polyclinic application;
- o Training Concepts, Methods, and Tools; and
- o Training Management and Follow-Up.

As of December 2001, the project had conducted TOT on all the polyclinic applications and on Training Concepts, Methods, and Tools in the Cairo and Northwest Delta Branches. Additionally, the project had completed the TOT on Training Management and Follow-Up for Cairo Branch technicians.

The contractor TSG developed and maintains a training management database which includes information on each trainee. For an individual trainee, the database includes:

- o training classes completed by class name,
- o start-end dates,

- o durations,
- o training providers,
- o training sites,
- o pre- and post-test scores (if required), and,
- o for MIS application end user trainees, e it and follow-up test scores.

. MIS Training Follow-Up

The majority of HIO staff who received project-sponsored training were still with the HIO and working with the MIS as of e cember , .

More importantly, the majority of the individuals followed up on were performing well, and many had demonstrated e ceptional performance in the positions for which they were trained. By virtue of the project's continuous on-the-job training, many had acquired proficiency in new skills, as well. However, attrition was a problem among the HIO staff trained by the project as HIO MIS Center and Cairo Branch technicians.

Attrition is a very serious problem when it occurs among HIO MIS Center and branch-level technicians, as these groups constitute the working core of the system, and technicians receive the greatest amount of MIS training. Training new technicians at these two levels is a priority in the second wave of project training, scheduled for . It is difficult to find people already trained with the technical skills required for the HIO MIS so HIO will have to recruit new candidates for the contractor to test and, based on test results, train to fill the slots lost to attrition. By e cember , , the HIO had lost one-third of the original core group of HIO MIS Center technicians and one-half of its Cairo Branch technicians trained by the project.

In uly , the project developed a follow-up methodology for tracking and measuring post-training on-the-job competency of individuals who were trained as MIS application end users in HIO facilities. This was done so that additional training interventions could be scientifically and easily determined, and implemented by branch TSG trainers. As of e cember , , the project had completed follow-up testing at the polyclinic level in Cairo Branch. Attrition among MIS application end users in the polyclinics has occurred, as is evidenced by the results of the Cairo Branch follow-up study.

Training replacements for these positions requires one week of training per new end user in each application that user needs to master. However, as of e cember , , all application end-user training at the polyclinic level (including refresher courses and training of new people necessitated by attrition) can be handled by the TSGs at the HIO MIS Center, Cairo Branch MIS Center, and Northwest elta Branch MIS Center. An important achievement of the project training

effort is that, as of December 2003, the HIO had 15 TSG technicians, either at the HIO MIS Center or at a branch MIS center, who had completed all their TOTs and had developed proven capabilities as trainers.

During the project identified certain areas of end-user training which needed strengthening. As a result, in August and September of that year training curricula were revised and standardized so that training class outcomes, as evidenced by exit test scores, could be used as the basis for end-user training follow-up. As of December 2003, the project had completed its follow-up field study of all end users who had been trained for Cairo Branch. As a result of the follow-up study, the project was able to precisely identify for HIO and Cairo Branch what types of training interventions were required to bring the Cairo Branch application end users to competency in the use of their applications.

As of December 2003, the project had determined the need for a more structured focus on orienting both HIO MIS Center and branch technicians to the importance of the Help desk function. By the end of December 2003, the project had designed and delivered a five-day orientation workshop for branch Help desk personnel. The workshop was attended by Cairo and East Delta Branch technicians, as well as some technicians from the HIO MIS Center. A Help desk orientation workshop for the Northwest Delta Branch was scheduled for January 2004.

. MIS Training in 2004

The major foci of project-sponsored training for 2004, the final year of the project are:

- . to start and complete the training of branch technicians in Canal Branch;
- . to complete the application TOTs for technicians in all four branches;
- . to complete the testing and training of new technicians for the HIO MIS Center and the Cairo Branch MIS Center, necessitated by relatively high levels of attrition of HIO staff at those two sites;
- . to complete the management orientations, and development and delivery of the management-user curricula; and
- . to complete follow-up testing of polyclinic application end users in the Northwest Delta Branch.

As a result of the TOT initiatives of the project in 2004, HIO technical support groups at the HIO MIS Center and at the Cairo, Northwest Delta, and East Delta Branches are now fully capable of conducting all MIS application end-user classroom training and on-site post-training support (Canal Branch will be implemented in 2005). Cairo and Northwest Delta Branch TSGs are also fully capable of conducting the follow-up visiting and testing to determine training

interventions. By the end of the project, the TSGs at the East Delta and Canal Branches will have these capabilities as well.

2 TRAINING EVALUATION

HIO employees who work with the MIS, and thus require training, fall into three categories: technicians, end users, and management users. Technicians are those who design and write applications; install, operate, and maintain hardware; construct and maintain databases; develop training curricula; train and support staff; and implement and support the MIS. End users are those who enter data, perform inquiries, and generate reports using the various MIS applications. Management users are those individuals who receive and use the products of the system (i.e., the reports various applications produce) to make decisions. All three categories of personnel are essential to the system and all three categories require training to perform their MIS functions correctly.

The number of MIS training classes received by an individual is determined by the position for which the person is being trained. Technicians at the HIO MIS Center and at the branch MIS centers receive more training than do individual application end users, or managers requiring orientation or training as management users. Exhibits A- , A- , A- , and A- , in Appendix A, list the project-sponsored MIS training curricula by categories of MIS trainee.

. Project-Sponsored MIS Training Delivered, by Trainee Type, as of December ,

As of December , , the project had completed formal training classes and/or orientations for MIS technicians, end users, and management users, for a total of , person-days of MIS training. This was accomplished during the period from April , when project-sponsored training for the HIO MIS started, through December , .

As stated above, there are three basic categories of trainees: technicians, end users, and management users. The following subsections describe project-sponsored training delivered, as of December , , to each of these three categories.

. . MIS Technicians

In order to ensure the long-term viability and success of the MIS, the HIO must be able to operate, maintain, and as desired or needed, enhance the system. To support the MIS, the project has trained a pool of HIO personnel as MIS technicians. MIS technicians work at all levels of the HIO: Headquarters, the MIS Center, branches, and facilities. As of December , , the project had completed training for the core groups of technicians at the HIO MIS Center and at three of the four HIO branches included in the project.

. . . HIO MIS Center Technicians

Twenty-seven personnel completed training as HIO MIS Center technicians. As of December 2000, 15 were still working with the MIS and using the skills for which they were trained. Two of the 15 had been promoted, and though still involved in the MIS, were no longer doing technical work. Two more of the original group were still with HIO but were no longer working with the MIS. Both were in non-MIS administrative work. Unfortunately, nine — that is, one-third — of the original group of 27 trained as HIO MIS Center technicians were no longer working for HIO.

Exhibit A-1, in Appendix A, lists the core curricula used for training the original group of HIO MIS Center technicians. Exhibit A-2, in Appendix A, lists the names, statuses, and ratings as of December 2000, of those 27 individuals.

... Cairo Branch MIS Center Technicians

Cairo Branch technicians were the first to receive branch technician training. A group of 15 persons was trained by the project to become the permanent Cairo Branch MIS Center Technical Support Group. Of these 15, 11 are still with the Cairo Branch MIS Center performing as branch technicians. Of this group of 11, two have demonstrated exceptional performance, three have demonstrated excellent performance, and one has demonstrated good performance. Unfortunately for Cairo Branch, two of the original group of 15 have been reassigned to non-MIS positions, and two are no longer with the HIO.

