ABSTRACT

The key focus of the thesis is an action research study, in which a critical approach was adopted. The thesis is about an investigation into the process of developing a computerized information system for physiotherapy services within the NHS in England.

The idea that there was an identifiable need for such a system to be developed specifically for physiotherapy services arose out of increasing requirements throughout the 1980s and early 1990s from government policy and initiatives. Important influences included; implementation of the Körner recommendations, a more business oriented approach and NHS Reforms; the clinical requirements of physiotherapy services and the continuing process of professionalization and managerial imperatives within the NHS and physiotherapy itself.

The principal method was an action research approach in which the researcher actively led the development and eventual successful implementation of a computerized information system for physiotherapy services. The research encompassed a reflective post-intervention evaluation using a conceptual problem solving framework, Normative Information Model-based Systems Analysis and Design – NIMSAD. Using this approach, the work was evaluated against three identified elements: The problem situation, the "intended" problem solver – the researcher - and the problem solving process.

A supplementary empirical study was also undertaken using a national questionnaire survey to assess the use of computerized information systems by physiotherapy managers; examine their impact and obtain information on the views of physiotherapy managers about the use and relevance of such systems in physiotherapy.

AN INVESTIGATION INTO THE DEVELOPMENT OF A COMPUTERIZED INFORMATION SYSTEM FOR NHS PHYSIOTHERAPY SERVICES IN ENGLAND

AN ACTION RESEARCH STUDY

ROBERT J. JONES

CONTENTS

LIST OF FIGURES

APPENDICES

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ABBREVIATION LIST

4 GL	Fourth Generation Language
AHA	Area Health Authority
BMA	British Medical Association
BMJ	British Medical Journal
CCU	Coronary Care Unit
CIS	Clinical Information System
CISP	Clinical Information Systems Project
CMMS	Case Mix Management System
COBOL	Common Business Orientated Language
COT	College of Occupational Therapists
CPSM	Council for Professions Supplementary to Medicine
CSP	Chartered Society of Physiotherapy
CVA	Cerebral Vascular Accident
DGH	District General Hospital
DGM	District General Manager
DHA	District Health Authority
DHSS	Department of Health and Social Security
DMT	District Management Team
DMU	Directly Managed Unit
DoH	Department of Health
DSS	Department of Social Security
DTI	Department of Trade and Industry
ETHICS	Effective Technical Human Implementation Computerized-based Systems
FHSA	Family Health Service Authority
FPC	Family Practitioner Committee
GP	General Practitioner
GPFH	General Practitioner Fund Holder
HAA	Hospital Activity Analysis
HAV	Home Assessment Visit
HIPE	Hospital In-patient Enquiry
ICD	International Classification of Diseases
IM&T	Information Management and Technology
IMG	Information Management Group
IPR	Individual Performance Review
IS	Information Systems
IT	Information Technology
ITU	Intensive Therapy Unit
JGPI	Joint Group on Performance Indicators
KT	Körner Table
LEA	Local Education Authority
MDS	Minimum Data Set
MP	Member of Parliament
MTS	Multi-Therapy System
NAQA	National Association of Quality Assurance
NCC	National Computing Centre
NHS	National Health Service
NHSCC	National Health Service Centre for Coding and Classification
NHSE	National Health Service Executive
NHSME	National Health Service Management Executive
NIMSAD	Normative Information Model-based Systems Analysis and Design
NSGC	National Steering Group on Costing
NWRHA	North West Regional Health Authority
OPCS	Office of Population Censuses and Surveys
OSV	Overseas Visitor
PAMs	Professions Allied to Medicine
PAS	Patient Administration System

PC	Personnel Computer
PCG	Primary Care Group
PI	Performance Indicator
PIU	Physiotherapy Input Unit
PMS	Physiotherapy Management System
POMR	Problem Orientated Medical Record
PP	Private Patient
PRP	Performance Related Pay
RAWP	Resource Allocation Working Party
RGM	Regional General Manager
RHA	Regional Health Authority
RM	Resource Management
RMI	Resource Management Initiative
SCBU	Special Care Baby Unit
SEPHI	South East Physiotherapy Information Technology
SLA	Service Level Agreement
SETRHA	South East Thames Regional Health Authority
SSADM	Structured Systems Analysis Design Method
SSM	Soft Systems Methodology
SWG	Specialty Working Group
UGM	Unit General Manager
WHO	World Health Organisation
WTE	Whole Time Equivalent

CHAPTER ONE

INTRODUCTION TO THE THESIS

1.1 Introduction

The key focus of this research, in which a critical approach was adopted, was an investigation into the process of developing a computerized information system for physiotherapy services within the National Health Service (NHS) in England. The idea that there was an *identifiable need for such a system to be developed* specifically for physiotherapy services arose out of increasing requirements throughout the 1980s and early 1990s from government policy and initiatives; the clinical requirements of physiotherapy services and the managerial imperatives within the NHS and physiotherapy itself, at all levels; these factors form the context of the problem situation, chapters 2-4 (below).

The principal method was the adoption of an action research approach in which the researcher was actively involved in the development and eventual successful implementation of an information system for physiotherapy services. A supplementary empirical study was undertaken to assess the use of computerized information systems by physiotherapy managers, to examine the impact of such systems and to obtain information on the views of senior physiotherapy managers about the use and relevance of computerized information systems in physiotherapy. Subsequent to the development, a reflective post-intervention evaluation was carried out using a conceptual problem solving framework, Normative Information

Model-based Systems Analysis and Design – NIMSAD – Jayaratna, (1997). Using the NIMSAD framework for the post intervention evaluation of the research, additional findings were abstracted from the evaluation of the adopted approaches. The work was evaluated against three identified elements: the problem situation, the "intended" problem solver - researcher - and the problem solving process.

1.2 Aims and Objectives

The aims were to research the need for computerized information systems development specific to physiotherapy services, to ascertain the availability and use of computerized information systems nationally and the views of physiotherapy managers on this; to undertake a long-term action research project in order to develop an effective and efficient computerized information system which would be acceptable to the user group and other stakeholders and to evaluate the process.

The objectives were:

To examine the reasons for the adoption of a user based approach to the design of a computerised information system for physiotherapy services.

To examine the constraints and requirements of such a system.

To give an account of the process by which this took place and to critically evaluate this approach.

1.3 Background

The NHS is the largest employing organization in the United Kingdom (UK) and possibly the second largest in the world after only the Indian National Railway System. It employs over one million whole time equivalent (WTE) staff, equal to approximately 1.3 million people including those working part-time; Gray (1991 p153). By far the largest group are nurses and midwives after this group are doctors and dentists, with physiotherapists forming the third largest patient care clinical profession with a membership of approximately 35,000. The NHS is the most occupationally complex organisation in this country. No publicly owned or private UK company has such a wide range and large number of professions and occupational groups; it provides a very wide range of services and uses large amounts of resources in workforce, finance, facilities and equipment and expenditure is approximately forty-two billion pounds per annum. Since 1979, when the Conservative Government under the Premiership of Mrs. Margaret Thatcher was elected, the NHS has undergone a series of rapid and radical changes, which continue today. It might reasonably be argued that the only constant throughout the entire period has been change. Accelerating progress in medicine, surgery, therapeutic and technical developments during this time has been accompanied by substantial upheavals in organizational structure and management arrangements. Fundamental changes have taken place to the way in which health services, including physiotherapy, are managed and provided and information has become increasingly central to health service management and clinical practice.

In 1985, the Researcher first began to consider how the district physiotherapy service he managed might meet the information requirements emanating from the Körner recommendations, DHSS (1984) and his analysis showed that there were many aspects to be taken into account in relation to data collection, processing, storage, reporting, analysis and interpretation. Other major issues to be considered would include the information requirements flowing from the many changes taking place within the NHS structure, organization and management, the scope and spectrum of modern physiotherapy practice and the information needs of physiotherapy managers and clinicians, as well as the development of information systems within the NHS and the needs and wants of NHS managers, and other stakeholders.

1.4 The Action Research Approach

The research method adopted for the case study is based on an action research approach, chapter 7 (below). The researcher, acting as problem solver, initiated and led the group work which was undertaken to develop the computerized information system. All the other work reported in this thesis, apart from the Chartered Society of Physiotherapy (CSP) survey (2.3.4, below), was undertaken by the researcher independently.

The major characteristics of action research drawn upon for the project include: the involvement of the researcher himself, the identification of a real problem

situation and the researcher's motivation to move from the problem situation to a desired situation, that is, to solve the problem. The approach also placed emphasis on improving the quality of action and practice, disciplined and systematic enquiry and a group working method acceptable to the group as a whole. It was an important objective that the findings and implementation of the work should be widely shared and seen as acceptable within the district physiotherapy service and be easily translatable, more widely within physiotherapy regionally and nationally. The solution needed to be acceptable to Eastbourne, the HA, South East Thames Regional Health Authority (SETRHA), by others with an interest and key stakeholders outside physiotherapy. The project represented essentially the core of a case study approach, the aim of which was to produce generalisable insights in order to contribute to existing knowledge, to extend knowledge and improve practice.

Cohen and Manion (1980 p178) point out that an important feature of action research is that the task is not finished when the project ends. The participants continue to review, evaluate and improve practice. The researcher saw this as an attractive approach because of the practical problem solving emphasis that the research would be directed towards greater understanding and improvement of practice over a long period. The action research methodology would allow sufficient flexibility to accommodate rapidly changing requirements forced upon the development process by the Government's NHS reforms and other changes taking place throughout the entire period. It was essential that the research

method adopted would allow for rapid evolution taking place within the contextual environment as well as within the development of the computerized information system itself.

In summary, the action research approach adopted for the case study incorporated the method set out by Cohen and Manion (1980 p174)

> *"Action research is small scale intervention in the functioning of the real world and a close examination of the effects of such intervention...(it) is situational - it is concerned with diagnosing a problem in specific context and attempting to solve it in that context; it is usually (though not inevitably) collaborative - teams of researchers and practitioners work together on a project; it is participatory - team members themselves take part directly or indirectly in implementing the research; and it is self evaluative - modifications are continuously evaluated within the ongoing situation, the ultimate objective being to improve practice in some way or other".*

Kolb's model of problem solving based on experiential learning was relevant to the research methodology. Kolb et al (1984 p31) postulate that the responsibility for problem solving rests with the problem solver who must 'experiment, take risks and come to grips with the problem'. He proposed a model which incorporates combining the characteristics of learning and problem solving and conceiving of them as a single process. These authors argue that an understanding of problem solving and 'academic learning' could be enhanced by viewing both processes - learning and problem solving - as specialized modifications of a 'single, more holistic adaptive process of learning from experience' Kolb et al(1984 p32). Within the experiential learning process the authors identify four phases, which are:

'concrete experience, reflective observation, abstract conceptualization, and active experimentation' Kolb et al (1984 p151). Kolb describes a model of the problem solving process that defines the stages and tasks involved in such a way that 'managers can better manage their own and their organization's problem solving activities'. This problem solving model is based on three premises:

> *"First that problem solving is basically a process of learning from experience, second that problem solving involves the manipulation and control of the external world through one's mental processes, and third that problem solving is by its nature a social process"*
>
> (Kolb et al, 1984 p151)

The computerized information system development process which is the subject of this case study took place over a ten year period, and continues to-day. Kolb's model of problem solving based on the theory of experiential learning affords a useful framework which approximates to the methodology used throughout the action research project. There was no conscious effort on the part of the researcher or his colleagues to follow any particular problem solving approach in a step-by-step way, however, the Kolb model demonstrates elements which closely mirror the approach adopted. Kolb's model reflects the natural order by which learning takes place, it is a model that promotes learning through experimentation and reflection on the process and outcome. The model provides no fundamental structure or framework to aid identification and elicitation of abstract concepts, and the roles and responsibilities of the individual.

A further model which contributes elements to the research project is Schön's (1991 pp49-69) reflection-in-action which advocates reflection on what the individual does, enabling him to make greater sense of the situation and to refine that understanding and corresponding actions which may be embodied into future actions:

> *"As he tries to make sense of it, he also reflects on the understandings which have been implicit in his action, understandings which he surfaces, criticises, restructures and embodies in future action".*
>
> "*It is the entire process of reflection-in-action which is* central to the art by which practitioners sometimes deal well with situations of uncertainty, instability, uniqueness *and value conflict".*
>
> *(Schön 1991 p50)*

The explication and scrutiny of the tacit knowledge of the individual is a principal component of the reflection-in-action model. This idea corresponds strongly with the notion of 'thinking on your feet', that is, not only that we can think about doing but that we can think about doing something while doing it:

> *"When someone reflects in action, he becomes a researcher in the practice context. He is not dependent on the categories of established theory and techniques, but constructs a new theory of the unique case. His inquiry is not limited to deliberation about means which depends on a prior agreement about ends. He does not keep ends and means separate, but defines them interactively as he frames a problematic situation. He does separate his thinking from his doing, ratiocinating his way to a decision which he must later convert to action".*
>
> *(Schön 1991 p68)*

The application of reflection-in-action within the context of the research involves the constant evaluation of the researcher's thought processes and action during the action research project.

1.5 Framework of the Thesis

The thesis is written in three major parts. The first part – chapters 2, 3 and 4 – is an analysis of the problem situation – the situation of concern. The main objective of this investigation was to deduce the underlying causes of the problem in order to evaluate whether it was necessary to propose a possible solution. The problem is perceived as residing within a particular organizational context which is the 'problem situation'.

Jayaratna (1997 p57) argues that:

> *"organizations serve as the context for information systems"*
>
> and that:
>
> *"most problem situations are set within an organizational context".*

In these chapters the problem is perceived, acknowledged and analysed. This examination demonstrates the problem situation as comprising many elements interacting with each other and with the environment in a complex entity. The enquiry into the identified problem encompasses an investigation of the historical context of circumstances and changes taking place in the NHS during the 1980s and early 1990s, and this provides a broad perspective of the context.

Chapter 2 discusses the development of computerized information systems in the NHS and the increasing demands for more information and the relationship of this to physiotherapy. Chapter 3 reviews the professionalisation process in physiotherapy and focuses on the scope and functions of modern physiotherapy practice in the "reformed" NHS. Analysis of the NHS in terms of the changes that have taken place, the radical "reforms" and their impact upon physiotherapy are presented in chapter 4 together with a review of management changes within the Service as a whole and the duties of physiotherapy managers in particular. Chapter 5 provides a review of the literature which underpins the theoretical perspectives of the thesis.

The second part of the thesis encompasses chapters 6 and 7. The supplementary empirical study explores the use of computerized information systems in physiotherapy through a survey of NHS physiotherapy managers in England. This serves as a diagnostic tool and as one yardstick by which the action research study reported in chapter 7 is measured. Jayaratna (1997 p37) considers a problem solving process as comprising three major phases: Firstly, the problem formulation phase, chapters 2, 3 and 4 (below), secondly a solution design phase and thirdly a design implementation phase. Chapter 7 relates to phases two and three of this framework. The chapter focuses on ways of transforming the current situation into a desired situation, within the finances available and:

> *"within the constraints of the political, social, organizational and technological components of the problem situation"*
>
> *(Lye, 1996 p11)*

The final part of the thesis, chapter 8, is a critical evaluation of the problem situation, 'intended' problem solver – the researcher, problem solving process and outcome of the action research study.

Further outcomes of the research including publications by the researcher, new developments to the system and abstracted research issues which contribute to increased knowledge and the lessons to be learned, are discussed. There is a final short section on the Labour Government's NHS information strategy and its relevance to this study, in the light of which possible further research and development is indicated.

1.6 The Researcher

The NIMSAD framework places emphasis on the importance of the role and characteristics of the 'intended' problem solver - in this case also the researcher:

> *"However powerful, useful and effective a methodology may be, the success of effective and efficient information processing systems design and development depends, among other things, on the personal characteristics of the intended problem solver".*
>
> *(Jayaratna, 1997 p63)*

In the spirit of this the researcher is introduced here, to provide an element to the background to the context of the thesis.

The researcher qualified as a Chartered and State Registered Physiotherapist in 1971 and worked as a physiotherapy clinician in several districts. In 1984, he took up post as District Physiotherapy Manager for Eastbourne Health Authority and in 1992, the remit of the post was altered to include the management of all the therapy services within Eastbourne Hospitals which as a result of the government NHS reforms of 1990-1991 had become Eastbourne Hospitals NHS Trust. Simultaneously with these changes the community physiotherapy service separated to form part of the newly created Eastbourne and County Healthcare Trust.

In 1983 the Researcher became a nationally elected member of the Chartered Society of Physiotherapy (CSP) Council and in this capacity became chair of a committee which was concerned with issues relevant to information systems and their use within the NHS and physiotherapy, working on a wide range of topics all of which were relevant to the content of this thesis, for example, NHS management arrangements, Körner and information requirements, the development of information management and technology within the NHS, workload measurement, costing and pricing physiotherapy services and the NHS reforms.

As chairman of this committee the researcher took a leading role in physiotherapy policy development and further developed the role in 1995 as Vice-Chair of the CSP council and in 1997 Chair. In 1985, the researcher was nominated chairman of the South East Thames District Physiotherapy Managers' Working Group on Körner and computerized information systems development. This

group was set up to advise and carry forward work for the fifteen district physiotherapy managers within SETRHA. A year later, the researcher set up and chaired a small group of physiotherapists to oversee the development of a new computerized information system for use in the District Physiotherapy Service in Eastbourne Health District, with a view to this being used regionally and possibly nationally.

Since the implementation of the computerized information system which is reported in the case study, chapter 7 (below) the researcher has acted as chair of the National User Group for the system.

During the late 1980's the researcher was co-opted to a Department of Health (DoH) working group on information systems in physiotherapy and in 1992 was co-opted to the Read Coding Specialty Working Group (SWG) for physiotherapy as its Chair. In 1994, he was awarded a Fellowship of the CSP, the citation for which recognised his 'original' and 'unique' contribution in the field of information systems and management within physiotherapy.

A number of papers and articles on topic areas related to this thesis have been published by the researcher. An important publication in physiotherapy was his "Guidelines for Computerised Information Systems for Therapy Services" Jones (1994) and he also edited and contributed to a book on 'Management in

Physiotherapy' Jones (1991) which is also relevant and drawn largely from the work undertaken for this research. These publications are listed in Appendix 1.

This outline of the researcher's involvement in physiotherapy management and computerized information systems at national, regional and local levels demonstrates that over a long period of time he has been and remains in a pivotal position to participate in, influence and develop work in this area. The researcher led the problem solving process, participating actively throughout the entire project. He identified the problem situation -'situation of concern' chapters 2-4 (below) - and assumed the role of 'problem solver' with the objective of transforming the situation from its current state to a desired state.

CHAPTER TWO

PROBLEM SITUATION 1:

INTRODUCTION OF COMPUTERIZED INFORMATION SYSTEMS IN THE NHS – THE SIGNIFICANCE FOR PHYSIOTHERAPY SERVICES AND THE PHYSIOTHERAPY RESPONSE

2.1 Introduction

For many years computerized information systems have been developed in order that organisations might be more aware of their own state and the state of the environment within which they operate. The growth of this phenomenon continues to take place within the NHS in common with other organisations. The process of developing information systems and technology has gathered momentum and continues as further changes take place both within and alongside the NHS.

Before the implementation of general management into the NHS, chapter 4 (below) HC(84)14 DHSS (1984a) computerized information systems were used to a limited extent only within the NHS and not at all in physiotherapy services.

> *"Regions set up computer facilities in the late 1960s mainly to process salaries and wages and keep account of stores"*
>
> *(Levitt and Wall, 1984 p61)*

The development of a wide range of information technology (IT) applications:

> *"reflects a concern with the management of the healthservice - with resource allocation, efficiency and budgeting..."*
>
> *(Coombs and Cooper, 1990)*

and more recently a focus on clinical information.

This chapter presents aspects of the problem situation considered significant to the development of an information system (IS) for physiotherapy. Important terms, in the context of computerized information systems, are defined. The background to the implementation of computerized information systems in the NHS is explored with particular reference to information requirements for physiotherapy services. The focal points of this chapter are: An overview of the history and development of computerized information systems in the NHS; the requirement for more, and improved quality of information laid upon the NHS by central government and health authorities; the relevance of the new requirements to and impact of these on physiotherapy services and an discussion of the physiotherapy response to this.

This chapter provides an insight into important aspects of the context of the problem situation.

2.2 Definition of Key Terms Used in the Context of Computerized Information Systems

In common with other fields of human activity computing has developed a

methodology of its own and there are many terms used in the context of computerized information systems. An explanation of the connotations of some of these terms is helpful; a convergence exists in the definitions laid out by most authors.

2.2.1 **Information**

The word information implies four things Maddison (1988 p8). To be recognised as information it must be communicated to the person who must receive it at an appropriate time. It must be in a language or form that the recipient can understand. It must be relevant to something they are trying to do and it must be accurate, i.e. agreeing correctly with the real world.

> *"Thus information is any form of communication that provides understandable, useful, relevant knowledge for the person receiving it".*
>
> *(Maddison 1988 p8)*

Information may be presented in a variety of different forms in, for example, words, tables or columns of figures, charts, diagrams or in other ways such as gesture, action and by word of mouth.

> *"Information is data that is presented in a form that is meaningful to the recipient. It has real or perceived value to the user and adds to what he or she already knows about an event or an area of concern".*
>
> *(Senn, 1990 p58)*

Senn (1990 p60) cites seven types of information necessary in management. These are:-

"Comfort Information - this informs managers about current situations or achievement levels. Allows managers to know that performance is in line with expectations: Status or Progress Information - keeps managers up-to-date with current problems and crises as well as reporting advances in, for example, competitor progress: Warning Information - shows that changes are taking place either in the form of emerging opportunities or as 'omens of trouble ahead': Planning Information - descriptions of major developments and programmes due to begin in the future, including assumptions on which plans are based: Internal Operations Information - key indicators of how the organisation as a whole or sections or individuals within it are performing: External Intelligence - information and gossip about activities in the environment: Externally Distributed Information - information to be reviewed by management before it is distributed to outside organisations, individuals, media, for example".

Information is knowledge based on data which has been processed to give meaning, purpose and usefulness.

2.2.2 *Information Technology (IT)*

The term IT is used to emphasise the use of computers for information processing, storage, transmission and presentation satisfying users needs

> *"This is the totality of the scientific, technological and engineering disciplines used in data handling and processing and includes the application of these in its widest sense to interactions between people and machines and the associated cultural and social aspects"*
>
> *(Maddison, 1988 – Audio Cassette Side 1 OU Course P792)*

2.2.3 *Data*

Data is the raw material from which information is constructed. It is made up of collections of words or numbers or other characters (symbols and signs in a particular structure). An element of data comprises a number of symbols. Data:

"can only be expressed by using symbols in particular ways as signs but those signs must have a meaning and represent something to their recipients".

(Capper, 1988 p7)

Samways and Byrne-Jones (1991p50) define 'data' as

"a general term for numbers, digits, characters and symbols which are accepted, stored and processed by a computer. Only when such data become meaningful to a person can we say we have information....."

In summary data is a collection of signs or symbols always within a structure and always in some sense representing facts or knowledge about the relevant parts of the real world.

2.2.4 *Information System*

A system is an assembly of parts which are linked together in an organised way to function as a whole. It has a common purpose. The behaviour of the whole system would change if any part were taken away. A computerised information system comprises all those:

"pieces of equipment which manipulate data, create, store, sort, transmit, display and provide us with information".

(Samways and Byrne-Jones, 1991 p93)

An IS must ensure the proper flow of information from people who provide it to those who receive it. Information systems must ensure the storage of data from

the time of its creation until the time it is needed to be communicated as information. IS is a collection of integrated facilities that can accept data as input, store and process the data and output data to give information for people to use. Social dimensions are integral to computer information systems. Mumford (1983 p10-11) emphasises the interaction between 'technology and people':

> *"enabling everyone concerned with the introduction of new technology to consider human as well as technical factors when embarking on the design of a new system"*

She postulates a socio-technological approach to the systems design process which:

> *"... produces work systems which are both technically efficient and have social characteristics which lead to high job satisfaction. Such an approach takes account of the fact that different individuals and groups have their own needs, interests and values."*

Computerized information systems are not technological entities alone, set in isolation from social contexts but are inextricably linked with human activity and organisation throughout the entire social spectrum affecting many aspects of all our lives.

A system is any group of inter-related and inter-dependent entities or functions that combine for a specific purpose. It receives certain inputs, and acts in a particular way upon them to produce outputs. A system although an entity in itself

may form part of a larger system, for example, the physiotherapy department of a District General Hospital (DGH) may have a computer system for its own use which in turn is part of the wider hospital computerized information system.

2.2.5 *User*

An information system user is any person or group of people that have requirements involving providing knowledge or receiving information from the system, while a primary user is a person who directly interfaces with the system equipment, such as a keyboard operator or secretary. Secondary users are those people who indirectly provide or receive information, for example, the business department of a DGH who regularly receive activity reports that are computer printouts.

2.2.6 *System Security*

System security is the mechanism for ensuring privacy. Security prevents unauthorised access to information or unauthorised flow of information across a boundary. The Data Protection Act 1984, Act of Parliament (l984) is relevant to this, protecting individuals against the misuse of computing equipment ensuring the security of personal data.

2.3 The Development of Computerised Information Systems in the National Health Service – A Historical Perspective

2.3.1 *Data Collection in the NHS Before the Introduction of General Management*

Before the introduction of General Management in the NHS in 1983, the use of computerized information systems was limited. Computers were in use in medical records departments for the Hospital Activity Analysis (HAA) which summarised selected basic information held in medical records on, for example, admission and discharge. This was introduced in 1969 and arose out of the perceived inadequacies of Hospital In-patient Enquiry (HIPE), a manual system which required data to be collected on a sampling basis about in-patients' illnesses and operations. HAA was based upon the completion of a multi-part form - HMR1- for every in-patient and which was used for computer input.

Until the mid 1980s patient activity or non-financial information was summarised on Form SH3. Neither HAA nor HIPE included any information about physiotherapy service provision. The SH3, submitted quarterly, related to every clinical speciality including physiotherapy; such details as number of deaths and discharges, average patient stay, size of the waiting list, average bed availability, average bed occupancy, and out-patient information were required. Kind and Prowle (1978) challenged the reliability of SH3 information on the grounds that there was no incentive for ward staff to be meticulous in collecting the information as it was not perceived as useful to them.

> *"There are difficulties, some would say impossibilities, in standardising the classification of source data under every possible variation from the assumed normal activity pattern. The problems are further compounded by the lack of a place to record re-admission and the failure to differentiate between a death and discharge further reduces the potential usefulness of the information"*
>
> *(Riseborough and Walter, 1988 p264)*

As a result of the poor quality SH3 data were little used at DHA level and 'accordingly its collection had low priority' Riseborough and Walter (1988 p264).

For the SH3 return, only a minimum of data about physiotherapy was collected; figures on numbers of new patients and 'attendances' by in- and out-patients were all that was required. Physiotherapy SH3 returns were often based on estimates rather than accurate data. There was no feedback to physiotherapy managers on local or national activity trends which resulted in very little managerial commitment to the quality of statistical data submitted by them. This was a wide-spread problem throughout many disciplines as, for example, in the pathology laboratory service

> *"indeed, we are aware of departments where proper data collection is regularly substituted by estimates based on data collected some fifteen years previously and updated in proportion to current workload"*
>
> *(Riseborough and Walter, 1988 p 265)*

SH3 and HAA information was collected by the Department of Health and Social Security (DHSS) for planning and finance purposes. The activity information was

used to calculate crude unit costs for inclusion in the annual accounts. However, such data was 'perceived by management to be of little local value in managing a department, particularly one perceived as being demand led' Riseborough and Walter, (1988 p265).

2.3.2 *Performance Indicators*

In the early 1980s the Government initiated a:

> *"System of annual review by regions or districts within their area. Performance indicators covering clinical activity, staff, finance, and estate management have been tested.."*
>
> *(Allsop, 1984 p139)*

which revealed enormous variations in cost. For example the cost of an in-patient case could vary by as much as fifty per cent and medical support services by one hundred per cent. Performance Indicators (PIs) are statistics which relate to the activities of services and departments or sections of the NHS, all the information for which was collected from existing manual data collection systems such as SH3 and HAA. The PIs were available as computer print-outs and on floppy disks and were produced centrally by the DHSS. The Joint Group on Performance Indicators (JGPI) stated:

> *"Performance indicators are a source of information whose development should be seen in the context of the changes that are taking place in the NHS particularly in the information field and in the development of a better managed service."*
>
> *(JGPI, 1985 p1)*

They also recommended that PIs should be displayed in groups which corresponded to the needs of users. By 1988 four hundred and fifty different PIs had been identified by the JGPI encompassing the work of acute services, mental handicap, mental illness, children and elderly services, management, support services, manpower and estates.

> *"PIs are intended to be practical and useful tools for management. They are indicators and not measures as the name states. They provide pointers and signals to areas which appear to merit further investigation. They enable managers to make comparisons between the performance of their services and that of others throughout England..."*
>
> *(DHSS, 1985 p2)*

However, a survey of HAs in England undertaken by Pollitt, (1984) demonstrated that of 133 HAs who responded more than half regarded PI data to be of limited value to them.

The PIs which related to physiotherapy were

- Cost of physiotherapy service per head of population in district PI M63.
- Number of qualified staff in district per one hundred thousand population PI M64.
- Ratio of qualified to non-qualified staff in district PI M65.

In 1989, the DoH reviewed the PIs for physiotherapy services and new indicators were proposed as follows:

- PY41 - first contacts with patients at any location related to age groups 0 - 4, 5 - 15 and 75+ in the district resident population.
- PY42 - number of first contacts by physiotherapists with persons aged 75+ and children aged 0 - 4 and 5 - 15 in a non-hospital location related to the district resident population aged 75+ and children aged 0 - 4 and 5 - 15.
- PY42 was also to include number of first contacts by physiotherapy staff with patients aged 16 - 64 in non-hospital locations related to district resident population aged 16 – 64, Jones (1991 p81).

All of these indicators were to be derived from the physiotherapy KT27 (Körner Table) return (Figure 2.1, below).

In order to provide the large volumes of data necessary for these PIs physiotherapy services would require computerized information systems. If this data were collected, stored, processed, analysed and reported manually it would have involved the service in a time consuming and almost impossible task for the resulting information to be accurate and timely. A large volume of data was required from physiotherapists distributed across a wide area of community and acute services.

PHYSIOTHERAPY DATA COLLECTION - KÖRNER REQUIREMENTS

DHSS Form KT27 : Summary of physiotherapy services

Year ending March 19 [ ] Name [ ]

District/SHA code [ ]

Part 1: Initial contacts - Source of referral

Source of referral	*Code*	*Total number of initial contacts*
Hospital specialties		
Trauma and orthopaedics	110	
General medicine	300	
Geriatric medicine	430	
Mental handicap	700	
Mental illness	710	
Other (specify and use codes in Appendix C)		
General practice	010	
Other medical	020	
Self referral	030	
Other sources	099	
Total		

Part 2: Initial contacts - Age, sex and source of referral

Note: This table is to be provided by authorities with computerised patient-based systems for 1988/89, and by all authorities for 1989/90 onwards. Other authorities will omit the source of referral. There are separate tables for males and females.

Source of referral	*Males - age*							*Males*
	0-4	5-15	16-54	55-64	65-74	75-84	85 and over	*Total all ages*
Hospital specialties								
Surgical group								
Medical group								
Psychiatry group								
Other sources								
Total								

Part 3: First contacts - Age and sex of patients

Sex	*Age*							*Total all ages*
	0-4	5-15	16-54	55-64	65-74	75-84	85 and over	
Male								
Female								
Total								

Part 4: Results of survey of activity

Type of activity	*Percentage of time (nearest whole number)*
Face-to-face contacts	
Telephone contacts	
Home assessment visits	
Other professional activity	
Total	100

Part 5: Home assessment visits

Total number	

Figure 2.1

A relatively small district physiotherapy service such as Eastbourne HA which included all community and hospital services, would undertake 14,000-15,000 physiotherapy episodes of care in a year or around 75,000-80,000 individual patient contacts, Eastbourne Health Authority KT27 return (1989).

