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FINAL REPORT OF ACTIVITIES AND RECOMMENDATIONS:
FINAL VISIT TO
CAJA COSTARRICENSE DE SEGURO SOCIAL,
COSTA RICA
(ENGLISH VERSION)

A Report Prepared By PRITECH Consultants:
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During The Periods:
MARCH 22 - 26, 1990
JUNE 18 - 29, 1990

TECHNOLOGIES FOR PRIMARY HEALTH CARE (PRITECH) PROJECT
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I. Acknowledgements

We would like to thank the Office of Health of USAID/Costa Rica for their support of this Project. We would also like to thank the staff at the Costa Rican Social Security Institute (*Caja Costarricense de Seguro Social - CCSS*) for their hospitality, especially the Department of Material Resources and Mr. Armando Oporta whose assistance has been invaluable.

II. Background and Workplan

Last year, the PRITECH Project of Management Sciences for Health (MSH) through funding from the Office of Health of USAID/Costa Rica began to offer technical assistance to the Costa Rica Social Security Institute (CCSS) in the implementation of the DEM (Drug Estimation and Monitoring Model - *MEM, Modelo para Estimar las necesidades de Medicamentos*) system developed by MSH. The DEM was designed to utilize the computer as a management tool that allows for the use of information on the cost and consumption of drugs for the planning of future purchases.

The first technical assistance was a visit to CCSS by an MSH team composed of a drug logistics specialist (Chris Olson) and a programmer/analyst (Ramón García). During that visit, the system was demonstrated, various training sessions took place, and several work meetings were organized with various departments within the CCSS. After the first visit, the following conclusions were made:

- It was not necessary to establish a new data collection and drug use reporting system because the data required by the DEM was already being collected and stored in the CCSS mainframe computer.
- Because the CCSS mainframe system is not compatible with the with the disk operating system of the microcomputers, it will be necessary to install a data transfer system from the mainframe to a microcomputer in the Department of Material Resources.
- The modifications that the DEM system will need to serve the needs of the CCSS were identified.

The workplan agreed upon was the following:

- The CCSS would install an Infogate system that will permit the transfer of the drug use data files from the mainframe to the hard disk of the microcomputer located in the Department of Material Resources.
- The technical personnel from MSH/PRITECH will develop programs in C language to extract from the data transferred the necessary information for the DEM system and to convert these into a legible format for the DEM file structure.

- The technical personnel from MSH/PRITECH will program in the DEM the necessary changes that were identified during the first visit.
- Once MSH/PRITECH is notified that CCSS has installed the Infogate system, a second visit is to be planned to install the DEM system with the adaptations required for the CCSS, and to provide additional training on the utilization of the DEM system as well on the maintenance of the system.

After researching the possibility of installing Infogate, the CCSS offices informed USAID/Costa Rica that this was not feasible because the cost of installing Infogate at CCSS was to be around US\$40,000.

At that time, the Office of Health of USAID/Costa Rica requested additional technical assistance from MSH/PRITECH to identify another solution that would assure taking into account local restrictions, so that the DEM can be totally operational at the CCSS. The technical assistance requested was divided into three phases:

1. A visit to Costa Rica to evaluate alternative methods and to identify the most appropriate to undertake the transfer of data from the mainframe to the microcomputer in the Department of Material Resources.
2. To undertake the necessary tests and installation of the system selected in the microcomputer at the Department of Material Resources.
3. To train the technical group of the Department of Material Resources in the data transfer procedure (mainframe to microcomputer) and in the use of the DEM system as a management tool.

The workplan consisted of the following activities:

A. Selection of a data transfer system:

1. A systems analyst and an information specialist will visit the CCSS to discuss the options available for data transfer systems and to select the most appropriate system to be purchased.
2. The consultants will analyze the programming and training needs for the installation and utilization of the DEM system in the Department of Material Resources. At that time, the appropriate personnel to be trained in the use of the system will be selected.
3. The consultants will identify, in collaboration with their Costa Rican counterparts, the logistic implications and the CCSS needs in relation to the implementation of the DEM system.

