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When a hospital expands its capacity but does so by building an entire new unit in a distant suburban town, how should its administrative facilities be arranged—centralized or duplicated? Here's an actual case history —

CENTRALIZING DATA PROCESSING IN A TWO-LOCATION HOSPITAL

by Ernest W. Kosty

Arthur Young & Company

A 179-BED general hospital in a large Midwestern city decided in 1965 to more than double its capacity by building a new 207-bed facility—in a suburban community some 35 miles away from the original hospital.

Basic question

In planning this expansion, the hospital's board of trustees and administrative staff faced a number

of major questions about how to administer the dual-location institution for maximum efficiency and economy. The latter consideration included, of course, the question of whether central facilities and equipment could be used to serve both locations or whether it would be necessary to duplicate some or all of these facilities. This question was of particular concern in connection with the hospital's business office, which was faced with both

rising clerical salary costs and increased demands for information, both internally (special reports for management purposes) and externally (more detailed patient billing requirements).

Centralization

The management services department of Arthur Young & Company was engaged by the hospital's board of trustees to help it de-

termine whether a centralized business office would meet the needs of the dual-location hospital. Specifically, the consultants were asked to (1) review the present business office systems, (2) determine the complement of personnel and equipment required to handle the business operations of the new hospital, and (3) recommend to the board whether a centralized business facility would be both practical and economical.

Data processing equipment

The results of the survey indicated that a centralized business facility would be practical provided more advanced data processing equipment were employed. The cost of this new equipment, the studies showed, could be justified by the economies resulting from centralization.

Recommendations

In view of the operating and information needs of the two locations, it was recommended that a Burroughs E4000 electronic accounting system be installed in the original hospital to replace Sensimatic accounting machines. This system (an E4294) would provide for visible records with magnetic ledger cards and would include 200 words of core memory, an auto-ledger reader, a punched card reader, and a card punch (to prepare punched cards as output from posting operations). The proposed system called for a touch tone Data

Phone communication system in both hospital locations so that patient charges could be transmitted directly to the business office from patient service cost centers for posting to patients' accounts.

Objectives sought

The installation of a small-scale central computer was recommended to reach the following goals:

- Reduce the number of manual clerical operations required in the business office
- Minimize the impact of clerical costs resulting from the doubling of bed capacity
- Integrate Blue Cross billing forms with patient ledgers
- Simplify preparation of more detailed data required for both internal management and external reporting purposes
- Establish a central business organization compatible with the skills of existing personnel.

Three applications were initially scheduled for conversion to the E4000: payroll, accounts payable, and patient accounting.

Payroll

The conversion of payroll to the E4000 (from a pegboard system) provided the hospital with the opportunity to re-evaluate its policies and procedures with a view to standardizing and streamlining payroll processing. This evaluation was opportune because there then was a question whether the manual system could have absorbed any increases in deduction schedules as well as a payroll to be about doubled with the opening of the new facility.

Union negotiations

It happened also that the hospital was involved in preliminary union negotiations which could affect several aspects of payroll preparation. In this regard, an unexpected benefit accrued to the hospital's administration: The standardization and clarification of cer-

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Patient accounting was the most difficult of the three conversion operations.

tain payroll practices brought about by mechanization aided in the final union settlement, particularly in the area of rates and classifications.

Following a period of simulation, payroll was converted to the E4000 at the start of the fourth quarter of 1966. As in most soundly conceived computer conversions, the problems that arose were resolved without excessive strain on clerical personnel or other employees. In retrospect, the hospital's controller undoubtedly would suggest that payroll should have been converted at the start of a calendar year, thus eliminating the need to carry forward year-to-date totals. However, the availability of the new equipment and the clerical cost savings to be realized dictated the earlier conversion at the start of the fourth quarter.

Accounts payable

In the accounts payable conversion, a thorough preparatory analysis resulted in substantial revisions of the hospital's chart of accounts. A new account number format was established to handle the requirements of both hospital facilities as well as those of a maternity home attached to the original hospital. However, considerable similarity was retained in the basic account numbering system so that statistical comparisons could be made with prior accounting periods.

System elements

The major elements of the accounts payable system were (1) a voucher build-up system with the flexibility to handle direct payments, (2) a vendor ledger on which payments are recorded, and (3) account distribution ledgers posted via the use of punched

cards prepared as a by-product of voucher preparation.

The new chart of accounts went into effect on January 1, 1967. It is worth noting that the establishment of a centralized accounts payable function was facilitated by centralizing the purchasing function to cover both hospital locations.