2.3.3 *External Data Gathering Relevant to the NHS*

Data relevant to the NHS has for many years been gathered outside the NHS through the Office of Population Censuses and Surveys (OPCS). This information is collected by special surveys or through the General Household Survey (a random comprehensive questionnaire carried out every two years) OPCS (1987b). This survey covers a wide range of information including morbidity, self treatment and the uptake of health services but has not included data about physiotherapy.

2.4. The Development of Information Systems Since the Introduction of General Management into the NHS - Körner Reports and Physiotherapy

From the early 1980s the production and use of information became a 'top priority' on the NHS management agenda Lattimer and Mason (undated).

> *"As cash limited budgeting spread down the management hierarchies in the early 1980s, NHS financial systems became increasingly automated at district level. Efforts to compare information on the management of the NHS districts at regional level and centrally led to the Körner Report on health*

services information and the first Performance Indicator (PI) packages"

(Steaff and Peel, 1995 p6)

In 1980 the Secretary of State for Social Services, Patrick Jenkin, appointed an NHS/DHSS Steering Group on Health Services Information under the chairmanship of Mrs. Edith Körner, vice chair of the South West Regional Health Authority. The work of this group continued for several years into the mid 1980s. The terms of reference for the Steering Group were:

1. *"To agree, implement and keep under review principles and procedures to guide the future development of health service information systems".*

2. *"To identify and resolve health service information issues requiring a co-ordinated approach".*

3. *"To review existing health service information systems".*

4. *"To consider proposals for changes to or developments in health service information systems arising elsewhere and if acceptable to assess priorities for their development and implementation".*

(Körner, 1982 Preface)

Between 1982 and 1986 the Körner Steering Group produced six reports and three supplementary reports on health services information. The reports were on:

Hospital Clinical Services (K1)
Patient Transport Services (K2)
Manpower Information (K3)
Paramedical Services and Other Issues (K4)
Community Health Services (K5)
Finance Information (K6)

In the first report Körner, (1982 p80) serious inadequacies in NHS management information strategies were acknowledged. The 'guiding principle' adopted by the Steering Group was stated as:

> *"an approach to the provision of information which is based on the requirement to collect data because they are essential for operational purposes; user-oriented information yields benefits to those who collect it and thus provides an incentive for accuracy and expedition".*

The introduction to this report Körner (1982 p7) stated that:

> *"The main task of those who guide and manage the provision of health care is to ensure quality, contain costs and secure access to those who need it or, to put it more simply, to provide a good service for as many people as need it at least cost. This task entails the weighing of options and their consequences and the making of choices. Such choices and the decisions flowing from them are likely to be more consistent and more rational if they are taken in the light of correct and relevant statistical information. They will also be more easily explicable to the public, to professionals and others affected by them and thus often easier to implement"*

Körner noted that much 'lip-service' was paid to the crucial and central importance of high quality statistics and that few HAs, management teams or heads of departments analysed data expertly or used them intelligently in the performance of their management tasks. Körner cited inaccuracy, lack of timeliness and inherent defects in NHS information. Such criticisms were true in the case of physiotherapy services where only SH3 data had previously been

collected (2.3.1 above). Before the Körner reports, data collection and the use and management of information in physiotherapy services had not been accorded any importance by physiotherapy managers and their staff and no work had been undertaken in this area; this is born out by the absence of any reference to the use of information and its management for computerized systems in the literature relevant to physiotherapy, chapter 5 (below). In order to comply with Körner requirements (below) substantial programmes of work would need to be undertaken.

The main philosophy underlying the Körner Steering Group Reports was that to enable sound and effective management decisions to be made, "accurate, valid and timely" information was required :

> *"the key to the work was the identification of 'minimum data sets' that would meet all national and most local needs for statistical information"*
>
> *(Simon and Jones1987 p254)*

2.4.1 *An Analysis of Physiotherapy Information Requirements - The Körner Reports*

The reports most relevant to physiotherapy were Körner 4 'A Further Report on the Collection and Use of Information about Activity in Hospitals and the Community in the National Health Service', Körner (1984a) and Körner 6 'A Report on the Collection and use of Financial Information in the NHS' Körner (1984b).

The main objectives of the Körner recommendations were to ensure that accurate information was available in useful and relevant format and at the times and in the quantities required to enable effective and efficient management of the NHS at all levels and throughout all disciplines.

The Körner Steering Group identified three main types of statistical information about physiotherapy. These were:

Data about manpower (K3 and K4)

Data about what the physiotherapists do and the patients they treat (activity statistics) (K4).

Data about what it costs (financial) (K6)

On manpower collection, data on matters such as reasons for leaving and absence were required (Körner 3), this involved the use of detailed timesheets. On physiotherapy activity and the patients they treat, radical changes were proposed in data collection, in the fourth report the Körner group recommended a 'minimum data set' (MDS) for activity statistics that represented a major shift from the old figures for new patients and 'attendances' by in-patients and out-patients (2.3.1 above). It was recommended that there should be a count over the financial year of the number of episodes of care begun in the year (initial contacts). An episode of care would be completed only when a patient was discharged from the

physiotherapist's care even if the location of the patient's treatment or the physiotherapist caring for the patient were to change. It also required a count of 'first contacts in the financial year', this represented the number of people who had contact with physiotherapy in the district during the financial year, however many times a patient was referred during that time he/she could - by definition - only have one first contact with the service during that year; whereas, within an episode of care a patient would generally have a number of contacts for assessment, treatment, advice and/or education.

The initial contacts (first contacts in episodes of care) were to be classified by the sex and age of patients together with the source of referral and the first contacts in the financial year by age and sex. This information was to be submitted via the district to the region and the DHSS on form KT27 (Figure 2.1 above). The first returns for physiotherapy were to relate to the financial year 1st April 1988 to 31st March 1989. This return is still used in a modified form today.

Körner also required that a 'sample inquiry' should be undertaken every year on a district basis. The purpose was to analyse the pattern of work by the percentage of time physiotherapists spent on: face-to-face contact with patients; telephone contacts with patients or relatives; home assessment visits and other professional activities.

For local purposes these items could be further broken down into more detailed categories.

Other data to be collected as part of the new MDS were: Referral date, first appointment date, NHS private patient or overseas visitor, unit of management, location of treatment, source of referral, consultant code where referred from a consultant, patient name, demographic details and number, discharge date and status and patient classification; that is whether the patient has been referred from out-patients, in-patients, community, day care or Accident and Emergency.

Similarly, the sample of physiotherapists' activity was required to be undertaken at least annually. The data to be collected for this were: Dates on which the sample was undertaken, unit of management, location of the physiotherapist, time taken during the sample period on face-to-face contacts with patients (individuals) and face-to-face contacts with patients (groups), telephone contacts and other professional activities.

The Körner proposals laid significantly increased demands on physiotherapy services for the collection, processing, analysis and delivery of data relating to the service, although none of this was for clinical information; the process was entirely driven for management purposes. In view of the large numbers of patients in contact with a typical hospital or community physiotherapy service during a

financial year it was clear to the researcher that it would not be possible to successfully achieve these tasks without the support of computerized information systems or a vastly increased workforce input to undertake the tasks manually resulting in loss of clinical time. The advent of the Körner reports was an important watershed in NHS information systems development and since their implementation computerized information systems have become increasingly more important in the NHS as a whole and consequently in physiotherapy.

In the early 1980s there was much interest in improving management systems particularly financial control within the Health Service:

> *"Decisions on how to allocate resources have not always been rational and the aim is to introduce systems that allow people to spend money more effectively. The recommendations of the sixth Körner report and the subsequent development in management budgeting - now renamed resource management - are designed to do this"*
>
> *(Simon and Jones, 1987 p254)*

The sixth report Körner, (1984b) discussed the ways in which Health Service spending could be divided. It recommended that accounts should be drawn up in three ways

- What is money spent on? This analysis lists spending under headings such as equipment, salaries, food and drugs.
- Who spends it? This analysis splits spending by departments - including the physiotherapy department.

- Which classes of patient benefit? This 'specialty' costing analysis, costs by reference to the medical and dental specialties to which patients were allocated.

The Körner reports were to be implemented on 1st April 1987 with the community systems scheduled to follow on 1st April 1988. This allowed community services an extra year to arrange their data collection procedures in recognition of the increased logistic complexities involved in collecting and processing the data from wide geographical areas where a variety of different services were extensively disseminated.

In order to facilitate implementation many districts appointed Körner implementation officers to review data collection systems and identify training needs; an enormous task in view of the radical changes proposed in data collection within the NHS as a whole Körner, (1982-1986). Officers were unable to commit time and resources to the individual needs of specific services such as physiotherapy and looked to introducing computerized information systems which had been developed for other purposes such as the processing of data about community nursing activity Jones and Rugg (1987 p257).

The Professions Allied to Medicine (PAMs) representatives had not been invited to sit on the Körner Steering Group or any of the Körner working groups at the

DHSS, the writing of the reports having been undertaken by DHSS officials, regional and district officers, finance officers and information consultants from outside the NHS. Therefore, the specific needs of these services were not taken into account as the PAMs themselves wished. When the fourth Körner report was published in draft form the then Chair of the CSP- Mrs Joyce Williams- made strong representations to the Steering Group about what the CSP considered to be an inappropriate MDS for physiotherapy. As a result of her representations one change to the MDS for physiotherapy was agreed; this exempted physiotherapists from collecting face-to-face contacts with patients on a daily basis. This was an important concession because the volume of work involved in collecting these contacts throughout each day would have been very substantial. For example, a physiotherapist working on orthopaedic wards might treat twenty five patients twice each day or working in the gymnasium might treat over one hundred patients a day in group work. As a result of the vast agenda of change in information management and technology (IM&T), Körner implementation officers in the Districts were often unaware of this concession to physiotherapy. There was no attempt on their part to facilitate this change and all the PAM services were treated in the same way with physiotherapists being asked to record the face-to-face contacts throughout the day. This requirement for other PAM groups was not seen as a problem by them as their individual daily caseload numbers were significantly less than physiotherapists'. Typically, a dietitian or podiatrist might treat an average of twelve to fifteen patients per day .

The DHSS gave no directions or recommendations on the computer or paperwork systems necessary for the operation of Körner. The RHAs and DHAs were left to work out their individual requirements and systems within the Körner framework and this proved to be a major problem for both them and physiotherapy services alike, particularly in light of the rapid implementation which Government required. The effect of the Körner proposals on physiotherapy services was that a wide range of new data was to be collected in order to fulfil the basic requirements of the physiotherapy MDS. Data collection, storage, analysis and reporting on this scale had never been attempted previously; there were no computerised or manual systems in place to enable the physiotherapists to comply and the staff were totally inexperienced in these areas of work CSP Management Budgeting and Workload Measurement committee minutes (1987). Furthermore, all the data required was for managerial rather than clinical purposes and the work was perceived by physiotherapy clinicians and managers as likely to have no beneficial outcomes for either their patients or themselves. It was therefore, not surprising that the Körner recommendations met with resistance from physiotherapy staff and their managers (2.4.3 below).

2.4.2 *Availability of Computerized Information Systems for Physiotherapy During the Mid 1980s*

District managers of physiotherapy services were required to formulate and negotiate (where possible) data collection systems for their services but no central funding or direction was available for this and consequently the work was given low priority by most regions and districts, chapter 6 (below). Regional and/or district evaluation exercises were rarely undertaken and generally physiotherapy service managers had to argue their cases. Alternatively, regions and districts imposed solutions that were often thought to be inappropriate by physiotherapists. The only full evaluation exercise undertaken was carried out by North Western Regional Health Authority (NWRHA) from 1987 – 1989, NWRHA (1989). There was little or no user involvement in the evaluation, specification and systems design and no computerized information systems available specifically for physiotherapy services. The major systems available were:

- Peak Systems' version of the Financial Information and Planning (FIP) system
- Comway II supplied by Systems Team North
- Community Information System (Comics) supplied by ICS
- Paracom designed and supplied by Wigan Health Authority
- Community Care (Comcare) marketed by ASL
- Financial Information and Planning (FIP) developed in the NHS West Midlands region.

On direct telephone contact with all of these companies and visits to Peak Systems and FIP the researcher elicited that all the systems were designed specifically for community nursing services and were developed over several years with community nursing input. The researcher also discovered that the systems were not compatible with one another or with other NHS systems. The physiotherapists were added when these computer systems' designers became aware that this occupational group would need computerized systems as a result of the Körner initiative. However the software was not modified to take account of the specific needs of physiotherapists and there were no therapists involved in the early design of these systems. *The action of RHAs and DHAs in placing* physiotherapists with community nursing for purposes of computerized information systems was perhaps understandable considering their small numbers relative to the nurses working in the NHS - 34,000 compared with half a million - and the relatively low financial cost of including them in existing systems. To initiate the development of computerized systems for use by the physiotherapists might have been seen as expensive, time consuming and unnecessary, however, this view was based on false premises about the specific requirements laid down by the Körner MDS for physiotherapy (2.4.1. above) which differed from that for community nurses and the other PAMs. A further significant factor being the much larger numbers of patients treated daily by individual physiotherapists compared with these groups.

Physiotherapists work in a wide variety of settings, chapter 3 (below), often carrying large caseloads, 2.4.1 (above). The proposed computerized systems involved the use of complicated paperwork routines, data relating to staff registrations and patient registrations or assessments were to be recorded on pre-printed forms (Appendix 4). Information regarding the treatments given to individual patients and data on the other duties which staff performed were to be captured on a second sheet also completed daily. Information on work activity was to be captured in a variety of categories, for example; patient related activity, non-patient related activity and clinical group sessions. Work was generally recorded as a series of separate codes to identify the patient, location and treatment given to the patient. Other codes recorded non-patient related activity. Some authorities introduced hand-held computers such as Psion Organisers, for the recording of data about patient related activity, non-patient related activity and clinic or group sessions. However, it was not possible to record clinical notes either in the data sheets or using these organisers. No discussion took place between the computer systems companies and physiotherapists about the data collection systems and in many cases physiotherapists reported to the CSP Information Systems and Resource Management Committee that they were subject to the imposition of inappropriate systems which substantially eroded clinical time through duplication of data collection and computer operation, CSP (1988).

Many senior physiotherapy managers informed the CSP that usually computer reports could not be made available from systems such as Comcare and FIP and where reports could be obtained off the systems these were inaccurate, out of date and of little value. In general little effort had been expended nationally on the part of regional computer centres, district information officers, Körner implementation officers, general managers and finance departments on what information was really needed for managerial and clinical purposes and physiotherapists were often the last to be consulted about their own needs and how the information could be best collected with least disruption to clinical activity. Appendix 4 to this thesis contains examples of paperwork systems introduced in association with the computerized information systems available at that time. These are the Comcare documentation; the staff registration form, the patient registration form and Daily Activity Sheet, the FIP documentation, and the Patient Registration and Daily Diary Sheets. This paperwork had to be completed in addition to the Patient Oriented Medical Records (POMR), the clinical record of patient history, assessment, intervention and discharge summary, already being completed by physiotherapy staff for each patient, thus greatly increasing the administrative workload.

All these data collection sheets were complicated and detailed and were required to be completed on a daily basis. This was an impossible task for a clinician with a daily caseload of thirty, forty, or even more patients.

The DoH requires under HC(89)20, DHSS (1989) that physiotherapy records are kept for a period of eight years. These clinical POMRs must be kept up-to-date and clearly written for clinical and legal purposes. It was not possible to obtain updated clinical records from paperwork computer return sheets or hand held computer readouts and therefore it was necessary to continue the hand written POMR.

There was no mention outside physiotherapy services of the need to obtain information relevant to clinical practice or the management of physiotherapy itself. The main concern of Körner implementation officers was to ensure that physiotherapists complied with the MDS requirements. Little care was given to making paperwork applicable to all physiotherapists throughout the entire service. That is, ensuring that the same form was used in hospitals, community, schools and all other locations where physiotherapists were working to cut out duplication of data recording and so to develop systems which would be acceptable to physiotherapists and could be used easily by all of them. Physiotherapy services were not accounted for in terms of resource input for computerized information systems in either capital or recurring revenue spending because priority was generally given to implementing large mainframe systems for finance and accounting, patient administration systems and early resource management

systems, for example, all of which were focused on as a result of government requirements.

There were many difficult problems which needed to be overcome if physiotherapy was to participate in NHS computerized information systems use in an efficient, effective and relevant way.

In the context of computer mainframe systems Eason observed:

> *"Attempts to provide standardised solutions at this level have often led to disasters. An excellent example is one development of Management Information Systems (MIS) in the 1970s. In many organisations grandiose plans were drawn up to provide rather rigid information systems to all managers. The result was what Ackoff (1967) called 'Management mis-information systems'; services that provided piles of irrelevant out-of-date data but little usable information because the services were inadequately matched to the needs of the managers. .... The need is to specify the technical service required to meet the unique organisational need and this requires a combination of technical knowledge, business requirements and inside knowledge of the organisation in question"*
>
> *(Eason, 1988 p23)*

It might be argued that this was equally applicable in the case of physiotherapy computerized information systems in the NHS at that time. However, it would be difficult to fulfil the many requirements without the active and positive contribution of physiotherapy managers and clinicians in systems design and

specification, implementation, piloting and use. Reasons included factors specific to physiotherapy services such as their unique Körner MDS and high volumes of patient contacts per day (2.4 above), cumbersome paperwork requirements in other systems (2.4.2 above), loss of clinical time resulting from duplication of data recording and the unavailability of developed computerized systems incorporating physiotherapy needs. This indicated that to harness the commitment and input of physiotherapy managers and clinicians, incorporating their tacit knowledge, would be likely to produce the optimum outcome for physiotherapists themselves and all other stakeholders.

> *"A work system that is designed to achieve objectives defined solely in technical terms is likely to have unpredictable consequences"*
>
> *(Mumford and Weir, 1979 p8)*

The researcher believed that in order to resolve the computerized information system problem, achieving optimum results for physiotherapists (the problem owners) and key stakeholders that he should act as problem solver and embark on a computerised information system development programme locally.

2.4.3 *An Analysis of Körner – the Response of Physiotherapists and the CSP*

During 1984 the CSP set up a working group (the Griffiths Working Party) to advise members on the impact of the Griffiths Report (1.3 above), to formulate

policy in response to the introduction of general management and to monitor changes in the NHS. In 1985 the remit of this small committee was changed to focus on management budgeting and work measurement issues and in 1989 the work of the group was again refocused to information systems and resource management. Finally, the group became the CSP Service Management Committee, in 1991, as the remit had been substantially broadened by this time to include all aspects of NHS management; throughout the entire period the researcher chaired these committees.

From 1985 onwards there was considerable concern within physiotherapy and much angst caused by what physiotherapists regarded as the imposition of inappropriate computer systems with minimal consultation, CSP (1987). The CSP was receiving several complaints daily about this from physiotherapy managers and staff and representations were also made to the Society by the Association of Chartered Physiotherapists in Management and the Organisation of District Physiotherapy Managers, CSP (1988)

As a result of the Management Budgeting and Workload Measurement Committee's work the CSP Council decided to issue a consultation document to the Government, the medical profession and other interested organisations as well as consulting its members. This document 'Principles on Information and Budgeting Systems', CSP (1987), (Appendix 2) was issued for consultation in

October 1987. The object of the statement was to promulgate CSP policy on information and management systems. The first four paragraphs were concerned with defining the way in which physiotherapists practice and their relationships with the medical profession; paragraphs five and six stated that physiotherapists were not only interested in looking at how much physiotherapy costs but that there was a need to look also at the quality of the service and in particular at the benefits that patients derive. Paragraph seven argued that physiotherapists 'are not clerks', that the information needed for management purposes should come out of physiotherapy clinical records. Paragraphs eight, nine and ten set specific limits on the data that might be collected, in response to various computerized information systems, notably Comcare and Comway systems, which did not meet the Körner MDS. It was therefore the policy of the CSP that members should not accept these systems for physiotherapy. The CSP recommended the collection of data within the Körner MDS for the KT27 return and the relevant performance indicators (2.4 and 2.3.2 above). There were also positive statements about the development of clinical outcome measurement. The CSP took a strong stance in advising members to collect only that information set out within the Körner MDS as a result of many strong representations from physiotherapy managers and clinicians about demands placed on them to provide information outside the Körner MDS, CSP (1987). The overriding concern for the CSP was the possible loss of clinical time to administrative and clerical tasks. As professional body and

trade union for physiotherapists the Society undertook to request full discussions on this consultation document with Government and representatives of the RHAs.

The CSP Management Budgeting and Workload Measurement Committee decided in its meeting of August 1988 that it was essential to obtain detailed information on the use of computerized information systems nationally in order to give Chartered Physiotherapists further guidance. CSP (1988) Minute 27 of the meeting states:

> *"It was agreed that there was a need to ascertain what systems of data collection were being used and how they work in practice at ground-level. This questionnaire would need to be as short and as simple as possible. The aim would be to have a picture of what is going on in physiotherapy departments. In particular the amount of physiotherapists' time being absorbed by data collection and the number of instances where no meaningful conclusions could be reached from the data collected should be identified. A question on provision of computer support and access to patient administration systems should be included. It was suggested that the Secretary of the Society would draw up a draft questionnaire to be piloted both by members of the committee and less experienced people..."*

The Secretary of the CSP devised the questionnaire to cover the areas of: data collected, data analysis, time taken collecting data by physiotherapy clinicians and the use of clerical support, (Appendix 3)

The questionnaires were sent out with a letter of November 1988, Simon (1988) (Appendix 3). The letter, although flawed, (2.4.3.5 below) demonstrates the concern of the CSP about computerized information systems, Körner and data collection. The questionnaires were posted to the most senior physiotherapy manager in all DHAs in England, Wales and Northern Ireland and Special Health Authorities to ensure representativeness of the exercise; a total of 207. There was a response rate of 76%, 157 completed questionnaires.

The analysis of the survey reproduced in Appendix 3 showed that in 75% of districts staff were recording every face-to-face contact for statistical purposes, of these 38% (20% of the entire sample) were required to record the name of the patient at each and every contact, (2.4.1 above).

74% of those who responded to the questionnaire stated they were required to record the pattern of their activity; 15% on a daily basis and 58% on a sample enquiry several times a year. The Körner MDS required only an 'annual sample enquiry'.

2.4.3.1 ***CSP Survey - Data Analysis***

The survey findings showed that 86 of the DHA physiotherapy managers – 41.5% of the sample - who responded had access to a computerized information system by the time of the report of the questionnaire findings to the committee in March

1989, CSP (1989), 63 of the respondents – 30.5% of the sample - did not have a computerized system. Only 33 District Physiotherapy Managers - 16% of the sample found their systems met their needs. In November 1988 ten Districts were using hand-held computers, just under 4.8% of the sample.

2.4.3.2 ***Time Taken on Computer Operations - Clerical Support***

An estimate of the number of minutes a day spent by each physiotherapist in data recording – in excess of clinical record keeping - was sought. The replies ranged from one minute per patient to a maximum of 120 minutes per day. The median was twenty minutes while the average time spent per WTE physiotherapist in data recording was 13.6 minutes. However in his note on this question the CSP Secretary stated:

> *"I would like to point out that there were many misunderstandings about this question. For instance there were numbers of replies which referred to 'numbers of new patients a day' and some responses were minutes per patient".*
>
> *(CSP, 1989 Minutes 17.3.1989)*

61% of physiotherapy managers stated that their Health Authorities did not allocate any additional resources to undertake any Körner analysis or computer operations. 24% of the respondents did get some staffing assistance either having been given new funding or by using their existing budget. The remainder did not reply to this question. The minimum additional staff time identified was 1.5 hours

per week and the maximum 37 hours per week. The median was 15 hours per week clerical assistance.

2.4.3.3 *Computerized Information Feedback to Physiotherapy Managers*

51% of District Physiotherapy Managers received statistical reports based on the figures collected. 32% of the entire sample said that these figures were of some help to themselves and their subordinate physiotherapy managers and 17% of the whole sample said that clinical staff found some of the figures helpful too.

2.4.3.4 *CSP Questionnaire Survey and Findings - Summary*

The CSP Information Systems and Resource Management Committee concluded:

> *"There had been a very satisfactory response rate to this questionnaire though not all those who participated had found it easy to interpret all the questions"*
>
> *(CSP, 1989 Minute 5)*

The Committee noted that based on the median time spent in data recording this absorbed the equivalent time of 358 out of 10,000 wte physiotherapy staff. The Committee regarded this as unacceptably high in terms of the loss of treatment time. If, for example, the average number of treatments undertaken by a physiotherapist was 100 per week a total of 35,800 treatments per week would be lost to the NHS:

358wte staff x 100 treatments per staff member per week per 10,000 wte physiotherapists.

The work took up a substantial amount of clerical time.

> *"It was agreed that this survey should be published in the form of a press notice which would draw attention to the amount of staff time being used on data recording"*
>
> *(CSP, 1989 Minute 17.3.1989)*

The survey showed that physiotherapists were being asked to collect data which was not required as part of the Körner MDS for physiotherapy; for example details of face-to-face contacts with patients and the name of the patient on each attendance (Appendix 3). Many were recording the pattern of their activity on a daily basis rather than on an annual basis as required under the Körner recommendations. The CSP survey provided information on the numbers of Districts using computerized systems and the time taken by physiotherapy clinicians in their use together with information about feedback on the data collected and the perceived usefulness of any feedback - computer reports.

Some of the questions related to the collection of data not required within the physiotherapy MDS. The use of hand held computers meant duplication of data collection because the DHSS still required physiotherapists to keep a full paper clinical record even for those inputting face-to-face contact information to the hand held machine. Patient's details had to be input to the hand held at each

attendance as well as being recorded on the clinical notes. Data packs from the hand held computers were then submitted so that the data could be down loaded to the mainframe computer and there was generally no return of this information from the mainframe computer.

2.4.3.5 ***Evaluation of CSP Survey***

The CSP questionnaire and table of results are not included in the main body of the thesis because they were not original work undertaken solely by the researcher. However, they provide evidence of the perceived problems facing physiotherapists at the time.

Although the results were relevant to this study, the quality of the survey was poor. The questionnaire was not piloted and therefore the questions were not tested which led to a significant number of unspecific responses. Some questions were loosely worded, for example, Question 8 "please make a rough estimate..." which may have led to inconsistency and inaccuracy in the responses. The tenor of the survey was biased strongly by the accompanying letter which indicated a number of the CSP's 'concerns' such as "cost in staff time" and "duplication in the development of systems". The study lacked objectivity and overall the methodology was flawed; for these reasons the survey was clearly unsatisfactory. The results were not reliable nor was the work valid (5.2.1. below) as the inferences were drawn from what may have been inaccurate measurements

resulting from the poor questionnaire structure and wording. However, the survey did reflect many of the difficulties faced by physiotherapy managers and their staff and was the first attempt to obtain information about what was happening at the time. As the survey questionnaire obtained a response rate of 76% from the 207 Districts it is reasonable to regard the findings as a useful indication of the overall picture.

2.4.3.6 *Körner, Response of Physiotherapists and the CSP - DHSS and Parliamentary Questions*

The concerns of Chartered Physiotherapists about data collection were raised by the Society's Management Budgeting and Workload Measurement Committee as reported in the minutes of its meeting held on 11th August 1988, CSP (1988 Minute 23):

> *"At the meeting with the DHSS the Society had stressed that physiotherapists were co-operating with the collection of the Körner minimum data set. There was however concern that this was impinging on clinical time especially given the national shortage of physiotherapists. Clerical support for physiotherapists was needed. The Society questioned going beyond the minimum data sets on grounds of the time spent in collection and the relevance of the data. However the attitude of the DHSS was that this was a matter for NHS management..."*

On behalf of the committee the Chairman (the researcher) requested David Blunkett, Member of Parliament for the Labour opposition who acted for the CSP

as a parliamentary advisor to ask a question in the House of Commons relating to time spent collecting Körner data and the cost of this.

> *"To ask the Secretary of State for Social Services if he is satisfied with the arrangements which health authorities have made for the calculation of data for physiotherapy services under the revised arrangements recommended by the fourth and sixth Körner reports; what he estimates the cost of this to be; and if he will make a statement"*
>
> *(Hansard, 13 June 1988, p60)*

The response of the Minister to this question was:

> *"We are satisfied that those health authorities which are not already doing so, will begin the collection of the full Körner data requirements on physiotherapy services during 1988-89. Authorities currently without computer systems have made interim arrangements to collect basic statistics. The cost of collecting the Körner data will vary between health authorities, depending upon the particular system in operation, the size and number of departments and existing data collection arrangements. This costing information is not available centrally"*
>
> *(Hansard, 13 June 1988, p60)*

In light of the researcher's experience, this Ministerial response was over optimistic and ill-informed. From 1987 to 1990 the researcher was a co-opted member of a Department of Health Working Group, a sub-committee of the Manpower Planning Advisory Group (MPAG). It was stated by the DoH researcher in the group, Dr. Ken Beaumont, that in 1989 only 22 DHAs had made Körner returns for physiotherapy out of a possible 200, and that some of these

were incorrectly completed. It would be a long time before many physiotherapy services had access to computer systems, chapter 6 (below).

The setting up of specialist CSP committees in response to the concerns of members, the CSP survey, the publication of the CSP consultation document, (2.4.3 above) and meetings with DHSS officials and Parliamentary questions, together with the struggle for professional recognition, chapter 3 (below), indicate the high levels of apprehension and disquiet within the profession about the implementation of Körner by physiotherapy services and the associated IM&T needs. Therefore this represented a significant contribution to the problem or situation of concern (1.4 above).

2.5 Resource Management

Whilst the Körner reports addressed the issue of standardisation of data capture for central management purposes, they failed to adequately satisfy the information requirements of the NHS at the operational management level (2.4.3.4 above). To span this gap the Resource Management Initiative (RMI) was brought in to acquire and deploy IT and develop systems for the provision of essential managerial and budgetary information. Far reaching management initiatives were being introduced with information systems implications for the NHS in parallel with the implementation of the Körner recommendations, chapters 2 and 4 (below). Many had information implications for physiotherapy.

Notice that Resource Management (RM) was to be introduced into the NHS was given by the NHS Director of Finance in Health Notice HN(86)34 DHSS (1986a p2). The aims of RM set out in this document were:

> *"To enable the NHS to give a better service by helping clinicians and other managers make better informed judgements about how the resources they control can be used to the maximum effect"*

The system which had been proposed before the RMI was Management Budgeting, a budget setting and costing system only.

> *"The recommendation of the NHS Management Inquiry (the Griffiths Report) in 1983 introduced a new term into the vocabulary of the National Health Service - 'Management Budgets'. The concept is relatively simple: budgets should be prepared relating workload and service objectives to financial and manpower allocations, and all personnel, including clinicians and nurses, who are significant users of resources should be properly accountable through a budgeting and monitoring process for the use of these resources".*
>
> *(Brooks, 1986 pii)*

Clinical matters were not within the remit of management budgeting and for this reason the experiment failed due to lack of support from clinicians in all disciplines. The RMI, however, recognised the importance of providing clinicians with clinical information as well as providing financial information.

The NHS Management Executive defined RM as:

> *"A complex process with a simple aim - to allow total, individual, high quality patient care to be planned, delivered and costed more effectively"*
>
> *(NHSME, 1990 p2)*

This definition is rooted in the 1986 Health Notice from which a number of subsidiary objectives may be drawn. These include, provision of information for clinicians which enable them to:

> *Identify areas of waste and inefficiency*
> *Benefit from clinical group discussions and review*
> *Highlight areas which could most benefit from more resources*
> *Identify and expose the healthcare consequences of given financial policies and constraints*
> *Understand the comparative costs of future health care options and hold informed debates about such options*
>
> *(IBM, 1990 p1)*

RM was intended to involve all clinical disciplines in setting up systems of value to them as stated in paragraphs 4 and 16 of HN(86)34, DHSS (1986a).