B. Installation and testing of the data transfer system

1. MSH will be responsible for the acquisition of the equipment selected and all the testing to be done. Additionally, MSH will communicate with counterparts at CCSS regarding the arrival of the consultants, customs procedures and the necessary preparations of CCSS for the installation of the equipment.
2. After the arrival of the equipment, the MSH consultants will travel to Costa Rica to assist in the installation of the equipment and the software in the computer of the Department of Material Resources.
3. The MSH consultants will make the necessary corrections, conduct quality control and test the installed system.
4. The consultants will train the identified technical personnel from the Department of Material Resources in the data transfer process and in the control of data integrity.

C. Implementation of the DEM using data from the mainframe

1. The consultants will assist officials of the CCSS in the transfer of data and in the production of reports that will be used in the management process.
2. The consultants will train their counterparts from the Department of Material Resources in the use of the information produced by the DEM in the planning, monitoring and evaluation of the consumption drugs.

III. Activities during this visit

1.) The team:

The team was composed of two MSH/PRITECH professionals:

Paul Auxila: Systems Analyst
Vinnie Goncalves: MIS Specialist

2.) Objectives of the visit:

At the request for technical assistance from USAID, the MSH/PRITECH technical team researched the possible alternatives for the transfer of data and consulted with various specialized firms in the US.

It was concluded that the work could be done using an emulating plaque of a 3270 mainframe system simultaneously with interface application programs. This alternative will

still require the development of a program in C language that could extract data from the IDMS/Query mainframe system of data banks and put them in dBASE format. Another program developed in dBASE would then select the appropriate fields to annex them to the DEM archives. The objectives formulated for this visit were:

- Given the difficulty in obtaining the exact specification of the existing equipment of the various departments of the CCSS, the principal objective of the visit was to investigate the computer stations in the CCSS so as to obtain the exact specifications and configuration of the equipment installed so as to be able to identify the most adequate solution.
- Visit local businesses to identify the available resources for assistance and technical support.
- Identify their training needs in the use of the DEM in the management process as well as in the transfer of data and maintenance of system.
- Develop a workplan for the finalization of the project.

3.) Activities accomplished:

Thursday, 03/22/90: Meeting with Mr. Armando Soporta/MIS Consultant of the Department of Material Resources:

- The objectives of the visit were revised.
- A workplan was developed for our visit.
- The specifications of the network that was being installed in the Department of Material Resources were discussed and its implication on this project.
- Information was collected on the relevant hardware to this project. It is important to note the following:
 - The MIS department has an IBM 3270 mainframe and an 4180 that is using an UNIX operating system and the Culinet data base system.
 - The Department of Material Resources has an IBM AT (286) with an internal memory of 512K with a 40MB hard disk. It is equipped with a 3720 emulating card. This machine which has an MS-DOS 3.3, is already connected to the mainframe using PC COM and PC Host communication software.
 - A network is being installed (by the IBM representative) with an IBM PS/2-70, an alternative PS/2-50 and four PS/2-25 terminals. The Department of Material Resources requested that we evaluate the

possibility of including the network in the data transfer process so the DEM can be employed by multiple users.

NOTE: Mr. Oporta was our main counterpart. He made all the logistical arrangements and attended all the meetings.

Thursday 03/22/90: Meeting with Nelson Brenes Muñoz (IBM)

- We are concerned about the possibility of encountering compatibility problems between the IBM AT (DOS), the mainframe (UNIX), and the network (OS/2).
- Mr. Muñoz made a presentation of the configuration of the network being installed, and answered our questions.
- The IBM technical personnel stated that there should not be a problem with the operation of the DEM in the network.

Thursday 03/22/90: Meeting with DATANET: Olman Boraschi (Regional Director) and Mauricio Morales (Sales Executive).

- The DATANET firm is the Costa Rican representative of Culinet (data base system in the mainframe) and from Ashton-Tate (dBASE producer). They provide technical support to the CCSS in the use of the mainframe.
- We discussed with them the application possibilities of Ashton-Tate's dBASE Direct 3270. This product contains extension language that permits the connection between the mainframe and the microcomputer.

Thursday 03/22/90: Meeting with Mr. Alvaro Muñoz (Director of Material Resources) and Omar Quiros (deputy-Director)

- The objectives of the project and scope of work were revised.

Friday 03/23/90: Meeting with Accounting/Supplies Fund: Mr. Gilberto Vega Miranda (Chief) and Gerardo Herrera Gabalceta (Administrator of the National Inventory System Data Base).