Exhibit A-3, in Appendix A, lists the core curricula, by provider, used for training the original group of 15 Cairo Branch MIS Center technicians. Exhibit A-4, in Appendix A, lists the names, statuses, and ratings, as of December 2000, of those 15 individuals.

... Northwest Delta Branch (NDB) MIS Center Technicians

The Northwest Delta Branch was the only HIO branch with prior experience using computers in the management of its branch and facilities. The project sponsored additional technical training for 15 Northwest Delta Branch staff members who had prior work experience with computers, although none had prior experience with an organization-wide, client-server based MIS such as that introduced by the project. Of the 15 NDB MIS Center staff members who received project-sponsored training, 10 were still with the MIS Center as of December 2000. Twelve were working as technicians with the branch TSG. Two of the technicians trained were still with the HIO and working with the MIS but were on extended leave (i.e., a year or more). Two others were still with the NDB and working with the MIS, but were serving as facility technicians at the Borg El Arab El Gedid Polyclinic. Only two of the original core group of 15 are no longer with the HIO.

Exhibit A- , in Appendix A, lists the core curricula, by provider, used for training the original group of N B MIS Center technicians. Exhibit A- , in Appendix A, lists the name, statuses, and ratings, as of December , , of those individuals.

. . . East elta Branch MIS Center Technicians

In the fourth quarter of , the project completed the training of HIO personnel as East elta Branch MIS Center technicians. As of December , , all were still with the branch. Ten were working as MIS Center technicians. One individual was still with the branch and working with the MIS but had been reassigned to work as the computer operator at the El Neel Polyclinic. One other individual, although still with the East elta Branch, had been reassigned from the branch's MIS Center to its Statistics epartment.

Exhibit A- , in Appendix A, lists the core curricula, by provider, used for training the original group of East elta Branch MIS Center technicians. Exhibit A- , in Appendix A, lists the names, statuses, and ratings, as of December , , of those individuals.

. . . Facility (polyclinic and hospital) Technicians

As of December , , the project had completed the training of facility technicians. Facility technicians are those trained as computer operators for polyclinics and hospitals. Of the facility technicians who had completed their training, were from Cairo Branch facilities, from Northwest elta Branch facilities, and from East elta Branch facilities.

Exhibit A- , in Appendix A, lists the core curricula, by provider, used for training facility technicians. Exhibit A- , in Appendix A, lists the numbers of persons, by branch and facility type, who had completed facility technician training as of December , . The exhibit also includes the numbers of those persons who were performing the job they had been trained for as of December , .

. . MIS Application End Users

By far the largest numbers of people scheduled to receive project-sponsored training are the end users who work at HIO facilities (polyclinics and hospitals), at branch offices, and at Headquarters.

HIO MIS applications are site-specific; the Polyclinic rug Control Inventory Application is different than the Hospital rug Control Inventory Application. Materials and curricula are developed for each site-specific application, and end users must be trained for each of these

applications as well. The numbers of people to be trained as end users is determined by a number of factors, including:

- o the number of HIO beneficiaries affiliated with a facility,
- o the number of terminals installed for a specific application at a site;
- o the number of MIS applications being run at a site;
- o the number of shifts to be worked per application at a site, and
- o employee attrition.

With respect to shifts, the projections of numbers to be trained are based on the assumption that polyclinics will run at least two six-hour shifts and are open six days a week. It is also assumed that hospitals operate three shifts (two six-hour and one four-hour shift) and that all hospitals are open and staffed seven days a week.

. . . **Cairo Branch End-User Training**

By December 2001, the project had completed the follow-up on Cairo Branch application end users working in polyclinics. (Appendix B of this document includes the results of the follow-up testing of Cairo Branch end users and outlines the project's follow-up testing methodology.) As of December 2001, Cairo Branch was the only branch in which polyclinic end-user training had been completed, where end users had considerable on-the-job experience, and where end users had worked for a significant period of time after receiving support follow-up. This combination of conditions warranted the implementation of the follow-up field visiting and testing to determine what branch-wide additional training interventions were needed. As these conditions are met in each of the other three branches, follow-up visiting and testing will be conducted there.

. . . **Northwest Delta Branch End-User Training**

As of December 2001, the NDB TSG, with contractor TSG support, had trained end users and facility technicians in more than one-third of the NDB's polyclinics. This is a notable achievement for the HIO MIS Project as a whole, and for NDB TSG trainers in particular. It represents not only the dedication and commitment of the HIO to the MIS, but serves as one of the best examples of success arising from the project's commitment to technology transfer. It also highlights the power of the project's training of trainers program.

. . . **East Delta Branch End-User Training**

As of December 31, 2000, East Delta Branch polyclinics were being prepared for implementation and polyclinic end-user training was in progress. End-user training will continue into 2001.

3.3.3 Canal Branch End-User Training

Site preparation of the Canal Branch's MIS Center is scheduled for 2001, funds permitting. Therefore, no Canal Branch technician, end-user, or management-user training had been completed as of December 31, 2000.

3.3.3.1 MIS Application Management Users

The project conducts two types of MIS orientations for HIO managers:

- MIS application orientations (for facility managers and physicians), and
- workshops on the Medical Quality Assurance and Management Modules (for Headquarters and branch management).

During 2000, 15 managers from HIO Headquarters completed an intensive two-day MIS orientation workshop on the Medical Quality Assurance (MQA) and Management Modules. As of December 31, 2000, all but four of those managers were in the management position they held at the time of the orientation workshop. Of the four, three are no longer with the HIO and one was promoted to the position of HIO Chairman.

Orientation workshops for branch managers on the MQA and Management Modules were designed to allow the use of live (real), as well as simulated, data. For this reason, the workshops can occur only after beta testing of the Management Module is completed. Beta testing of the Management Module was not finished until the end of December 2000, so the four Branch Management Orientation workshops are scheduled for 2001. The first, for Cairo Branch Management, and for new Headquarters and HIO MIS Center managers, is scheduled for January 2001. NAB managers are scheduled for March-April. The orientation workshop for East Delta Branch managers is scheduled for June. The dates for the Canal Branch workshop is yet to be determined.

Management users of the MIS will receive specific training in using the applications for queries and reports, and in interpreting data generated by those reports. As of December 31, 2000, management-user training curricula were planned for development. The management-user training classes will be delivered in 2001, starting with the Cairo and Northwest Delta Branches.

Exhibit A-1, in Appendix A, lists the curricula used for training HIO managers at the facility, branch, and Headquarters levels.

. Training Materials Development, Training Sites, and Training Delivery Constraints

What training materials are appropriate for MIS training, where can training best be delivered, and what constraints exist in the development and delivery of MIS training are the questions this section of the report seeks to address.

. . Training Materials Development

Early in the project a training needs assessment was done to identify what MIS training HIO required. A review of curricula from various training centers in Egypt was also undertaken to ensure that the project did not devote level of effort to the development of courses which were already being adequately offered by local training institutions. The project identified two vendors with the capability to offer a wide variety of the technical curricula required for HIO MIS technician training (NCR and Oracle). The project paid for the technician training with credits earned through purchase of hardware and software from these vendors. When training credits were exhausted, costs of technician training were moved to the MAXIMUS training line item.