The RMI was brought to fruition in a pilot study, the principles having been agreed in advance with the Joint Consultants' Committee. The initial six pilot sites were Arrowe Park and Clatterbridge, Wirral, Huddersfield, Winchester, Newcastle and Guys Hospital. These were all acute hospital sites and for community services the RMI would build on work undertaken at Bromley and Worcester as indicated in HN(86)34. The action plan for setting up acute sites was:

set up systems to collect costs

set up shadow budgets based on costs

run systems

evaluation

extend to all acute units

For the community sites the timing was:

complete systems at Bromley and Worcester

second generation sites begin

remaining community sites

By 1990 the RMI included an emphasis on the development of costing mechanisms, development of pricing for contract purposes, development of care profiles for clinical and managerial audit purposes, the installation of Case Mix systems and computers, coding systems, balancing organisational development and clinical information systems, Jones (1991a pp84 and 85). These lists of areas of work did not clearly indicate what the RMI was about, because projects varied greatly in methodology and systems deployment from one district or unit to another. However, it was clear that RMI projects would require the provision and development of appropriate computerised information systems in order to collect, provide and manage the volume, complexity and variety of data needed.

2.6 Case-Mix Management and Clinical Information Systems

Case-mix management systems (CMMS) and clinical information systems (CIS) were designed to satisfy the core specification laid down by the NHS Management Executive (NHSME), RM Unit and also local needs. Such systems were seen as central to the development of the RMI projects and were based on newly introduced computerized information systems.

> *"CMMS is a system which provides a common management information data base for clinicians and managers as an aid to improve effective and efficient use of resources and measurable improvements in patient care"*
>
> *(DHSS, 1989 p21)*

An analysis of RMI shows that the main themes were:

1. Development of speciality and consultant costing systems in detail
2. development of case-mix measures for planning and management purposes
3. the development of advanced nursing dependency and management systems
4. financial and staff activity systems linked together
5. future budget setting based on planned activity levels and case-mix costs
6. regular report generation and on-going monitoring against budgets and planned activity
7. the development of costing systems

8. comparison of actual and predicted use of resources to allow monitoring of clinical performance and deployment of resources.

The basis of case-mix systems was a record of every patient with information about every event occurring during a complete episode of hospital care. Such a record included the patient's personal details, diagnosis and operative procedures together with all diagnostic events and therapeutic interventions, for example, x-rays, blood tests or physiotherapy episodes of care. All of these events had resource use implications in, manpower, materials and facilities. Therefore costing was an important element of the case-mix equation.

It was intended that detailed information would be available from case-mix systems for clinical audit, quality control and clinical research as well as on resource use which was to include mechanisms for costing and pricing, and information about care profiles against which actual care could be compared.

The computerized CMMS would receive data from a wide range of operational feeder systems throughout the local service. Patient identification and details of hospital stay would typically be downloaded to the CMMS from the patient administration system (PAS). Other events would be downloaded to CMMS by individual operational computer feeder systems throughout the hospital. Eventually services such as physiotherapy would be included within the systems

and therefore it would be necessary for these services to have available computerized information systems feeding in to the mainframe case-mix computer. In 1989 the DoH RM Directorate cited certain operational systems as being 'essential' for effective resource management within the roll-out sites. These were:

> Patient Administration Systems (PAS)
>
> Nursing systems and initially any two out of pathology, radiology, pharmacy and operating theatres.

This document also lists physiotherapy as a service which would become part of the CMMS, figure 2.2 (below).

Resource Management - CMMS
Feeder Systems

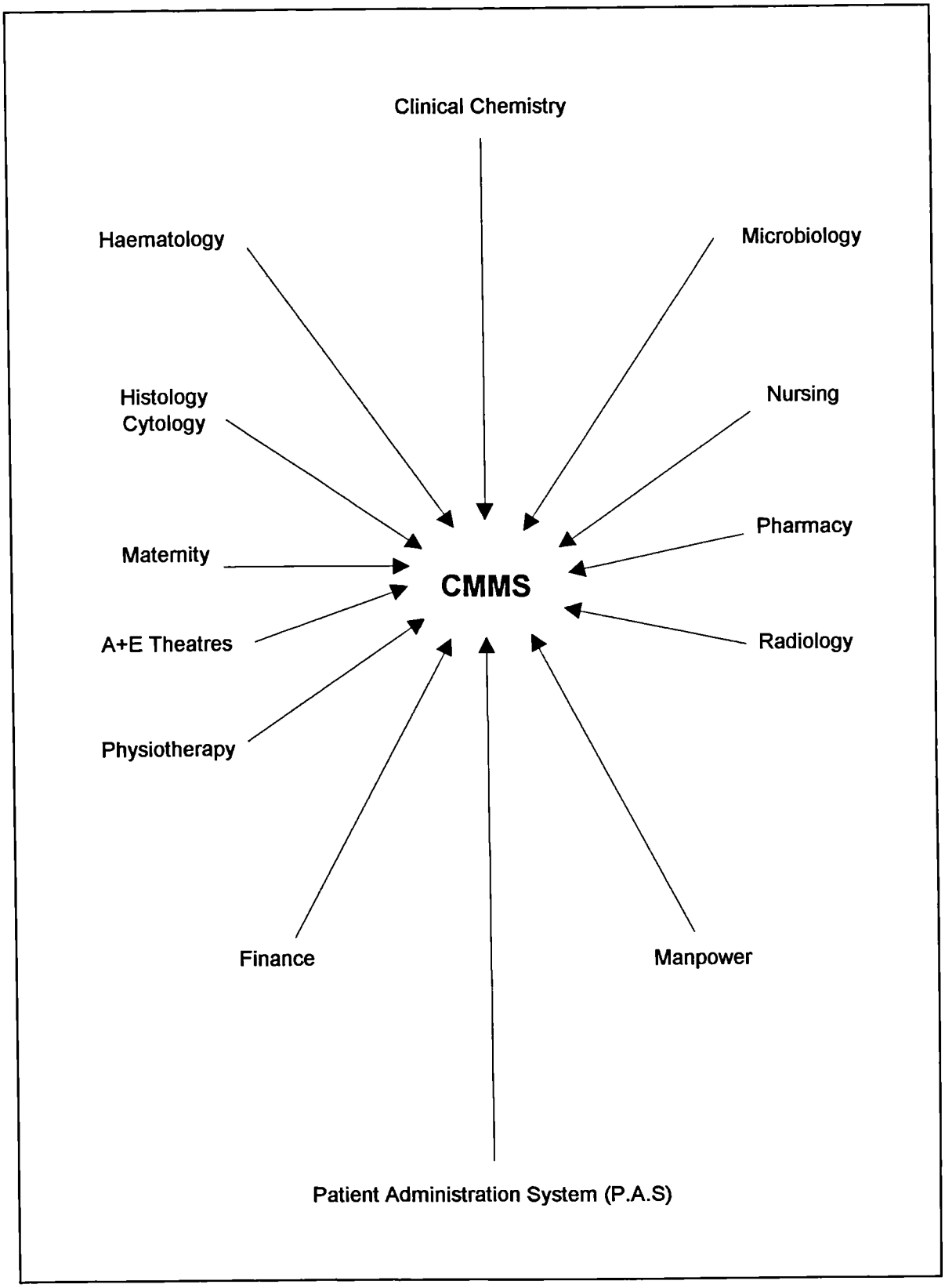


Figure 2.2

2.7 Read Coding

The object of coding systems is to provide a common and shared factual basis or language which can be used both by clinicians from all disciplines and managers, Read and Benson (1986) . However, this objective has not yet been achieved in the NHS due to the wide range of coding systems in operation.

2.7.1 *Read Coding - the Terms Project*

In 1987, the Joint Computing Group of the Royal College of General Practitioners (RCGP) and the General Medical Services Committee of the British Medical Association (BMA) established a technical working party to consider clinical classification systems for use in general practice. This report was published in August 1988 'the Classification of General Practice Data'. It recommended that the Read Codes should become the standard way of recording medical data in general practice and that the implications of this should be considered throughout the NHS.

There are six 'key criteria' which 'standard computerised medical language must satisfy' Read and Benson, (1986 p22-25). The language must be:

Comprehensive
Hierarchical
Computerised
Coded
Cross referenced
Dynamic

James Read, himself a General Practitioner, developed a clinical classification system which fulfilled all of these criteria and is now in the process of adoption as a standard by the NHS. The Read Codes have their origin in primary health care which is reflected in their coverage of all areas of health care development including medical, nursing services and PAMs. The system provides an agreed thesaurus of terms in everyday language for all health care professionals extending the application of the codes to all parts of the NHS in order to capture on computer all aspects of activity in patient care.

> *"the Read Codes were endorsed in 1990 by the UK medical profession and by the NHSME as the standard clinical coding system in general practice. The launch in April 1992 of the clinical terms project marks the additional endorsement by the NHS as a whole"*
>
> *(NHSME, IMG 1993a p3)*

The Read Codes were purchased for the NHS by the Secretary of State for Health in 1990 and they became Crown Copyright. Since then the codes have become the recommended standard in the UK. In England and Wales Read Codes have been recognised as a source of primary coding in the hospital and community health services for the coding of:

Diagnosis
Operations and Procedures
Signs and Symptoms

and for use in all MDS and national statistics for all disciplines. There are discipline specific codes determined by the Specialty Working Groups (SWGs) in

conjunction with the NHS Centre for Classification and Coding (NHS CCC). As with the other NHS disciplines there is an SWG for physiotherapy of which the researcher was the first Chairman.

The Read coding system was developed specifically for use with computerized information systems. There have been complex problems around the development and implementation of Read coding including; questions about financial arrangements for the development – the NHS CCC has been under scrutiny by the Audit Commission - an extended time frame for the creation of codes and expensive software license arrangements for users. These issues have been well publicised in the media. However the Read coding system continues as the NHS standard coding system and there has been no adverse effect on the continued development of the codes including those for physiotherapy, nursing and the PAMs.

In common with all other NHS services physiotherapy requires computerized information systems in order to participate in the Read coding exercise. Although it will take many years for Read coding to be fully implemented in the NHS, use of the system is steadily gaining momentum as demonstrated by the release throughout the NHS of the Read coding CD version three during 1988.

2.8 Further Developments in Data Requirements

In January 1990 a consultative document entitled 'Framework for Information Systems' was published by the DoH. Working Paper 11, DoH IMG (1990a) was an updating of information requirements, IT and information, in the context of 'Working for Patients' DoH, (1989a) chapter 4 (below). There were thirteen individual annexes associated with this document. Following the consultation period the DoH published 'Framework for Information Systems - the Next Steps' in June 1990, DoH IMG (1990b) which had a wide ranging content covering most aspects of information within the NHS. Sections fifteen and fifty related to the PAMs. The document acknowledged that the changes required in information systems as a result of the implementation of the Körner recommendations for PAMs were far from complete in most areas. Systems for PAMS were supposed to have been in place from 1st April 1988, (2.4.1 above). For this reason further substantial changes were not proposed until 1st April 1991; thus from that year the provider and contract MDS were required to conform to Körner, DoH IMG, (1990b) p33.

The document proposed alteration to the definition of 'first contacts', (2.4.1 above) because of the changes in health care provision resulting from the Government's NHS reforms under which DHAs were to become purchasers or commissioners of services and the hospitals and community, services providers, chapter 4 (below). It was proposed that first contacts in financial years would be counted by providers

rather than on a district basis. It would not be possible to implement any of these changes or provide any of the required information without the support of computers, because of the complexity and volume of information required, DoH IMG, (1990b p33).

2.9 IM&T Strategy for the NHS in England

During 1993 the Information Management Group (IMG) of the NHSME published an IM&T strategy for the NHS in England, IMG NHSME, (1993). This strategy was designed to ensure that information and IT were managed as significant resources, and as Sir Duncan Nichol, the Chief Executive of the NHS wrote in his letter of introduction to the document, IMG NHSME (1993 p1):

> *"managed for the benefit of individual patient care as well as for the population as a whole"*

The main purpose of the strategy was the co-ordination of IM&T across the entire NHS.

It was intended to contribute to a better health service; the main goals were to ensure services were of the highest quality, responsive to the needs and wishes of patients, health services effectively targeted so as to improve the health of local populations and to improve efficiency so that as great a volume of well targeted effective services as possible were provided from the available resources.

The explicit aim of the document was to support better care and communication through appropriate use of IM&T where information would be used to improve service provision and to communicate and handle information securely, smoothly and efficiently. The strategy to be in place for at least five years, being guided by key principles which were that information would be person based, systems should be integrated, information would be derived from operational systems and be secure, confidential and stored across the NHS.

For the first time in NHS history a strategy for IM&T was initiated requiring active participation and implementation by the entire service. The impact would inevitably be substantial as earlier *IM&T initiatives had been uncoordinated. The* potential benefits of this ambitious strategy would become clear only in the light of experience and time.

In an executive letter - EL(93)117 Information Quality - a top management issue NHSME (1993 p1) Sir Duncan Nichol stressed the importance of the collection and effective use of information within NHS Management:

> *"Recent NHSME studies have highlighted some good practice in purchasers, providers and health authorities. But some senior managers show inadequate commitment to the collection and effective use of high quality information. You should be absolutely clear that information quality is an issue for NHS boards and senior managers, it is not something to be left to specialists"*

In September 1994, 'A View for Physiotherapists - Focus on Information and Computing in the NHS' was published (Appendix 6). Much of this paper was written for the NHSE by the researcher, IMG NHSE (1994). It set out the national IM&T strategy and provided an overview of the main principles and initiatives that affected physiotherapists. The importance of computerized information systems in relation to physiotherapy in the context of the NHS as a whole was presented. This introduction to the IM&T strategy for physiotherapists – in common with other papers in the series, for a wide range of disciplines – left no doubt that computerized information systems were regarded by the NHSE as essential for this and all other services.

2.10 Overview

This chapter has explored the introduction of information systems and data collection in the NHS, the significance of this to physiotherapy and the physiotherapy response. The sum of these developments are a synergistic series of events which contribute an essential groundwork for the action research study since they are core elements of the problem situation.

CHAPTER THREE

PROBLEM SITUATION 2:

PROFESSIONALIZATION WITHIN PHYSIOTHERAPY AND THE SCOPE AND SPECTRUM OF CONTEMPORARY PHYSIOTHERAPY PRACTICE

3.1. Introduction

Chartered physiotherapists employed in the NHS work in a wide variety of health care settings including hospitals, community services, GP practices, mainstream and special schools and local authority homes. In this chapter the scope of contemporary physiotherapy and what physiotherapists do is reviewed in the context of the 'reformed' NHS, chapter 4 (below); the growth of professionalization and occupational development within physiotherapy is also discussed.

The situation of concern which gave rise to this research relates to computerized information systems in physiotherapy. It is therefore necessary to establish the role and place of physiotherapy in the context of the NHS and to discuss the unique contribution of physiotherapy as a profession which has particular computerized information system needs. This chapter is a further essential element of the analysis of the context and content of the problem situation.

3.2 What is Physiotherapy?

The CSP gives no formal definition of the word 'physiotherapy' on the grounds that too rigid a definition might impose 'restrictive boundaries' on the further development of a still growing profession. However, as a guide to prospective students the 1991 Curriculum of Study states that physiotherapy is:

"A health care profession which emphasizes the use of physical approaches in the prevention and treatment of disease and disability".

"This definition distinguishes physiotherapy from other health care professions which either put greater emphasis on the biomolecular or psychological functioning of the body particularly organ systems or particular aspects of health and disease such as activities, nutrition and imaging".

"Chartered physiotherapists are consulted in relation to physical problems of patients, in particular those associated with neuromuscular, musculoskeletal, cardiovascular and respiratory systems and also about the prevention of problems relating to these".

'The analysis by Chartered Physiotherapists of their patients' physical problems takes account of the patients' current psychological, cultural and social factors and is based on an assessment of movement and function. The aim is to identify and diagnose the specific components of movement or function responsible for the patients' physical problems'.

"The skills and knowledge required to make such a diagnosis...".

'Chartered physiotherapists use both specific treatments and prophylactic methods...".

(CSP, 1991a pp12 - 13)

The work of the physiotherapist is more concisely encapsulated in the 1984 Curriculum of Study definition:

"A systematic method of assessing musculoskeletal, cardiovascular, respiratory and neurological disorders of function, including pain and those of psychosomatic origin and of dealing with or preventing those problems by natural methods based essentially on movement, manual therapy and physical agencies".

(CSP, 1984a p.2)

3.3 The Growth of Professionalization in Physiotherapy

The title "health professions" embraces many of the occupational groups involved in health care provision, physiotherapy is one such occupational group. Exactly what constitutes a profession is a complex issue:

> *"It should be realised from the outset that the term 'professional may be used in both a descriptive and an evaluative sense. It may merely denote a group of people who share a common occupation and, in accordance with certain objective criteria, occupy a specific position in the social hierarchy. Additionally, however, it may convey a value judgement, implying that, on more subjective criteria, an individual's behaviour makes him worthy of his professional position".*
>
> *(Sim, 1985, p14)*

Friedson (1970) distinguished between the structural element or "professional status" and that concerned with values and attitudes, "professionalism". However, an examination of this will indicate aspects of physiotherapy practice which are of relevance to the relationship between it and other health care groups.

Having referred to two methods of defining and describing a profession by characteristics (or traits), and by the process of its development through the interaction with related occupations, a brief review of the history of increasing professionalisation in physiotherapy shows its changing relationship to the medical profession.

3.3.1 The Profession and Professionalization

An early work on the professions was a study by Carr-Saunders and Wilson (1933 p151) which concluded that a:

> *"Profession ..... is a complex of characteristics. The acknowledged professions (law and medicine) exhibit all or most of these features; they stand at the centre, and all around them on all sides are growing vocations exhibiting some but not all of these features"*

The features to which they referred were: a technique acquired by virtue of prolonged and intellectual training, which enabled them to provide a specialised service; and the development of association which imposed tests of competence and required the observance of certain standards of conduct. This model was conceived in the static terms of the definable characteristics or traits which accepted professions possessed. However, the authors accepted that other occupational groups may have been in the process of developing some of these characteristics. The description of the traits of "ideal" professions also indicates that the professional characteristics of physiotherapy must be compared with those of the medical profession which is considered one of the "ideal" professions and in a dominant position in the field of health care.

Greenwood, (1957) proposed five attributes of a profession; systematic theory, authority, community sanction, ethical code, and a culture of professional knowledge, behaviour and ethos. It would be interesting to test physiotherapists' claims to professional status against each of these criteria. However, this approach would be of limited value in the context of this discussion as no account would be taken of the interaction between occupational groups working in related fields, nor

of the process of interaction between the community and the would be profession. Were it true that:

> *".....ancillary medical occupations will arrive at an autonomy befitting professional status only at the expense of control now in the hands of physicians... who will not readily yield".*
>
> *(Wilensky, 1964)*

then the extent to which the medical profession actually controlled physiotherapy must be examined. The claims of physiotherapy to full professional status turn largely upon the issue of autonomy and the extent of its freedom from control by the medical profession. The question of autonomy is explored here .

3.3.2 *The History and Development of Physiotherapy as a Profession*

A review of the development of physiotherapy illustrates the connections with related professions, including medicine. In the 1880's Swedish remedial gymnasts came to this country and were "freely employed by the progressive members of the medical professions" for "medical rubbing", Wickstead (1948, p19)

> *" These Swedes were usually well trained, well educated, robust and vigorous...Prior to this influx, 'rubbing' had been practised in this country mainly by women of scant general education and slender qualification".*
>
> *(Wickstead, 1948 p19)*

This migration of Swedish masseuses led to British women taking up this work as an alternative to, or in addition to, nursing and midwifery. In 1895 an organisation "The Society of Trained Masseuses" was established by a small group of nurses and midwives, dedicated to "medical rubbing" and determined to protect it from the

"massage scandals" that were common at the time. By 1896 this Society was inviting patronage from eminent doctors and was seeking medical assistance in qualifying their students. Certificates of competence were:

> *"issued to trainees once they had reached a satisfactory standard...the founders of the new Society claimed that their certificates would place pupils on a firmer and surer professional footing than the majority of masseuses had hitherto attained"*
>
> *(Larkin, 1983, P94)*

The Society quickly contrived a code of conduct:

> *"The dress of a masseuse should be plain and suited to her work.*
> *She should avoid gossip respecting her patients, and should refrain from even mentioning their names to other parties.*
> *She should refuse any offers of stimulants at the houses of her patients.*
> *She should not recommend any drugs to her patient, or make any profit by procuring them; but in every way she should observe the strictest loyalty towards the medical advisers.*
> *She should take every precaution against conveying infectious diseases.*
> *The fees she charges should be in accordance with professional rules."*
>
> *(Wickstead, 1948, p39)*

Thus at this early stage in its development the Society had accorded with one of the stages in the "natural history of professionalisation", cited by Wilensky (1964, pp142-6).

The medical profession had recognised the Society of Trained Masseuses, but the founders of the Society had realised that they had no real public or legal status and no legal hold over their members. The Society had obtained legal advice

concerning incorporation. They were advised to apply for this without the use of the word "limited" as the omission of this word:

> *"indicates incorporation as a professional, and not as a business or organisation"*
>
> *(Wickstead, 1948 p39)*

In 1905 male nursing orderlies of the Royal Medical Corps were permitted to take the examinations of the Society, but were not at that stage admitted to membership. Male masseurs could not become members as membership carried with it the right to membership of the Trained Nurses Club,

> *"the admission of male members to a nurses' social club would have created a major scandal".*
>
> *(Wickstead, 1948 p61)*

The establishment of physiotherapy was facilitated by the 1914-18 war. The huge numbers of war wounded, especially amputees, greatly increased the experience of orthopaedic surgeons and as a result of the First World War there were 250,000 new amputees. Many more patients thus survived disabling injuries and surgeons looked to masseuses for rehabilitation work. This increased reliance by the medical profession on trained masseuses, who had extended their range of techniques and treatments to provide a wider range of services, resulted in greater public recognition of the profession. In 1916 Queen Mary became Patron of the Society and in 1920 George V granted a Royal Charter to the Society, in which manual therapy, electrotherapy, exercise therapy and 'kindred methods of treatment' were recognised as the central core of physiotherapy practice, CSP (1920). It is these together with behavioural science, clinical diagnosis and assessment skills, upon which modern physiotherapy practice has developed. The Society's name was changed to the Chartered Society of Massage and Medical Gymnastics and for the first time, in 1920 men were admitted to membership.

Between this time and 1939 the Chartered Society of Massage and Medical Gymnastics continued to develop as a national organisation. A structure of Boards and Branches was established throughout the country, Branch constitutions were drawn up and the Branches were given financial assistance from headquarter funds. The Second World War created an increased demand for physiotherapy services and the Armed Forces set up their own physiotherapy schools.

The founding of the NHS in 1948 allowed the Chartered Society of Physiotherapy (CSP), as the Society had been called since 1942, Harrison (1987) to become the dominant occupational group in the remedial therapy services.

Physiotherapy training schools were absorbed into the new NHS which provided financial security. The CSP continued as the qualifying association and professional body and further developed a centralised and efficient bureaucracy, Mercer (1978). The tradition of medical patronage remained strong, the decision making body within the Society - the Council - appointed as successive chairmen distinguished doctors, until 1972, when the first physiotherapist, since 1920, was elected Chairman of Council. In 1920 when the Royal Charter was granted the Council comprised: 16 elected members of the Society, 6 honorary members (all founders) and 8 co-opted members including seven doctors and one Baronet.
The present Council membership lists four co-opted lay members and thirty-eight physiotherapist members. The Society's policies are now, therefore, decided by physiotherapists within their own organisation. This process, of slowly evolving

autonomy of decision making, accorded with the idea of the development of professionalisation on a continuum movement of occupational groups having few characteristics of a profession through a variety of intermediate changes culminating in an approximation to an ideal type of profession, Goode (1969).

The CSP has evolved into a decision making body with its own ethical code of practice. It controls education for, and membership of the profession, and takes action against those members who breach its Code of Ethics and against unqualified people who claim the title Chartered Physiotherapist.

Wilensky (1964) proposed a developmental sequence of professionalisation:

> *"An obvious first step is to start doing full time the thing that needs doing (and) to set up a new area of practice recruited 'of necessity' from other occupations".*
>
> *(Wilensky, 1964 p142)*

This was to be followed by the establishment of training schools which would lead directly to the consideration of standards and recognition by the community.

> *"Those pushing for prescribed training and the first ones to go through it combine to form a professional association"*
>
> *(Wilensky, 1964 p 143)*

Wilensky postulated that the next steps would be inter-occupational conflict between the new practitioners and older established occupations in the same sphere, the definition of core tasks, efforts to gain support of the law for areas of practice and the prescription of an ethical code.

Johnson (1972 p29) challenges this sequence on the grounds that in Britain the:

> *"formation of a professional association has emerged before*

the founding of a training school, whether professionally run or university based".

Nevertheless, having accepted this reordering, the pattern put forward by Wilensky has been followed in the development of physiotherapy as a profession.

There are two areas for further investigation in the Wilensky model; the inter-occupational conflict which he claims to be generated by the establishment of a professional association, and the role of training in gaining community recognition and public trust.

The establishment of the physiotherapy professional association did not give rise to inter-occupational conflict in the early days. The medical profession retained a firm control over the new Society, the founders having actively sought the patronage of eminent medical men. The ethical code of practice of the profession forbade the treatment of patients except by direct referral from a doctor. Originally physiotherapists carried out the doctor's instructions exactly; much in the same way as a pharmacist would dispense a prescription. The willingness of the Society's members to be directed by doctors served to reinforce this practice.

Etzioni (1969) coined the term "Semi-Professions" to identify those would-be professions which exhibited some of the characteristics of the ideal professions, this concept is relevant here. This is an elaboration of the "trait" method of definition which:

"comprise a list of 'attributes which are said to represent the common core of professional occupations"

(Johnson, 1972 p23).

Etzioni (1969) suggested that semi-professions were deficient as professions because their training was shorter, their mandate to control their work was less fully granted, their right to privileged communication was less established, there was less of a specialised body of knowledge and less individual autonomy because there was more supervision. His main argument was that semi-professions, like nurses, teachers and paramedical "professionals", worked in bureaucratic organisations and were subordinate. He further argued that semi-professionals were predominantly women who were on the whole more amenable to administrative control than men, also less conscious of organisational status and more submissive in this context than men".

It is possible that the original relationship between physiotherapy and medicine developed because the early physiotherapists were mostly women, and readily accepted the dominance of a largely male medical profession.

The executive capacity of the CSP in validating degree programmes is carried out together with the Council for Professions Supplementary to Medicine (CPSM). The CPSM was set up by Act of Parliament in 1960, and was welcomed by physiotherapists and the other professions involved.

The CPSM - through its constituent Boards - which were set up as a consequence of the 1960 Act – was given responsibility for physiotherapy schools, and jointly approved any changes proposed in curriculum or qualifying procedures with the CSP.

Each of the seven member professions of the CPSM is represented by its Board on the Council, physiotherapy is one of these "professions" and has a slender majority on its own Board.

Implicit in State Registration was the increasing public recognition of physiotherapy; public confidence rests upon the knowledge of maintained standards. It is the responsibility of the CPSM to regularly inspect schools of physiotherapy, and they have the power to enforce changes recommended. Furthermore, any physiotherapists working in the NHS must be registered with the CPSM and have undertaken a training acceptable to that body. As Friedson argues (1971) to attain the autonomy of a profession, the paramedical occupation must control a fairly discrete area of work that can be separated from the main body of medicine and that can be practised without routine contact with or dependence on medicine.

A fairly discrete area of work exists, that is, therapeutic skills and competencies with practical and theoretical knowledge about their application. There is a limited but steadily growing literature of objective findings which validate the use of many of these skills. Physiotherapists research into their own knowledge and skill base has accelerated rapidly since the move, during the 1980s, from hospital based

physiotherapy schools to higher education with many physiotherapists holding higher degrees and with the creation of professorial chairs in physiotherapy at most university physiotherapy schools.

Since 1977 a two way communication between doctors and physiotherapists has been encouraged under the DHSS Circular "Health Services Development Relationship between the medical and remedial professions" - HC(77)33, DHSS (1977).

In the code of practice laid down in this Health Circular the DHSS recognised that physiotherapists had the right to make their own decisions on prescribing appropriate forms of physiotherapy treatment for patients referred by medical practitioners, therefore the referral by a doctor could be as vague as 'physiotherapy please' or simply a description, for example 'pain in the left knee'. The Circular also gave formal recognition to the right of physiotherapists to alter or terminate treatment if and when appropriate in their professional judgement. If a physiotherapist were to accept detailed prescriptions of treatment from a doctor such as 'short wave diathermy twice a week for six weeks' as opposed to a note of the medical diagnosis, reason for referral and information concerning relevant contra-indications that therapist would be accepting the doctor's knowledge of physiotherapy practice as being greater than his or her own.

> *"The notion of maximal expertise has as its corollary that the practitioner is the final judge of whether intervention is appropriate and, if so, the form that it should take"*
>
> *(Sim, 1985 p14)*

However, the doctor in referring patients for physiotherapy was not seen as handing over total control of the patients, rather "in asking for treatment by a physiotherapist

the doctor is clearly asking for the help of another trained professional..." Sim (1985 p14). Furthermore, HC(77)33 stated that the therapist 'had a duty and a consequential right to decline to perform any therapy which his professional training and expertise suggest is actively harmful to the patient', DHSS (1977 p2). Within this health circular was a statement by the Standing Medical Advisory Committee on the relationship between the medical and remedial professions. Advice was given after changes in physiotherapy practice were reviewed and the increasing trend of doctors working with physiotherapists in multi-disciplinary teams was noted. In the context of the NHS the relationship between the doctors and therapists (both in hospitals and the community) has been developed by convention guided by the codes of practice set out by the Statutory and professional bodies of the therapists concerned.

> *"Therapists are in very close contact with their patients during their treatment and therefore develop the facility for equating the different forms of treatment to the pattern of patient response. More use should be made of this experience"*
>
> *(DHSS HC(77)33 1977 p2)*

As a document concerning the respective roles of doctors and physiotherapists HC(77)33 was and remains an important landmark, Jones (1987 pp48-52).

Rule One of the CSP's 'Rules of Professional Conduct' states '

'Rule One: Scope of Practice'

> *"Chartered physiotherapists shall confine themselves to clinical diagnosis and practice in those fields of physiotherapy in which they have been trained and which are recognised by the profession to be beneficial"*
>
> *(CSP, 1993 p17)*

The explanatory note to this rule draws attention to an important aspect of physiotherapy practice, that is, 'clinical diagnosis'. This term is used to describe the physiotherapy practice of history taking, clinical examination and functional assessment undertaken in order to enable a conclusion to be drawn concerning the cause of the patient's symptoms and thus justify institution of appropriate physiotherapy. Clinical diagnosis underlies the problem solving approach of physiotherapy practice today. This term is used rather than 'medical' or 'pathological' diagnosis. Medical diagnosis is the doctor's prerogative, it encompasses a clinical diagnosis together with medical examination, test findings, x-rays, biopsies, and medical judgement, while the pathological diagnosis can only be made when the patient has died. This rule underlies the clinical independence of the Chartered physiotherapist in deciding appropriate action to be taken, if any. Although the doctor may give a medical diagnosis, the Chartered physiotherapist's independent professional role is acknowledged.

Also the CSP Ethical Code of Practice allows that a physiotherapist may treat a patient without a referral, as long as the therapist has direct access to the patient's doctor. The physiotherapist makes a clinical diagnosis and carries out the appropriate treatment in the light of this assessment.

Physiotherapists now have an advanced level of clinical autonomy in their practice, although this remains under the umbrella of the doctor's medical diagnosis. Thus, under the Friedson, Friedson (1971), definition physiotherapy has attained, to a considerable extent, the autonomy of a profession.

