DOUGLAS HOSPITAL CENTRE MEMORANDUM

TO: M. Gérard Soucy
Directeur Géneral Adjoint

FROM: Henry Olders, MD
Chairman, CMDP Committee on Computerization

DATE: 29 December, 1987

SUBJECT: CMDP Committee on Computerization "Report on Clinical Computerization at Douglas Hospital"

As we discussed today on the telephone, attached please find the "Report on Clinical Computerization at Douglas Hospital" prepared by the CMDP Committee on Computerization.

We anticipate that the report will be approved by the Executive Committee of the CMDP at its meeting on 12 January 1988, after which you would receive the report officially, through formal channels. To save time, however, I am asking that you include the report in the agenda for the next meeting of the hospital's Comité de l'Informatisation to be held on 19 January 1988. We would also very much appreciate it if you could arrange for copies of the report to be distributed to members of the committee prior to the 19 January meeting.

I, and the members of the CMDP committee, look forward to working with you to advance the state of clinical computerization at Douglas Hospital.

Best wishes for very pleasant holidays,

Henry Olders, MD, FRCPC
Psychiatrist

C.C. Dr. D. Bloom, Président, CMDP
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Report on Clinical Computerization at Douglas Hospital

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I. Introduction

This report presents the conclusions to date and recommendations of the Committee on Computerisation, of the Conseil des Médecins, Dentistes, et Pharmaciens of Douglas Hospital, with regard to the general approach to be taken by the hospital for clinical computer applications. These conclusions deal with the selection of the hardware configuration for clinical computer systems only.

II. Current Assessment

A. Role of a Central Computer

The overriding rationale for using a single, central computer seems to be for applications in which only a single version of a piece of information at any time can be tolerated (ie multiple versions might result in confusion and errors). Examples include financial applications such as accounts payable, payroll, general ledger.

B. Roles For distributed Computers

When local processing or manipulation of information is important, a single central computer seems to have no particular advantage compared to distributed processing such as a network of mini- or microcomputers. Word processing of progress notes or patient data bases at the level of individual nursing units or clinics are examples of information which requires local processing.

C. Networks of Computers

Distributed processing networks take several forms. The simplest is individual computers (eg IBM PC compatibles or Apple McIntosh computers) which are not electronically connected. Users can interchange data by physically transporting diskettes from one computer to another.

Computers equipped with modems can communicate with each other at slow speeds, either through direct cables, or inside an institution through a private telephone system, or at longer distances using the public telephone system. This is a low-cost solution when the amounts of data to be interchanged are small, and slow response is not a handicap.

Local Area Networks (LAN's) are available in a range of speeds, for operation via twisted-pair cable, coaxial cable, or fibre optics. A popular, inexpensive LAN achieves relatively high data transmission speeds at distances of less than 1000 feet, using spare telephone wiring such as that available in Douglas Hospital buildings.

D. Apparent Advantages of Central Computers

1. Easier maintenance. When all the components of a system are purchased from one source, as is the usual case for central computer installations, it is easier to fix responsibility for ensuring proper operation on one organization.
2. For very large data bases or extremely complex mathematical problems, only large mainframe computers possess the data storage and processing power necessary.

E. Apparent Advantages of Local Area Networks of Microcomputers

1. Lower cost. It is necessary to purchase only as much computer power as required in the short-term, not to meet future expansion plans.
2. Higher reliability. When a computer fails, other units in the network can take over.
3. Faster response. For many applications, local processing power reduces the need to transmit large amounts of data.
4. Wider range of capabilities. Microcomputers possess bit-mapped graphics capabilities which are highly suitable for desk-top publishing, production of slides, graphs, posters, and medical illustrations. Products such as laser printers, scanners, optical disks, "mice", voice recognition, and voice synthesizers are readily available for microcomputers.
5. User-friendliness. Because of the intense competition in the microcomputer software and hardware markets, a wide range of low-cost, powerful yet easy-to-use products are available. Many can be easily utilized without users' manuals.
6. Flexibility. The wide range of products allows systems and networks to be tailored to meet highly specific needs.
7. Multiple sourcing. Functionally equivalent microcomputers, disks, peripherals, etc are available from a wide array of manufacturers, thus relieving the anxiety of being dependent on a single source that could discontinue support for a mainframe or minicomputer system at any time.
8. Connections to mainframes. In those situations where the absolute speed or data storage capacity of a mainframe is essential, most LAN's can be linked to mainframe computers, thus allowing any microcomputer in the LAN to serve as a terminal to the mainframe computer. This can be less expensive than hooking up an equivalent number of terminals directly.
9. Faster development. Fourth generation data base languages available on microcomputers allow users to develop their own systems, reducing their dependence on data processing department programmers who usually have a backlog of work.

III. Interim Conclusions

Given the apparent preponderance of advantages that LAN's of microcomputers have over central computers, the CMDP Committee on Computerization currently favours the development of Local Area Networks of microcomputers for clinical applications.

As this policy would be at odds with current planning in the Service de l'informatique, we propose the recommendations which follow.

IV. Recommendations

In order to test the relative advantages of LAN's of microcomputers and a central computer, we propose the following:

1. That the project to computerize the outpatient clinics of CPC be realized as soon as possible, to provide data on the feasibility, strengths, and weaknesses of the central computer approach to clinical computing;
2. That a pilot project be commenced: the computerization of a clinical unit, such as the Emergency Room, using a Local Area Network of microcomputers. Such a project should include hardware (three or four computers in a LAN); software (off-the-shelf fourth generation relational database, word processing, utilities, networking software); the services of a consultant (initially on a full-time basis).

A. Rationale

The proposed pilot project, which would be developed concurrently with the computerization of CPC outpatient clinics, is indicated for the following reasons:

1. justification for computerizing clinical areas:

1. to collect clinical data which will improve clinical decision-making, and thus enhance patient care;
2. to train and educate clinicians in the clinical uses of computers;
3. to assess the feasibility of using computers for various clinical and clinical/administrative tasks;
4. to improve efficiency.

2. justification for a microcomputer LAN:

5. to assess the feasibility of Local Area Networks in clinical applications;
6. to compare the relative advantages and disadvantages of LAN solutions and central computer solutions in clinical applications.

V. Afterword

Computerization of general administrative applications (for example, Finance and Personnel) on the Sperry 1100, ought to progress to completion. However, expansion of the central computer system into clinical areas should not proceed beyond the computerization of the CPC outpatient clinics, until enough data has been accumulated to justify such expansion in comparison to alternative solutions.

Henry Olders, Eng, MD, FRCPC
Chairman, CMDP Committee on Computerization, Douglas Hospital

Committee Members:
Daniel Kraus, MD
Suzanne Lamarre, MD
Pierre Larose
Richard Lavoie / Michel Perreault
Gert Morgenstern, MD
John O'Neil, MD
Jeannine Paré, N