Using the existing local training institutions for the technician training enabled the project to dedicate its limited number of training personnel (one long-term expatriate training specialist and two local training specialists) to developing and conducting custom training designed around the unique and new needs of the HIO and the HIO MIS. Contractor training personnel (making up the contractor TSG) developed the application-specific training materials for training end users and management users. The contractor TSG also developed intensive training of trainers curricula to prepare HIO branch personnel to carry on the training effort at their level. This is part of the project's commitment to technology transfer, with an emphasis on developing a well-trained cadre of technical support groups at the HIO MIS Center and at branch MIS centers. It is the goal of this effort to ensure that, as the project ends and HIO assumes sole responsibility for the MIS, the TSGs at the HIO MIS Center and at the branches will have the skills and experience needed to design, conduct, support, and follow up end-user, management, and TOT technician training, and that those TSGs will be able to devise training interventions to meet future HIO needs.

One of the primary responsibilities of the contractor TSG is to develop training curricula with accompanying training materials (for orientations and workshops) or training manuals (for application end-user and management-user training). Training programs vary in length from one to six days of formal classroom training and/or orientation. Exhibit - is a breakdown, by general training-type category, of the training manuals and materials developed for the curricula.

Exhibit 2-1
BREAKDOWN OF HIO MIS PROJECT TRAINING MANUALS AND MATERIALS

Training-Type Category	Number of Manuals or Material Sets Developed
Training manuals for facility technicians (computer operators)	2
Training manuals for application end users	26
Training materials for training of trainers courses	27
Medical Quality Assurance and Management Modules orientation workshop materials	5
Application-specific orientation materials for managers	21
Management-user training manuals	23
Branch-level help desk orientation workshop materials	2

The training manuals for application end users constitute the core of the training materials development effort. These serve as the basis for the design of the application TOT manuals and of the management-user training manuals. Exhibit 2-2 is a matrix listing the modules of the HIO MIS, and their applications by site type. An end-user training manual is developed for each application.

Exhibit 2-2
MIS SOFTWARE APPLICATION/END-USER TRAINING MANUAL MATRIX

Module	Location				
	HQ	Branch	Polyclinic	Hospital	Store
Beneficiary Registration/Eligibility Check	X	X	X		
Drug Control and Inventory	X	X	X	X	X
Patient Records			X	X	
Cost Accounting	X	X	X	X	
Medical Quality Assurance			X	X	
Admission/Discharge/Transfer				X	
Contracted Pharmacy		X			
Periodic Medical Exams		X			
Management Reporting	X	X			
Computer Operators	X	X	X	X	

Contracted Providers		X			
----------------------	--	---	--	--	--

HIO MIS training manuals do not just take trainees through an application's menu and options. That is the purpose of an application's user manual. The manuals developed for the HIO MIS Project are organized around clusters of tasks determined by job situations. Work scenarios are presented and trainees are instructed in how to deal with each work scenario, integrating the HIO MIS. For example, when beneficiary registration clerks are trained how to check eligibility, they do not just learn the Beneficiary Registration Application's menu and options, although this is included in the training. The trainees learn how to ask a beneficiary questions, get information, and then decide how to check eligibility in seven different situations. Trainees learn how to use the application to perform their jobs well.

The training manuals and other training materials are written in a language and style that engages the trainees. HIO MIS applications are in Arabic, and all terminals related to the MIS are Arabicized. Arabic is the principle language of Egypt and all HIO beneficiaries are Arabic-speaking Egyptians. Therefore, the training manuals are written in Arabic and all MIS technician, end-user, and management-user training is conducted in Arabic. The manuals talk to the trainee. They ask questions. They give answers. They let trainees check themselves periodically by the use of built-in self-tests. They are designed to help make the training experience fun as well as easy.

The self-tests included in the training manuals enable trainees to prepare themselves to perform each itemized skill that has to be covered. Trainees check themselves on how well they can do each skill at three levels of competency:

- . I understand how to do this task,
- . I can do this task with assistance, and
- . I can perform this task by myself without any assistance.

Once the trainees have checked themselves on all three competency levels for all skills, they approach a trainer and ask to be officially tested. This approach reduces trainee fear and instills confidence, both of which lead to quicker learning and better job performance. Self-testing occurs throughout the six days of formal training. The final exit test is administered on the last day of formal training. The self-test approach also prepares the trainees to do well (they must score 80%, demonstrating mastery of each application) on the official examination. As of December 2000, more than 90% of end users who had completed training scored 80% on the exit test after taking a particular course only once.

During the early summer of 2001, the contractor TSG conducted a thorough review of the courses and training manuals that had been written prior to May 2000. Modifications were introduced to make the training even better. Specifically, all application end-user training curricula

were revised to include a minimum of six days of training. This was done in order to ensure that all trainees had sufficient time for practice during the formal training. A quick quiz was developed and standardized for each application to be administered by the trainer. The results of these quizzes are used to devote attention to areas of weakness experienced by a trainee or the group of trainees before the formal training is completed. The quiz is usually conducted on the fourth day of the formal classroom training. A formal exit test was developed and standardized for each application. This test is scheduled to be given to each trainee on the last day of training. The exit test scores become part of the training class report and are entered in the training management database as the baseline against which to determine the type of training interventions required (on-the-job training, one-day refresher training, or full course retake), based on the results of the follow-up testing.

. . Training Sites

Project-sponsored HIO MIS training takes place at various locations throughout Egypt. These include:

- o vendors' training centers (NCR and Oracle),
- o the HIO MIS Center,
- o MIS Center Training Rooms at the Cairo, Northwest Delta, and East Delta Branches, and
- o on-site at Branch facilities.

. . Training Delivery Constraints and the Training Materials Development Process

There are two main constraints that define the window in which training materials development and training delivery can take place: Software must be ready to run (i.e., fully and finally beta tested), and work sites must be fully operational and ready to receive trained end users.

MIS training is dependent on software applications. Software has to be designed (functional and detailed designs), coded and programmed, and alpha and beta tested. Only when final beta testing of a specific software application is completed can the technical support group learn the application, develop scenarios, and prepare the application training material for pilot testing.

The training materials development process involves a number of steps. In order to develop training materials, training specialists:

- o learn the application, then develop work scenarios for the application;

- o write day-by-day and session-by-session segments of the training curricula, and the training manual;
- o develop and test application-specific trainee self-tests, quick quizzes, and final exit tests (with keys) to be administered by the trainer;
- o design and conduct training of trainers for HIO MIS Center and branch TSG personnel to test the training manual;
- o classroom test the training manual with application end users;
- o modify the training manual based on training of trainers and end-user training results; and
- o prepare version 1.0 of the training manual.

Once an application's training manual and curricula are developed, the scheduling of training for individual end users becomes critical. The optimal time for end-user training to be completed on any given MIS application is within two weeks of the time the trainees will be ready to work at their fully-operational sites. If training occurs too early, trainees are unable to practice and apply the skills learned during training, and these skills deteriorate, necessitating additional training.

Throughout this project, training materials development, and thus training delivery, has been affected by both software development and scheduling constraints. Until a software application is completed and beta tested, the project can not train HIO staff to use that software. Thus, the software development schedule has a direct impact on the training schedule. Likewise, training delivery was also constrained in some cases by the fact that sites at which the trainees were to work were not operational due to unavoidable and unforeseen site preparation situations. In these cases, training was appropriately postponed.

Though there have been delays in the project, serious difficulties have been avoided through the coordination of the project management team. As delays or problems become evident, the management team works in concert to address them and to minimize negative effects on implementation. Where a problem or delay is beyond the direct influence of the contractor, resources are redirected toward other areas of the project where work can proceed. This flexible approach allows the project to progress with implementation across a broad front.