In relation to the development of computerized information systems throughout the NHS a factor influencing physiotherapists' ideas about their perceived needs for specific systems was the extent to which they had progressed along the continuum of professionalization. This reinforced the physiotherapy view of their unique contribution, mode of working and thus consequent needs. The awareness within physiotherapy that their occupational group had largely achieved the status of a profession interlinks strongly with their views about the inappropriateness of computerized information systems proposed for physiotherapy use during the mid 1980s, chapter 2 (above).

3.4 Physiotherapy Problem Definition

A physiotherapy problem is one which may be resolved, ameliorated, prevented or deferred by a physiotherapy intervention using the specific skills of a Chartered physiotherapist. Included are problems of motivation, behaviour and understanding which affect normal movement, function or fitness and extrinsic problems of function relating to family, carer, work, social situation or leisure. Key problem categories include:

Musculo-skeletal - contracture/deformity
Movement - range and pattern
Strength, fitness - muscular, cardiovascular
Inappropriate muscle tone
Abnormal posture or balance reactions
Stiffness, inflammation - joints, soft tissues
Pain
Gait, and mobility - including mobility appliances
Function in daily living

Circulatory function

Respiratory function

Dermatological

Mental state affecting physical function

Lack of knowledge or understanding

Difficulty in management by carers

Other intrinsic problems - environment, social.

Medical diagnosis is used by referrers to physiotherapy to indicate the implied existence of a 'physiotherapy problem', for example Cerebro Vascular Accident - Stroke. The diagnosis 'closed fracture, head of femur' may indicate that the patient has a gait problem, a joint range problem and pain, or none of these and an elderly patient admitted to hospital with a diagnosis of 'bronchopneumonia' may well develop a separate mobility problem as well as the respiratory function problem. Physiotherapy problems may be defined in terms of both the current and target situations, for example, what can the patient do now? and what does the patient need to be able to do?

3.5 Physiotherapy Interventions and Treatments

Chartered physiotherapists have at their disposal a wide range of possible interventions and treatments. Decisions are made about the appropriateness of a particular intervention following a thorough assessment and a physiotherapy clinical diagnosis, 3.3.2 (above). The interventions include movement therapy, manual therapy, physical modalities, appliances, advice and education, biomechanical analysis and behavioural therapy, and others.

3.6 Theoretical Models of Physiotherapy

In common with other health care professions physiotherapy is changing rapidly as the scope and spectrum of practice develops, with increased specialism and altered relationships with the medical profession, diversity of practice, locations and alterations in emphasis. The task for physiotherapy is to produce a simple concise,

readily understood and appropriate model, that practitioners, patients and others recognise as physiotherapy - the major natural healing method within orthodox medicine - which may be seen as a prime alternative or adjunct to treatment by drugs or surgery in a wide range of conditions. Physiotherapy is becoming more widely recognised as a major contributor to the well-being of patients who are rehabilitated in order to achieve their full potential research and education.

A useful model is that suggested by Cott and Finch (1995) (Figure 3.1 below) which proposes that physiotherapy is based on a multi-dimensional movement continuum. They assert that movement is central and unique to physiotherapy practice from the micro – where the application of physiotherapy may be at cellular level in, for example, promoting tissue healing – through to the macro level where the patient may be mobilized in their environment or more broadly in society. The authors argue that this model is broad enough to apply to all aspects of physiotherapy, to current and future practice and informs education.

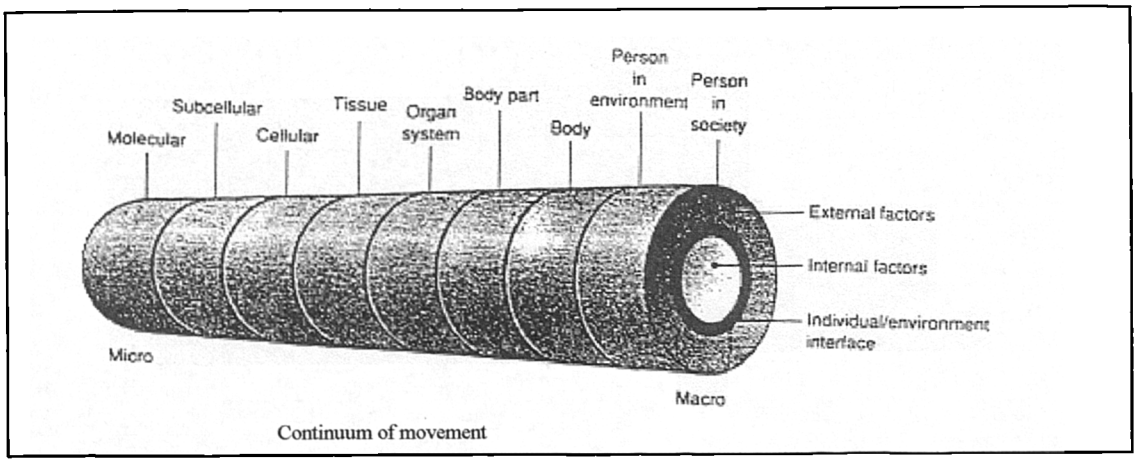


Figure 3.1 Multidimensional movement continuum. (Cott and Finch, 1995)

3.7 A New Model of Provision

There are many influences acting upon physiotherapy, both internally and outside the profession which affect how physiotherapy provision might be described today.

Any model of physiotherapy - in order to be meaningful - maps useful directions and does not prescribe or define an 'only' or correct way of practice or mode of service provision, such a model must be dynamic in order to accommodate a continually changing environment.

A Model of Physiotherapy Provision, figure 3.2 (below) has been developed by the researcher to demonstrate major elements and represents the researcher's analysis, recognizing many influences which are relevant to physiotherapy service provision and management within the NHS. Other models of theoretical healthcare provision such as the social model, French, (1992) and Johnson, (1993), the medical model Roberts, (1994) and the holistic model Smuts, (1952) also contribute elements.

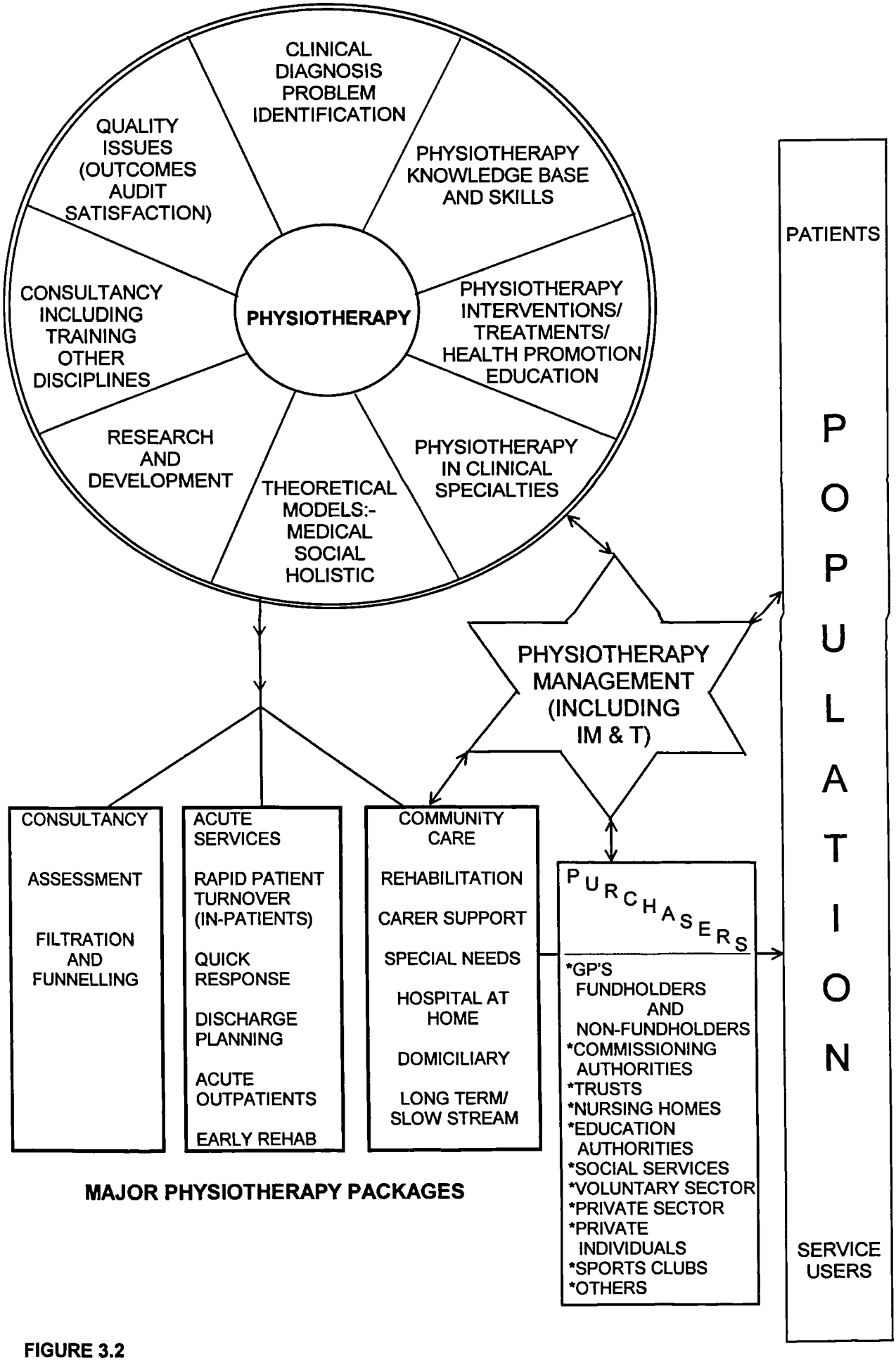
As with other services in the NHS today, physiotherapy is commissioned for the population by many purchasers including: health authorities, general practitioner fundholders, education authorities and social services, trusts and others, chapter 4 (below). The model, figure 3.2 (below) illustrates how physiotherapy might be provided in various ways to form physiotherapy packages of care which could 'stand alone' in a wider multi-disciplinary context. This model shows possible major physiotherapy packages of care which might be purchased; firstly consultancy, assessment, filtration and funnelling and then a range from either acute or community care services, as appropriate. The model represents a dynamic environment and not a situation where the elements are set in 'tablets of stone'. Some service elements might move from one package or box to another to be commissioned in isolation from other elements.

There are many different physiotherapy service users within the population, from people with sporting injuries, back pain, amputations or respiratory problems to children with special needs, people with chronic neurological conditions, elderly care and terminal care. It is the role of the purchaser or commissioners to buy the relevant physiotherapy for these service users and a large diversity of other users, chapter 4 (below). The model shows physiotherapy management at a pivotal point in the process of clinical physiotherapy and its purchase and provision. Firstly, all of the facets within modern physiotherapy need to be organised and managed in order that relevant physiotherapy is available for purchasers to buy for the population. There must be significant physiotherapy management input into service specifications and service level agreements or contracts, chapter 4 (below). There is an extensive managerial agenda, not only in managing physiotherapy itself, but also in ensuring that the relevant services are provided for people with physiotherapy needs via one purchasing process for which a wide spectrum and significant volume of information is necessary.

3.8 Medical and Clinical Audit

In an executive letter EL(89)226, DoH (1989b) Sir Duncan Nichol, identified five key areas for DHAs to target.

MODEL OF PHYSIOTHERAPY PROVISION



MAJOR PHYSIOTHERAPY PACKAGES

FIGURE 3.2

"The fifth of these was that an effective system of medical audit is in place and undertaking responsibility for the day to day management of their consultants' contracts."

(EL(89)226, DoH 1989b p2)

'Working for Patients', DoH (1989a), chapter 4 (below) made a commitment to medical audit which it describes as 'a systematic critical analysis of the quality of medical care'. It is a system of peer review, an analysis of work and a review by colleagues, an objective way to improve quality of care, resolve problems and iron out any anomalies in the system.

In the hospital and community health services 'Working for Patients' proposed that District Audit Advisory Committees should be established to plan and monitor comprehensive programmes of medical audit. The programmes were to review the treatment of particular conditions and publicise the findings in annual reports that might contain recommendations for change or follow up action.

In 1992 the NHSME required that medical audit should be broadened to include all other patient care services - clinical audit.

For the purposes of clinical audit it would be necessary for a wide range of data about patient care programmes, interventions and their outcomes to be collected, processed, reported and analysed to enable clinicians to modify treatment programmes to maximise the beneficial effects for patients, taking into account resource use.

3.8.1 *Quality Assurance*

Quality may be defined as a degree of excellence, whilst assurance means making sure that the quality expected via the standards set is achieved. The term 'quality assurance', however, is much more complex. It has become an evolving science within its own society - the National Association of Quality Assurance (NAQA) - and has its own practitioners in the field. Maxwell (1984 pp470-471) describes six essential components of a quality service:

1. *" 'Appropriateness': the service or procedure is what the population or individual actually needs. This is different from demand if demand is taken to mean a willingness on the part of the consumer to pay for the service. Need is professionally identified.*

2. *'Equity': There is a fair share for the population.*

3. *'Accessibility': Services are not compromised by undue limits of time or distance.*

4. *'Effectiveness': The intended benefit is achieved for the individual or the population.*

5. *'Acceptability': Services are provided to satisfy the reasonable expectations of the patient, providers and the community.*

6. *'Efficiency': Resources are not wasted on one patient or service to the detriment of another.' "*

Morris (1995 p121) indicates that there is no 'universal' definition of what quality is in healthcare, but that quality is a major issue. However she offers a definition of quality based on the idea of value for money and recognising that the consumer of healthcare services is not necessarily the purchaser of them:

> *"Quality in healthcare is the total package of features and characteristics in health care service or product and the way in which it is provided, that bear on its ability to satisfy the agreed needs of the consumer and the agreed requirements of*

the purchaser within constraints imposed by professional judgement, at lowest cost, and whilst minimizing wastes and losses".

(Morris, 1995 p127)

Øvretveit, (1992 p2) defines quality in health services as:

"specifically, fully meeting requirements at the lowest cost or more specifically, fully meeting the needs of those who need the service most at the lowest cost to the organisation within limits and directives set by higher authorities and purchasers"

Hunter (1991 p103) identifies three main components in a comprehensive quality assurance programme; standards, audit and consumer satisfaction surveys. Hunter then takes the three areas of structure, process and outcome as laid down by Donobedian, (1966) for consideration in the context of the three main components. Øvretveit (1992 p125) sets out quality management and quality correction cycles which provide a framework within which to use 'quality methods' such as methods for setting standards, for measuring quality performance and outcome. Staff within a service or section carry out each of the steps in the cycle.

Physiotherapy managers and their services are now required to participate in many aspects of quality assurance work, uni and multi-disciplinary and clinical audit, outcome measurement, standard setting, service monitoring, for example. For this work, accurate and up-to-date information is vital.

3.9 Overview

The scope and spectrum of physiotherapy practice has steadily broadened in recent years and there is significantly increasing demand

for physiotherapy within the NHS. Pressure for expansion and further diversification is growing as a result of the Reforms brought about by the NHS and Community Care Act 1990, chapter 4 (below). During the past two decades the computer industry has:

> *"contributed to the biggest technological revolution of the twentieth century and has changed the way we live, work and interact with the world around us in many dramatic ways".*
>
> *(Bawa, 1994 p1)*

Physiotherapy services cannot be immune from these developments and in common with all other areas of work within the NHS, the use of computerized information systems has become increasingly significant to the continuing development of the service. Physiotherapy provision is distributed widely throughout hospitals and the community and the volume of work undertaken ranges from 50,000 patient contacts per annum to more than 100,000 contacts depending on the size of the physiotherapy service, DoH (1995). The researcher identified that professionalization itself, the scope and spectrum of modern practice, service provision and the need to undertake outcome measurement, clinical audit and maintenance of quality were all contributory factors to the situation of concern.

CHAPTER FOUR

PROBLEM SITUATION 3:

THE CHANGING STRUCTURE, ORGANIZATION AND MANAGEMENT OF THE NHS AND MANAGEMENT OF PHYSIOTHERAPY

4.1 Introduction

The 'White Paper' reforms of 1989, DoH (1989a) and a series of significant changes introduced during the preceding ten years contributed to an increased emphasis on the introduction and application of computerized information systems into the NHS. In order to facilitate effective and efficient management, existing information systems had to be improved and new ones established. An essential element of the reorganization process, which focussed on the introduction of radical management changes, was the widespread deployment of IM&T. The impact of the 1989 Reforms and the many changes preceding them on the information needs within the NHS – including physiotherapy services – was an integral part of the problem situation which was the focus of this research. Government intervention from the late 1970s to the present day changed many aspects of the way in which healthcare is provided in the UK and this has been made possible through a radical transformation in management practices and organizational structure. These, together with the consequent changes in healthcare provision, formed the contextual setting and imperative for the development of computerized

information systems and improved mechanisms for information use. Physiotherapy services have been, and continue to be, involved in this continuing process of change.

4.2 A Platform for Change in the NHS – 'Patients First'

In December 1979, the Government produced a consultative document 'Patients First', DHSS (1979) in response to the Royal Commission on the NHS (Royal Commission 1979) which had been set up by the previous Labour government. It was the aim of 'Patients First' to simplify the organisational structure of the NHS and to incorporate some of the Royal Commission recommendations. *The object of 'Patients First' was to move responsibility for* making decisions closer to the locality for which services were being provided. A major recommendation was that the District should become the key accountable body in the new structure. It would be responsible for planning and service provision. The arrangement of DHAs in the NHS until 1st April 1991 derived largely from the recommendations of 'Patients First' and the consequent DHSS circular HC(80)8, DHSS (1980). This laid out the Government's intentions following the consultation period after the publication of 'Patients First'; removal of the area tier of management, bringing decision making as near to the patient as possible; the simplification of professional consultative machinery and that unit management - based on hospitals - should

be introduced. 'Patients First' was the platform for the wide ranging series of changes which would be introduced throughout the next two decades.

4.3 Introduction of General Management - The Griffiths Report

A year after the 1982 reorganisation, general management was introduced into the NHS following the publication of the 'National Health Service Management Inquiry' - Griffiths Report - DHSS (1983a) and the subsequent Health Circular HC(84)13, DHSS (1984a).

Mrs. Jill Knight, MP put a written question to Norman Fowler, the Secretary of State for Social Services asking:

> *"If he will make a statement on his plans to control manpower in the National Health Service?"*
>
> *(Hansard, 3rd February 1983, p181)*

The Secretary of State replied:

> *"I have today established an independent NHS Management Inquiry into these matters. Health Authorities in England have a revenue budget of almost nine billion pounds; employ about a million people; and spend almost 75% of their revenue on pay. The government needs to be satisfied that these considerable resources are managed efficiently and give the nation value for money. The inquiry will be led by Mr. Roy Griffiths, Deputy Chairman and Managing Director of J. Sainsbury PLC."*
>
> *(Hansard, 3rd February 1983, p181)*

The Griffiths Inquiry was unique in the history of official investigations into the workings and management of the NHS having no medical interests represented in contrast with previous investigations, such as the Grey Book, DHSS (1972a), Tunbridge Report, DHSS (1972b) and Jones (1991a p34).

In his letter to the Secretary of State attached to the NHS Management Inquiry Report, Griffiths stated:

> *"We were asked by you in February to give advice on the effective use and management of manpower and related resources in the National Health Service; to inform you as our inquiries proceeded; and to advise you on progress by the end of June. It was emphasised that we had not been asked to prepare a report, but that we should go straight for recommendations on management action".*
>
> *(DHSS, 1983a p1)*

The way was thus prepared by the Secretary of State for an innovative and radical series of changes in the organisational structure and management of the NHS.

The introduction of general management into the NHS involved the setting and attainment of objectives and targets for the organization. There was to be a system of reviews and PIs, chapter 2 (above) to support this in order to promote a greater degree of accountability and responsibility by clinicians and managers in the running of the Service. Clinicians were to manage their own budgets and financial systems would be put in place to support this. The

Griffiths Report emphasised the importance of obtaining value for money, making effectiveness and efficiency the key focus throughout and the dominant power base within the NHS was to be the general management function. Previously NHS management was characterised by a consensus rather than a general management approach:

> *"... a highly developed 'corporate pluralism' with the following features; consensus management 'where there could be a temptation for teams of officers to present members with a unified view rather than options for decision'; a symbolic commitment to democracy (combined with administrative 'secret gardens' as a result of the lack of member representation at District); continuing negotiation between the centre and the periphery; and an emphasis on representation from various political, professional and social interests..."*
>
> *(Pettigrew, Ferlie, and McKee, 1992 p47)*

The Griffiths' team concluded that there was a lack of drive in the NHS because at each level of management there was no one person held accountable for actions. Decisions were delayed or avoided, leading to an inefficient service. There was no real continuous evaluation of performance. Precise management objectives were rarely set:

> *"..... it still lacks any real continuous evaulation of its performance against criteria... there is little measurement of health output; clinical evaluation of particular practices is by no means common and economic evaluation of these practices extremely rare."*
>
> *(DHSS, 1983a pp 10-12)*

At the time that Griffiths was making these observations there were no mechanisms in place within the NHS to support the measurement and evaluation work deemed necessary. The recommendations emanating from the Griffiths team – who had been drawn from a business background – together with the Körner recommendations, chapter 2 (above) were strong imperatives for the introduction of computerized information systems throughout the NHS. Such systems would be necessary for the NHS to achieve the demanding and innovative objectives set out by these groups.

Figures 4.1 and 4.2 (below) and Jones (1991 pp 37-38) show the NHS management Structure before implementation of the Griffiths Report and the NHS management structure (Griffiths recommendations) respectively. The Health Circular HC(84)13, DHSS (1984a) charged Health Authorities with the task of establishing the General Management function and identifying general managers. The introduction of the philosophy and structures of general management as recommended in the Griffiths Report:

> *"laid down the foundations of a management culture of command and obedience that increased the responsiveness of the NHS to political direction. It gave the managers new skills and powers in planning and managing clinical services, and a growing confidence in exercising them. And it created a climate of opinion and practice that finally enabled the government to implement its plans for the internal market..."*
>
> *(Butler, 1992 p18)*

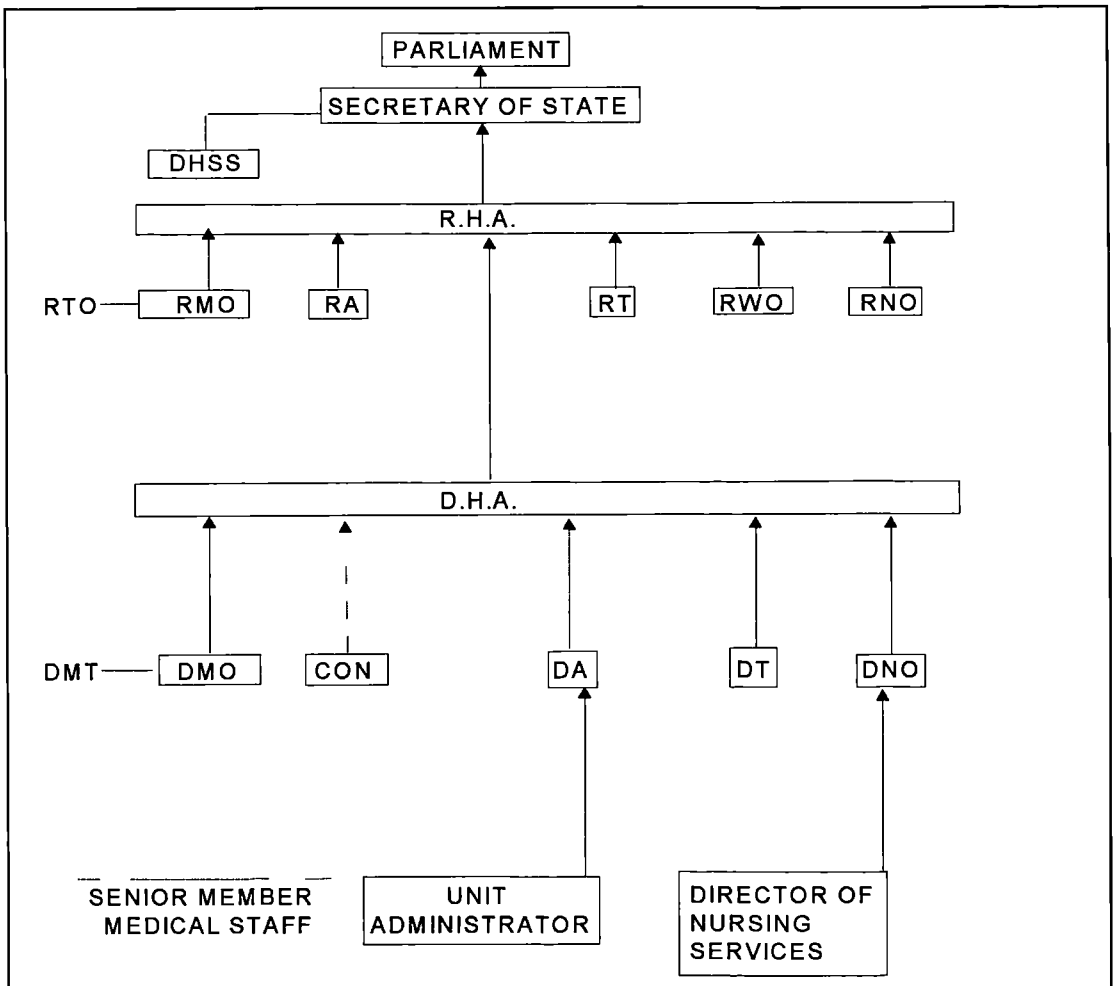


Figure 4.1 *(Jones, 1991 p37)*

By the time of the NHS Review initiated by the Prime Minister in 1988, a clear foundation for a further series of radical reforms - culminating in the

National Health Service and Community Care Act 1990 (Act of Parliament 1990) was in place.

NHS Management Structure
(Griffiths Recommendations)

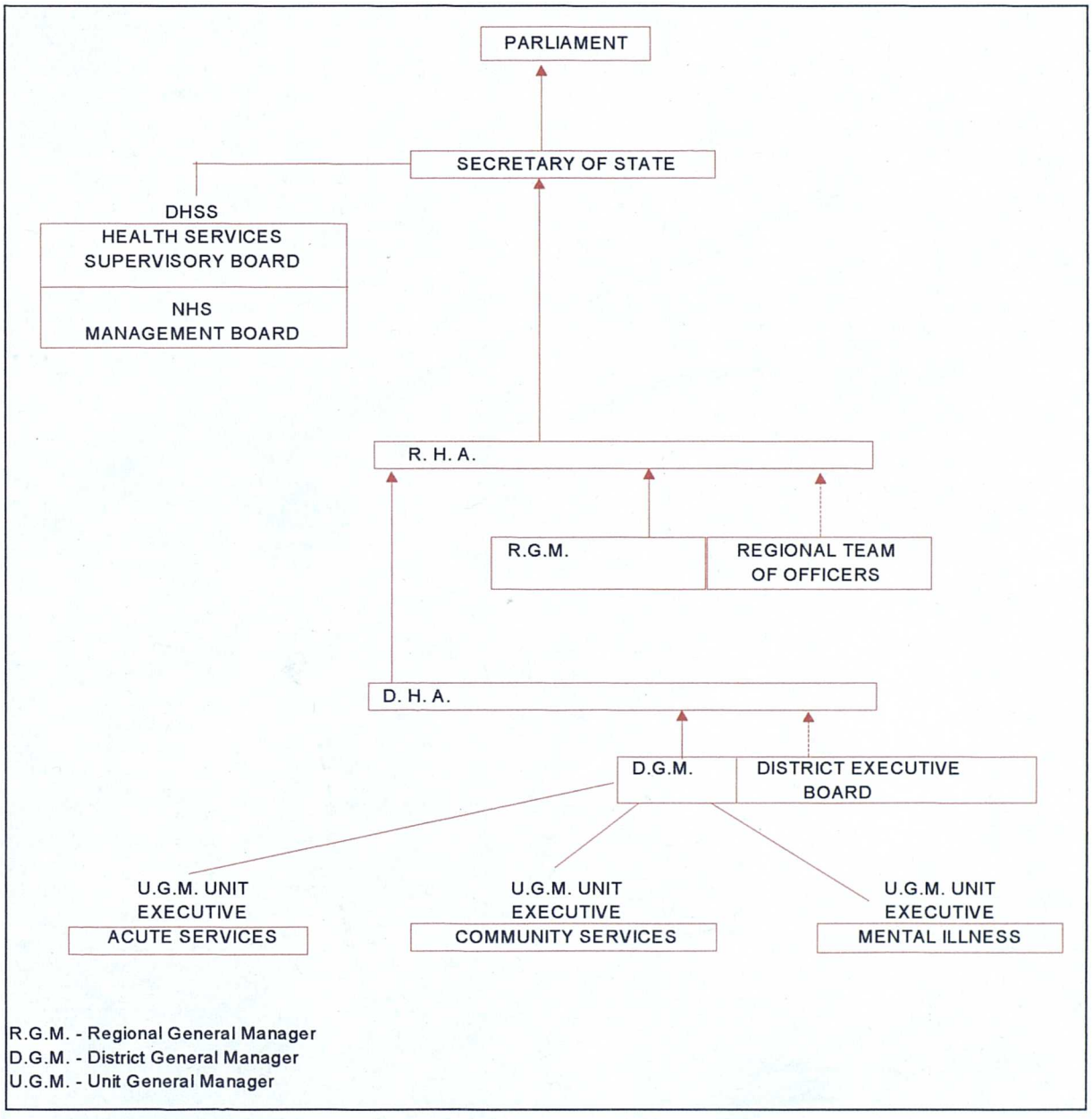


Figure 4.2 *(Jones, 1991 p38)*

4.4 The 1990 NHS and Community Care Act

In January 1988, the Prime Minister revealed in a BBC television interview that a review of the NHS was in progress. The review was:

> *"tightly controlled within the bosom of the government led by the Prime Minister herself ...the other original members of the group were Nigel Lawson (Chancellor of the Exchequer), John Major (Chief Secretary to the Treasury), John Moore (Secretary of State for Social Services), Tony Newton (Minister of State for Health) and Sir Roy Griffiths (Deputy Chairman of the NHS Management Board)"*
>
> *(Brown, The 'Independent' 30.1.1989)*

It undertook no formal consultation and had no published terms of reference and although submissions were received privately no list of those consulted was ever published:

> *"The review group functioned, in effect as a Cabinet committee and its initial objective was primarily political; to change the NHS in ways that would still the chorus of discontent about its funding while maintaining, and preferably advancing, the broad thrust of government policy for the public services".*
>
> *(Butler, 1992 p5)*

The NHS and Community Care Act received the Royal Assent in June 1990 and encompassed the most radical shake-up of the NHS since its inception. The legislation took effect in April 1991 and was based on the three White Papers 'Working for Patients', DoH (1989a), 'Caring for People', DoH (1989b) and 'Promoting Better Health, DHSS (1987). 'Working for Patients' and

'Caring for People' dealt with reform of health and social care in the hospitals and community and 'Promoting Better Health' proposed changes to Family Practitioner Committees which were under the legislation to become Family Health Service Authorities (FHSAs).

'Working for Patients' was born out of the need to review NHS funding:

> *"Each day we learn of new problems in the NHS - beds are shut, operating rooms are not available, emergency wards are closed, essential services are shut down in order to make financial savings... acute hospital services have almost reached breaking point... additional and alternative funding must be found, we call on the government to do something now to save our health service, once the envy of the world"*
>
> *(Hoffenberg, Todd and Pinker, 1987 p295)*

It did not address this issue. Rather it recommended changing funding arrangements to be based on weighted capitation through which money would follow patients together with the introduction of an internal market (4.5 below) to bring about an element of competition into health care. The Government proposed to create an atmosphere of managed competition in the NHS through the employment of market forces as a primary stimulant for the more efficient provision of health services.

Following 'Working for Patients' (DoH 1989a) a series of associated papers were issued giving guidance on the implementation of many aspects of the

Reforms. In February 1989 the first eight working papers were published; (DoH 1989c). Further working papers relevant to 'Working for Patients' were published later. Seven key changes were identified.