- The Supplies Fund is responsible for the collection and entry of data related with the consumption of drugs in the 160 CCSS pharmacies.
- Mr. Gabalceta made a presentation on the flow of information from services

to the central office of the CCSS.

- The structure of the pharmaceutical products and drug consumption data base was discussed.
- Mr. Gabalceta made available to us examples of the reports produced by the mainframe.

Friday 03/23/90: Meeting with Mario Vinchez (Systems Analyst of the MIS Department) and Mr. Nicolás Fallas Ríos (Manager of Technical Support for DATANET).

- Mr. Vinchez explained how the mainframe worked and how it communicates with the microcomputers and the connected terminals.
- It was confirmed that communication between the microcomputers and the mainframe was possible with the equipment available at the CCSS.

Friday 03/23/90: Meeting with DATANET technical personnel.

- A meeting took place with the DATANET technical personnel to revise the technical aspects and the information collected to date and a more detailed discussion of the possible use of dBASE Direct 3270 that they represent in Costa Rica.
- Mr. Nicolas Falla Rios, technical support manager, made a technical presentation of dBASE Direct 3270. The technical restrictions were discussed and the legal requirements for the implementation of the product in Costa Rica. Additionally, the cost and type of technical support DATANET could provide CCSS in this process was discussed.
- The Regional Director of DATANET was requested to prepare a proposal for the purchase of the software and the technical support as discussed.

Friday 03/23/90: Final meeting with Mr. Oporta.

- We met with Mr. Oporta to discuss our findings and recommendations. Additionally, we discussed the workplan and the time frame proposed.

Monday 03/26/90: Meeting with DATANET

- We met with Ms. Betsy Murray to discuss our conclusions and the workplan to the end of the project.
- It was agreed that the equipment should be purchased locally so as to take

advantage of the complimentary DATANET technical support.

Monday 03/26/90: Meeting with DATANET.

- Plans were finalized with DATANET for the implementation of dBASE Direct 3270.
- After receiving authorization from MSH/Boston, DATANET will proceed with the purchase of the necessary equipment and will undertake the necessary tests for the preparation for the implementation of the system in June.

IV. Recommendations

A. The network being installed in the Department of Material Resources

We recommend that the DEM be implemented in the AT machine located in Mr. Oporta's office and not in the network server for the following reasons:

- 1) The operating system of the server is not totally compatible with the system of the AT microcomputer (DOS) nor in the mainframe system (Unix). This combination of systems would add an unnecessary complexity that would make the maintenance of the system more difficult locally. <--- CK
- 2) The DEM system programs were not designed for a multi-user environment as would be necessary for a network.
- 3) Permitting access to the mainframe discs from various terminals (to work on the DEM) would compromise the integrity of the data, and would also make more difficult to control the access to the information.

B. Transfer System Recommended

The system to be installed should not only permit the easy connection of the microcomputer to the mainframe but it should also integrate the applications of both machines and where possible, only extract the data required by the DEM. This would avoid working directly with the mainframe.

The product which we estimate satisfies most closely those requirements is dBASE Direct 3270, recently launched by Ashton-Tate. That product is a logical extension to the language and of the dBASE data management system.

dBASE Direct will permit the connection of the Material Resource's Department IBM AT (using the emulating card of the 3270 terminal that is already installed) to the 3270 system

without the need to modifying or making additions to the mainframe. The advantages of this option when it is compared to the original idea of using a PC-COM or PC HOST conversion programs are:

- 1) The PC-COM option would require converting the mainframe data into ASCII to then transfer it to the microcomputer and then convert it into dBASE format using sub-routines in C and dBASE. dBASE Direct would permit direct access the specific fields that contain the data required by the DEM, which reduces the capacity of external memory required.
- 2) The dBASE Direct option eliminates the need to develop conversion programs in C and dBASE.
- 3) The installation of dBASE Direct is simple and will not require that the user learn complicated interface programming commands.
- 4) dBASE Direct allows user training so the process can be repeated as necessary in the future.
- 5) dBASE Direct conforms to the IBM standard Systems Applications Architecture (SAA) guaranteeing its compatibility with future applications in the mainframe.

C. Upgrade of the AT microcomputer

Given the volume of data to be processed (approximately 30,000 entries per month), to make more efficient the utilization of the DEM and of the volume of data, if the financial resources allow it, it is recommended that the internal memory capacity be increased to a megabyte and the external memory to 60 megabytes.