Constraints notwithstanding, as of December 31, 1998, the project had completed all training manuals for which final beta-tested software existed, all polyclinic end-user training in Cairo Branch, and nearly one-third of polyclinic end-user training in N. B. In addition, the project had completed training of trainers in the Cairo, Northwest Delta, and East Delta Branches so that those branches are poised to independently conduct training with completed training manuals.

. Training of Trainers

The primary goal of the training component of the project is to prepare HIO to run its MIS operations after the project has ended and HIO has sole responsibility for the system. A vital part of this preparation is the training of HIO technical support personnel to plan and deliver MIS training now and in the future. The contractor TSG consists of three individuals, each of whom trains his or her HIO MIS Center TSG counterpart. The HIO MIS Center TSG members were part of the original core group of HIO staff trained as MIS technicians.

Training of trainers (TOT) is an important component of the project-sponsored training. The contractor TSG designs and delivers two types of TOT courses for HIO MIS Center and branch TSGs. They are:

- o **Application TOTs**

The core training team (contractor and HIO MIS Center TSGs) designs and conducts the application TOTs in all software applications (see Exhibit - , above) for branch TSG personnel. The branch TSG personnel then plan and conduct end-user training in their branches, with support of the core training team, as needed.

- o **Training TOTs**

Most members of the HIO MIS Center and branch TSGs had no training experience prior to their appointments as trainers. In order to prepare these individuals to be trainers of others, the contractor TSG designed two core training TOT curricula:

- . TOT in Training Concepts, Methods and Tools, and

- . TOT in Training Management and Follow-up.

Both curricula were delivered to the TSGs in Cairo, Northwest Delta, and East Delta Branches prior to December , .

. MIS Training Summary and Follow-Up

HIO MIS Center and branch MIS Center technical personnel constitute the central focus of the project's training effort, and hence of this report, because they are essential to the operation of the MIS, to the training of end users, and to the orientation and training of management users.

While these technicians will be (and already are) taking responsibility for MIS training of end users and management users, the contractor had primary responsibility for the training of both these groups prior to December , .

The following subsections describe — either briefly and with reference to exhibits, or in narrative — training conducted by the project for HIO managers, technicians, and end users.

. . HIO MIS Center Technician Training

Exhibit A- (Appendix A) is a list of the core training curricula, by training provider, received by HIO MIS Center technicians. Exhibit A- is a list of HIO personnel who received the training described in Exhibit A- . Besides the name of each trainee, the exhibit includes the trainee's status, as of December , , and a performance rating.

. . Branch Technician Training

Exhibit A- (Appendix A) shows the list of core training curricula, by training provider, received by branch MIS technicians. Exhibit A- is a list of HIO personnel who received the training described in Exhibit A- . Beside the name of each trainee, the exhibit includes the trainee's status, as of December , , and a performance rating.

. . Facility Technician Training

Exhibit A- (Appendix A) shows the list of core training curricula received by facility (polyclinic and hospital) MIS technicians. Exhibit A- provides a breakdown of the numbers of facility technicians trained, by branch and facility type, as well as the numbers of those technicians who were performing the job they were trained for as of December , .

. . Management-User Training

By December , , all polyclinic managers and physicians in the Cairo Branch had completed the orientation to the MIS, as well as orientations to the five basic polyclinic applications. In the N B, one-third of the polyclinic managers and physicians had completed the orientations. Polyclinic managers and physicians from six East Delta Branch polyclinics had completed those orientations. Orientations to the MIS and the polyclinic applications for Canal Branch polyclinic managers and physicians are scheduled for .

As of December , , there had been no Medical Quality Assurance and Management Module Orientation workshops held for branch-level managers. These are planned for , after the beta testing of the Management Module software is completed.

Management-user training is scheduled for . Management-user training should not take place until all the personnel at the facility and branch levels have completed their formal application end-user training on all relevant applications, and until all the applications for each level of the MIS are running. The management-user training classes (as opposed to the management orientations) require real data from multiple applications for managers to develop their skills in

making queries, generating reports, and interpreting the reports in order to make management decisions.

Exhibit A- (Appendix A) shows the list of training curricula received by HIO management users, by manager type. Exhibit A- is a list of the HIO Headquarters managers who attended the Medical Quality Assurance and Management Module Orientation workshop. The exhibit lists the position each manager held at the time of the workshop, as well as the position held by the manager as of December , .

2.2 End-User Training

MIS applications end-user courses are all designed and produced by the contractor TSG. The courses that the project designs and for which it delivers training and application TOTs appear in Exhibit - , above, and need not be repeated here.

As of December , , MIS application end-user training was completed for all polyclinics in Cairo Branch and for approximately one-third of the polyclinics in the North B. The East Delta and Canal Branches were still in the early phases of site and facility preparation at the end of December , , so no application end-user training had yet been conducted in those branches.

During October and November , , end users who had been working at the Cairo Branch polyclinics on their own for at least one month after completing training and post-training support were visited and given follow-up tests. This was done in order to determine any additional training interventions required by the Cairo Branch TSG. A summary of the Cairo Branch follow-up report appears as Appendix B of this document.

No hospital application end-user training had been conducted as of December , . Beta testing of hospital application software had not yet been completed.

MIS branch and Headquarters application end-user training is scheduled for , after software beta testing and training materials development are completed.

2.3 Project-Sponsored MIS Training for

The major foci of project-sponsored training for , the final year of the project are:

- o to start and complete the training of Canal Branch technicians,
- o to complete the application TOTs for technicians in all four branches,

- o to complete the testing and training of new technicians for the HIO MIS Center and the Cairo Branch MIS Center (necessitated by relatively high levels of attrition among technical staff at those two sites),
- o to complete management orientations, and development and delivery of the management-user curricula, and
- o to complete follow-up testing of polyclinic application end users in the Northwest elta Branch.

Exhibit - shows the extent of the project training effort for the life of the project. It lists the minimum number of persons to be trained at each site type by branch, and at the HIO MIS Center.

Exhibit 2-3
EXTENT OF THE PROJECT TRAINING EFFORT FOR HIO MIS TECHNICIANS, END USERS, AND MANAGERS: MINIMUM NUMBER OF PERSONS TO BE TRAINED AT EACH SITE TYPE BY BRANCH, AND AT THE HIO HEADQUARTERS (INCLUDING THE MIS CENTER AT AL AHAM)

Site Type	HIO Headquarters	Branch				Total
		Cairo	Northwest Delta	East Delta	Canal	
Polyclinic	–	314	533	170	68	1085
Hospital	–	84	63	126	42	315
Branch	–	65	68	48	34	215
HIO Headquarters	60	–	–	–	–	60
Total	60	463	664	344	144	1,675

As a result of the TOT initiatives of the project in , HIO technical support groups at the MIS Center and at the branches (except for Canal Branch, which is being implemented in) are now fully capable of conducting all application end-user formal classroom training and on-site post-training support. The Cairo and Northwest elta Branch TSGs are also fully capable of conducting the follow-up visiting and testing to determine training interventions. By the end of the project, all branch TSGs will have attained this capability.

Hence in , the HIO MIS Center and branch TSG trainers will focus on completion of end-user and facility technician training. The contractor TSG's primary foci will be on completion of:

- o MIS training curricula for MIS applications not yet through the beta-testing stage,
- o HIO MIS Center and branch MIS Center technician training, and
- o HIO management-orientation workshops and management-user training.

