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HOSPITAL INFORMATION SYSTEMS :

A Nursing Viewpoint.

A thesis presented in partial fulfilment  
of the requirements for the degree of Master of Arts  
in Nursing Studies at Massey University.

JANICE WENN

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ABSTRACT

This thesis is concerned with hospital information systems. The literature relating to management information systems is examined in conjunction with the literature which specifically focuses upon hospital and nursing information systems.

A field study, using a case study approach, is designed and implemented, its purpose being to analyse five sub-systems of a current hospital information system in use in one Hospital Board. This field study utilises a basic systems analysis methodology focusing upon the problem identification and performance identifications of the analysis cycle.

In the problem identification phase forty-two subjects are interviewed, (83.3% of the sample being nurses in management positions). Check lists designed to test the sub-systems abilities to generate, store, retrieve and utilise data, and test the subjects knowledge of the sub-systems are devised and applied. The data obtained from the application of check lists is analysed and data flow charts and in-depth interview schedules developed for use in phase two or the performance identification phase of the field study.

In phase two (performance identification) eleven subjects in administrative positions within the Hospital Board

are interviewed using the data flow charts and the in-depth interview schedules as tools for eliciting data.

Contrary to the author's expectations the field study results reveal a considerable diversity. In phase one the respondents possessed a sound knowledge of the admission/discharge, patient care and nursing management sub-systems. 85,7% of the nurse respondents have knowledge of the patient care sub-system and a further 79.2% have some knowledge of its ability to generate, store, retrieve and utilise information. In common with the administrators the high level of knowledge of retrieval and utilisation (89.2%) would indicate frequent use of the system. By contrast only 5.4% of the respondents in phase one had knowledge of retrieval and utilisation of the staffing information sub-system as compared with 100% in the administrators group. This same pattern emerges for the financial sub-system with 13.5% of the respondents having knowledge of retrieval and 18.9% of utilisation of the sub-system compared with 81.8% of administrators.

These results indicate to the author that information systems development tends to be associated with each health discipline rather than with the macro development of a relevant, comprehensive hospital information system. To this end a series of questions are raised and possible answers provided. Finally a model which

could become a prescription for future development  
is presented.

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## GLOSSARY

- CASE STUDY A detailed, factual, largely narrative description and analysis of an existing system.
- CLUSTER ANALYSIS A technique for determining clusters. It is analogous to the technique of factor analysis.
- COMPUTER A piece of electronic equipment that: performs large numbers of mathematical calculations at high speed; operates under the command of a set of changeable instructions called programmes; stores both programmes and data in electronic and electromagnetic devices called memories.
- CONSTRAINTS The boundaries or limitations, rules and regulations, legal and organizational, that affect a particular operation.
- CORRELATION ANALYSIS An analysis of the significant relationships occurring between stated criteria.
- CYBERNETIC MODEL A model or depiction of the 'real world' which incorporates a control and/or feedback mechanism.
- DATA A general term used to denote any or all facts, numbers, letters, symbols that refer to or describe an object, idea, condition, situation, or other factors e.g. time delineation.

DATA-FLOW  
CHART

A graphic depiction of the flow of data through a system or sub-system.

EQUITABLE  
HOSPITAL BOARD  
FUNDING

A population based formula which provides equitable funding for Hospital Boards. This formula was adopted on April 1 1983. It is a descriptive model possessing a considerable number of variables.

FREQUENCY  
DISTRIBUTION

A grouping of data collected in a study that indicates the number of study subjects possessing the different values of the scale of the variable measured.

G R A S P

An H I S specifically designed in 1976 by the Greater Vancouver Regional Hospitals Management Engineering Unit to investigate the feasibility of patient classification.

HARDWARE

The electric, electronic and mechanical equipment used for processing data, consisting of cabinets, racks, tubes, transistors, wires, notes etc. Terminals used for on-line patient registration are examples of hardware.

HOSPITAL  
INFORMATION  
SYSTEM

H I S : An Information system designed specifically for use in the hospital health care system.

INFOLOGICAL

Pertaining specifically to the generation of information.