D. Purchase of dBASE III Plus:

dBASE IV version 1.0 cannot be used with dBASE Direct due to the fact that it does not recognize extended memory. So as to allow the Department of Material Resources to install dBASE IV version 1.1 when it becomes available in the market in the future so as to take advantage of its new features, we recommend that a copy of dBASE III Plus version 1.1 registered in Costa Rica be installed.

V. Proposed workplan

- 1) Modification in MSH/Boston of the DEM programs to incorporate the needs of CCSS. (April-June 90)

- 2) Negotiation with DATANET for the purchase of the software and the local technical support necessary. (April 90)
- 3) Purchase of the recommended software. (May 90)
- 4) Planning for the implementation, the testing and training of the DEM system.
- 5) Installation of the system and development of the necessary CCSS protocols. (June 1990)
- 6) Conducting system tests. (June 90)
- 7) Training in the data transfer process (June 90). This training will include Mr. Oporta, Mr. Mario Vinchez and two analysts of the Department of Material Resources that will be identified.
- 8) Training in the use of the DEM programs and in the use of information in the decision making process. This training will include Mr. Oporta, the seven analysts in his department, a representative from Pharmaceutical-therapy and a representative of MIS. (June 90)

We estimate that the second and last visit of this team will be around the 18th of June and will last approximately two weeks.

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JUNE 18 - 29, 1990

I. Acknowledgement

We would like to thank the Health Office of USAID/Costa Rica for all the support provided during this project, as well as all the staff of CCSS (Caja Costarricense del Seguro Social) for their hospitality, in particular Mr. Armando Oporta, Advisor to the Material Resources Department and Mr. Carlos Quesada Solano, Manager of the Operations Division, who made our visit both pleasant and efficient. Also, we would like to thank Datanet for their support in accomplishing this project. Finally, our thanks to the Popular Bank of Costa Rica, which allowed us to use its facilities to test the software and hardware in the Bank during the period that Mr. Oporta's machine was under repair.

II. Project History and Workplan

In our last visit to CCSS in March 1990, we recommended that the DEM be implemented in a PC AT located at Mr. Oporta's office and not at the host of the LAN (Local Area Network) which had recently been installed. The following are the reasons (see first visit report for more details) for this recommendation:

- 1) The LAN's operation system is not totally compatible with the one installed at the PC AT (DOS), nor with the mainframe system (UNIX).
- 2) The DEM was not designed to operate under a multi-user environment.
- 3) For security reasons, it was not advisable to allow many different terminals to access the hard disk of the mainframe, endangering the mainframe's data integrity.

The Transferring System Recommended

As discussed in the first report, the system to be installed not only should allow the easy link between the PC and the mainframe, but also should integrate the applications of the two systems in a way that only the necessary information required by the DEM would be downloaded. It would avoid transferring masses of data without any need and would reduce the time required for downloading. Furthermore, it would avoid the need for users to work directly with the mainframe.

The product identified was the dBase Direct 3270, developed by Ashton-Tate. This product provides a logic extension to the dbase language and the management of data under dBase format.

The advantages of this option compared to the original idea of using PC-COM and PC-HOST were also discussed on the first report and are outlined here:

- 1) In order to use PC-COM it would be necessary to convert the data from the mainframe in ASCII and then transfer it to the PC. It would also require subroutines in C language and dBase. The use of dBase Direct would allow direct access to the specific data required by the DEM, which would reduce substantially the amount of secondary memory storage required.
- 2) Using dBASE Direct eliminates the needs of programming in C and dbase.
- 3) The installation of dBASE Direct is much easier and does not require any learning of special commands of programming.

- 4) dBase Direct allows shorter training of the users in order for them to reproduce the downloading process themselves in the future.
- 5) Another important reason is that dBASE Direct conforms with the "Systems Applications Architecture" (SAA) standards of IBM, which guarantees its compatibility with future applications under IBM's architecture domain.

The Upgrading of the PC AT.

Due to the volume of data to be processed (about 30,000 records monthly), we recommended the upgrade of the AT's memory system. The primary memory (RAM) would be upgraded from 512K to 1MB and the secondary mass storage from 30MB hard disk to 80MB.