Conclusions and Recommendations

Evaluation of the project training effort thus far allows some encouraging conclusions to be reached. Likewise, it offers the opportunity to identify some concerns and to make recommendations in those areas needing attention. The following subsections offer some conclusions reached about the project training effort and some recommendations, to HIO, to help ensure the success of subsequent training efforts and the MIS overall.

Conclusions

The project has successfully demonstrated its capability to plan and implement a large-scale MIS training program for HIO staff. As of December , , it had completed training:

- o core groups of MIS technicians for the HIO MIS Center and for three of the four branch MIS centers,
- o of the application end-user training at the polyclinic level is scheduled for completion throughout the life of the project, and
- o of the management orientations/training classes for HIO Headquarters, branch, and facility managers.

The project's initiation and continuation of its TOT program for HIO TSG trainers is a vitally important achievement of the training effort. It gives the HIO the multiplier effect it needs to continue the MIS training efforts in the future.

In addition to the MIS application training manuals developed by the project, the project is creating a library of videos of key project-sponsored orientation workshops. These videos, covering workshops for Help desk personnel and branch managers, can be used by HIO to supplement its live training, or as refresher training.

Recommendations

The project recommends that the HIO:

- . recognize that MIS training is an ongoing process, and develop the management and support capability for meeting MIS training needs for existing MIS applications and for new applications that HIO may wish to develop in the future;
- . continue its efforts at organizational development and/or reengineering;
- . closely examine HIO management practices and the salary structure, and make all necessary changes to enable the HIO to retain its highly-trained MIS personnel, and to foster their growth and career development as valued MIS personnel.

Exhibit A-1
CORE MIS CURRICULA RECEIVED BY HIO MIS CENTER (AL AHRAM) TECHNICAL
TRAINEES, BY PROVIDER*

Name of Curriculum	Provider
Basic Systems Analysis	NCR
Relational Database Design	NCR
Structured Analysis I	NCR
Structured Analysis II	NCR
Introduction to Structured Query Language (SQL)	NCR
UNIX Basic Concepts	NCR
UNIX Fundamentals	NCR
UNIX Administration	NCR
Wide Area Networks (WAN)	NCR
X.25	NCR
Introduction to Computers	NCR
Data Communication Concepts	NCR
TCP/IP	NCR
TCP/IP Implementation	NCR
Local Area Networks (LAN)	NCR
Keyboard Training	NCR
Network Management	NCR
Structured Procedural Language (SPL)	Oracle
Relational System Design	Oracle
Procedural Options	Oracle
Introduction to ReportWriter	Oracle
Forms and Menus	Oracle
Detailed Systems Analysis	Oracle
Database Administration I	Oracle
Database Administration II	Oracle
CASE Method Overview	Oracle
MIS Applications	MAXIMUS-Chemonics-Arabsoft Project Team

* Not all those being trained as technicians for the HIO HQ MIS Center received all the above courses. However, each received those courses required for the specific technical functions they were to perform post training (e.g., those scheduled to be communications specialists received training on X.25).

**ORIGINAL GROUP OF HIO PERSONNEL WHO COMPLETED TECHNICIAN TRAINING
FOR HIO MIS CENTER TECHNICIAN POSITIONS,
BY NAME, STATUS, AND RATING, AS OF DECEMBER 31, 1996**

Trainee	Status as of 12/ 31/96	Rating
Mary Fahim	2 Assigned as HIO MIS Center Manager of Applications Development immediately after technician training so did not perform as a technician	HIO assigned as counterpart to J. F. Meere
Madiha Mokhtar	1 HIO MIS Training Manager	★★★★ Capable of team leadership
Khalil Radwan	1 Analyst	★★★★ Multiple applications
Sohyla Hamid	1 Analyst	★★★★
Hind M. Amer	1 Analyst	★★★ Capable of taking over Cost Accounting Module
Reda Ahmed	1 Analyst	★★ Multiple applications
Mamdouh Ibrahim	1 Programmer	★★★★ The best HIO programmer
Gehan Malik	4	
Azza Atta	1 Programmer	★
Ahmed Tamam	1 Director, EDB MIS Center	★★★★ Promoted to Director of the EDB MIS Center
Fikry Abbass	1 Analyst	★★ Multiple applications
Nadia Hamed	3 Accountant at Roxy	
Asmaa El Emam	1 Data Base Administrator	★★★
Rawya Ghareb	1 Technical Support Group: Training	★★★★ Training materials development, MIS applications TOT and user training
Salwa A. Mohamed	1 Technical Support Group: Training	★★★ Training materials development, MIS applications TOT and

Heba El Agamawy	4	
Magdy Soussa	4	
Ahmed Shawky	4	
Ahlam El Eryan	4	

Exhibit A-2 (page 2 of 2)
**ORIGINAL GROUP OF HIO PERSONNEL WHO COMPLETED TECHNICIAN
 TRAINING FOR HIO MIS CENTER TECHNICIAN POSITIONS,
 BY NAME, STATUS, AND RATING, AS OF DECEMBER 31, 1996**

Trainee	Status as of 12/ 31/96	Rating
Faten Hussein	4	
Iman Abd El Rahman	4	
Saiida Aref	4	
Assia Aly Kheir	2 Assigned to administration at HIO MIS Center	
Hala Saleh Mahmoud	1 Help Desk	★★
Zaki Farid	1 Communications Specialist	★★
Mohamed Abdel Rahim	1 System Administrator	★★★★ Multiple responsibilities
Ranya Abdel Halim	4	

Key to status codes:

- 1 = Still with the HIO and performing MIS technical work for which the person was trained
- 2 = Still with the HIO and MIS, but no longer in technical work
- 3 = Still with the HIO, but no longer working with the MIS
- 4 = No longer with the HIO

Note on and key to ratings:

A performance rating was given to the trainee by the contractor manager(s) with which the trainee worked most closely. The contractor manager(s) assigned a performance rating based on a scale of 1-4. Ratings were performed only for those HIO employees still with the HIO and performing MIS technical work for which they were trained. For the sake of this exhibit:

- ★ = "fair,"
- ★★ = "good,"
- ★★★ = "excellent," and
- ★★★★ = "exceptional/outstanding."

**Exhibit A-3
BRANCH TECHNICIAN TRAINING COURSES BY PROVIDER***

Branch Technician Training Courses (#=number of courses provided)	Provider
UNIX Operating System (1)	NCR
UNIX Administration (1)	NCR
Relational Database Design (1)	NCR
Introduction to SQL (1)	NCR
Data Communication Concepts (1)	NCR
Local Area Networks (LAN) (1)	NCR
TCP/IP (1)	NCR
Wide Area Networks (WAN) (1)	NCR
MIS Application End-User TOTs (27) Courses and Management User TOTs (23) Courses	MAXIMUS-Chemonics-Arabsoft Project Team
Training TOTs (2) and Help Desk Orientation TOT (1)	MAXIMUS-Chemonics-Arabsoft Project Team

* NCR courses are one-week courses; MAXIMUS-Chemonics-Arabsoft MIS application end-user Training of Trainers (TOT) are one week for each of the 27 courses; management-user TOTs are one-day courses for each of the 23 courses; training TOTs and the Branch Help Desk Orientation are one-week courses.