A review of the imposed timetable for the enforcement of the reforms indicated an extremely hectic pace of implementation. In attempting to sustain the momentum of change particularly in view of the political climate many aspects of the reforms were implemented without adequate periods of development and consolidation. This restricted full evaluation of the long term implications of the changes, as well as the necessary planning and preparation required to manage this crucial process of change.

Fundamental to the reforms was the concept of freeing DHAs from their responsibility for funding and managing the hospitals and units within their areas and the creation of a new role whereby they would be responsible for the purchase of care for their local population. As commissioning or purchasing authorities the Districts were empowered to look further afield for the provision of services if they wished. The Government's main aim would be to increase competition throughout the NHS. Large GP practices were to be encouraged to accept budgets with which to buy services from provider units. In becoming self-governing trusts hospitals and community units were encouraged to cut loose from the NHS management structure, receiving

funding through their success in competition for health care contracts to be offered by the DHAs and budget holding general practitioners and private sector.

The overall aims and objectives were summarised by Dennis (1991 p207).

- *"That there should be better care and greater choice for the patient through emphasizing the outcome of care as a measure of quality and effectiveness of the service using, for example, medical audit. The distinguishing of buying and providing roles so that Health Authorities could offer choice of secondary care, venue, seeking the best buy rather than looking towards the local service and involving general practitioners in the buying process through developing priorities in conjunction with the local Health Authorities with the option of practice budgets".*

- *"That there should be greater cost effectiveness on the part of the provider. Money to follow the patient, development of the purchasing and provider roles, introducing capital charging so that Authorities should take realistic attitudes to estate assets and introducing the notion of self governing status as a means of further instilling private sector motivation into the public sector".*

After the Health Service reforms large numbers of hospitals and community units became NHS Trusts. The contracting arrangements for service provision were put in place and increasing numbers of general practitioners became fund holders. The purchaser/provider split was implemented, DHAs merged to form larger commissioning authorities, the Patients' Charter DoH (1991) was published together with the publication of quality standards and waiting list initiatives, capital charge registers were drawn up and resource management initiatives (RMI) were rolled out throughout the NHS as a whole. Much of

the philosophy which underpinned these reforms was drawn from the work of Enthoven, (1985) on the feasibility of applying efficiency based management practices within the environment of the NHS.

For physiotherapy management the main effect of the NHS reforms was the fragmentation of district managed services into separate Trusts and Directly Managed Units (DMUs). Before the implementation of the NHS and Community Care Act (1990) there were at least 160 of the 200 districts of England and Wales with district-wide physiotherapy services each with its own physiotherapy manager (Jones, 1991 p2). When these districts were split into the new provider units a variety of models for service management and provision were adopted including separating component parts of the physiotherapy service into different directorates within the provider unit; integrating physiotherapy with other therapy services into a single therapy structure to be managed by a Therapy Services Manager within the provider unit, physiotherapy or therapy directorates or locality managed multi-disciplinary structures. Øvretveit (1992 pp53-62) provides a description and critique of several such models.

4.5 The 'Internal Market'

In 1982 the NHS in England was structured so that, theoretically, there were no geographical barriers to the freedom of referral to any hospital or service.

There was no competition amongst service providers and budget allocation took place on an annual basis with patients being referred regardless of cost. There was little incentive to efficiency and effectiveness and there were rigid boundaries between the public and private healthcare sectors rendering the NHS immune to competition.

The phrase 'internal market' was not used in 'Working for Patients' however, a market culture was created. The Government's intention was that by creating this increased competition would lead to greater efficiency as units would have to cut costs to be competitive. In this way, so it was argued, improved value for money would be obtained from available resources. The most influential architect of an 'internal market' in the NHS was Alain Enthoven who applied his concept of a managed market in the United States Healthcare System to the NHS in 'Reflections on the Management of the National Health Service', Enthoven (1985). His argument for a limited form of quasi or managed market for the NHS provided the basic framework for the NHS reforms. His thesis was that the problems of inefficiency in the NHS could be dealt with by using some of the rigour and incentives of competitive markets. He argued for the separation of purchasers and providers or a structure in which there were buyers and sellers, the idea that purchasers could buy services from providers who would offer good value for money. Competition would improve value for money as purchasers would also be able

to buy services outside the NHS. As a framework for the NHS reforms, the idea of an 'internal market' formed a basis for 'Working for Patients', DHSS (1989a) an important feature of which was the concept that the ills of the NHS do not relate to the level of funding but that rather, the NHS needed a new set of incentives provided by a market.

4.6 An Analysis of the Management of Physiotherapy Services in the NHS

It is difficult to answer the question with a single definition 'what is a manager?' because "there are as wide a variety of management jobs in the economy as there are definitions in the extensive academic literature", Lock, (1992 p10). However, some broad definitions may be helpful as a foundation from which to examine the management responsibilities of senior physiotherapy managers and to provide a basis to examine the need for the use of computerised information systems as management tools to assist the physiotherapy managers in the management process.

Effective management involves understanding what factors affect it

> *"...being able to measure these factors, setting targets that we wish to achieve and being able to monitor progress towards these targets ... if you can't measure what is happening, then you can't manage it.*
> (*Bullas, 1994 p6*)

Managers require information and the ability to process it for many reasons including the needs of internal and external stakeholders and market requirements in the context of continuing change. (4.6.1 below)

4.6.1 *What is Management?*

A dictionary definition of 'management' is

> *"the task of ensuring that a number of diverse activities are performed in such a way that a defined objective is achieved - especially the task of creating and maintaining conditions in which desired objectives are achieved by the combined efforts of a group of people (which include the person carrying out the management)"*
>
> *(French, and Saward, 1984 p261)*

Henry Mintzberg (1988 p26) sets out a basic description of managerial work:

> *"earlier I defined the manager as the person in charge of an organisation or one of its sub units. Besides chief executive officers, this definition would include vice-presidents, bishops, foremen, hockey coaches and Prime Ministers"*

In answer to the question "can all of these people have anything in common?" Mintzberg cites an important starting point that all are "vested with formal authority over an organisational unit":

> *"From formal authority comes status which leads to various interpersonal relations and from these comes access to information. Information in turn enables the manager to make decisions and strategies for his unit. The manager's job can be described in terms of various 'roles' or organised sets of behaviours identified with a position. My description.... comprises ten roles'.*
>
> *(Mintzberg, 1988 p27)*

Formal authority gives rise to the three interpersonal roles which in turn give rise to the three informational roles. These two sets of roles enable the

manager to play the four decisional roles, (figure 4.3 below). In his book Handy (1986) uses more colloquial descriptions of Mintzberg's three sets of roles which are leading, administrating and fixing. All of these are central to the management of physiotherapy services in the NHS. Barnard, (1938) sets out three functions of the executive - by which he means all kinds of managers - as being the maintenance of organisational communication, the securing of essential services from individuals in the organisation, and the formulation and definition of purpose, that is, planning. These three functions are essential components in the management of physiotherapy services in integrating the whole and finding the best balance between conflicting forces and events. Planning and control are seen by Armstrong (1986 p15), to be the two key managerial activities recognizing the importance of the part played by management techniques in managerial skills, procedures and activities.

Øvretveit (1992 p80) defines management as the work of :

> *"getting the best match between needs and resources, over the short, medium and long term"*

while Koontz, O'Donnell and Weihrich (1984 p64) cite the basic functional areas of management as planning, organising, staffing and leading and controlling.

Two 'popular' answers to the question 'what is a manager?' are mentioned by Drucker (1965 p17). Firstly, that "management is the people at the top - the term 'management' being little more than a euphemism for 'the boss'".

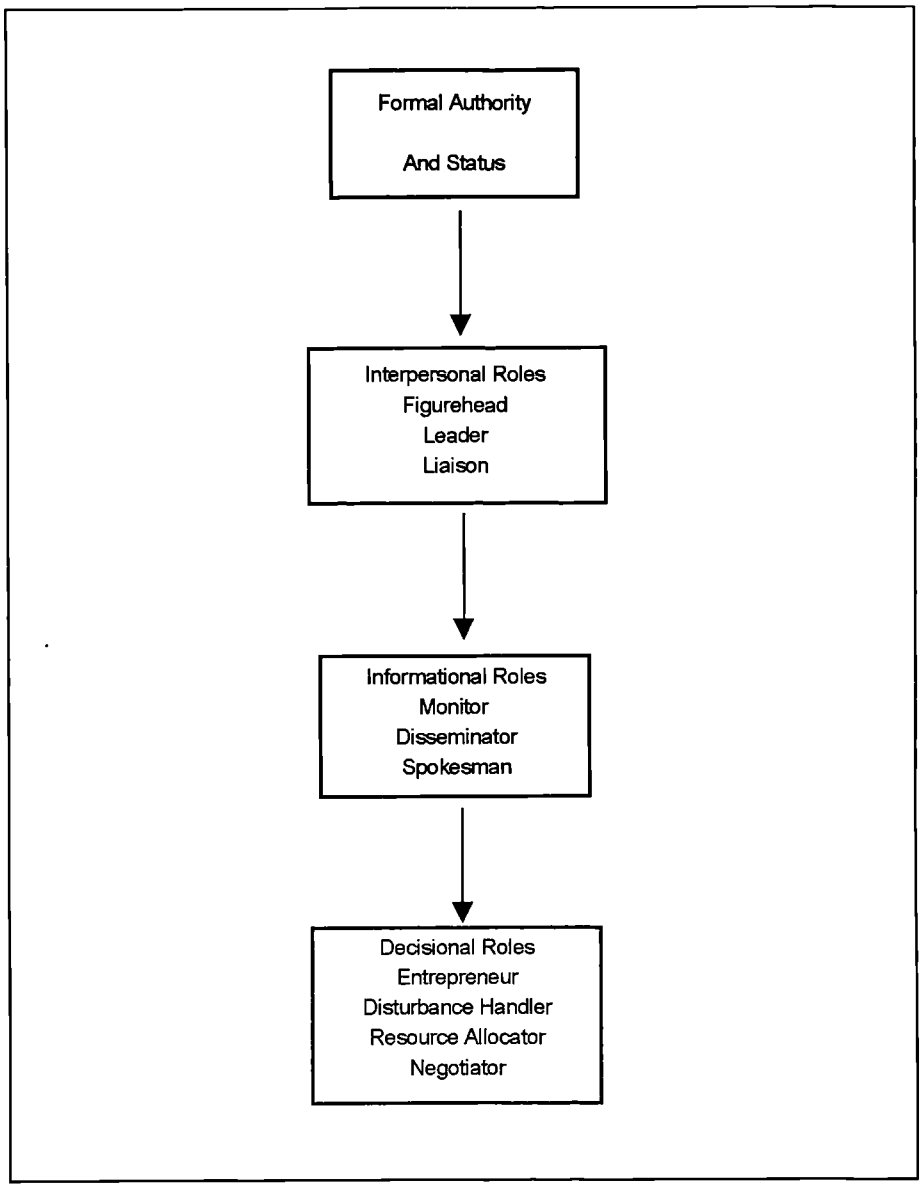


Figure 4.3

Secondly a manager is defined as:

> *"someone who directs the work of others and who, as the slogan puts it 'does his work by getting other people to do theirs'"*

These descriptions are not adequate because they do not explain what management is and 'what it does'. These two questions can 'only' be answered by:

> *"analysing management's function for management is an organ; and organs can be described and defined only through their functions".*
>
> *(Drucker, 1965 p18)*

The idea of the function of management - in the context of physiotherapy services - is a useful one and is adopted here. Elements from the other definitions and explanations above are also encompassed.

4.6.2 *Analysis of the Job Content of the Senior Physiotherapy Manager*

During 1987 a postal questionnaire survey of senior physiotherapy managers throughout England and Wales was carried out, Jones (1989). The major objective of this survey was to analyse the workload of senior physiotherapy manager posts. A questionnaire was posted to the most senior physiotherapy manager in each district in England and Wales, Jones (1991 p2). Of the 200 questionnaires posted 90% were completed and returned.

Physiotherapy managers are concerned with decisions on the alternatives available in physiotherapy provision and in the allocation of resources, their decisions materially affect the level and efficiency of resources used in various patient care areas. The physiotherapy manager is responsible for co-ordinative

and integrative activities, - important features of the role - ensuring evenness of service provision in a service which crosses many specialty boundaries, chapter 3 (above).

Physiotherapy managers in this survey were asked to indicate the managerial duties and responsibilities which they undertook. The results are set out in (Table 4.1 below). This shows that physiotherapy managers have wide-ranging managerial duties and responsibilities and that a high percentage were carrying out a substantial personnel management workload. Those management responsibilities with a high level of clinical implication are clearly very substantially undertaken by physiotherapy heads of service, such as, individual performance review (IPR), organisation of staff post-registration education and training, monitoring services, and management of research projects.

Between April 1987 and March 1988 seventeen senior physiotherapy management appointments in eleven Regional Health Authorities (RHAs) of England and Wales were advertised nationally and the job descriptions were obtained for analysis, Jones (1991 pp3 and 4). These job descriptions were broken down and sorted into key function areas and the figures were collated to show how many authorities required work to be undertaken in each of the main work areas. The results of this analysis are shown in (Table 4.2. below).

Managerial Duties and Responsibilities

Undertaken by Senior Physiotherapy Managers

Managerial Responsibilities and Duties	Percentage (%) of Senior Physiotherapy Managers Undertaking this Work
Physiotherapy Budget Management	86.3
Management of Physiotherapy Clinical Student Placements	66.3
Organisation of Post-registration Physiotherapy Education	98.8
Manage Staff Training Budget	31.9
Organisation of Research Projects	67.5
Recruitment Advertising	87.5
Recruitment Interviewing	98.1
Writing Job and Role Descriptions	97.5
Appointment/Termination Papers	69.4
IPR (Staff Development/Individual Performance Review Appraisal)	95.6
Grievance/Disciplinary Procedures	91.3
Statistical Returns	94.4
Time Sheets	84.4
Sick Leave Returns	89.4
Annual Leave Returns	91.3
Staff Rotations	91.9
Ordering and Deployment of Equipment	92.5
Ordering Uniforms	77.5
Ordering Stores	84.4
Physiotherapy Development Proposals (Planning)	98.8
Monitoring Services	100.
Patients' Audit	68.8
Körner and Other Information Systems	89.4
Management Budgeting/Resource Management Work	56.3

(Jones, 1991 p3)

Table 4.1

A requirement in every case was management of the District Physiotherapy Service. Other duties which all DHAs included were: Individual Performance Review, training strategies, liaison with other disciplines, service review and monitoring, planning.

Personnel duties ranked highly as did clinical work and responsibility for managing a clinical area as well as the District Service. Professional leadership together with professional standards and clinical practice was also important in

the view of the HAs. Most post holders were required to be responsible for managing the physiotherapy budget and other resources. These data confirm that post holders were undertaking a full managerial workload as clinical heads of service. Table 4.3 (below) shows a comparison of findings from the questionnaire survey of senior physiotherapy managers and the survey of District Health Authority job descriptions. Since these surveys were undertaken the scope of work of the physiotherapy manager has increased as a result of the health service reforms. The work would now include, for example, service specification and marketing, contracting, user satisfaction monitoring, waiting time monitoring, outcome measurement and clinical audit (3.8 and 3.9 above).

District Health Authority Requirement for Job Content

- Senior Physiotherapy Manager Posts

Work Undertaken	No.of DHAs Requiring This % in Parenthesis
Manage District Service	17 (100.0)
Manage a Clinical Unit as well as District Service	15 (88.2)
Undertake some Clinical Work	13 (76.4)
Professional Leadership	15 (88.2)
Professional Standards and Clinical Practice	16 (94.1)
Manage Budget and Other Resources	15 (88.2)
Personnel	
Recruitment Procedures	16 (94.1)
Counselling	15 (88.2)
IPR (Appraisal,Career Development)	17 (100.0)
Disciplinary and Grievance	15 (88.2)
Health and Safety	13 (76.4)
Training Needs	17 (100.0)
Liaising With	
Training School	10 (58.8)
Organisations Outside NHS	13 (76.4)
Heads of Other Services, Medical Staff, Managers	17 (100.0)
Input to District Health Authority	17 (100.0)
Planning Teams and Committee Work	8 (47.0)
Manpower and Finance Planning	17 (100.0)
Physiotherapy Policy/Strategy	12 (70.5)
Service Review and Monitoring Standards	17 (100.0)
Quality Assurance	12 (70.5)
Staff Deployment	15 (88.2)
Information Systems, Statistics, Körner, etc	13 (76.4)
Implementation of Health Authority Policies	9 (52.9)
Implementation of National/DHSS Policies	8 (47.0)
Total Health Authorities Included	17 = 100%

Table 4.2 *(Jones, 1991 p4)*

A Comparison of Findings from the Questionnaire Survey and Job Description

Item of Job Content and Responsibility	Senior Physiotherapy Manager's Questionnaires	Analysis of District Health Authority Job Description
	%	%
Managed Budget	86.3	88.2
Planning	98.8	100.0
Monitor Service	100.0	100.0
Recruitment Procedures	92.8	94.1
IPR	95.6	100.0
Deployment of Staff	70.0	88.2
Training Needs Post-registration Education	98.8	100.0

Table 4.3

(Jones, 1991 p5)

Berry, (1994) conducted a postal questionnaire survey of Physiotherapy Managers to examine the management of the therapy professions, particularly physiotherapy. The work of Physiotherapy Managers was analysed and the results of the survey compared with the work reported by Jones in 1991. Berry grouped together the main tasks from the list of duties cited by Jones under nine main headings, (Table 4.4 below). The table shows the number of respondents and percentage of the total physiotherapy managers undertaking

the work listed. Berry continues by making a comparison between her own findings with the findings of Jones in the survey undertaken earlier, (Table 4.5 below). "It can be seen that although there has been a slight decrease in responsibility in some areas, notably quality assurance and service development, in all other areas responsibility has remained the same or increased", Berry (1994 p63).

The Berry survey indicates that the responsibilities and duties of senior Physiotherapy Managers remain wide ranging verifying the previous work undertaken by the researcher. This is also borne out by the further survey (Table 4.6 below) which indicates the widening scope of management work in the context of the NHS reforms and 'internal market'.

During 1993 a further questionnaire survey of senior physiotherapy managers in England was undertaken by the researcher, the supplementary empirical study, chapter 6 (below). The questionnaire centred on aspects of physiotherapy management related to the use of computerised information systems but three of the questions focused specifically on physiotherapy management.

Managerial Responsibilities

Managerial Responsibilities		
Quality Assurance	93	64.9%
Clinical Audit	93	94.9%
Service Delivery	92	93.9%
Service Development	88	89.8%
Staff Training	91	92.9%
Staff Development	92	93.9%
Recruitment	91	92.9%
Budgetary Control	89	90.8%
Student Management	84	85.7%
Adapted from Berry, M. 1994 (Table 18)		

Table 4.4

Managerial Responsibilities - Comparison with Jones 1987

	1994	Jones
Quality Assurance	94.9%	100%
Clinical Audit	94.9%	68.8%
Service Delivery (Deployment of staff)	93.9%	70%
Service Development	89.8%	98.8%
Staff Training	92.9%	98.8%
Staff Development (IPR)	93.9%	95.6%
Recruitment	92.9%	92.8%
Budgetary Control	90.8%	86.3%
Student Management	85.7%	66.3%
Table adapted from Berry, M. 1994 (Table 24)		

Table 4.5

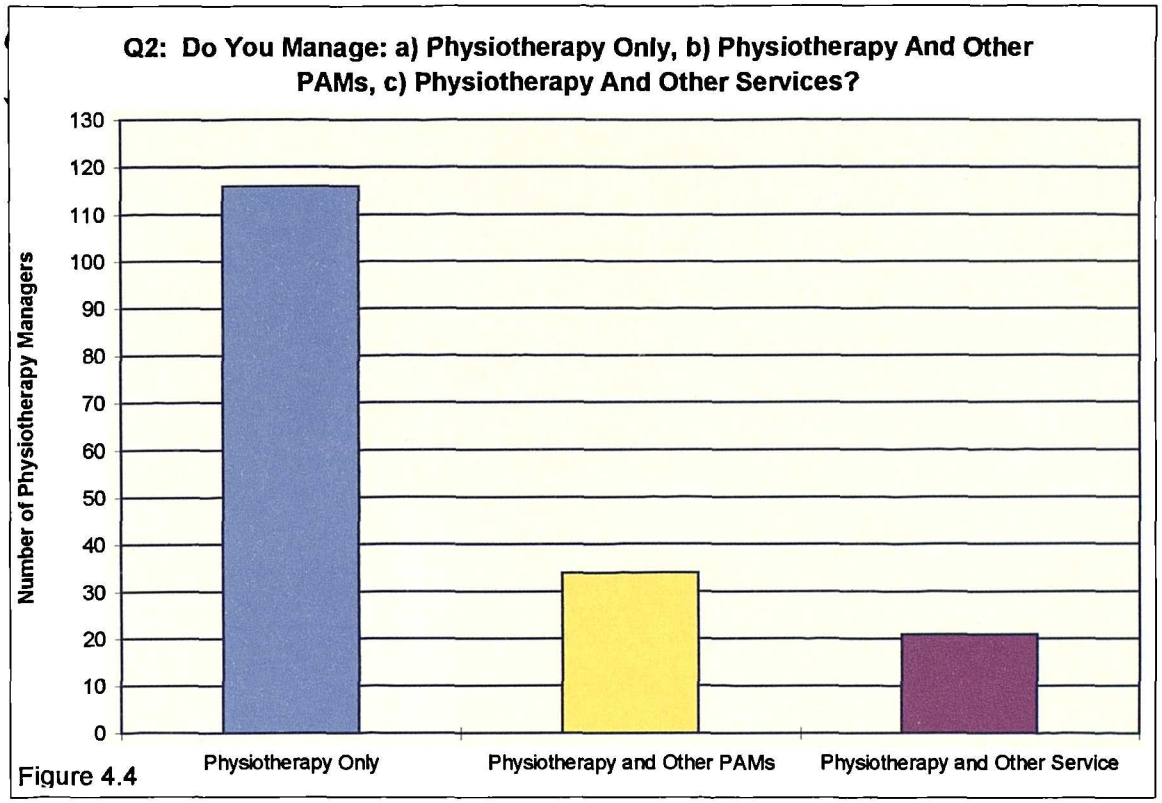


Figure 4.4

Table 4.6	No.
Physiotherapy Only	116
Physiotherapy And Other PAMs	34
Physiotherapy And Other Services	21

To ascertain the span of control of senior physiotherapy managers in the 'reformed' NHS they were asked, 'Do you manage (a) physiotherapy only? (b) physiotherapy and other professions allied to medicine? (c) physiotherapy and other services?' The results are shown in figure 4.4 and table 4.6 (above).

A significant number of senior physiotherapy managers 116 of the 161 respondents were, in 1993, still managing only physiotherapy services. However, the broadening of the span of control and remit of these senior managers was gaining momentum with a total of 45 of them managing other services, including 34 managing other professions allied to medicine.

Physiotherapy managers were asked about their management roles. In response to the question 'do you manage the physiotherapy budget?' 150 (93.2%) responded. Of these – 147 (91.3%) answered 'yes' and 3 (1.9%) 'no' - Figure 4.5 and Table 4.7 (below). This represents an increase in those responsible for budget management on the previous survey, (Tables 4.1, 4.2 and 4.3 above) where 86.3% managed the physiotherapy budget.

Question 4 asked the managers whether they were responsible for certain tasks. The results were Table 4.8 (below).

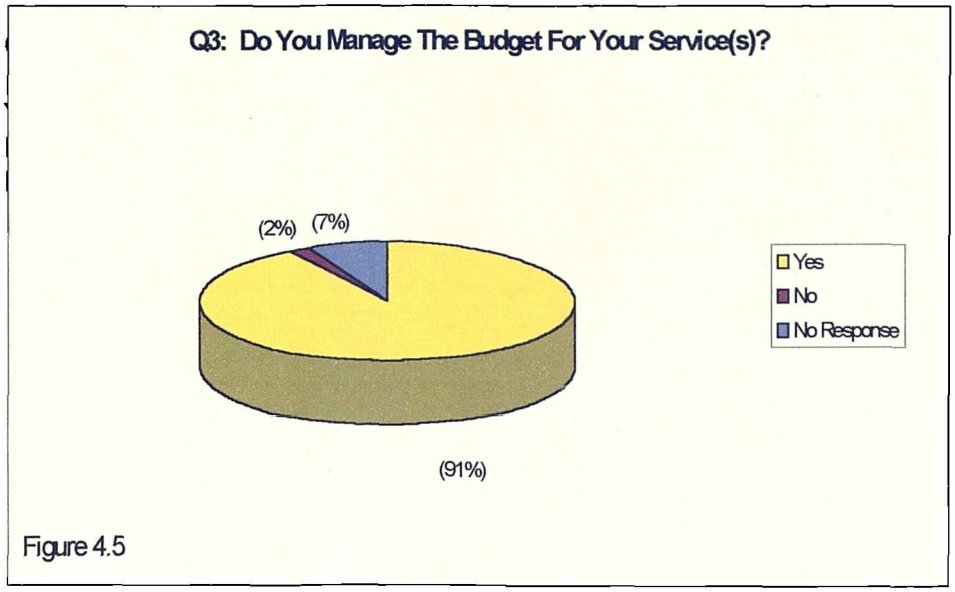


Figure 4.5

Table 4.7	No.	%
Yes	147	91
No	3	2
No Response	11	7
Total	161	100

Questionnaire - Management Responsibilities

Question: 'Are your responsible for the management of'

		YES	NO	NO REPLY	TOTAL
A	Statistical Returns	96.9%	3.1%	0%	100%
B	Clinical Audit	93.8%	3.1%	3.1%	100%
C	Outcome Measures	92.5%	4.3%	2.2%	100%
D	Appliance Issuing	67%	28.6%	4.4%	100%
E	Statistical Reports	78.3%	19.9%	1.8%	100%
F	Activity Reports	90.7%	6.8%	2.5%	100%
G	Case Load Measurement	83.8%	12.4%	3.8%	100%
H	Physiotherapy in Resource Management Initiative	78.9%	17.4%	3.7%	100%
I	Patient Appointments	80.1%	19.2%	0.7%	100%
J	Waiting List Monitoring	94.4%	3.7%	1.9%	100%
K	Stock Control	80.7%	17.4%	1.9%	100%

Table 4.8

The information in figure 4.6 and table 4.9 (below) indicates that senior physiotherapy managers were in 1993 undertaking a wide variety of managerial tasks. It was not the primary remit of this questionnaire survey to ascertain the range and scope of management work being undertaken by physiotherapy managers in the reformed NHS, although the questionnaire findings are helpful in indicating continuing significant managerial work. The questionnaire is discussed and analysed in chapter 6 (below).

Managerial Responsibilities

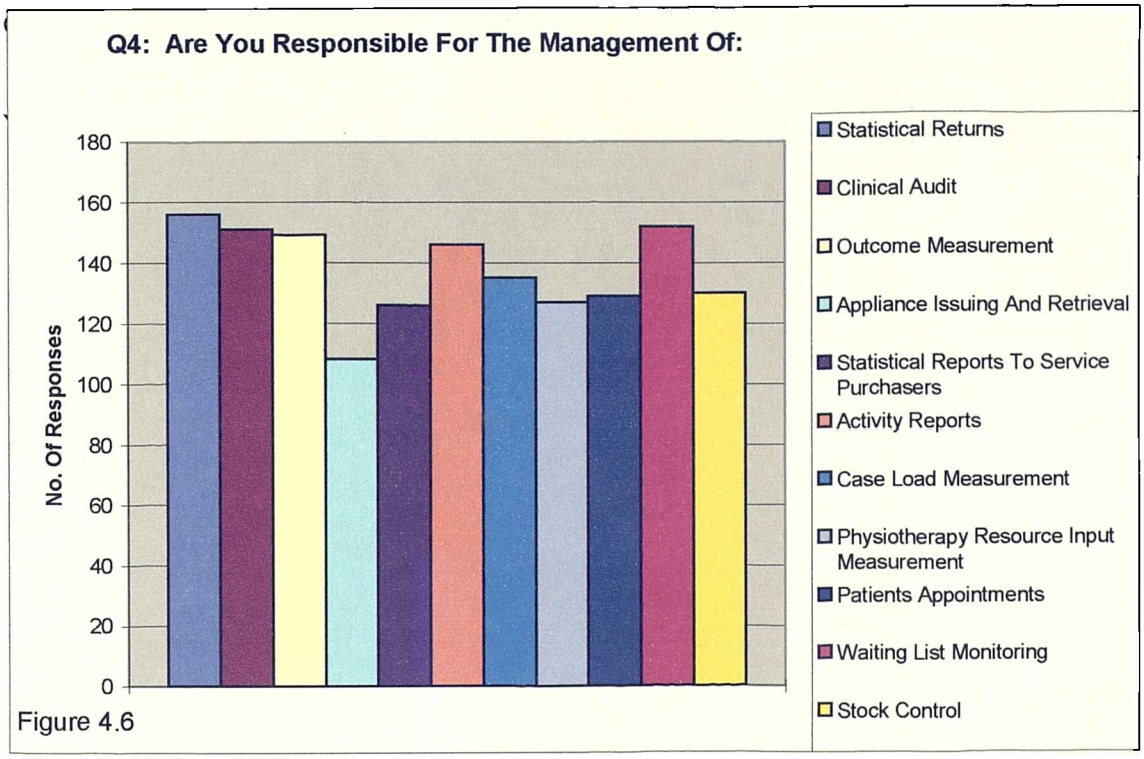


Figure 4.6

Table 4.9	Total Responses = 161 (100%)	
	No.	%
Responsibility for:		
a) Statistical Returns	156	97
b) Clinical Audit	151	94
c) Outcome Measurement	149	93
d) Appliance Issuing And Retrieval	108	67
e) Statistical Reports To Service Purchasers	126	78
f) Activity Reports	146	88
g) Case Load Measurement	135	84
h) Physiotherapy Resource Input Measurement	127	79
i) Patients Appointments	129	80
j) Waiting List Monitoring	152	94
k) Stock Control	130	81

4.7 Further Aspects of Physiotherapy Management

It is the role of the senior physiotherapy manager to act as clinical head of this clinical service, a role demanding a fusion of managerial skills together with wide ranging clinical experience. The physiotherapy manager fulfils a clinical consultancy role within and outside the service. Physiotherapy services are distributed widely in most aspects of clinical activity. The work of a physiotherapy manager stems from "actions and decisions about patients and clinical matters", Williams (1985) and therefore a thorough understanding of clinical matters is necessary because the service manager fulfils the role of clinical leader and director. A wide range of good quality information will be required to support effective decision making and actions.

4.7.1 *Effectiveness and Efficiency*

'Value for money' is demanded in relation to public services, industries and businesses of all types including the NHS and in common with other services this requirement is central to the management of physiotherapy. Optimum value for money for patients and for tax payers is attainable only through maximising effectiveness and efficiency within the service and it is the management of an effective and efficient service in all its aspects that is the core of the physiotherapy manager's job.

Levels of effectiveness and efficiency can only be measured by the use of relevant and meaningful information:

> *"Despite the improvements taking place in the provision of financial information for management in the NHS, there is a need to supplement this information in order to demonstrate the full extent to which the providers of healthcare are also providing value for money (VFM)"*
>
> *(Glynn, 1995 p 90)*

Effectiveness and efficiency are two quite different concepts. Effectiveness relates to the clinical outcomes of service provision whilst efficiency is concerned with maximising the outputs from a given set of inputs.