Acquisition of dBASE III Plus

Since dBase IV version 1.0 does not recognize the extended memory, and the release 1.1 was not available at that time, dBase III Plus was recommended. It is totally comparable with dBase IV and will allow future upgrades without any problems.

Proposed Working Plan

It was agreed during our last visit (see first trip report) that MSH/PRITECH would follow up on the preparation for the installation and implementation of the dBase Direct and DEM, as well as prepare a training session to enable selected staff to use these applications. It also included some modifications on the DEM and working plans with Datanet. The following is a list of the issues that were to be addressed before and during this final visit:

- 1) Modification of the DEM program to adapt Caja's needs
- 2) Negotiate with Datanet on the acquisition, installation and technical support necessary
- 3) Purchasing of the necessary software (dBase III Plus and dBase Direct 3270)
- 4) Implementation planning and debugging of the DEM and training
- 5) Hardware system installation and configuration
- 6) Training selected staff in transferring and using the data.

III. Activities Performed During this Final Visit

1. The MSH TA Staff

Paul Auxila: System Analyst.
Vinnie Gonçalves: Hardware Specialist.

2) Objectives of this Final Visit:

- 2.1) Testing of the new version of the DEM program according to needs of Caja.
- 2.2) Working with Datanet in installing, testing and setting up the dBase Direct and dBase III Plus at Caja. Set up a working plan and the level of technical support to be provided during and after the completion of this project.
- 2.3) Installing and testing of the upgrading hardware at the PC AT.
- 2.4) Transfer of the data from the Mainframe to the PC AT, setting up the transferring routines of data acquisition, menus and implementation of the DEM.
- 2.5) Training of selected staff in using the DEM and transferring data from the mainframe using dBase Direct.

3) Summary of Activities

- 3.1) Monday 06/18/90: Meeting with Datanet Staff, including Mr. Olman Boraschi and Mr. Mauricio Morales:
 - The objectives of this visit were reviewed.
 - A working plan suitable for the three parties (Caja, Datanet and MSH/PRITECH) was drafted. This working plan was later approved by the three parties in a meeting with Mr. Oporta, from Caja.
 - Datanet reported the status of the hardware upgrade, which they were responsible for. The PC AT at the office of Mr. Armando Oporta was under repair during the past two weeks. Therefore, they were not able to upgrade the hard drive, nor the primary memory storage (RAM). A visit to Compuworld, responsible for the repair of the machine, was necessary in order to speed up the process and keep up with our schedule.

- The dBase Direct, as well as the dBase III Plus, was already in-house but tests could not be performed due to the problems with the microcomputer. Datanet agreed to test the software at the Bank Popular saving time and efforts.
- 3.2) Monday 06/18/90: Meeting with Caja Staff, including Mr. Armando Oporta, Mr. Mauricio Morales and Mr. Nicolas Fallas Rios (from Datanet), Mr. Mario Vinchez and Mr. Alvaro Aguilar Romero (from Caja's MIS Dept.).
- Visit to Caja with Datanet staff, meeting with Mr. Oporta to review the objectives of this visit and agree on the working plan drafted previously with Datanet.
 - A meeting with the MIS Dept. was arranged to discuss the implications of linking the two systems. The MIS Dept. agreed to provide the passwords to allow the linking of the PC AT to the mainframe as well as all the technical support necessary. Mr. Romero was very interested in applying dBase Direct in other applications of Caja.
- 3.3) Monday 06/18/90: Meeting with Mr. Julio Duenas, from Compuworld.
- Mr. Duenas explained the problems with the PC AT. He explained that Caja authorized a service to replace the motherboard of the system upgrading the clock speed from 8 to 12MHz, which will benefit the project even more since the speed of data acquisition will be increased. He also explained that the machine would be delivered on the 20th of June.
- 3.4) Tuesday 06/19/90: Visit to Datanet, working with Mr. Morales.
- We started to review the new version of the DEM and its flagging system trying to anticipate possible compatibility problems and mainframe interface requirements. The number of fields of DEM's file structure on the DEM was smaller than the one of the mainframe. Adjustments would be necessary in order to get all the information required by the DEM from the mainframe. A second meeting was set for the 20th of June to debug this problem.
 - The hardware was tested, including hard drive formatting and configuration.
 - In the afternoon we started to run tests of dBase Direct using the facilities of the Popular Bank of Costa Rica.
- 3.5) Wednesday 06/20/90: Visit to Datanet, working with Mr. Nicolas F. Rios and Mr. Eduardo Quirano, dbase programmer.