INFORMATION	Data which has been specifically ordered and interpreted. An increased level of knowledge derived from processing data.
INFORMATION SYSTEM	An open system specifically designed to create, collect, store, process, distribute and interpret data so as to produce relevant information for the purpose of assisting in the decision making, problem solving and evaluating the management processes within organizations.
INFORMATION SYSTEMS : ANALYSIS OF CHANGES	I S A C : An analysis methodology based on the needs, problems and ideas experienced by users of manual routines and computer programmes. Devised by Lundeberg et al 1978.
INFORMATION THEORY	A process of defining information. A sub-set of decision theory. It is based on the determination of the value of perfect information.
INPUT DEVICES	Devices primarily responsible for making information available to the system, transferring and retrieving data.
INTERFACE	Electronic components that allow for two different devices or systems to communicate.
MANAGEMENT INFORMATION SYSTEM	M I S : An information system designed specifically for a management function: A data base bearing all relevant data relating to the resources deployed by

an organization; a set of systems enabling the resources and their use to be costed and to produce financial information; a set of systems permitting the management of the resources in quantitative but non financial terms, including the measurement of outputs; a set of management models to aid planning and decision making.

MICROCOMPUTER A small, limited capability, relatively slower than a mini, low cost computer made up of a microprocessor and memory and input/output devices.

MINICOMPUTER A small low priced computer which has the same components as a full sized system and can be programmed to perform the tasks of larger computers.

NURSES  
QUALIFICATIONS These are explained in the Nurses Act 1977.

R.N.	Registered Nurse
R.G.O.N.	" General and Obstetric Nurse
R.Cp.N.	" Comprehensive Nurse
R.Pd.N.	" Psychopaedic Nurse
R.P.N.	" Psychiatric Nurse

Other qualifications -

Dip.N.(SANS)	Diploma of Nursing from the New Zealand School of Advanced Nursing Studies. Phased out 1978.
Dip.N.(Massey)	Diploma of Nursing. Massey University.
Adv.Dip.	Advanced Diploma. Obtained at a Technical Institute.

NURSING AUDIT A logical system of measuring whether Nursing Standards are being achieved. A measurement tool.



NURSING  
INFORMATION  
SYSTEM

N I S : An information system designed to include those parts of an H I S which are oriented specifically to nursing.

NURSING  
STANDARDS

A criterion, a level or degree of quality considered proper and adequate for a specific purpose. A model or example established by authority, custom or consent. A value against which to measure nursing care.

ON LINE

Descriptive of a system and peripheral equipment in a system in which the operation of such equipment is under control of a central processing unit.

ORGANIZATION  
CHART

A graphic depiction of functions performed within an organization. Through vertical and horizontal lines it demonstrates the authority and responsibility relationship of workers and administrators. Depicts line and staff relationships and identifies the titles of jobs in accordance with job descriptions.

PLANNING

The process of making decisions in the present to bring about an outcome in the future. The determining of proper goals and the means of achieving them.

PROBLEM ORIENTED  
MEDICAL  
INFORMATION  
SYSTEM

A comprehensive patient care system utilizing a problem oriented approach. The system has the ability to integrate data to enable it to be utilized for

planning purposes. It is designed to help solve four major problems: Lack of co-ordination of data; failure to record logically; dependence upon human memory; lack of meaningful feedback. It provides general patient information, has flexibility, streamlines input, validates and provides scheduled reports.

RELIABILITY

A criterion for assessing the quality of data. Data are reliable if they are consistent, accurate and precise.

own

STAND-ALONE SYSTEM

A part of a total system capable of functioning autonomously.

SUB=SYSTEM

A complete component of a total system. Capable of being analysed as a system.

SYSTEMS ANALYSIS

A scientific method of problem solving. A process that can be used to examine an activity, procedure, method, technique or business. It utilizes a structured order to determine what must be accomplished to achieve change, select the best method for achieving a goal, and provide direction and evaluation for implementing change or introducing new methods.

THE HOSPITALS ACT 1957 - SECTION 62

That section of the Act which refers to non disclosure of medical information.