Identifying requirements for automation is the first step toward designing any information system. This paper delineates a methodology that nurses can utilize to define the content of information to be accepted, processed and printed by the computer for nursing.

Introduction

The benefits of computer technology to nursing are predicated on the profession's ability to define its requirements in the areas of practice, education and research. Often the information to be accepted, processed, and printed by a computer for a nursing work center has been identified and determined by technical rather than by functional experts. Since nurse users have been reluctant to commit the time and energy necessary to define their automation demands, they have been forced to fit their needs to already established systems. This has resulted in a mismatch between computer technology and nursing requirements.

Nurses, to date, have remained naive concerning the definition and design of information systems for day to day functioning because they assume that any automated hospital system would automatically satisfy nursing requirements. Yet, a recent analysis of the health care computer technology available from major companies indicated just the opposite. Nursing was the least defined area in terms of computer applications. Although some strides have been made in nursing documentation and nurse care planning, little has been developed specific to administrative reporting, patient classification, or the many facets of scheduling. The reason is simple - major automated efforts have been made in areas where costs can be pinpointed and retrieved, such as pharmacy or laboratory. Documenting how many pills are dispensed or how long it takes to do a CBC is far easier than delineating time spent in the nursing process. Therefore, computer support for a nursing work center has been considered only in a limited context.

There also exists another issue of problematic proportion that must be addressed. Nursing, as a profession, lacks the knowledge and expertise to define its information requirements. Therefore, when the decision is made to identify and delineate those functions in nursing which would benefit from automated support, nurses do not know how or where to begin.

Purpose

The purpose of this paper is to describe a methodology for defining information requirements for an automated information system. The focus will be narrow, since we shall only be addressing requirements and not computer hardware or software. Requirements define the information functions, the policy associated with the functions, and the data needed to design a computerized system. The sequential steps for defining information requirements consist of:

1. Analyze relevance and usage of present forms and reports
2. Analyze information flow and how it is processed
3. Determine how this information can be automated
4. Define inputs necessary to generate outputs
5. Define outputs and their format
6. Define the data - in terms of the data elements required for all inputs and outputs

Methodology

As stated, the first step is to analyze present forms and reports. The purpose of this paperwork analysis is to detail the scope of information needed by the nursing staff in performing their professional duties. For example, in the area of patient care planning each step of the patient's progress on the ward or in the clinics is chronicled with its accompanying paperwork. The paperwork could encompass patient assessment, admission note, nursing diagnosis, problem list, patient care plan, patient profile, medication record, nurses' notes, discharge
instructions, and health teaching. Therefore, each piece of paper that the nursing staff creates or supplements is identified and catalogued, and samples are collected.

Once collected these forms and reports are evaluated for relevance and usage within the nursing setting based on the following items:

1. **Document Name:** The actual name of the form or the composite name agreed upon if more than one form is being used by various specialty areas.

2. **When Used:** What event initiates the use of this document?

3. **Who Completes:** Name the staff usually responsible for completing the form initially and the location where this takes place.

4. **Who Uses:** Name the staff who normally utilizes the form (if more than one staff person uses it, name the person who is the primary user followed by the secondary users).

5. **Purpose:** What is the purpose of the information on the form? Does it fulfill its purpose and provide the information needed by the people who are the primary users? Since there may be multiple uses for a form, identify as many of them as possible.

6. **Filed:** Where is the form filed? Is it a permanent part of the patient's medical record? A part of the unit's log file? Is it destroyed? When is it filed?

The second step is to identify and analyse the information that flows through the nursing settings. The purpose of this information flow analysis is to detail the creation and use of information by nursing staff in performing their professional duties. From this description of how information is processed a physical model for nursing service emerges. This can be accomplished by using a structured analysis and system specification technique which details every piece of information at its origin and how it is communicated within nursing service. For example, the physical model for patient care could consist of the nursing process function which breaks down into assess patient, plan patient care, implement plan, and re-assess.

The next step is to determine how this information can be automated. Processes that must remain manual need to be identified and similar computer processes should be combined to eliminate redundancy. Because of the complexity of this task, you will need the assistance of technical experts to help make these decisions. An analysis of the physical flow results in the identification of the computer processes necessary to logically transmit the needed information.

Once the information to be automated has been identified, the data base for the computer process must be developed. This involves defining:

1. **Inputs** which are groups of data or information that are actually placed in a computer by a user, such as a nurse, or are transmitted to nursing by another work center such as radiology or laboratory. This includes identifying all the information necessary for producing the output that has been identified. Remember that most information only needs to be entered once.

2. **Outputs** of the system which are defined in terms of screen display and/or hard-copy reports. The screen displays are used either to display data stored in the system for review or to allow the user to enter and update data. Hard-copy outputs are actual forms or reports generated and printed by the system, for example, patient care plans and patient assessment data. You may need several outputs with different formats from one computer process.

3. **Inputs** and **outputs** are characterized in terms of data elements which are basic units of information having a unique meaning within a specific context - for example, "color of eyes," "date of last visit," "patient name".

When the inputs, outputs and data elements have been defined, a detailed description of the nursing computer process has been delineated. In essence what has occurred is that a physical model of nursing functions has been translated into the computer processes necessary to support information requirements for a nursing system.

The resulting functional description will provide a blueprint for either the design phase of a nursing system or for effectively evaluating the hardware and software currently being offered in the data processing market. Defining requirements in the first step toward developing the content of information to be accepted, processed, and printed by the computer for nursing.

**References**