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- The DEM had some other changes to be made:
 - A. The currency field had to be extended again to accomodate the local currency.
 - B. The number of digits in the drug supply's code field also needed extention.
- 3.6) Wednesday, 06/20/90: Visit to Caja, working with Mr. Duenas, from Compuworld.
- The PC AT was back from the shop and Mr. Duenas tried to set up the machine at Mr. Oporta's office. However, after some tests we found out that the machine was not operating properly. Despite Mr. Duenas opinion that the machine was ready, performance tests indicated that it was working at 8MHz only, which he could not understand nor explain why. Mr. Gonçalves, the MSH/PRITECH's hardware specialist assessed the situation recommending a solution for the problem: the motherboard should be reset with higher clock speed by changing its original setup. Mr. Oporta was pleased with this intervention, and the machine finally was ready for use.
 - The 40MB Miniscribe hard drive was installed and tested. The machine now has two 40MB hard drive (80MB), with plenty of room for data storage, 12MHz processing speed and enough primary memory for running the new applications.
- 3.7) Wednesday, 06/20/90: Visit to Datanet to work with Mr. Morales on adapting the DEM to run with dBase Direct and receive information from the mainframe.
- Due to the mainframe data structure, as well as some characteristics of the DEM, several modifications were still necessary in order for the DEM to work fully. Many were done at Datanet with the support of their staff, and some at Caja during the final set up of the system.
- 3.8) Thursday, 06/21/90: Visit to Caja with Mr. Morales and Mr. Eduardo Quirano to install dBase Direct and dBase III Plus.
- The installation of dBase III Plus was successfully done. It was followed by a training session of selected staff from the Material Resources Department, including Mr. Armando Oporta, Mr. Manuel Rodriguez and Ana Philips. The training covered the basic dBase language commands used with dBase Direct to interface with the mainframe. Unfortunately, this training session

was short and had to be postponed due to problems in accessing the mainframe. Two factors were responsible for this:

- A. The IRMA board 3270 emulator already owned by Caja and installed into the microcomputer was not fully compatible with the basic requirements of the dBase Direct. Despite the fact that Caja's MIS Department had used this board successfully linking the mainframe to the microcomputer, this new application with dBase Direct required a new interconnection component involving a data acquisition application called HLLAPI, which was not supported by the IRMA board.
- B. The MIS Department had not released all the necessary passwords to access the information in the mainframe. The working plan had to be delayed for about three hours in order to bring the issue to the Manager of the Operation Division, which promptly submitted a request to Mr. Alvaro Aguilar Romero (see attached), from MIS, asking for authorization and support to the Datanet and MSH/PRITECH staff in developing a subroutine in ADS to link the mainframe to the microcomputer. The MIS did not respond promptly and the activities scheduled for that day at Caja had to be postponed for the next day.

Due to these delays and the time constraints of this project, MSH's Hardware Specialist, Mr. Gonçalves, requested another meeting with Caja (represented by Mr. Armando Oporta and Mr. Carlos Quesada Solano) and Datanet (represented by Mr. Mauricio Morales) to discuss the logistics and new strategies to be adopted in order to successfully finish the project. It was agreed between Caja, Datanet and MSH/PRITECH that it would be necessary to work on Saturday at least half-day in order to complete the software installation and testing, before the starting of the training session scheduled for the following week.

3.9) Thursday, 06/21/90: Visit to Datanet to continue the work with Mr. Morales and Mr. Quirano in making changes to the DEM.

The DEM was reviewed and tested. Simulation tests, using real data downloaded from the mainframe were performed and evaluated. The DEM worked without major problems. It was found that the mainframe does not hold all the data required by the DEM. Much of it will have to be entered by the user. Therefore, the DEM will only work effectively after this information is entered. Also, a subroutine had to be compiled in ADS, since the mainframe's database was in Cullinet, in order to attach two different fields into a single one in dBase format. This was quite time consuming. The Datanet staff were very supportive and worked in cooperation with MSH/PRITECH hardware specialist until very late that night.

3.10) Friday, 06/22/90: Visit to Datanet to test and evaluate programming and debugging done on the previous night.