Exhibit A-4 (page 1 of 3)
PROJECT-SPONSORED MIS TRAINING FOR HIO BRANCH TECHNICIANS BY
BRANCH, NAME, STATUS, AND RATING, AS OF DECEMBER 31, 1996

Trainee	Status as of 12/31/96	Rating
Cairo Branch MIS Center		
Mona M. el Samman	1 Technical Support Group: Training	★★★★ Materials development; TOT and user training
Gamatat Wahaba	4	
Aml Abdul Gawad	1 Technical Support Group: Training	★★★★ Training materials development; MIS applications TOT and user training
Gurgis Yusuf Ayub	1 Technical Support Group: Computer Operator	★★★ Also functions as Help Desk person for Cairo Branch facilities
Mohamed Mostafa	1 Technical Support Group: Computer Operator	★★★ Also capable of functioning as Help Desk person for Cairo Branch facilities
Abeer El Sayed Khalil	1 Technical Support Group: Communications Specialist	★★ On leave
Shehata Yousef Rezk-Allah	2 Administration at HIO MIS Center (Al Ahram)	
Hanan Sabet Ali	1 Technical Support Group: Training Coordinator	★★★ Coordinates Cairo Branch training; Conducts MIS application TOT and user training
Milad Roshdi	3 Helwan administration	
Mohamed el Lethy	4	

Key to status codes:

- 1 = Still with the HIO and performing MIS technical work for which the person was trained
- 2 = Still with the HIO and MIS, but no longer in technical work
- 3 = Still with the HIO, but no longer working with the MIS
- 4 = No longer with the HIO

Note on and key to ratings:

A performance rating was given to the trainee by the contractor manager(s) with which the trainee worked most closely. The contractor manager(s) assigned a performance rating based on a scale of 1-4. Ratings were performed only for those HIO employees still with the HIO and performing MIS technical work for which they were trained. For the sake of this exhibit:

- ★ = "fair,"
- ★★ = "good,"
- ★★★ = "excellent," and
- ★★★★ = "exceptional/outstanding."

Exhibit A-4 (page 2 of 3)

**PROJECT-SPONSORED MIS TRAINING FOR HIO BRANCH TECHNICIANS BY
BRANCH, NAME, STATUS, AND RATING, AS OF DECEMBER 31, 1996**

Trainee	Status as of 12/31/96	Rating
Northwest Delta Branch MIS Center		
Dr. Salwa El Seewi	1 MIS Center Director	★★★★ Also serves as NWDB MIS Implementation Director
Dr. Hoda Bakry	1 Technical Support Group	★★★ Also MIS Trainer
Dr. Nabil Ayoub	2 Technical Support Group	On extended leave
Dr. Fatma Fadly	1 Technical Support Group	★★★ Training and Help Desk
Dr. Zakia Houssen Mohamed	1 Technical Support Group	★★★ Help Desk
Ms. Sayida A. Gelil	1 Technical Support Group	★★★ Computer Operator and Trainer
Ms. Nema' A. Wahat	1 Technical Support Group	★★★ MIS Trainer
Mr. Hassen Al Sageer	1 Technical Support Group	★★★ Communications Specialist and Trainer
Mr. Sami Zohdi	1 Technical Support Group	★★★ Communications Specialist
Mr. Mohamed Mostafa	1 Technical Support Group	★★★ Computer Operator
Mr. Shereen Fahmi	1 Technical Support Group	★★★ Trainer
Dr. Sami Remond	1 Technical Support Group	★★★★ Assistant MIS Training Coordinator
Dr. Maysa Ahmed	1 Technical Support Group	★★★★ Training Coordinator
Besmat El Rokshy	2 Technical Support Group	On extended (one-year) leave
Soliman Abdel Latif Soliman	1 Borg El Arab El Gedid Polyclinic	★★★ Facility technician
Gehad Faber Abd El Halim	1 Borg El Arab El Gedid Polyclinic	★★★ Facility technician
Ashraf Mostafa Ibrahim	4	

Hanan Ismail Abd Allah	4	
---------------------------	---	--

Exhibit A-4 (page 3 of 3)
PROJECT-SPONSORED MIS TRAINING FOR HIO BRANCH TECHNICIANS BY
BRANCH, NAME, STATUS, AND RATING, AS OF DECEMBER 31, 1996

Trainee	Status as of 12/31/96	Rating
East Delta Branch MIS Center		
Sohier Abd El Zaher	3 East Delta Branch	Transferred to Statistics Department
Nahed Abd Allah	1 Technical Support Group	★★ Trainer
Ashraf Fouad Mahdy	1 Technical Support Group	★ MIS Trainer
Yaser Abd el Rashed Mohamed	1 Technical Support Group	★★★ MIS Trainer
Hatem Ahmed	1 Technical Support Group	★★★★ Help Desk Specialist
Yehia Ahmed	1 Technical Support Group	★★★★ Help Desk Specialist
Reda Ramzy	1 Technical Support Group	★ MIS Trainer
Hamdy El Sayed	1 Technical Support Group	★ El Neel Polyclinic Computer Operator
Ayman Galal	1 Technical Support Group	★★★ Branch Computer Operator
Neven Farouk	1 Technical Support Group	★★★ MIS trainer
Hanan Mohamed	1 Technical Support Group	★★ MIS Trainer
Azza Mohamed	1 Technical Support Group	★★★ MIS Training Coordinator
Canal Branch MIS Center		
Canal Branch technician training is scheduled for 1997		

**Exhibit A-5
TRAINING CURRICULA
FOR FACILITY
TECHNICIANS (COMPUTER
OPERATORS) BY COURSE
NAME AND PROVIDER**

Facility Type	Course Name	Course Designer and Primary Provider
Polyclinic	Introduction to Computers	MAXIMUS-Chemonics-Arabsoft Project Team
	Introduction to the HIO MIS	MAXIMUS-Chemonics-Arabsoft Project Team
	Basic Computer Operator Skills	MAXIMUS-Chemonics-Arabsoft Project Team
	Computer Operator System	MAXIMUS-Chemonics-Arabsoft Project Team
	Beneficiary Registration at Polyclinic	MAXIMUS-Chemonics-Arabsoft Project Team
	Patient Records at Polyclinic	MAXIMUS-Chemonics-Arabsoft Project Team
	Patient Records - Super User at Polyclinic	MAXIMUS-Chemonics-Arabsoft Project Team
	Drug Control at Polyclinic	MAXIMUS-Chemonics-Arabsoft Project Team
	Cost Accounting at Polyclinic	MAXIMUS-Chemonics-Arabsoft Project Team
Hospital	Introduction to Computers	MAXIMUS-Chemonics-Arabsoft Project Team
	Introduction to the HIO MIS	MAXIMUS-Chemonics-Arabsoft Project Team
	Basic Computer Operator Skills	MAXIMUS-Chemonics-Arabsoft Project Team
	Computer Operator System	MAXIMUS-Chemonics-Arabsoft Project Team
	Admissions/Discharge/Transfer (A/D/T)	MAXIMUS-Chemonics-Arabsoft Project Team
	Inpatient Records at Hospital	MAXIMUS-Chemonics-Arabsoft Project Team
	Drug Control at Hospital	MAXIMUS-Chemonics-Arabsoft Project Team
	Cost Accounting at Hospital	MAXIMUS-Chemonics-Arabsoft Project Team

Exhibit A-6
PROJECT-SPONSORED MIS TRAINING FOR FACILITY TECHNICIANS BY BRANCH
AND BY FACILITY TYPE: NUMBERS WHO HAD COMPLETED TRAINING AS OF
DECEMBER 31, 1996

