Date: 31 May 1974

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Subject: Proposed Automated Data Management System for CEPIS

Introduction

Recently, CEPIS received a proposal entitled "The Data Management System and a Proposal for Contractual Automation", submitted by Prof. George Reid of the University of Oklahoma (OU) and Mr. Charles Dawson of the Oklahoma Foundation for Research and Development (OKF).

In addition to proposing a data management system for the CU-AID project on lower cost methods for water and waste treatment in less developed countries, the document also proposes the development of a complementary automated data retrieval system to be established in CEPIS. This automated system would consist of a minicomputer configuration (Fig. 1) including I/O by teletype, card, printer, paper tape and disk, together with the necessary software to support the data management system.

It is anticipated that the OKF will purchase, ship, assemble and implement the minicomputer system for CEPIS as well as provide sufficient training and support to permit adequate operation in Lima.

CEPIS would then operate the data retrieval system on a regional basis as part of the CU-AID effort to assemble and disseminate information on low cost technology, the automated system providing the necessary interface between the two institutions and the countries of the Region.

The proposal is still contingent upon finding a funding agency to provide nearly US$ 144,000.

After having reviewed the proposal presented, I would like to make several comments with regard to the system and CEPIS' role in the project.
Comments on the Proposal

1. CEPIS should be aware of the magnitude of the associated costs that will have to be assumed for installation and operation of the automated system. Installation costs will include expenditures for renovation of about 60 m² of office space and installation of air conditioning, electrical circuits and possibly telephone lines. Although it should be possible to allocate 60 m² of space in the new CEPIS building, it would require some major modifications and would immediately create a shortage of space. It might be preferable to think of expanding the existing structures to accommodate the system. In any case, the cost would be significant and will have to be anticipated.

2. Annual Operation and maintenance costs are estimated at $13,000. This would include two additional full-time personnel — a programmer-operator and a typist-keypuncher. It would also include supplies, keypunch rental and routine maintenance. A backup operator is suggested in the proposal, but since I will also be operating the system, additional staff will not be required at the moment.

3. One serious drawback could be the lack of local maintenance. Although CEPIS personnel will be trained in maintenance procedures and a stock of spare parts will be on hand, major repairs will be affected in the U.S. This arrangement could be very inefficient given international problems with shipments and customs controls.

4. The minicomputer configuration proposed by the OKF seems adequate for the uses proposed. However, although I also favor the use of the flexible disk as a medium of interchange, its use in Latin America is almost unknown. This efficient interchange with other centers here, and I suspect in other developing areas, might better be accomplished with magnetic tape. This would require augmenting the configuration to include at least one tape unit at a cost of $9,170. This cost could be offset considerably by excluding the flexible disk. I feel this should be studied further.

5. Along the same line, CEPIS must take into account the many scientific applications we have and determine if the suggested configuration will support them. Of particular relevance is the memory and word size (16 bits) and the FORTRAN compiler available. More information will be needed. Several of our library programs require a large computer with memory in excess of 128 KB, so it will still be necessary to make use of the National University of Engineering’s IBM/360.

6. As a viable alternative to the minicomputer CEPIS could consider using exclusively the university’s IBM/360. Our operating costs would still be about $12,000 per year, but since we do not pay for the computer time this would be a favorable arrangement. Furthermore, the MERCURY system
is also available for use on an IBM/360 with H-level FORTRAN and operating under FULL OS. Thus we could still accomplish the proposal objectives for the data management systems with the collaboration of the OKF. There are, of course, some disadvantages including the remoteness of the university's facilities from CEPIIS, the impossibility of teleprocessing, and the uncertainty that the university could or would be willing to grant us increased time in the quantities needed. These factors would have to be studied more carefully.

7. The OKF proposes to modify all software so that system commands, error statements and diagnostic printouts will be in Spanish. Experience would indicate that this is unnecessary and perhaps even undesirable. All computer installation in the Region work with English-based software and experience shows that the uniformity is beneficial. Besides, many countries in the Region speak English, French or Portuguese, and not Spanish. To be certain, all documentation should be presented in English and Spanish.

8. I doubt that sufficient leeway has been provided for shipping the minicomputer components from Oklahoma to Lima. By air freight about 4-6 weeks would be ordinary, and by ship 3 months should be allowed to give ample margin for delay. Time lost in customs is often a significant component of the delivery time.

9. Reference is made in the proposal to an Appendix D containing the detailed specifications for hardware components, but the appendix was not included. It would be most useful to us to have more detailed technical information, and I think we should request that CEPIIS is provided with the brochures on all the equipment suggested.

Conclusions and Recommendations

My overall impression of the CU-OKF proposal is that it is a very imaginative solution to the information management problem that we have been facing for some time. Given the basic structure and file organization capabilities of the MERCURY system, and the capacity of the hardware configuration, the data retrieval system could serve us not only with respect to the CU-AID project but also in the development of the regional information network, which CEPIIS has had under consideration for the past year.

I would recommend that we agree in principle with the CU-OKF proposal and that we join with them in the search for a funding agency. At the same time the OKF could respond to comments 3, 4, 5, 7, 8 and 9 above, and a modified proposal could be prepared if needed.
Figure 1.- General Minicomputer Configuration suggested by OKF