- All the modules of the DEM that were modified were reviewed and tested before our visit and its installation at Caja.
- Mr. Olman Boraschi, Regional Director from Datanet, expressed his concern that the DEM was compiled using Clipper, and that dBase Direct, as well as the DEM will be running using dBase III Plus and not Clipper. His recommendation was that the DEM should be recompiled in dBase, since its operation and performance are slightly different from Clipper.

However, due to the time constraint, as well as financial limitations of this project, recompilation was not possible. The MSH/PRITECH hardware specialist explained to Mr. Boraschi that there was a deadline to meet, that even though the DEM would run more smoothly if compiled with dBase, it would also run with Clipper. The recompilation would be ideal, but not necessary.

3.11) Friday, 06/22/90: Visit to Caja with Mr. Morales to finish the installation and test of the applications.

- All the remaining modules of the Dbase Direct, as well as the subroutines interfacing dBase Direct, dbase III Plus and the Cullinet database system were finalized. Mr. Nicolas Fallas Rios worked at the MIS Department to develop a subroutine in ADS to generate the gateway-like bridge of information from the mainframe to the microcomputer.
- Meanwhile, Mr. Morales and Mr. Gonçaves worked at the Material Resources Department setting up the menus and batch programs to be used during the access time of the mainframe and the data acquisition.
- A meeting with Mr. Oporta was held to explain the status of the project and the working plan for the next day, Saturday. The objectives of our work were:
 - A. To finalize the menu screens for operating dBase Direct and the Cullinet system, from the mainframe.
 - B. To finish and test the batch files for data transferring.
 - C. To download a large portion of data and test it with the DEM.

D. To printout a sample report from the DEM looking for bugs.

3.12) Saturday, 06/23/90: Working with Mr. Morales from Datanet at Caja.

- Three menu screens were set to interface the dBase Direct/DEM with the user (see attached). The first one, the main menu, allows the user to (1) download data from the mainframe, (2) update the DEM with data from the mainframe, (3) update the DEM with data from the drug supplies catalog file and (4) quit.

A second menu, now dBase Direct 3270 Control Center, allows the user to create, entry, retrieve, and customize a database file, as well as disconnect it from the Cullinet system.

The third menu is generated from the mainframe, under Cullinet, and allows the user to identify himself as an authorized user to the system.

- Mr. Morales finished and tested the batch routines.
- A bigger portion of data from the mainframe could not be downloaded. We learned that the mainframe went down, and would not be in operation until next monday, the 25th. However, tests could be performed with the old sample loaded into the PC.
- A sample report could not be printed out since the mainframe did not have all the information required by the DEM. It will be necessary to have a manual input of the fields, or a new change in the DEM system.

3.13) Monday, 06/25/90: Arrival of the MSH/PRITECH System Analyst, Paul Auxila for training sessions and evaluations. Meeting with Caja's staff, Mr. Quesada and Mr. Oporta.

- We reviewed all the activities performed so far and addressed some logistics and administrative issues among Caja that were delaying the completion of this project:
 - a. Due to the work schedules of the MIS dept. we had to reschedule some of our activities planned for Saturday.
 - b. Mr. Oporta was promoted and transfered to another department (Administrative Management Dept.). Although Mr. Oporta was very useful as liason with the other departments, it is not clear who will be responsible for the system.

3.14) Tuesday, 06/26/90: Working with Datanet at Caja, finalizing the systems installation.

- All the pending hardware setup was finished. A second training session with the selected users identified on the previous training was done. Mr. Morales explained to the users how to maintain and troubleshoot the data acquisition system.
- A meeting with Mr. Mario Vinchez from MIS was held in order to prepare for the final download of the whole data required by the DEM from the mainframe into the PC. The transferring time was set for the next day in the morning.

3.15) Wednesday, 06/27/90: Working at Caja with Datanet staff.

- All the required data contained in the selected fields at the mainframe were downloaded into the PC. The user could monitor this data by a temporary file created at the dBase Direct 3270 Control Center. The file, called RET00 (meaning retrieved step 00) stores all the data downloaded from the main frame. The file RET01 holds data converted from the mainframe, stored at RET00 into dBase format. Finally, the file CONSUMOS combines the requirements of the DEM with the dBase format set in the RET01. For a sample of this menu, please refer to exhibits.
- A training session in decision making and management of the information provided was held with users selected by the CCSS participants.