> *"Effectiveness measures should be able to demonstrate that the output from any given activity is achieving the desired results. In healthcare such indicators should ideally be related to the outcome or impact of particular treatments - measures such as improved quality of life..."*
>
> *(Glynn, 1995 p91)*

In order to measure effectiveness, clinical and managerial objectives must be set. Agreed goals are set by physiotherapists with their individual patients, for example, to enable an immobile patient to become mobile again. In terms of management, goals are set for the service as a whole or sections of the service. The next step is to devise a method of measuring the degree to which these objectives are met. The level of success in achieving these goals is evaluated on a time scale so as to give a measure of outcome; further goals are then set. The summation of clinical outcomes measured against the expected outcomes

is an important clinical and managerial tool. Managerially this may relate to the possible options concerning the use of physiotherapy staff resources. It might, for example, be judged that physiotherapy staff time is better spent in treating patients in groups rather than on an individual basis. The senior physiotherapy manager agrees a series of aims and objectives for the unit, care group or specific clinical area as well as for administrative and managerial tasks. The effectiveness of a physiotherapy section, or whole service is calculated by the summation of the effectiveness of all its parts. An individual physiotherapist can use outcome measurements to modify treatment approaches and outcomes.

During 1986 a series of four workshops for senior physiotherapy managers took place in Doncaster. The purpose of which was:

> *"to explore and clarify the concepts of effectiveness and efficiency in physiotherapy services and to develop consensus models which can be used as an agreed basis for descriptive measures by the profession"*
>
> *(Williams, 1986 p1-2)*

The two workshops on 'effectiveness' were attended by a total of 130 physiotherapy managers and the two on 'efficiency' were attended by 125 from all parts of the country. The conclusion of the two workshops on 'effectiveness' was that the effectiveness of physiotherapy services should be judged ultimately not only in terms of the number of people passing through

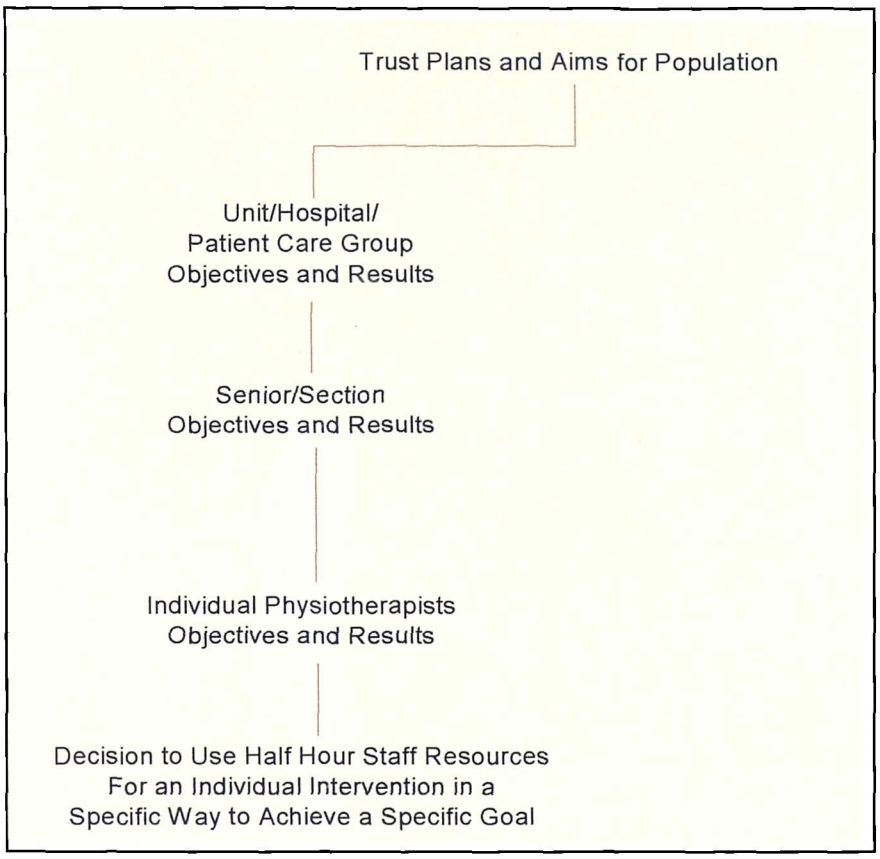


Figure 4.7

the service or even in terms of the particular items of service they received, but rather in terms of: "Was it an effective use of a scarce resource?" and "Was the goal achieved?".

As a result of the workshops a model "hierarchy of effectiveness measures" was proposed by Williams (1986 p4) (Figure 4.7 above).

This diagram represents the way in which performance at the level of individual physiotherapy interventions adds up to overall performance at service level. An important task for the senior physiotherapy manager is to

facilitate development of the relevant outcome measures which are necessary to achieve the balance of resources needed for the agreed and optimum use of finances.

The concept of effectiveness is inextricably linked with that of efficiency. Whereas effectiveness is concerned with the outcomes resulting from physiotherapy interventions, efficiency is measured by the ratio of inputs in the service provided.

> *"The greater the outputs from a given set of inputs the greater is the efficiency"*
>
> *(Brooks, 1986 p190)*

A further useful definition given was

> *"to consider effectiveness as referring to achieving maximum professional and clinical outcomes and efficiency and doing so at least cost"*
>
> *(Williams, 1986 p4)*

This definition encompasses the concept of a ratio of inputs to outputs, the idea of maximising outputs from the allocated resources. The physiotherapy resource inputs include for example, revenue spending on workforce input, travel costs, printing and energy and capital resources such as buildings, facilities and equipment.

> *"Efficiency should not be confused with productivity. Efficiency is productivity related to some standard, target or goal".*
>
> *(Brooks, 1996 p91)*

There are many factors involved in achieving efficiency, examples of which were drawn up by the researcher in the absence of any published literature on this topic specific to physiotherapy - apart from Williams (1986) and Jones (1991) – (Table 4.10 below).

EFFICIENCY FACTORS IN PHYSIOTHERAPY	
Staff time spent treating patients Planning and scheduling the working day Caseload adjustment Comparison of staff caseloads Avoidance of unnecessary overtime Prioritising problems Efficient skill use (teaching other carers where appropriate) Thorough clinical assessment Thorough record keeping system Patient discharge at appropriate time Monitoring changes in referral patterns Accessibility of adequate equipment Optimum skill mix appropriate to task	Monitoring objectives and outcomes Caseload priority when staff absent Waiting list times (why?) Treatment priority of most urgent patients Monitoring patient non-attendance in out-patients Use of diary appointment systems Patients advised how to continue at home Optimum use of space Timetabling of busy equipment Arranging relevant postgraduate staff education and training Priming travel to other units Simple and relevant paperwork systems Most effective use of skilled staff Monitoring of staff absence Monitoring of overtime 'on-call' and travel costs Analysis of monthly turnover figures Pattern of service use by referrers Average numbers of contacts per patient within episodes of care.

Table 4.10

In all these areas relevant data is required in order that the factors can be measured and adjusted.

4.7.2 *Costing and Pricing Physiotherapy Services*

Before the introduction of Körner, chapter 2 (above) and general management (4.3 above) no work on costing and pricing physiotherapy services was undertaken. The direction given by the Government to provide value for money, to be able to demonstrate this and the requirement for effective and efficient service provision further increased the urgency for costing and pricing mechanisms to be introduced.

There are circumstances in which contracts specific to physiotherapy are drawn up, for example, GP open access to physiotherapy out-patient departments. A physiotherapy pricing mechanism is necessary for physiotherapy managers who are selling their services to non NHS purchasers in the wider community.

Cost is taken to mean the expenditure incurred to produce goods or provide a service. The cost to the NHS of providing a service must take into account expenditure on workforce, equipment, drugs, facilities and overheads. The cost of a service to a buyer is a measurement in cash terms of what that purchaser has to part with in order to obtain that service. When a service provider sells a service to a purchaser he will sell at a price sufficient to cover the full costs plus profit where that is appropriate.

The concept of 'break even' indicates the minimum quantity of products that must be sold – in this case episodes of physiotherapy care (2.4.1 above) – and that a hospital must carry out to simply cover its costs. Figure 4.8 (below) illustrates this concept.

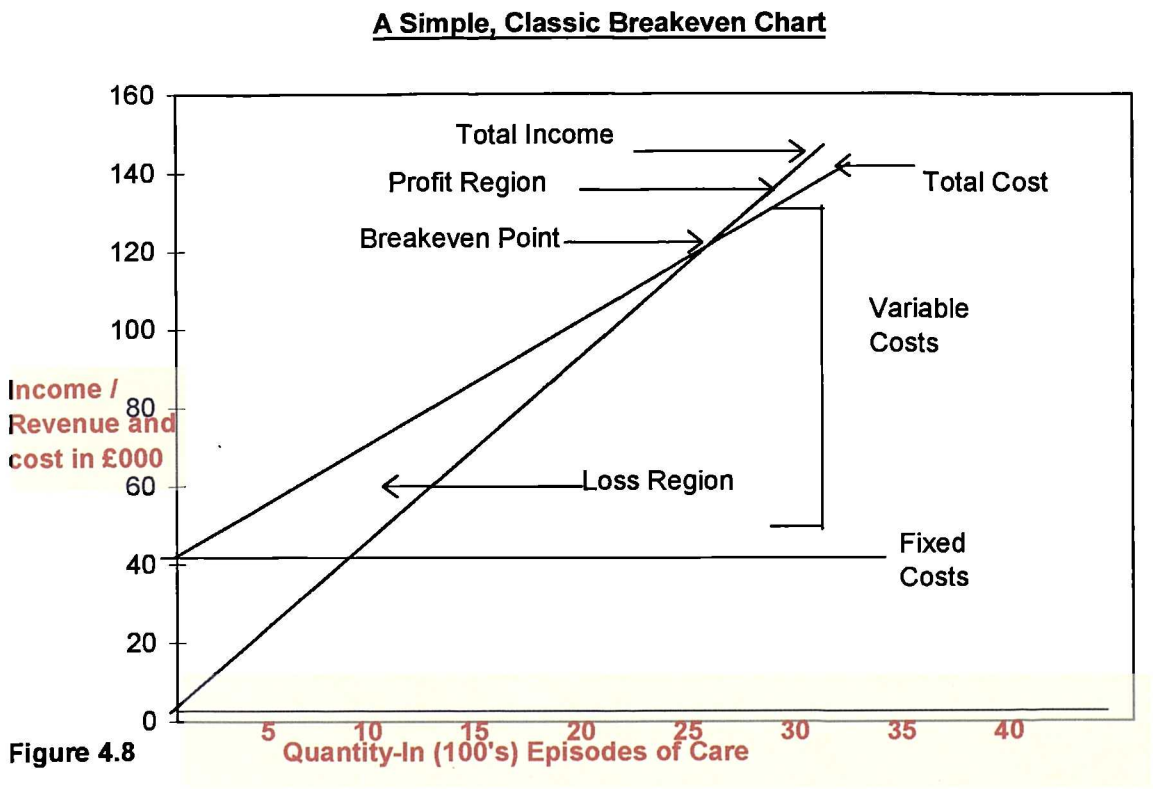


Figure 4.8

Costing is the system by which the cost of service provision is calculated. Costs include several factors such as marginal cost, that is, the additional cost incurred by producing just one more unit of production or treating just one more patient. The variable costs are those costs which vary according to the level of activity, for example, materials. Fixed costs are those which do not vary when activity increases or decreases. In some respects pay costs are fixed

in terms of physiotherapy services because of manpower and contract constraints. However these costs may vary marginally in terms of, for example, 'on-call' emergency services and overtime. In the almost unprecedented event of workloads decreasing, staff vacancies arising may not be filled. In such circumstances pay would not be a fixed cost.

The price is the amount at which a service is valued, bought or sold, a measure of what a purchaser must expend in order to obtain the service. Overheads are expenses incurred by the service provider over and above the direct cost of providing the service itself and the materials associated with this, for example, building maintenance and administration. Standard costs are planned target costs for an area of activity or unit of production, for example, a standard cost per case could be calculated assuming the average costs incurred in treating a certain type of case. In practice the actual cost of treating each case may turn out to be more or less than the pre-calculated standard.

Within the NHS there is, at present, no universal tried and tested method of pricing services which can result in pricing policies being disorganised and illogical:

> *"Setting and maintaining the right prices for its products is perhaps the most delicate and important of all the problems facing a company. It is, however, a reality of business life that there is probably no area of business*

activity in which practice differs so unduly from theory as the area of pricing"

(Lock, 1995 p287)

In the absence of any NHS recommendations on methods to be adopted for pricing physiotherapy services, the researcher has devised a methodology which is currently being tested in Eastbourne Hospitals NHS Trust. This is incorporated into the software development, chapter 7 below and this proposed methodology is discussed in the context of the software development as set out in 4.7.3 (below).

Essential data in costing and pricing physiotherapy services include: the volume of work, the numbers of staff in different service areas providing physiotherapy, the sources from which patients are referred, numbers of episodes of care per annum, the length of each episode of care, and the resources used in service provision not only in terms of manpower, but also consumables and overheads.

The information necessary for physiotherapy managers to undertake costing and pricing of their services is set out in Table 4.11 (below).

There is some information which it would be difficult for finance departments to quantify accurately due to the volume and complexity of the consumables and services involved on a Trust wide basis; overheads such as the cost of

postage and telephones, building maintenance, the use of services from other departments, for example, finance, payroll and occupational medicine.

Finance departments within NHS Trusts are concerned with costing and pricing services and physiotherapy managers have an important role to play as acknowledged by the NHSME (1993a). The NHSME acknowledge the roll of physiotherapists recognising that the use of their knowledge and experience will improve the accuracy of the results and promote a better understanding of the costing process amongst non-finance staff.

4.7.3 *Tendering for Contracts and Physiotherapy Tendering*

Within the NHS 'internal market' (4.5 above) physiotherapy service providers participated in tendering for contracts, CSP (1994). The mechanisms for this were sometimes formalised or in the form of casual requests to determine providers' interest in specified areas of care.

> *"The mechanism whereby purchsers' strategic intentions are translated into practice is the contract... most contracts are negotiated and placed annually... there are two principle types of contract being operated by healthcare purchasers: cost per case contracts; block contracts."*
>
> *(Hunter, 1995 p56)*

There were several types of contracts which physiotherapy services might enter into. Many factors influenced the type of contract to be agreed, the

Information for Costing and Pricing Physiotherapy Services

Budget information	A breakdown of the total financial allocation to the physiotherapy service for the year. Budget allocation and expenditure to date in the areas of staff pay, equipment, travel, appliances, consumables and services provided, and others.
Manpower information:	These data relate to the amount of time which staff are absent from work and the nature of such absences, such as, annual leave, sick leave, maternity leave and study leave. When all of these and other absence factors are taken into account one whole time equivalent (wte) physiotherapist might be expected to be in the work place for approximately forty-two weeks of the year, five to six weeks annual leave, bank and statutory holidays, some study leave, possibility of some sick leave.
Physiotherapy staff activity	On average physiotherapists typically spend between fifty and sixty per cent of their time in face-to-face or hands-on contact with patients. For the calculation of accurate costs and prices physiotherapy managers need to know the proportion of total staff time spent in face-to face contact with patients, proxy contact – patient related activity - and non-patient related activity. The percentages of each of these are required for costing mechanisms.
Data about the patients using the service	Information relating to numbers of episodes of physiotherapy care provided in relation to sources of referral may be used to apportion the volume of work to specialities, GP practices, self referral and others.
Staff information.	Physiotherapy managers need available to them a full list of their staff including grade mix and skill mix. Staff, such as clerical and secretarial officers, porters and some senior physiotherapy managers do not carry responsibility for a case load. This detail will be required for the apportionment of staff costs into the physiotherapy prices.
Capital charges	Under the provisions of the National Health Service and Community Care Act 1990 health authorities are required to undertake work on equipment and facility inventories – capital asset registers - for the purpose of capital charges.
Cost of materials and consumables.	Most health care providers have well established mechanisms by which requisitioning officers receive computer print-outs about the cost of the materials and services managers have purchased. These costs must be included in the pricing mechanism.

Table 4.11

choice depended on the type of activity required, that is the complexity, frequency, cost and price as well desired outcome of the activity.

In block contracts an annual fee was agreed and paid in instalments in return for a defined range of services.

In cost and volume contracts a price would be agreed for a specified level of service. This was usually stated in terms of activity based on completed episodes of care. This type of contract was used for high volume, low cost items or activities with relatively predictable levels of input, for example, a contract with general practitioner fundholders for a given number of physiotherapy episodes of care in the year at an agreed price.

Cost per case contracts typically involved an agreement to pay a set sum of money for each patient referred for physiotherapy irrespective of the number of treatment sessions provided within the episode.

Tertiary referral contracts applied where onward referral was the providers' responsibility. In this the provider sub-contracted these services and so bears the cost.

In the case of fees per treatment, contract costs were based upon the number of face-to-face contacts, a fee was payable for each individual treatment contact similar to the arrangement where an individual might pay for a physiotherapy service themselves in the private sector.

There were a number of benefits and drawbacks for service providers and commissioners in each of these contract types; it is not the remit of this thesis to explore these in detail. A wide range of accurate information was, and still is, required for setting up contracts and for contract monitoring - information generated at the provider end of the process:

> *"Almost all Health Service data are created at the point of service use".*
>
> *(Opit, 1993 p86)*

A wide range of information is needed to facilitate thorough planning and costing and a rapid response to invitations to tender including relevant documents, such as, the Regional corporate contract, the Director of Public Health Annual Report, local purchasers intentions and the community care plan.

Punt (1996 p84) lists five 'key issues' integral to the contracting process; volume, cost, quality, effectiveness, and efficiency .

Effective contracting was an essential feature of the internal market.

4.7.4 *Service Specifications*

Service specifications are needed in the contracting process. Medical and clinical audit procedures and quality assurance measures were all identified as important elements for service specifications and methods for service costing and pricing and a tendering process for the provision of some services are

required together with indications of the volume of work to be undertaken. NHSME (1993a, 1993c, 1993d, 1994).

A service specification is a description or profile of the service to be offered. It may be constructed as part of an internal service agreement within a provider unit or in response to an invitation to tender, where it may be used as a basis for negotiation between the physiotherapy service as a provider and the purchaser. The service specification forms part of the business plan and accompanies the contract document if and when this is awarded.

There may be a large number of service specifications for individual elements of the physiotherapy service and therefore service specifications have no set format. A typical physiotherapy service specification, CSP (1994) includes:

> introduction to the physiotherapy service and to the specific areas to which the document relates
>
> philosophy and/or mission statement
>
> organisational structure
>
> notes on management systems including personnel management, quality management, staffing levels or numbers of staff by grade or skill mix, methods of identifying and carrying out training and in-service education for staff physical resources, perhaps location, specific equipment scope of the service: a definition in terms of specialities or client age groups, preventative and health education/promotion initiatives, the time the services are available, the expected volume of work including emergency or out of hours services, the arrangements for referrals and access to the service, waiting list arrangements, system for allocating priorities and discharge arrangements
>
> quality systems including standards adhered to, clinical audit systems, methods of outcome measurement

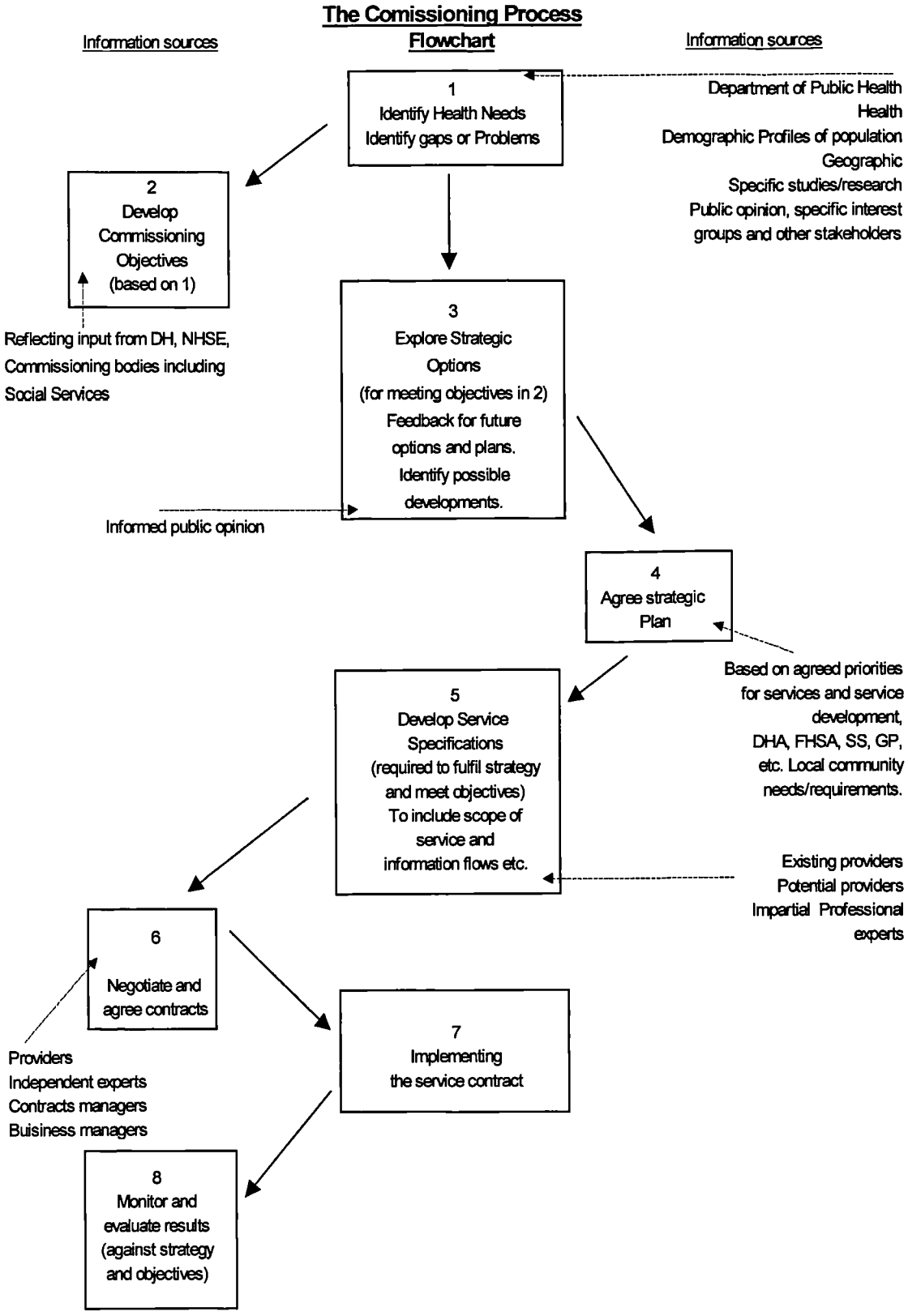

The Comissioning Process
Flowchart
Information sources
Information sources
1
Identify Health Needs
Identify gaps or Problems
Department of Public Health
Health
Demographic Profiles of population
Geographic
Specific studies/research
Public opinion, specific interest
groups and other stakeholders
2
Develop
Commissioning
Objectives
(based on 1)
Reflecting input from DH, NHSE,
Commissioning bodies including
Social Services
3
Explore Strategic
Options
(for meeting objectives in 2)
Feedback for future
options and plans.
Identify possible
developments.
Informed public opinion
4
Agree strategic
Plan
Based on agreed priorities
for services and service
development,
DHA, FHSA, SS, GP,
etc. Local community
needs/requirements.
5
Develop Service
Specifications
(required to fulfil strategy
and meet objectives)
To include scope of
service and
information flows etc.
Existing providers
Potential providers
Impartial Professional
experts
6
Negotiate and
agree contracts
Providers
Independent experts
Contracts managers
Buisiness managers
7
Implementing
the service contract
8
Monitor and
evaluate results
(against strategy
and objectives)

Figure 4.9

a statement regarding compliance with purchasers' existing policies and procedures communication mechanisms and information systems

Figure 4.9 (above) is a commissioning process flow chart devised by the researcher which shows the stages of this process.

4.8 Overview

The changes that took place in the structure, organization and management of the NHS between 1979 and 1988 represent a preliminary series of synergistic events which underpinned and formed an essential foundation for the radical reforms introduced in 1989. An important concomitant was an increased appreciation of the value of and dependence on IM&T which provided the vital instrument for driving the NHS forward into a new era of 'internal market' competition.

The requirement to provide more detailed and relevant information than ever before was fundamental to the NHS reforms, as was the way in which health services – including physiotherapy – were to be purchased and provided. Physiotherapy managers are now required to market their services, participate in drawing up service specifications and to agree contracts. They are involved in a plethora of managerial tasks such as clinical audit, outcome measurement procedures and quality standards to monitor patient care and staff activity.

"Information in healthcare is power and the use of information systems in physiotherapy will enable physiotherapists to make their own particular contributions to the contracting process".

(Jones, 1994a p1)

It is unlikely that the business environment in which the NHS is now operating could be sustained without a flow of relevant up-to-date good quality information and this, together with the managerial needs within the NHS, and physiotherapy itself, are further imperatives to the development and use of computerized information systems. These provide further essential elements of the problem situation which forms the basis of this research:

"Homosapiens survived for over one hundred thousand years by napping flints into tools for hunting, processing food and building shelters. Metal tools fulfilled the same role for a little more than ten thousand years. The industrial revolution started around the mid 18th century, just over 200 years ago. The information age is barely 30 years old. Whether you believe in revolutions or not, it is clear that the rate of social change is increasing and currently the greatest influence on change is our ability to process information".

(Thomas 1995 p9)

CHAPTER FIVE

LITERATURE REVIEW

5.1 Introduction

The major focus of this chapter is the literature review which provides a theoretical framework for the thesis. This research uses the NIMSAD framework (5.2.5.8 below), Jayaratna (1997) as a conceptual device to raise questions in the mind of the methodology user – the researcher. The first two elements of the framework, the problem situation or methodology context and the problem solver methodology user are the basis for chapters 1-4 (above), Jayaratna (1997 p128).

In chapter 1 the researcher is identified as the problem solver and in chapters 2, 3 and 4 components of the problem situation are examined. Chapter 6, comprises the empirical research study, which is supplementary to the action research project. In chapter 7 the problem solving process, element three of the NIMSAD framework – the action research project is set out and discussed while in chapter 8 an evaluation of the study is presented – element four of the NIMSAD framework.

5.2 Literature Review

An extensive range of literature including books, articles and papers was drawn upon to provide a theoretical foundation for the thesis. The literature survey is divided into several sections; firstly that relating to the research approach which is reported in 5.2.1 (below). Secondly, the literature relating to chapters 2, 3 and 4

inclusive; next a literature search for the supplementary empirical study reported in chapter 6 (below), the literature review undertaken for the case study and finally the literature relevant to the evaluation and conclusion of the research.

5.2.1 *Action Research*

The research method adopted for the case study was based on an action research approach and literature relevant to this project is reviewed here.

Action research was defined by Cohen and Manion (1986 p208) as:

> *"an on the spot procedure designed to deal with a concrete problem located in an immediate situation"*

They argue that action research should be used:

> *"wherever specific knowledge is required for a specific purpose in a specific situation"*
> *(Cohen and Manion 1986 p216).*

According to Elliott (1991) the fundamental aim of action research is to improve the current practice rather than generate new theory. The role of the researcher in action research is that of an interventionist who is actively involved in planning, implementing, monitoring and evaluating changes in policy; rather than that of a detached outsider. French (1993 p180) asserts that :

> *"The main aim of action research is to change given practice or solve a particular problem within a given, practical context: The problem is never studied in isolation from the social setting which gives it meaning".*

The origins of action research are relatively recent in comparison with more traditional research methods. An early use of action research is accredited to Kurt

Lewin (1946) a social psychologist who wanted to help people move forward by studying their own relationships and lives.

> *"Lewin does not seem to have used any comprehensive definition of the term but he nevertheless refers to research programmes within organizations whose progress is guided by the needs of the organisations, and frequently uses the expression 'problem centred research'".*
>
> *(Gill and Johnson 1991 p58)*

According to Lewin, the main facet of action research is that it should be:

> *"focused on problems and that it should lead to some kind of action and research on the effects of that action by understanding the dynamic nature of change and studying it under controlled conditions as it took place"*
>
> *(Gill and Johnson 1991 p59)*

Lewin described action research as being composed of a spiral of steps. Each step has four stages; planning, acting, observing and reflecting. Each problem is identified, an aim is set, actions taken and an evaluation made. He stressed the problems and limitations of studying social events of a complex nature in laboratory conditions. However, Lewin does not emphasize the importance of revising the plan and reinitiating the whole process as the work develops: An approach that would be essential to the study reported in this thesis. Kemmis and McTaggart (1988) extrapolate Lewin`s original concept to include a link with a second spiral, which as a result of the original research, provides a focus for revising the original planning step. This takes into consideration any changes that were deemed desirable from the first cyclical stage.

Action research is not the first choice method in all circumstances, however, it is particularly appropriate where problem solving and improvement are required:

> *"The combination of enquiry, intervention and evaluation which powers the action research cycle mirrors the iterative processes employed by professional staff in assessing the needs of vulnerable people, responding to them and reviewing progress".*
>
> *(Hart and Bond 1995 p3)*

Figure 5.1 (below) demonstrates the action research cycle.

AN ACTION RESEARCH CYCLE

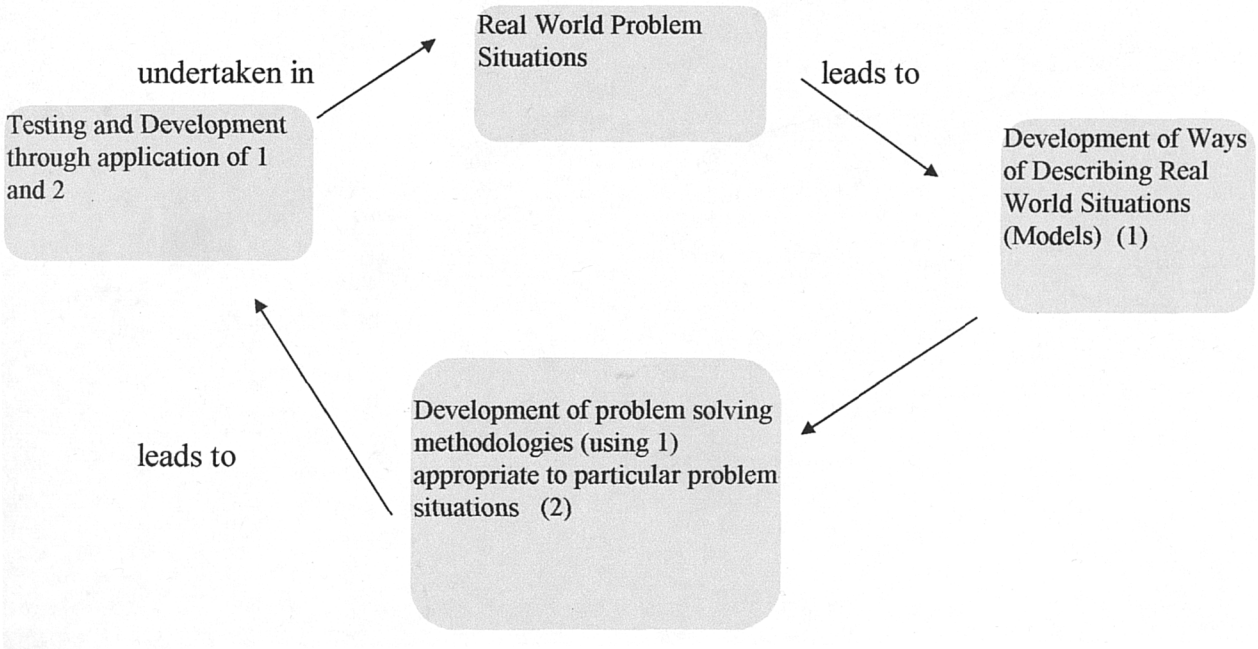


Figure 5.1
(Hart and Bond 1995 p3)

The emphasis of modern action research is "upon awareness raising and empowerment and upon finding ways for researchers and practitioners to work collaboratively and for practitioners to become action researchers in their own rights", Hart and Bond (1995 p21). The concept of action research has evolved to

"an expression of an essentially democratic spirit in social research" Kemmis et al (1982 p14):

> *"Action research aims to contribute both to the practical concerns of people in an immediate problematic situation*
>
> *and to the goals of social science by joint collaboration within a mutually acceptable ethical framework"*
>
> *(Rapoport 1970)*

It is clear from these authors that the action research approach emphasizes a problem focused, context specific and future orientated process. It is founded on a research relationship where the people involved are participants in the change process.