Branch	Facility Type	Number of HIO Staff Who Completed Facility Technician Training	Number of HIO MIS Staff Performing as Facility Technicians
Cairo Branch	Polyclinic	56	47
	Hospital	7	6
Northwest Delta Branch	Polyclinic	25	25
	Hospital	0	0
East Delta Branch	Polyclinic	16	11
	Hospital	0	0
Canal Branch	Polyclinic	training scheduled for 1997	
	Hospital	training scheduled for 1997	

Exhibit A-7
HIO MANAGEMENT-USER CURRICULA BY TYPE OF MANAGER

Type of Manager by Site	Course
Polyclinic Manager	Orientation to MIS: Introduction to Computers and the HIO MIS
	Medical Quality Assurance and Management Modules Orientation Workshop
	Polyclinic Beneficiary Registration Application queries, reports, and report interpretation
	Polyclinic Patient Records Application queries, reports, and report interpretation
	Polyclinic Drug Control Application queries, reports, and report interpretation
	Polyclinic Cost Accounting Application queries, reports, and report interpretation
	Medical Quality Assurance Module: Use, queries, reports, and report interpretation
Hospital Manager	Orientation to MIS: Introduction to Computers and HIO MIS
	Medical Quality Assurance and Management Modules Orientation Workshop
	Admission/Discharge/Transfer (A/D/T) Application queries, reports, and report interpretation
	Inpatient Patient Records Application queries, reports, and report interpretation
	Hospital Drug Control Application queries, reports, and report interpretation
	Hospital Cost Accounting Application queries, reports, and report interpretation
	Medical Quality Assurance Module: Use, queries, reports, and report interpretation
Branch Manager	Orientation to MIS: Introduction to Computers and the HIO MIS
	Medical Quality Assurance and Management Modules Orientation Workshop
	Branch Beneficiary Registration Application queries, reports, and report interpretation
	Branch Drug Control Application queries, reports, and report interpretation
	Branch Cost Accounting Application queries, reports, and report interpretation
	Contracted Pharmacy Application queries reports, and report interpretation

	Periodic Medical Exams (PME) Application queries, reports, and report interpretation
	Contracted Providers Application queries, reports, and report interpretation
	Medical Quality Assurance Module use, queries, reports, and report interpretation
	Management Module use, queries, reports, and report interpretation
Headquarters Manager	Orientation to MIS: Introduction to Computers and the HIO MIS
	Medical Quality Assurance and Management Modules Orientation Workshop
	Medical Quality Assurance and Management Modules queries and reports

Exhibit A-8 (page 1 of 2)
HIO HEADQUARTERS MANAGERS ATTENDING THE MEDICAL QUALITY ASSURANCE AND MANAGEMENT MODULES ORIENTATION WORKSHOP, BY NAME AND STATUS, AS OF DECEMBER 31, 1996

Headquarters Manager	Position at Time of Orientation Workshop	Status as of December 31, 1996
Professor Dr. Nabil Amin El Mehairy	HIO Chairman and Project Director	No longer with the HIO
Dr. Hassan Abdel Fattah	Deputy HIO Chairman	HIO Chairman and Project Director
Ms. Horreya Mohamed Ali	Head of Central Department for Planning, Training and Follow-up	Same position
Mr. Mohi El Din Abdel Basset Hassouna	Head of Central Department for Administrative Affairs	Same position
Dr. Refaat Soliman Ali	Head of Central Department for Medical Supplies and Pharmacies	Same position
Dr. Ahmed Shawqi Hasan	Head of Central Department for Medical Affairs	Same position
Dr. Fawzia Abdel Samei'ha Ali	Head of Central Department for Medical Committees	Same Position
Ms. Amina Ahmed Kamel El Sayed	Manager of Public Department for Ordering and Management	Same position
Ms. Kawthar El Sayed el Khalawafi	Manager of Public Department for Serving the Public	Manager of Personnel
Dr. Fatma El Sayed Soliman	Manager of Public Department for Work Injuries	Same position
Mr. Ali Mustafa El Aroussi	Manager of Information and Documentation Department	Same position
Mr. Ali Mohamed Dawood	Head of Central Department for Finance	Same position
Dr. Tharwat Helmi Wahbi	Manager of Public Department for Dental Affairs	Same position
Dr. Thoraya Ismail Saad	Manager of Public Department for Medical Supplies	Same position
Mr. Mohamed Abdel Hamid Ibrahim	Manager of Public Department for Legal Affairs	Same position
Ms. Laila Salem El Garadini	Manager of Public Department for Planning and Follow-Up	Same position
Dr. Hani Abdel Fattah Ashour	Manager of Public Department for Medical Services	Same position
Dr. Salwa Mohamed Abdel Latif	Public Department for Medical Committees	Same position
Mr. Abbas Abdel El Aleem Mustafa	Public Department for Follow-up	Same position

Mr. Rabeth Abbas Abdel El Reheem	Public Department for Finance and Administrative Investigation	Same position
Dr. Awatef Ibrahim Idris	Public Department for Pharmacies	Same position
Dr. Karima Aql	Department of Dental Affairs	Same position
Ms. Saneya Mohamed Shehata	Manager of Public Department for Training	Same position
Mr. Mahmoud Abdel Salam Madi	Manager of Budget Department	Same position
Mr. ali Mohamed El Lathy	Manager of Public Relations Department	Same position
Mr. Amin Ibrahim Zulfiqar	Manager of Stores and Purchasing Department	Training Department
Mr. Nadr Louis Louqa	Manager of Statistics Department	Same position
Mr. Ghonemi Abdel Wahab Mohamed	Cost Accounting Manager	Same position
Mr. Sobhi Hasan Hegazi	Manager of Libraries and Documentation Department (Microfilm)	Same position

Exhibit A-8 (page 2 of 2)
HIO HEADQUARTERS MANAGERS ATTENDING
THE MEDICAL QUALITY ASSURANCE AND MANAGEMENT MODULES
ORIENTATION WORKSHOP, BY STATUS, AS OF DECEMBER 31, 1996

Headquarters Manager	Position at Time of Orientation Workshop	Status as of December 31, 1996
Mr. Mohamed Ahmed Ismail	Manager of Training Department	Retired, no longer with the HIO
Mr. Said El Ganzory	Manager of General Department for Financial Affairs	Same position
Mr. Basan Mhana	Manager of General Department for Administrative Services	Same position
Mr. Malak Shehata Yawaquin	Manager of Public Department for Organization and Management	Same position

APPENDIX B:CAIRO BRANCH MIS END-USER FOLLOW-UP TESTING

SUMMARY OF FINDINGS

Below is a summary of the results of the project's follow-up and testing of Cairo Branch polyclinic application end users. The full report was given to HIO for action. It contained the names of all Cairo Branch polyclinic end user trainees, their status as of the follow-up test day, and the results of testing by person by type of application for which s/he was tested. This level of detail was provided so that the Cairo Branch Technical Support Group (TSG) could plan and deliver the training interventions recommended by the project as a result of the report.

HIO personnel from 19 Cairo Branch polyclinics were designated as MIS application end users and were trained on the polyclinic applications. Trainees received formal classroom training at the Cairo Branch MIS Training Center or on-site at the polyclinic at which they worked. After completing their formal classroom training, trainees were supported at their work site for an additional week by the contractor, HIO MIS Center, and Cairo Branch Technical Support Groups. Follow-up visits and testing were conducted during October and November 1996 by the contractor TSG. All 19 Cairo Branch polyclinics were visited. The contractor TSG attempted to administer the follow-up test to all those who had received MIS applications training as Cairo Branch polyclinic application end users.