3.16) Recommendations to follow up:

- For this system to be implemented and maintained successfully, it will be important that the responsibility for its operation be assigned somewhere (and to somebody) within the CCSS structure. There are still important unanswered questions such as: what will be the link and communication between the MIS dept. and the dept. of Material Resources? what will be the flow of information, at what level will the system be used, what delivery grouping will be used?
- The Hardware/Software installed and the training given can be applied to many other mainframe applications now being used in the CCSS. Five extra copies of dBase Direct were given to the Department of Material Resources. Where appropriate, the MIS dept. could install these copies in other PC's and train these departments in the downloading and processing of their data.

As mentioned earlier, there are data required by DEM which is not presently entered into the mainframe system. This data will have to be entered separately into the PC system.

APPENDICES

CAJA COSTARRICENSE DE SEGURO SOCIAL
GERENCIA DIVISION DE OPERACIONES
Apartado 10105 Teléfono 23-40-33
San José, Costa Rica

No. 10769

26 de Junio de 1990

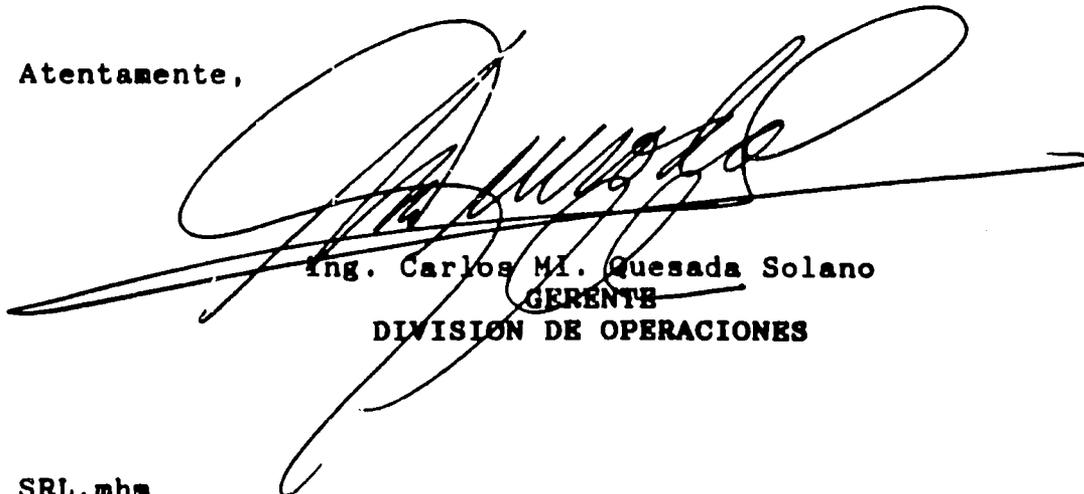
Señor
Alvaro Aguilar Romero
Dirección de Informática
Presente

Estimado señor:

Solicitamos a Ud. toda la colaboración para que personeros de Datanet puedan desarrollar un programa en ADS, necesario para concluir la aplicación en desarrollo por MSH para la Institución.

Su colaboración implica permitir que el funcionario de Datanet, pueda hacer el programa o programas necesario (s) para concluir el Sistema en Desarrollo.

Atentamente,



ing. Carlos M. Guesada Solano
GERENTE
DIVISION DE OPERACIONES

SRL.mhm

CC: Archivo
10769

Directory Tools Exit

Serial #4570265

DBASE DIRECT 3270 CONTROL CENTER

WORKING DIRECTORY: E:\DBASE

Connect	Entry	Retrieve	Disconnect	Custom
(create)	(create)	(create)	(create)	(create)
		CONSUMOS RET00 RET01		

Help: F1 Use: — Menus: F10

Directory Tools Exit

Serial #4570265

DBASE DIRECT 3270 CONTROL CENTER

WORKING DIRECTORY: E:\DBASE

Connect	Entry	Retrieve	Disconnect	Custom
(create)	(create)	(create)	(create)	(create)
		CONSUMOS RET00 RET01		

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Caja Costarricense de Seguro Social
Menu principal

1. Extraer los datos del MAINFRAME
2. Actualizar datos archivo catalogo al DEM
3. Actualizar datos archivo MAINFRAME al DEM
4. Fin de la sesion

Opcion: 0