Action research is applicable to any social system, although the method does not appear to have been widely used within physiotherapy. It is recognised that Action Research has possible disadvantages as well as benefits of which the researcher was aware at the outset of the project. Some criticisms of the method are cited by Manion and Cohen (1994 p193) as:

> *"Its objective is situational and specific; its sample is restrictive and unrepresentative; it has little or no control over independent variables; its findings are not generalizeable but generally restricted to the environment in which the research is carried out".*

Although these criticisms might be valid in many cases, they were of less significance to the outcome of this action research project as borne out by the

successful implementation of the Eastbourne system and at least twelve other Trusts nationally.

French (1986) found several reasons why practising physiotherapists were inhibited from undertaking research, including; expense, lack of time and knowledge, and a greater interest in clinical work. Action research, however, is adaptable and flexible and this method can be used to effect change despite these constraints. This method of research has the advantage over more traditional approaches, having the potential of implementing solutions to problems quickly. Whitehead (1985) states that teachers "tend to decry educational theory because it does not relate to their practical skills or their immediate concerns". It might be that this is also the case for physiotherapists. Therefore, as Bell (1987 p5) emphasizes:

> *"The essentially practical problem solving nature of action research makes this approach attractive to practitioner-researchers who have identified a problem during the course of their work, see the merit of investigating it and, if possible, of improving practice."*

The distinction between action research, applied research and evaluation research is not always clear cut. Cohen and Manion (1986) suggested that although applied research and action research are scientific, action research is less scientifically rigorous in application of methods. Whereas applied research is often concerned with large representative samples and the control of independent variables, action research is more concerned with specific small scale problems. Applied research is concerned mainly with establishing relationships and testing hypotheses and is strict in application of the conditions within the method. This results in precise sampling

techniques, large samples and exacting precise controls over variables; it does not seek to provide solutions to the problems. Action research, however, interprets the scientific method more loosely due to the notion that it is concentrating on a specific problem in a specific area. The action research method is less concerned with generating general scientific knowledge, but rather, is concerned with generating knowledge for a particular situation and purpose. Thus, strict conditions and rigorous testing are less stringent in action research than in applied research.

Evaluation research is, according to Smith (1985 p293):

> *"The assessment of the effectiveness of social programmes already put in practice which were designed as tentative solutions to existing social problems".*

The evaluative element, however, is often part of action research and both action research and evaluation research can be subsumed under applied research, Judd et al (1991).

5.2.2 *The Problem Situation - Literature Review*

Physiotherapy in common with all other sections of the NHS was required to participate in the information revolution taking place. The approach adopted to solve the physiotherapy information systems problem was a practical one, an important element of which was the involvement of users - physiotherapists - in the system design process, led by the researcher. Such a participative user-centred approach to computer systems design is explored in this literature review.

A wide range of literature relevant to the structure, organization and management of the NHS was studied, concentrating particularly on the period since the election of the Conservative Government in 1979, chapter 4 (above). An extensive literature on the role, scope and spectrum of physiotherapy and a wide range of management literature was also drawn upon, chapters 3 and 4 (above). The literature sources included official documents, papers, reports and statements published by Government departments as well as material from other official bodies and organizations. These documents were studied in order to gain a full background to the politics and history of the NHS, particularly during the period under review, to clarify the structure, organization and management of the NHS. The development and use of computerized information systems taking place in tandem with these changes together with literature defining key terminology relevant to computerized information systems, chapter 2 (above) was also studied extensively. A range of books, articles and papers together with professional literature produced by the CSP and other organizations and individuals, including physiotherapists and NHS managers, was also consulted in depth. Although sometimes subjective, these were important sources of background information on many aspects including general management, politics of NHS management and the 'official' CSP point of view. An important literature source was provided by academic and clinical authors on topics such as management, effectiveness and efficiency, physiotherapy practice, research methodology and computerized information systems, all of which were essential to the development of the thesis,

the empirical study, and the case study. A wide range of academic and professional literature on the growth of professionalization and occupational development much of it American in origin was also reviewed to inform the discussion on professionalization of physiotherapy. The understanding derived from the review of this literature provided the preliminary framework for the direction of the research elucidating the many elements of the problem situation.

5.2.3 *Supplementary Empirical Study - Literature Search*

A comprehensive on-line computer literature search was undertaken by the researcher. The key words used to search data bases were; 'information and physical therapy/physiotherapy', 'computerized information systems in physical therapy/physiotherapy' and 'management systems and physical therapy/physiotherapy'.

A total of sixty-one papers were identified and on investigation all but one proved to be irrelevant to this study. The papers covered a range of topics mostly on clinical matters, record keeping, use of equipment, education and individual performance review. The only publication listed in the topic area relevant to this study was written jointly by the researcher and the Secretary of the CSP, Simon and Jones (1987).

The on-line literature searches undertaken as part of this review reveal that a minimum of work had been carried out in the areas of study of interest to the researcher. Therefore, it is reasonable to assume that the proposed programme of research for this thesis would result in a new significant contribution to the literature in this area. The researcher has already published a number of papers and articles related to this work (1.6 above and Appendix 1).

A range of literature was consulted on survey methodologies, statistics and the presentation of survey findings. The publications included McCall (1996), Moser, and Katton (1975), Partridge and Barnitt (1986) and Howard and Sharp (1983). The methodology adopted for the supplementary empirical study is reported in 6.22 (below) and the survey findings are presented and discussed in 6.3 and 6.4 (below).

5.2.4. *Reliability and Validity*

The concepts of reliability and validity are central to the research process and the academic literature in this area is extensive. A range of books and papers on research methodology was drawn upon for this study.

Reliability and validity are often poorly distinguished from one another; purported claims of validity often only demonstrate reliability:

> *"at the most general level there are two basic properties of empirical measurements.... Reliability concerns the extent to which an experiment, test, or any measuring procedure yields the same results on repeated trials".*
>
> *(Carmines and Zeller 1988 p22)*

In order to provide an accurate representation of an abstract concept a measure must also be valid. Whilst reliability is focused on a particular property of empirical indicators – the extent to which they provide consistent results across repeated measurements – validity concerns the crucial relationship between concept and indicator:

> *"Reliability refers to the extent to which you can rely on the results obtained from an instrument ...(it) refers to the degree of consistency with which an instrument measures an attribute or the ability of an instrument or indicator to produce similar scores on repeated testing occasions that occur under similar conditions".*
>
> *(DePoy and Gitlin 1994 p202).*

An example of reliability would be a measuring rule, which rather then being twelve inches in length is only eleven inches long, if used to measure a table which is three feet wide (thirty six inches) this ruler will consistently understate the width of the table by three inches. This particular ruler has given an invalid indication of the width of the table, however these results do not affect the reliability of the ruler, as a measuring tool.

Thus:

> *"The reliability of a measure indicates the stability and consistency with which the instrument is measuring the concept".*
>
> *(Sekaran 1992 p173)*

While reliability relates to the reproducibility of measurements:

> *"validity deals with the accuracy (correctness) of inferences drawn from such measurements".*
>
> *(Sim and Arnell 1993 p103)*

In summary, the reliability of a test is the degree to which the results obtained in using the test are reproducible, Michels (1982 p828), and it is argued by DePoy and Gitlin (1994 p293) that the:

> *"reduction of ambiguity decreases the likelihood of misinterpretation and thus of error, the longer the test or more information collected to represent the underlying concept, the more reliable the instrument will become"*

Polgar and Thomas (1991 p333) define validity as "the extent to which a test measures what it is intended to measure", and Sekaran (1992 p373) defines the concept of validity as "evidence that the instrument, technique, or process used to measure a concept does indeed measure the intended concept". Using the example of the measuring ruler and table set out above, the concept of validity can be demonstrated considering the measurement of the table using the eleven inch ruler. If, on repeated measurement of the same table, the same readings are reproduced they are said to be reliable. However, this is not to say that the measurements produced are valid. Although the readings have been the same each time the table was measured, it does not show that the readings are a true representation of the entity – the width of the table. Additional independent information would be required to validate the true width of the table and it would therefore be necessary for the measuring rule to be calibrated against a measure of known accuracy. In relation to research two broad types of validity are important:

> *"The notion of external validity refers to the extent to which the findings of research conducted on a sample can be generalized to the population from which the sample was drawn. The notion of internal validity, in contrast, refers to the possibility that the conclusions drawn from experimental results may not accurately reflect what has*

gone on in the experiment itself".

(Sim and Arnell 1993 p193).

In the context of questionnaire inquiries Payton (1988 p74) in discussing research design states that:

> *"predictive statements about the external validity is concerned with generalization from the sample to the population, therefore, methods of sampling are crucial... the more externally valid the study the more safely one can make the basis of the results of the study"*

The concepts of reliability and validity including external validity are relevant to the empirical research, chapter 6 (below) and the CSP questionnaire study, (2.4.3 above).

5.2.5 *Information Systems Design and The Action Research Project*

It is not the remit here or in the thesis generally to examine and discuss in detail the technicalities of computerized information systems design. The focus of this section of the literature review is to identify literature which relates to the work undertaken in the action research project.

5.2.5.1 *Introduction*

Many of the changes in the NHS which have taken place during the last two decades have been accompanied by technological developments including developments in information technology (IT). The advance of IT has often not been accomplished successfully:

> *"Many information systems are never delivered or never used, with a figure in the region of forty per cent being*

suggested (Eason 1988). In addition, perhaps only twenty per cent of systems have a positive effect on organization, the remaining forty per cent having only a neutral effect.
(Flynn 1992 p13)

A survey by Asby (1992) found that only 11% of British companies invest effectively in IT whilst 62% have experienced run-away projects that fail to meet budgets and delivery deadlines. It has been recognised, for example, in the Department of Trade and Industry (DTI) Usability Programme that designing and implementing systems must be more user-centred, DTI (1990). Along with the notion of user-centred design comes:

"The idea that most people who become users will play some role in the planning and implementation of new systems".
(Eason 1988 p218)

User-centred design goes much of the way towards achieving this goal. 'Fully participatory' design is based on Ackoff's definition of participants, being all those directly affected by the system, that is, the stakeholders. The IT industry seems to have taken seriously the concept of taking user interests into consideration only to the extent of designing user-friendly interfaces. Software houses have consistently targeted organizations rather than end users making it difficult to incorporate users into the design process. This is certainly true within the NHS and particularly in the case of physiotherapy where off-the-shelf software systems developed for other users were imposed upon physiotherapy services, (2.4.2 above) and chapter 6 (below):

"Traditional systems development is based on a defined power relationship where control is firmly held by management and system developers respond to managers'

set objectives, as a consultant or specialist would. In participatory design the system developer assumes the role of facilitator between equal groups. The potential for conflict arises when previously defined areas designated managerial in the decision making context are infringed by user".

(Louw 1994 p160)

In traditional systems analysis methodology, the importance of user involvement was often stressed:

"However, the computer professional was the person making the real decisions and driving the development process. Systems analysts were trained in, and knowledgeable of, the technological and economic aspects of computer applications but far more rarely on the human (or behavioural) aspects which are at least as important".

Avison and Fitzgerald (1995) p87

Major problems associated with systems analysis "arise in the understanding of the user's environment and the subsequent specification of the user's requirements, Cutts (1991 p8). Problems may arise from difficulties in communication between the user and systems analyst, and the analyst can find it very difficult to learn enough about the business to observe the system from the point of view of the user. Also, the users rarely know enough about computer systems to be able to specify their requirements accurately, unambiguously and precisely.

5.2.5.2 *The Conventional Approach*

During the 1950s and 1960s there was no widely accepted formalized methodology for the development of data processing systems.

> *"In these early days the people who implemented computer systems were computer programmers who were not necessarily good communicators nor understood the users' requirements"*
>
> *(Avison and Fitzgerald 1995 p17)*

Systems users were often discontented with their systems because their needs had not be properly identified.

Conventional systems analysis - also known as: traditional systems analysis, the systems development life cycle or the waterfall model – Avison and Fitzgerald (1995 p20) comprises a methodology with six main stages; a feasibility study, system investigation, systems analysis, systems design, implementation and lastly review and maintenance. This methodology was recommended by the National Computing Centre (NCC) in the UK during the late 1960s and 1970s. Avison and Fitzgerald (1995) cite the potential strengths of conventional systems analysis as: a series of phases starting from the feasibility study through to review and maintenance, techniques to evaluate the costs and benefits of different solutions and methods, a series of tools such as project management tools, a training scheme to enable analysts and others new to their roles and responsibilities to adopt the standards suggested and finally, a philosophy that computer systems are usually good solutions to clerical problems. The same authors, Avison and Fitzgerald (1995 p30), identify possible weaknesses of this approach as: failure to meet the needs of management, unambitious systems design, instability, inflexibility, user dissatisfaction, problems with documentation, lack of control, incomplete systems, application backlog, maintenance and workload.

5.2.5.3 ***SSADM***

Structured Systems Analysis and Design Method (SSADM) has been adopted in a number of Government applications since 1981 and its use has been mandatory in many Civil Service applications since 1983, Downs et al (1988 p1). SSADM is an important systems development methodology which has been in the forefront of methodologies in Britain since the 1980s. The origin of SSADM was with Learmonth and Burchett Management Systems, who developed it in conjunction with the Government's Central Computer and Telecommunications Agency. It was specified that the methodology should be self-checking, use tried-and-tested techniques, 'be tailorable and be teachable':

> *"The methodology provides project development staff with very detailed rules and guidelines to work to. It is highly structured...documentation pervades all aspects of the information systems project."*
>
> *(Avison and Fitzgerald 1995 p294)*

SSADM is one of the most widely used structured methods in this country, it requires a significant investment in training and learning curves.

> *"Even though SSADM adopts this rather prescriptive approach, there is still a large amount of flexibility within the method and the method should be tailored to specific project circumstances."*
>
> *(Ashworth and Goodland 1990 p7)*

The defined methodological approach of SSADM has been most often used in very large systems design and within large organizations where there might be strong

arguments for the use of prescriptive, formalized and thoroughly documented approaches. However, in the development of smaller systems such as that required by NHS physiotherapy services or the PAMs as a whole a more flexible approach to the design and development work would be likely to be appropriate and achieve satisfactory results for the systems users. However, many elements of SSADM would undoubtedly be incorporated into the design process in a less formalized manner. A SSADM fourth version was issued during 1990 covering business analysis and systems design stages. In this version, the stages cover feasibility, requirement specification and logical and physical design allowing for effective iteration such as may be achieved by using prototyping methods (5.2.5.7 below). However, the overall dependence on extensive rules and guidelines is indicative of a rationalistic approach (5.2.5.4 below).

There are dangers in viewing an information system in isolation from its organizational context in that it may then not be seen as a component and product of the organization itself. Dumdum and Klein (1986) believe that the failure of information systems methodologies may be ascribed to ignorance of organizational, social and psychological factors. To link information systems with the goals and work of the organization might be a way around this problem. "Each possible approach to the design of an information system depends on the characteristics of the business area in question", Olle et al (1991). The match or fit, of computerized information systems with the goals and work of the organization, or

in this case physiotherapy services, would seem to indicate higher potential organizational performance.

5.2.5.4 *Other Methodologies*

Morgan (1986) describes the rationalistic or 'mechanistic' approach which is the foundation for much of the traditional and conventional literature on information systems design. It views efficient systems design as being one of maximum extraction, codification and automation of knowledge and skills. Ehn and Kyng (1984) analyse this approach:

> *"Structure plays a dominant role. A system consists of a collection of objects and their relations. Processes occur within fixed boundaries; and the basic aspects of the objects and their relations are further unaffected by the processes".*

A means of describing this approach to information systems design is provided by Kling (1987) who refers to them as discrete entity models. They are bounded by rules and procedures along bureaucratic lines. They focus on explicit economic, physical or information processing features of the technology. Some IT systems' designers still operate from this sort of rationalistic perspective and design systems that reflect a predetermined fixed pattern. However, lack of user involvement in the design process and the associated problems of lack of ownership could be a reason for the rejection of traditional systems. Other reasons might include the inflexibility of systems that were difficult to change once programmed; inability to comprehend the implications of decisions that might have been taken too lightly by potential users without an adequate knowledge or understanding of the technology,

and the lack of weighting placed on documentation, maintenance and training resulting in difficulties in undertaking change development. The researcher held that the limitations of the rationalistic approach would result in the adoption of an inflexible and rigid system. Other methodologies based on a rationalistic approach which were rejected included the adoption of a top down approach where managerial needs were reconciled without considering operational needs; a method by which discrete problems would be focused upon, in isolation from the work context. An important factor in the development of a computerized system for physiotherapy was held by the researcher to be thoroughness in paying attention to the definition of the problem. Should the diagnosis of the problem be ignored there might be the possibility of fewer benefits to the users.

Olle (1991 p1) recognizes the need for methodology to mean 'a study of method', he defines information systems methodology as 'a methodical approach to information systems planning, analysis and design'. Some methodologies have evolved based on an holistic philosophy. Checkland's Soft Systems Methodology (SSM) (1981) incorporates the human element to such an extent that he describes the system as Human Activity Systems. It incorporates the view that participants have different perspectives and, therefore, different expectations, Checkland (1991 p115-119). It was classified as an 'issues-oriented' methodology, Jayaratna (1988). Its strength is that it makes its users approach problem solving situations with an open mind and with a powerful set of conceptual notions; it has now been further developed:

"The new version is based on the former one and incorporates

many lessons learned from the application of the former in 'action research"

(Jayaratna 1997 p175)

Other holistic methodologies include: Beer's Viable Systems Model (1985), Wood-Harper, Antill and Avison's Multiview (1985) which incorporates Checkland's as one of the "views", and Mumford's Effective Technical and Human Implementation of Computer-based Systems (ETHICS), Mumford and Weir, (1979).

The SSM and ETHICS methodologies do not adopt a reductionist approach of breaking down systems into their constituent parts and use many systems concepts. SSM focuses on the need to create systems for the organization as a whole as opposed to the isolated problem area.

5.2.5.5 ***ETHICS***

ETHICS is an acronym for Effective Technical and Human Implementation of Computer-based Systems. It is concerned with the design process and:

"in encouraging the participation of those organizational members whose lives may be affected by the design".

(Jayaratna 1997 p151)

ETHICS is meant to imply that it is a methodology that embodies an ethical position. This methodology - devised by Enid Mumford - is based on the participative approach to information systems development. It encompasses the

socio-technical view that for a system to be effective, the technology must fit closely with the social and organizational factors:

> *"This means that an improved quality of working life and enhanced job satisfaction of the users must be a major objective of the systems design process. This is not simply to guard the interests of the users in the introduction of computing and technology, although this is obviously of major importance, but it is an essential prerequisite to achieve effective systems as far as the organization and its management is concerned... to support her case, Mumford points to the failure of many traditionally - performed system implementations, where technical and economic objectives were the only consideration".*
>
> *(Avison and Fitzgerald 1995 p353)*

The philosophy of Mumford's ETHICS methodology differs from some other computerized information systems development methodologies. The philosophy was evolved from organizational behaviour and perceives the development of systems as an organizational issue fundamentally concerned with the process of change, rather than a technical issue. It is based on the socio-technical approach of the social sciences.

> *"ETHICS is a problem solving methodology that has been developed to assist the introduction of organizational systems incorporating new technology. It has as its principal objective the successful integration of company objectives with the needs of employees and customers... it is an ethical approach to systems design because it assists designers to maximize human gains while achieving business and technical excellence".*
>
> *(Mumford 1983b p64)*

ETHICS is made up of fifteen steps with parallel processes seeking social systems solutions and technical system solutions, Mumford (1983b pp68-105, Table 5.1 below).

ETHICS Methodology - The Fifteen Steps

Step 1	Why Change?
Step 2	System Boundaries
Step 3	Description of Existing System
Step 4	Definition of Key Objectives
Step 5	Definition of Key Tasks
Step 6	Key Information Needs
Step 7	Diagnosis of Efficiency Needs
Step 8	Diagnosis of Job Satisfaction Needs
Step 9	Future Analysis
Step 10	Specifying and Weighting Efficiency and Job Satisfaction Needs and Objectives
Step 11	The Organizational Design of the New System
Step 12	Technical Options
Step 13	The Preparation of a Detailed Work Design
Step 14	Implementation
Step 15	Evaluation

Table 5.1

Some methodologies advocate the need for user participation and ETHICS regards this as essential. The structure of ETHICS is such that users are involved in decisions affecting their job satisfaction as well as all other aspects of the work process. Users are involved from the outset as part of the design group comprising a cross-section of user representatives who work with design specialists. The group examines their current work organization and proposes alternative work processes . In summary, arguments which underpin the ETHICS methodology are that people should be able to influence the design of their own work situations and that if this kind of intervention is encouraged then there are likely to be both job satisfaction and efficiency gains. Unless job satisfaction and quality of working life objectives are made explicit, and the computer system and associated organization of work designed to achieve these, the human impact of a new computer system will be unpredictable because it has not been consciously planned for:

> *"Technical design is only one part of a large, complex, design process which includes everything that both interacts with and surrounds the technical system in the total design task. Experience has shown that user involvement, clear job satisfaction objectives and a recognition of organizational factors will greatly assist the successful planning, design and implementation of computer based work systems".*
>
> *(Mumford 1983b pp9 and 10)*

5.2.5.6 **The Participatory Design Approach**

The participatory design approach - also known as the Scandinavian approach - incorporates a number of concepts that fundamentally challenge traditional concepts of systems development. Among these ideas is the shift in focus from

computer applications suiting the business needs to computer applications suiting users' skills and working practices. The emphasis on user interaction is an important component as it alters previous perceptions of work being a machine-centred goal-focused process to work being a social activity. Together with these ideas is the view that communication between technologists and users is the important element and that barriers preventing communication from taking place effectively must be broken down. Participating in the design of systems necessitates involvement in the design of a set of complementary integrated activities such as job design, work content and technological support. The purpose of participation is the enabling of users to allow not only their experience and knowledge to be used, but also to develop an environment where their creativity can be expressed, Hales (1993). Hales uses the metaphor of a developing system as a seed rather than the engineering approach to development that sees it as a nail to be hammered. In the place of the hammer he suggests the use of a softer more nurturing approach 'think seed and garden not hammer and factory', Hales (1993 p215).

Methods of incorporating human factors in designing systems are now being studied. The recognition of human factors in the development of information systems which was introduced principally by the socio-technical approach was enhanced significantly by developments in Sweden and Norway during the 1960s. A key phrase of the time was 'job satisfaction and productivity' which influenced production and management techniques, Lassoe and Ramuaawm (1989). In

1962 the beginning of the Norwegian Industrial Democracy Project had a significant influence on enhancing user participation in systems development. A participation project was started with the principal objective of answering the question 'under what conditions can more rights and responsibilities be achieved for the individual in the work place?' In 1975, the recognition of the need to consult and involve users in system development was legally agreed by the National Employers Federation and the Trade Unions in Norway and passed as a statute of law. In effect, unions had the right to elect 'data shop stewards' who would represent the interests of the users, Louw (1994 p87).

Implicit in the greater involvement of systems development was a recognition of changes that needed to be made. The changes related to perception of users, their work practices and the work processes within the organization and were made possible by a shift in emphasis. A number of concepts evolved including 'situated design' and 'mutual understanding'. The design ideas that accompany these concepts were centred on the users' full participation with high levels of training and active co-operation of decision makers in the organization. The emphasis on co-operation is illustrated in the adoption of the Japanese approach of 'people first, technology second' by the Scandinavian approach of 'co-operation first, people second and technology third', Louw (1994 p88). The idea of 'shared knowledge' is introduced based on the tacit knowledge of the users and the need to establish suitable levels of communication. The emphasis on quality products and productivity is stressed. The political context of organizations is recognised, in

particular, the role of conflict in that context. One reason for conflict developing is the mis-alignment of objectives that may arise between managers and users as well as users and technologists. The need to understand current working methods is crucial in this approach. Initial development begins with an assessment of how computers may fit into the work organization. The term 'use situation' has been coined to incorporate this concept, Greenbaum and Kyng (1991). These authors contrast the work done in isolation in traditional systems development to the approach outlined above:

> *"The premise of our approach shifts to looking at groups interacting in multifarious ways within complex organizational contexts. And, by the same token, although traditional methods require describing these work tasks, our approach is based on the belief that the complex pattern of workplace life is not easily describable...we need new tools and techniques to capture this complexity, and to develop a more detailed understanding of its depth".*
>
> *(Greenbaum and Kyng 1991 p4)*

The relationship between users and designers is summarized by them 'users can actively learn, participate and co-operate with systems designers'.

Research into the possible benefits of participative design is mixed. Earlier studies, for example, Hirschheim (1983), suggested that participative approaches to design were not particularly effective. The problems he identified concerned the resolution of disagreements and potential conflicts of interest, establishing boundaries for problems, ensuring trust was established and problems associated

with accusations of manipulation by management. He attempted to measure product quality but found contradictory results mainly because evaluation studies were not undertaken by the organizations involved. Although users did not favour the systems they did tend to support the notion of participation; participative systems design was praised almost universally by those who had been involved with it.

Anderson (1985) found the attitude to systems designed along participative lines to be positive. However, he rejects the need for user participation in decision making in instances where users have a lack of technical knowledge. The Scandinavian response is to emphasize the need for mutual learning and to have conflict resolution techniques addressed by the group. Gill et al (1993) provides a cautionary note:

> *"User involvement, however, is a term with many meanings and does not of itself imply a participative process, if by participative, we mean full entry to the decision making process. It does not necessarily erode the designer's need to fit user requirements around the constraints of the system, nor does it attempt to address wider issues of system design with societal and qualitative perspectives. Indeed, it may imply the reverse as there may only be a widening of the interest group and further embedding of the perspectives of that group".*
>
> *(Gill et al 1993)*

The literature supporting this study is drawn from the work of Mumford and Henshal(1979), Mumford and Weir (1979), Jayaratna (1997), Flynn (1992), Eason

(1988), Greenbaum and Kyng (1991), Avison and Fitzgerald (1995), amongst others (above) and the Scandinavian School of thought on user involvement. The Scandinavian School as described by Greenbaum and Kyng (1991) incorporates an approach which is relevant to this thesis. The issues which they cite and which impact on the project include; the need for full participation and an elaboration of the term, the need to enhance work place skills such as 'respect for tacit knowledge, building on shared knowledge and communication' Greenbaum and Kyng (1991 p2), and seeing computers as tools to support work activities. Other factors which they cite as being important are; improving quality not only productivity of work processes, understanding the conflicts inherent in all design processes and understanding the 'use situation' of computers in work. The action research project reported in this thesis has the user central to the design process and the designer enabling the process. Participative systems design is defined as:

> *"Handling responsibility for the design of a new work system to the employees who eventually will have to operate it".*
>
> *(Flynn 1992 p300)*

Mumford and Weir (1979) note that:

> *"There is a strong argument for using a participative approach to systems design, so that users or their representatives can do their own analysis and arrive at their own preferred solution".*
>
> *(Flynn 1992 p295)*

An important factor in the participative computer systems design approach postulated by Mumford and Henshall (1979) is that the systems users of a

department construct a new form of work organization which is based on a diagnosis by them, of their own needs. The development of PMS and MTS, chapter 7 (below) was also strongly dependent on a prototyping approach – incorporated into the overall participative design method adopted.

5.2.5.7 ***Prototyping and Participation***

One of the crucial factors which motivated the researcher and his colleagues to embark on the development of a computerized information system for the physiotherapy service was the complaint that the physiotherapists, as users, would only see the information system which they were required to use, at the time of implementation. The system which was to be imposed - Comcare – (2.4.2 above) was to be the first and only version; an approach which ran the risk of failure and outright user rejection. It was clear to the researcher that this problem could only be resolved satisfactorily if he and his colleagues - the users - could become central in the design process for a new purpose built system. Prototyping is an approach

> *"lacking tightly written systems design specifications which is capable of providing the user with a tentative system for experimental purposes at the earliest possible time and which can evolve into the production system"*
>
> *(Ashworth and Goodland 1990 p157),*

It is used as 'a response to user dissatisfaction found when using the traditional approach to information systems development', Avison and Fitzgerald (1995 p77).

Avison, (1992 p181) proposes several reasons for organizations to use prototyping when developing applications, including; the avoidance of incorrect requirement specification, to provide a tangible means of assessment, to provide a common baseline, to encourage user participation, and improve user/analyst relationships,.

> *"...One way to reduce this possibility is to develop a prototype first so that the users can see what the output of the final system could be like. If comments are unfavourable, ideas from the user can be implemented on the prototype until the users are happy with it. Users are frequently unsure about what they want from the system, and the prototypes can guide them towards a knowledge and communication of their requirements".*
>
> *(Avison 1992 p181)*

Afferson et al (1992 p380) in describing generic prototyping postulate that prototyping techniques may be used to 'reduce development time and the barriers of knowledge, perception and developed system expectations between end user and developer', Seaton and Stewart (1992), recommended that users are treated as partners in their proposal for evolving task oriented systems. Rector et al (1992) also held this view, arguing that user participation, integral in the development process, leads to a "shared culture" where mutual understanding "advances the development of the system". Mumford (1983) proposed three forms of user participation which were; consultation, representation and consensus. Jayaratna (1994) suggests that participation is simply an advanced form of user involvement, true participation or co-determination rarely taking place due to the political nature of organizational decision making. A possible drawback of prototyping might be the question of whether the resulting computerized

information system is organization specific or generic. Prototyping was used extensively in the development of the Physiotherapy Management System (PMS) reported in the study, chapter 7 (below) and it is clear that in the case of this system the end result of the work was a system that could be used in other services nation-wide and therefore, it is generic and not specific to the Eastbourne Physiotherapy service only.

The rapid realization of a design idea, giving a view of the end product is another essential attribute central to the prototyping process. It captures an initial set of requirements and through iterative discovery builds a system to meet the needs of the users.

5.2.5.8 *NIMSAD Framework*

NIMSAD is an acronym for Normative Information Model-based Systems Analysis and Design. It is a general framework which was derived from:

> *"problem solving in industry, consultancy practice and action research, and can be used for evaluating any methodology, not just information systems methodologies".*
>
> (Jayaratna 1997 p44).

The NIMSAD framework considers problem solving from three integrated conceptual perspectives, namely, the problem situation, the problem solver and the problem solving process, (Figure 5.2 below).