B.1 Purpose of Follow-Up Visits

Follow-up visiting procedures and the follow-up tests for each application were designed and administered by the contractor TSG. Contractor staff also trained the Cairo Branch MIS Center Technical Support Group in follow-up methodology. The contractor TSG trained the Cairo Branch trainers in the field practicum on follow-up visiting and testing during October and November 1996.

Follow-up visiting and testing is an important part of competency-based training. It permits a training organization to find out if trainees are able to perform the functions for which they were trained and if so, to establish their post-training level of competency. The follow-up test serves as the measure of competency. A score of 100% correct responses/actions equals competency; lesser scores identify the training intervention required: either on-the-job training, refresher training, or a retake of the course.

In the case of the HIO MIS, follow-up visiting and testing results alert management to nontraining issues that require further investigation and/or intervention by facility or branch management.

The follow-up visit and testing also gives those who were trained an opportunity to reflect on the training they received, make suggestions for improving training, and to have their questions answered "on the spot" by the trainers.

B.2 Results of Follow-Up Testing in Cairo Branch

As of the end of September 1996, 335 persons from the Cairo Branch had received formal classroom training in a polyclinic end-user application, had been supported in the field, and were to be assigned full time to the use of the polyclinic application on which they were trained. The follow-up visits and testing of the 335 Cairo Branch end users resulted in a number of findings and recommendations.

B.2.1 Findings

- 1. Of the 335 persons who had received formal classroom end-user training, 215 were in place performing the function for which they had been trained. This means that, on the day of the follow-up visit, nearly two-thirds of all Cairo Branch polyclinic end users who had received formal classroom training were on the job doing the work for which they had been trained. Of these 215 persons, all took the follow-up test and 170 of them achieved 100%. This means that 79% of those 215 persons who were using the MIS application on which they had been trained had retained their competency. Sixty-five persons, or 21% of the 215, had not retained competency.**

- 2. Of the 335 persons who had received formal classroom end-user training, 120, or slightly more than one-third, were not doing the MIS end-user work for which they had been trained, or were absent on the follow-up visit date and could not be tested. Of these 120 persons:**
 - o 14 had left the HIO;**

 - o 25 were working elsewhere in the HIO system but not with the MIS;**

 - o 25 were still working at the polyclinic for which they were trained and were also still working in MIS, but were not working with the MIS application for which they had been trained;**

 - o 21 were listed as being at the polyclinic but were absent on the follow-up visit day and could not be tested;**

- o 14 were at the El Alf Masken site, for which they had been trained, but were unable to perform their MIS end-user functions or take the follow-up test because of system and management problems; and
 - o 21 others were lost to follow-up or had moved to other sites and were not working on the applications for which they had been trained.
3. Nineteen new persons who had not received formal end-user application training were performing as MIS end users. These 19 had some on-the-job training from their predecessors or someone else other than an MIS end-user application trainer, but had received no formal training on the application. All 19 of these persons took the follow-up test for the application with which they were working. However, only two 2 had achieved competency;
 4. During the follow-up visits, the contractor TSG found that all polyclinics were experiencing printer use difficulties and that several clinics were inconsistent in applying data back-up procedures.
 5. The members of the Cairo Branch TSG who were taking the practicum on follow-up visiting and testing demonstrated a high degree of professionalism and capability, and proved that they could do follow-up testing on their own.
 6. During the follow-up visits it became apparent that there was enthusiasm for, and interest in the MIS from polyclinic managers and MIS staff.

B.2.2 Recommendations

1. **Attrition**
Fourteen of those trained as MIS application end users for Cairo Branch polyclinics left the HIO shortly after completing training. This is a matter of concern. We recommend that Cairo Branch management find out why these individuals left the HIO and take action to ensure that any management practices, salary structures, or other organizational factors, which may have contributed to the untimely departure of these 14 persons, be promptly addressed. We also recommend that Cairo Branch begin recruitment of and training for 14 new individuals so that the MIS at the polyclinics will not be understaffed.
2. **Absenteeism**
Twenty-one of those trained as MIS application end users were absent at the time of follow-up. In proportion to those trained, this is a fairly high number of absentees. Perhaps better management procedures to control absenteeism are required at the polyclinic level.

3. **Trained Personnel Reassigned to Non-MIS Work**
The HIO invested resources in recruiting, screening, selecting, and training many individuals as end users of the MIS in Cairo Branch polyclinics. Yet, a relatively high number of those trained had been reassigned to non-MIS work between the conclusion of their training and the day of the follow-up visit. HIO management needs to find out why this is the case and take corrective action to ensure that persons trained for MIS work are not allocated to non-MIS functions.

4. **Untrained Persons Working as Application End Users**
Cairo Branch should provide formal training for all of the 19 persons who received no formal MIS training but were performing MIS application end-user functions. Follow-up testing showed that 17 of these 19 individuals had not achieved competency. These individuals need formal training on the application on which they are working, provided that management agrees that they will continue to work as end users in the future. The formal courses can be given at the Cairo Branch MIS Training Center or on-site by the Cairo Branch TSG. We recommend that this training be completed as soon as possible so that MIS end-user competency is attained rapidly by the new users in the polyclinics.

All persons whom management assigns to be MIS end users should receive formal training (including end-of-course exit testing) before beginning work in a live setting.

5. **Polyclinic Printer Use and Data Back-Up**
Cairo Branch trainers should conduct a one-day workshop at the Cairo Branch MIS Training Center to retrain all Cairo Branch polyclinic computer operators in the correct operation and maintenance of printers and in data back-up procedures.

6. **MIS Applications End-User Competency**
Competency was maintained by most of those end users who had received formal training and were using their skills. However, some did not maintain their post-training competency and require training interventions.

Failure to maintain competency was associated with a number of factors:

- o lack of opportunity for regular use of the MIS application,
- o management issues concerning system maintenance, and
- o training duration and sequencing.

HIO management should ensure that MIS work stations are adequately furnished, and that equipment is maintained in working order at all times and

during all shifts so that MIS staff can always use the applications for which they were trained.

Three types of training interventions are needed to bring Cairo Branch polyclinic application end users up to competency:

- A. On-the-Job Refresher Training**
For MIS end users whose follow-up test score deviated from the score required for competency by one or two points, provide on-the-job training at the sites. Focus on the area(s) where the individual answered/performed incorrectly. Give the trainee one hour practice time per incorrect response, have the person take the self-test, and then, at the end of the day, administer the follow-up test again.
- B. One Full-Day Refresher Course at the Cairo Branch MIS Training Center**
For MIS end users whose follow-up test score deviated from the score required for competency by 3-10 points, provide a one-day refresher course at the Cairo Branch MIS Training Center. This course should be tailored to correct all those items missed by the MIS staff. At the end of the one-day refresher course, the full exit test should be administered to all before they return to their work sites. The Cairo Branch TSG should then provide one-day support to the trainees, and conduct another follow-up test one month after the refresher course and support are completed.
- C. Retake of the Complete Course**
For MIS end users whose follow-up test score deviated from the score required for competency by 11 or more points, provide a retake of the complete course, (including the full exit test), one week of support at the work site, and another follow-up test one month later.

B.3 Revised Training Curricula

The contractor TSG revised the training curricula for the polyclinic applications to ensure more time for midcourse correction, for formal exit testing, and for more practice before trainees go "live" with the application at the work site. Past curricula have been revised and are in use now in all the branches currently conducting training. New curricula to be developed after beta testing will follow the new standards developed by the project.