Patient accounting

Patient accounting was the most difficult of the three conversion operations. Without question, patient accounting is the most significant activity within the business office in terms of its impact on hospital revenues as well as on statistical reporting.

To gain perspective, a brief review of the previous system may be helpful: Patient charges and credits were posted to ledgers on Burroughs Sensimatic accounting machines. These data originated with tickets prepared at nursing stations, in ancillary areas, and at the business office. Blue Cross billings represented a completely separate typing operation. Revenue and statistical analyses were accomplished manually.

Automating posting

Although the E4000 could have been used in essentially the same way to update ledgers, it was decided to automate posting through the combined use of punched cards and the storage capability of magnetic-stripe ledgers. To connect the two facilities, touch tone telephones at the new location were linked to a Data Phone/IBM 026 keypunch combination at the old location. A translator was required at the old location to convert the incoming touch tone impulses for the 026. Touch tone tele-

phones were installed in key areas at the new location, including X-ray, central supply, pharmacy, laboratory, and the satellite business office (which also transmits charges for the operating room and obstetrics area). A similar arrangement was installed in the old facility with the exception that a touch tone telephone was also installed adjacent to the operating room area.

Data transmitted

On assigned time schedules, each of these sending areas dials a restricted extension number to establish contact with the Data Phone set-up and transmits its charges or credits to the business office, where punched cards are automatically prepared. The data transmitted include the following:

- Patient case number
- Sending area
- Transaction code
- Floor on which the patient is located
- Type of case (medical, surgical, obstetrical)
- Type of patient (Medicare, Medicaid, other)
- Procedure code (e.g., to identify type of X-ray)
- Charge or credit amount.

Controls

The cards are then sorted on an IBM 082 sorter, and a total for each area is tabulated on the E4000. As a control, the charge tickets also are sent to the business office, batched according to sending area. Tapes are prepared for balancing purposes and to guard against discrepancies. Once the balancing function is completed, the cards are re-sorted according to patient case number and transac-

tion code, and the sorted cards are placed in the E4000 card reader. Each patient's ledger is inserted, and charges are automatically posted. Room and board charges stored on the magnetic ledger stripe also are automatically posted to the patient's ledger. A by-product card is punched, thus providing a complete punched card file on all entries to the individual patient's ledger. During the posting operation, control totals are further established to verify that all charges are processed against open accounts based on daily census reports. (Slightly different procedures are used when a patient has already been discharged.)

Billing

At the time a patient is to be discharged column totals are automatically printed for room and board, pharmacy, X-ray, laboratory, OR, miscellaneous, and credits. These totals detail the types of charges for the patient. They also serve as a basis for computing reimbursement data for third parties. The patient ledger is actually a three-ply form: The first copy is used to prepare Blue Cross billings; the second copy is sent to the patient (who generally receives a copy four days after discharge); and the third copy (on ledger stock) remains in the business office. The integration of the Blue Cross billing form with the patient ledger was worked out after numerous meetings with the state Blue Cross office. It is expected that this procedure will serve as a model for other hospitals converting to similar equipment.

Management reports

A further use of the punched cards associated with posting to the patient ledgers is in the preparation of various revenue and statistical analyses. The cards are sorted on such keys as transaction code, type of service, floor area, etc., and processed through the E4000 to print reports for management use.

In addition to the touch tone equipment installed in the two facilities, a teletype machine has also been employed to facilitate communications required for other central functions such as purchasing. The use of touch tone equipment in conjunction with the data processing system in the old location has largely eliminated the necessity for additional clerical help in the new location to handle payroll, accounts payable, and patient accounting. It was necessary, however, to station in the new location an employee who was familiar with all aspects of the business office and the E4000 system.

The original hospital was converted to the touch tone/E4000 system on July 1, 1967. The new facility went onto the system on August 15, 1967, when its first patients were accepted.

Lessons learned

As advice to other hospitals contemplating computerizing their business office operations, emphasis should be placed on the need for thorough systems analysis of existing systems and potential requirements, adequate training of and communication with personnel affected by the system, thorough testing of the computer programs prior to conversion, and a willingness on the part of the hospital administration to explore new methods and approaches. In addition, it may be necessary to hire a qualified data processing manager to supervise overall operations and to provide technical guidance. Such was the case in this hospital.

Future plans

Continued refinements in the original applications are scheduled, such as the use of plastic cards to automatically transmit portions of the data now manually indexed on the touch tone phones. In addition, plans call for eventual conversion of general ledger accounting, fixed asset accounting, and inventory control.

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