NIMSAD: Elements and Stages

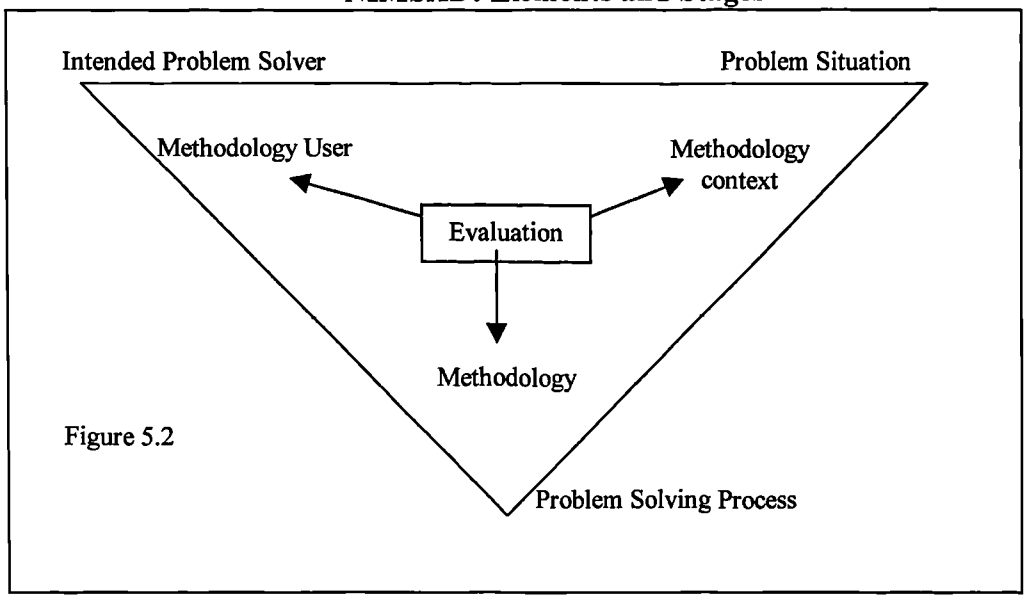


Figure 5.2

Each perspective:

> *"provides a viewpoint of the elements, and its constituent parts, which impinge upon the resolution of a problem"*
>
> *(Lye 1996 p69)*

The framework uses a general model to show some of the essential elements of a problem situation and the formal and informal interconnections and relationships. The problem situation may be examined through using an organizational model showing the interactions between six constituent components which are: people, processes, information, technology, material flows and structures. These elements and their interconnections are dynamic and the degree of the connections depends not only on time and space but also on the perceiver, that is, whether the elements are human relationships, work procedures or technological interactions, different people perceive different connections or levels of connections between the elements. The problem situation serves as the context in which methodologies will

be used. The six components used to examine the problem situation assist an understanding of it and the interactions of stakeholders in the organizational context. The problem situation analysed in chapters 2-4 (above) uses all six of these elements.

The problem solving process has three essential elements which are; problem formulation, solution design and design implementation. However, Jayaratna (1997 p72) has expanded this into eight "detailed stages" which can be applied to any problem solving process.

THE PROBLEM SOLVING PROCESS

Stage	PHASE 1: PROBLEM FORMULATION
1	Understanding the 'Situation of Concern'
2	Performing the Diagnosis
3	Defining the Prognosis outline
4	Defining 'Problems'
5	Deriving Notional systems
	PHASE 2: SOLUTION DESIGN
6	Performing conceptual/logical design
7	Performing physical design
	PHASE 3: DESIGN IMPLEMENTATION
8	Implementing the designs

TABLE 5.2

Before the problem can be properly formulated a good grasp of the contextual situation is needed – stage 1 "understanding the situation of concern" chapters 2-4 (above). Stage 2 – performing the diagnosis – is the explicit projection or expression of the understanding gained from the investigation; chapter 6 (below) also contributes to this understanding formulated from the study undertaken in chapters 2-4. As a result of the study and analysis undertaken for these chapters the researcher, as problem solver, formulated a thorough understanding of the reasons for the state of the situation of concern. This understanding is essential to the diagnosis which having been arrived at, enabled him to proceed to the next stage of the process – defining the prognosis outline. Having studied the situation of concern in depth, the researcher was motivated to move to a new 'desired' situation: the prognosis is the expression of this. When there is a difference between these two states- the current situation and the desired situation - a problem exists, the fourth stage of the problem solving process. At a conceptual level this situation is defined as:

> *"the difference between perceived reality and perceived expectation for that reality, together with a desire to make the perceived expectation become reality"*
>
> *(Jayaratna 1991 p85)*

The main task in this stage is the identification of the absence of elements and the current arrangement of the elements in the diagnosis stage that prevent the transformation from current to desired state. Chapters 2-4 (above) indicate many barriers which militated against the immediate achievement of the desired state,

these included; the speed of changes taking place within the NHS, the cost of developing a stand alone system for physiotherapy services, the idea that other systems solutions would suffice, physiotherapy not being regarded as a high priority in terms of computerizeed systems allocation and a huge agenda for change across the NHS as a whole.

The final part of the problem formulation stage in the NIMSAD framework is of deriving notional systems, that is, developing systems to overcome the previously defined problems. These are systems that can be formulated from our 'mental constructs' as being relevant, and if desired, built and put into operation; they are believed to eliminate the identified problem.

In summary, the problem formulation phase helps the problem solver – researcher – to understand the problem situation by analysing the reasons for problem perception. It assists the problem solver to consider the appropriate use of notional systems to progress the problem situation from the current to a desired state. SSADM and SSM, for example, (above) are two of the methodologies available for performing the analysis, design and implementation stages of the problem solving process. However, the action research project chapter 7 (below) uses elements from a variety of different methodologies.

Jayaratna (1997 p63) stresses the importance of understanding the context of information systems - the problem situation. He also stresses the vital role of the problem solver:

> *"However powerful, useful and effective a methodology may be, the success of effective and efficient information processing systems design and development depends, among other things, on the personal characteristics of the intended problem solver."*

The problem solver is influenced by their personal characteristics which together form the "mental constructs" and govern their decisions and actions. Problem solvers tend to select various elements of the problem situation as being relevant and useful for study and transformation. Some of this selection is founded on "gut feelings" but the selection may at other times be based on concepts, methodologies and models. The interaction between the characteristics is dynamic, it is affected by many internal and external factors.

Transforming the problem situation into the desired situation must be evaluated in order to determine success or failure:

> *"it is the evaluation which helps us to measure the effectiveness of the problem solving process and the problem solver in the problem situation – unless this element is considered there is no way of establishing that the problems have been successfully resolved".*
>
> *(Jayaratna 1997 p108)*

Evaluation should be integral to the research process. It is a key element at all stages: before the intervention to maximise effectiveness; throughout the process to take account of the changing environment; and at the conclusion of the process in order that lessons can be drawn about all elements. Evaluation is the final and most important element of the NIMSAD framework.

5.3 Overview

An extensive and diverse literature was used to underpin the theoretical perspectives which are the foundation of this thesis. The NIMSAD framework has been used to structure the research by focusing the researcher on the different aspects of problem solving from analysing the problem situation, through the problem solving process and evaluation phases. Literature relevant to each of these stages has been studied in depth and presented.

The research was not based on a single methodology, but rather, incorporates elements of many:

> *"The transformation of the organization is far too complex for any one methodology to fully address".*
>
> *(Lye 1996 p70)*

CHAPTER SIX

THE SUPPLEMENTARY EMPIRICAL STUDY

6.1. Introduction

The use of computerized information systems in physiotherapy within the NHS in England was investigated in an empirical study supplementary to the action research study, chapter 7 (below) and this is described in this chapter. The chapter comprises two sections, the first of which outlines the research methods used in this supplementary study, and in the second the survey findings are presented and discussed.

The survey of practitioners reported in this chapter serves as a yardstick against which to assess the computerized information system reported in chapter 7 (below), it centres on the need for senior physiotherapy managers in the NHS to have the use of relevant computerized information systems for managerial and clinical purposes. The need derived from the main themes discussed in the thesis; the imperatives for the development of information systems throughout the NHS as a whole; the scope and spectrum of and demands placed on modern physiotherapy service providers; changes in NHS structure, organisation and management; and the management needs of physiotherapists and managers throughout the NHS both service purchasers and providers.

Since the introduction of general management into the NHS, chapter 4 (above) there has been steadily increasing pressure for the development and use of computerized information systems within the NHS. The many radical changes introduced since the early 1980s culminated in the implementation of the NHS and Community Care Act, Act of Parliament (1990) which resulted in the introduction of an 'internal market', chapter 4 (above).

At the same time as these structural, organisational and managerial upheavals in the NHS were taking place there was a drive to improve the quality, timeliness, relevance, scope and quantity of information at all levels and relating to all activities within the NHS, chapter 2 (above).

The scope and spectrum of modern physiotherapy practice is very wide ranging, chapter 3 (above) and during the 1980s and early 1990s physiotherapists expanded their clinical expertise and types of possible interventions and now provide their services in an ever increasing range of health care settings. As a result of increased information requirements, including Körner, chapter 2 (above), management changes and the NHS reforms of the late 1980s and early 1990s, chapter 4 (above), physiotherapy managers and clinicians now need much more detailed information about the services they provide in order to operate effectively in the 'reformed' NHS. Other managers and clinicians and a wide range of organisations

and individuals with an interest in physiotherapy service provision also require information. There are national and regional requirements for information which must be fulfilled, chapter 2 (above).

Accurate and timely information is required for contracts and business departments within Trusts and there is a requirement for physiotherapists to be working in the development of outcome measures, clinical audit, research and evaluation of practice and so on, chapter 4 (above).

The management roles of senior physiotherapy managers have expanded rapidly since the late 1970s and there is no doubt that in order to fulfil the many demands placed upon them a wide variety of good quality information is required.

Important themes relevant to the empirical study may therefore be summarized as:

> Major changes taking place on a continuum throughout the period of the Conservative Government 1979 to 1997, in NHS structure, organisation and management; culminating in the introduction of an 'internal market' and wide ranging health service reforms.
>
> Government policy in the area of information itself, providing a major imperative to innovate, develop, improve and increase the production, scope quality and quantity of information.
>
> The needs of physiotherapy as a clinical service required to respond to the many new areas of activity such as outcome measurement, clinical audit, research and evaluation.
>
> The management needs of physiotherapy managers enabling them to manage their services in a new and demanding environment.

The researcher decided to assess the use of computerized information systems by physiotherapy managers; to analyse the impact of such systems and to obtain information on the views of senior physiotherapy managers about the use and relevance of computerized information systems in physiotherapy because there was not literature in this area and no previous research had been undertaken. The investigation would also consider the aspirations of those physiotherapy managers who did not have computerized information systems within their services and those who had no access to shared computerized information systems within their units.

It seemed likely that senior physiotherapy managers would need to acquire relevant computerized information systems in order to operate successfully in the new environment and in response to the many other demands placed upon the services. It was also considered likely that some of these managers would already be actively engaged on working with computerized information systems and it was therefore decided to test whether this was so and to examine the scope, impact, and manner of systems development and implementation.

6.2 The Supplementary Empirical Study

The main objective of the empirical investigation was to gather information on;

the management roles of senior physiotherapy managers, the numbers of senior physiotherapy managers whose services use computerized information systems

specific to their own services or shared with other disciplines, and to ascertain a wide range of information about the procurement, provision, development and use of these systems. It was also necessary to establish the number of physiotherapy services not using or having access to computerized information systems specific to their own services or shared with other disciplines, to seek the managers views and ascertain whether they felt able to cope successfully without computer systems, to provide senior physiotherapy managers with an opportunity to comment on the issue of computerized information systems for their services in order to ascertain the range of views and to establish any conclusions which could be drawn from these and to use the information obtained to supplement and inform the major study, chapters 7 and 8 (below), and the thesis as a whole.

6.2.1 *Literature Review*

The literature search and review is reported in (5.2.3 above).

6.2.2 *The Study Method*

There has been no methodical, valid national study investigating the topic of computerized information systems with particular reference to physiotherapy services in the NHS. The information available in this area is extremely limited amounting to a handful of publications only.

The only attempt to assess the situation was the flawed survey undertaken by the CSP in 1988, (2.4.3 above). A postal questionnaire survey was undertaken with the most senior physiotherapy managers in two hundred units throughout all regions of England and a search of the professional literature was undertaken, chapter 5 (above). The questionnaire (Appendix 9) was designed to be wide ranging and to provide results from which generalisations could be made. The selection of this method also took account of the limited resources available to the individual researcher undertaking the study. Crucial to the success of the survey was the requirement to obtain a wide range of relevant information to use as a yardstick with which to inform the action research case study and arguments put forward in the thesis.

6.2.3 *The Postal Survey*

The questionnaire was designed to fulfil the criteria set out in 6.2.1 (above). The advantages of this method rather than an interview survey were that the cost would be relatively small; it would be possible to pilot the questionnaire quickly through colleagues in the same region as the researcher, and many responses could be obtained and processed. The study could be mounted on a national basis using only the single researcher rather than a series of interviewers with the added complexities that such an arrangement would bring. The same questionnaire was posted to each senior physiotherapy manager to ensure meaningful comparison.

There are a number of possible drawbacks in the use of postal questionnaire surveys which include the possibility of non-response on the part of a large percentage of the recipients (a low percentage response rate may invalidate the findings) (5.2.4.1 above). The survey population comprised the most senior physiotherapy managers in each of two hundred units in all districts throughout England - experienced physiotherapists with similar management roles on Whitley Council Physiotherapy Managerial grades and all having to lead their services in a rapidly changing NHS environment. This is a reasonably homogenous population and it might therefore be expected that the variation in quality of response would be of low significance thus overcoming the problem of wide variation within the survey group. There are also limitations on the type and quality of information resulting from postal surveys. Therefore the questionnaire was designed to be simple and to minimise ambiguity and uncertainty as far as possible. The problem of coding the questionnaire was addressed through the assistance and advice of the computer centre at the Health Service Research Unit (HSRU) in the University of Kent. The completed questionnaires were coded by the researcher and results obtained on each of the questions. The processes of collation, tabulation and cross referencing of the figures together with full analysis were undertaken by the researcher alone with appropriate secretarial assistance, Moser and Katton (1975) Partridge and Barnitt (1986)

6.2.4. *The Survey Population*

The survey was restricted to England because there are important differences in the structure, management and organisation of Health Services for Scotland, Wales and Northern Ireland, all of which are at different stages along the continuum of change, which would make meaningful comparison difficult. The names of the most senior physiotherapy managers in each of the districts in England were obtained from the CSP. There were two hundred and six physiotherapists on this list. Although there were fewer than this number of NHS districts in England a number of the districts had more than one NHS Trust or directly managed unit (NHST or DMU) within their boundaries. This accounted for the discrepancy between the number of senior physiotherapy managers on the list and the numbers of districts in 1992. The 'Hospital and Health Service Year Book', IHSM (1992) was used to cross reference the districts in England to ensure that a questionnaire was sent to at least one unit in each district, of these, 200 senior physiotherapy managers formed the survey population.

6.2.5 *Piloting the Questionnaire*

The objectives of piloting the survey were to test the adequacy of the questionnaire for gathering relevant data, to test the satisfactoriness of the questionnaire in terms of comprehensibility of instructions and questions, simplicity, non-ambiguity, layout and as a coding instrument and to ensure the reliability and validity of the survey (5.2.4.1 above).

In order to minimise administration work and cost in the pilot study, pilot questionnaires were handed out to six of the fifteen senior physiotherapy managers attending a SETRHA Regional Physiotherapy Senior Managers Meeting. These questionnaires were not included in the final questionnaire survey and the six respondents were not requested to complete a second questionnaire in the full study. Therefore, these six senior physiotherapy managers are not included in the final study results. All six questionnaires were returned to the researcher by post within three weeks. Analysis of the pilot questionnaires was undertaken by hand and several modifications were made in the light of comments received; for the main survey the postal service was used.

6.2.6. *The Questionnaire Survey*

A questionnaire was posted to the most senior physiotherapy manager in each of two hundred Trusts and DMU's in all districts in England excluding the six pilot respondents in SETRHA (Appendix 9). An explanatory letter was enclosed (Appendix 10) together with a stamped addressed envelope for return of the completed questionnaire. Although a reminder letter and questionnaire are generally used in postal questionnaire surveys of this sort the researcher decided not to use this as the response was considered very satisfactory and would enable the researcher to obtain reliable information on this first and only mailing. The response rate to the survey questionnaire mailing is discussed in 6.3.2 (below).

The questionnaire was coded by the researcher, his secretary and a voluntary assistant and was input to the computer; and the results were tabulated, cross referenced and analysed by him. There were forty-two questions, only two of which were open questions. The responses to the first of these were coded (Q39) and the general responses to the other open question (Q42) were not coded but the comments which respondents made were documented in a type- written paper by the researcher for content analysis.

6.3 Presentation and Discussion of Questionnaire Survey Findings

6.3.1 *Introduction*

In this section the information gathered in the postal questionnaire survey (Appendix 9) is reported, analysed and discussed.

6.3.2. *Response Rate*

On the 28th July 1993 two hundred questionnaires were posted to the most senior physiotherapy managers listed on the CSP list of managers'. The two hundred managers were based in NHS Trusts and DMUs in all districts in England. The accompanying letter of explanation requested that the completed questionnaires be returned by Tuesday, 31st August 1993 (Appendix. 10). Of the two hundred questionnaires posted one hundred and sixty-one (80.5%) were completed and returned by the closing date Table 6.1 (below) – responses were received from all regions within England demonstrating geographical representativeness, Table 6.2

(below). This response rate was very encouraging as it would provide an indication of the national picture. The high response rate and speed at which the questionnaires were returned indicated that there was a substantial level of interest and concern about the topic. As Maitland and Nickalls (1985) argue a better response rate from an in-service survey than a survey of the population at large would be anticipated. A further factor influencing the level of response may have been that the researcher was known personally to a substantial number of the respondents.

National Response Rate to Postal Questionnaire

(Percentages in Brackets - 200 Questionnaires Posted)

Questionnaires Sent		Responses Returned		Non Response	
200	(100%)	161	(80.5%)	39	(19.5%)

TABLE 6.1

6.3.3 ***Survey Findings***

Question 1 of the questionnaire asked respondents to give the names of their Trusts and the titles of their post to indicate geographical spread and to ensure that the most senior physiotherapy manager had participated in the survey.

The participants were identified as the most senior physiotherapy managers in all cases.

Questions 2 - 4 of the questionnaire related to the management responsibilities of the survey participants, and the findings from these questions are reported in chapter 4 of the thesis.

The response rate was considered very satisfactory for the purposes of the study as it would be possible to obtain a clear National picture, particularly in the light of the overall response rate of 80.5% (Table 6.1 and 6.2 above).

Regional Response Rate to Postal Questionnaire

Regional or Special Health Authority	Number of Responses
Northern	8
Yorkshire	9
Trent	9
East Anglia	8
North West Thames	13
North East Thames	8
South East Thames	13
South West Thames	9
Wessex	8
Oxford	9
South West	13
West Midlands	26
Mersey	14
North Western	12
Special Health Authority	2
No response	39
TOTAL	200

TABLE 6.2

Pilot Study SETRHA = 6 (Not included in main study)

Physiotherapy Services With and Without Computerized Information Systems

Q5: Do You Have a Computerized Information System For Your Service?

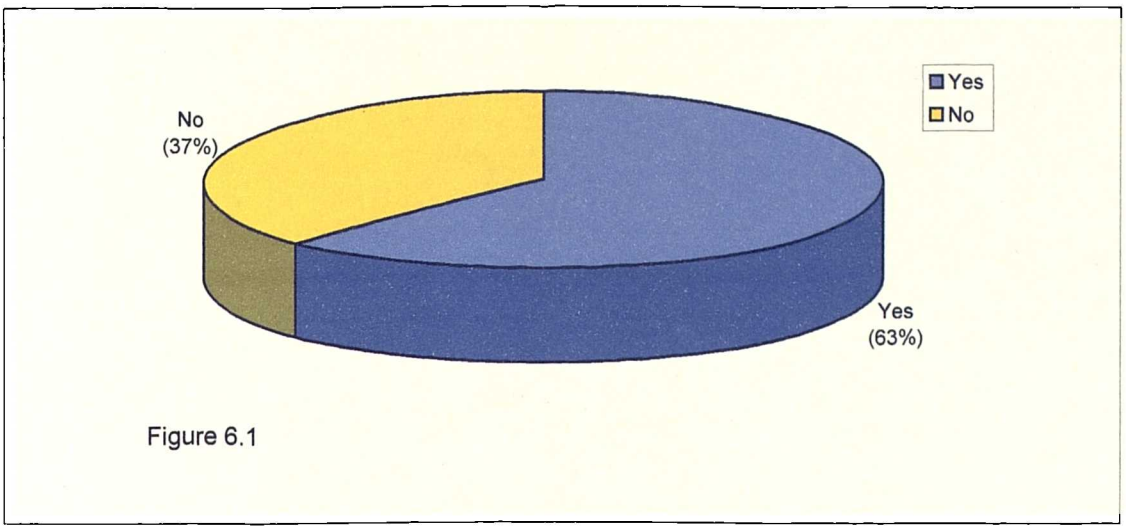


Figure 6.1

Table 6.3	No.	%
Physiotherapy Services With Computerized Information Systems.	101	63
Physiotherapy Services Without Computerized Information Systems.	60	37
Total	**161**	**100**

The respondents were asked if they had a computerized information system for their services, in order to ascertain how extensively computers were used within physiotherapy. Figure 6.1 and the associated Table 6.3 (above) show that a significant number - sixty-three percent - had such systems. There were still substantial numbers of physiotherapy services without computerized information system support - thirty-seven percent. The first group answered questions six to thirty-four inclusive about their systems. The last group answered questions thirty-five to forty-one inclusive which relate to the procedures they adopted without the use of computerized information systems and their aspirations for the future. All respondents were asked to answer questions one to five and question forty-two.

Ownership of Computer Systems in Physiotherapy

Q6: Is Your Computer System a) Specifically for Your Service b) Shared With Other Disciplines?

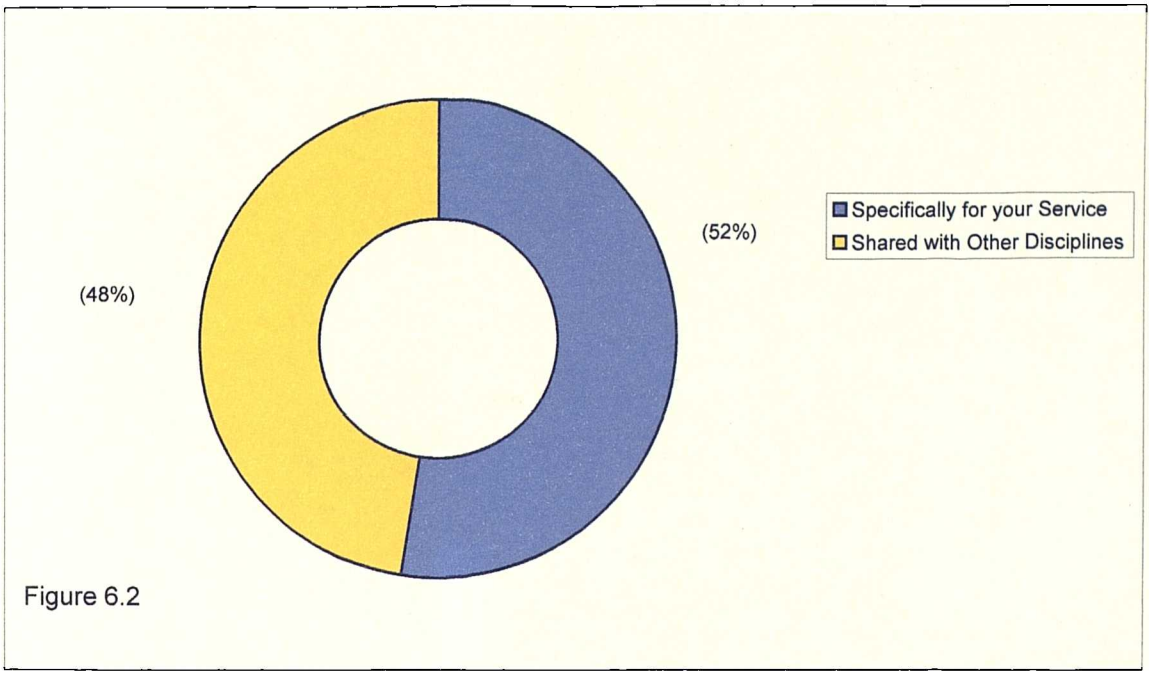


Figure 6.2

Table 6.4	No.	%
Computer System Specifically for Physiotherapy.	53	52
Computer System Shared With Other Disciplines.	48	48
Total	**101**	**100**

The physiotherapy managers were asked whether their computer systems were specifically for their own services or shared with other disciplines. Of the one hundred and one respondents who had access to computerized information systems, fifty-three (fifty-two percent) had systems specifically for their own services, while forty-eight (forty-eight percent) shared with other disciplines. The responses to this and the previous question (Q5 and Q6) indicated that there were three main groups; sixty managers without computer systems, fifty-three with their own "stand-alone" systems and forty-eight with shared systems.

Q7: Where is Your Computer System Sited? a) In the Physiotherapy Department/Base b) Within your Unit Premises c) In Premises Outside Your Unit.

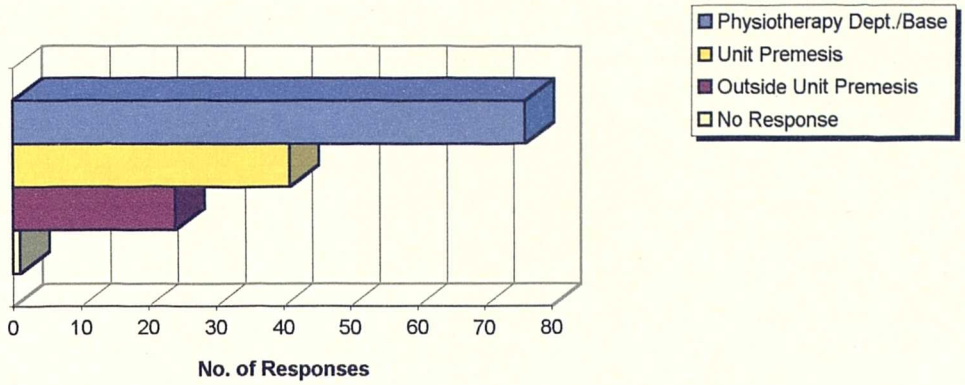


Figure 6.3

Table 6.5	No.
In the managers department/base	76
Within your unit premises	41
In premises outside your unit	24
No response	1

In order to ascertain the accessibility of their computerized information systems, the physiotherapy managers were asked to indicate where their systems were sited (Figure 6.3 and Table 6.5 above) The majority of respondents - seventy-six of the one hundred and one managers stated that their systems were sited within the physiotherapy departments where they were based, while twenty-four of them used systems outside their unit bases. One person did not reply. Forty-one of the managers stated that their computer systems were housed within their units of management. These responses, therefore, showed that the majority of physiotherapy managers had easy access to their computerized information systems, but there remained a significant minority for whom access may be less convenient. However, from the total number of responses to the questionnaire (161) only seventy-six physiotherapy managers (47.2%) had access to their systems within their own departments.

Q8: Is Your Computerized Information System: a) "Stand Alone" b) Part of a Networked System

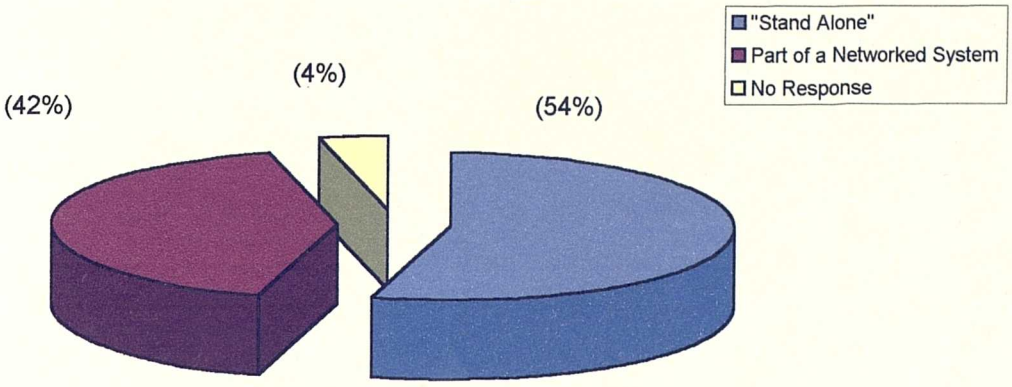


Figure 6.4

Table 6.6	No.	%
Physiotherapy Managers Who Have "Stand Alone" Computer Systems	55	54
Physiotherapy Managers Who Have Networked Computer Systems	42	42
No Response	4	4
Total	**101**	**100**

The questionnaire participants were asked whether their computerized information systems were "stand-alone", that is, independent, self contained set-ups or whether they were part of a networked system - integrated into wider computer systems or sets of computers. Of the one hundred and one physiotherapy managers using computers, fifty-five (fifty-four per cent) had their own "stand alone" computers, while forty-two (forty-two per cent) were networked (see Figure 6.4 and Table 6.6 above). These figures show that at least fifty-five physiotherapy managers were using systems specific to their own services. The networked computers may have been specific to their own services. The networked computers may have been specific to physiotherapy services or might have been generic - common to several disciplines.

Q9: Do Other PAMs Have Computerized Information Systems

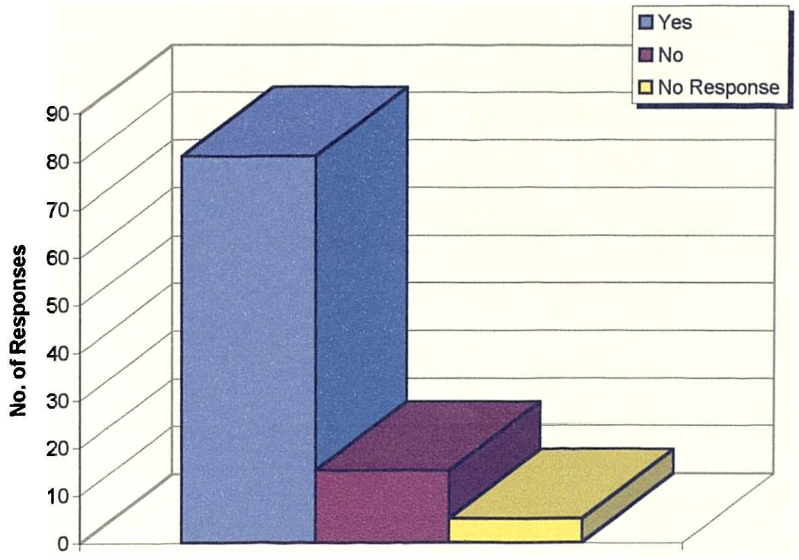


Figure 6.5

Table 6.7	No.	%
PAMs With Computer Systems	81	80
PAMs Without Computer Systems	15	15
No Response	5	5
Total	**101**	**100**

The physiotherapy managers were asked whether other PAMs within their units had computerized information systems (Figure 6.5 and Table 6.7 above).

Of the one-hundred and one physiotherapy managers with computerized information systems eighty per cent had PAM colleagues using computerized systems. At the time of the questionnaire, therefore, the use of computers was not universal within the PAM occupational groups as a whole.

Q10: If Other PAMs Have Computerized Systems, Do Your Systems Network?

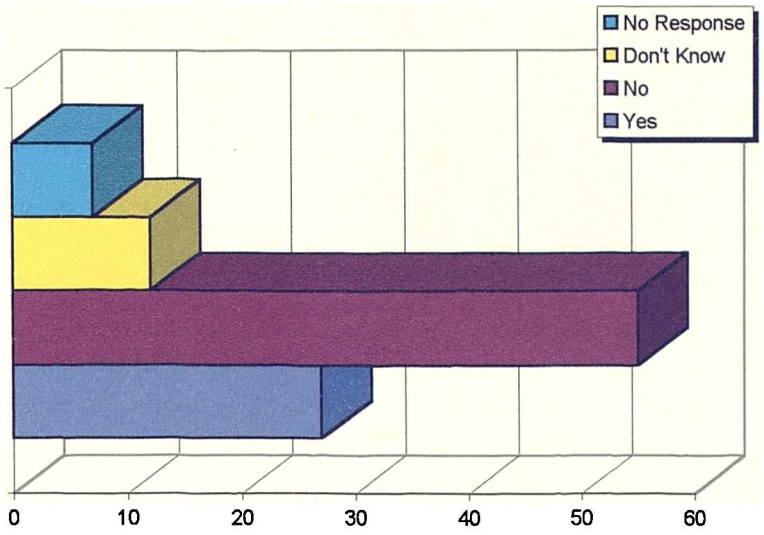


Figure 6.6

Table 6.8	No.	%
No Response	7	7
Not Known	12	12
Physiotherapists and Other PAMs Not Networked	55	54
Physiotherapists and Other PAMs Networked	27	27
Total	**101**	**100**

The questionnaire respondents were asked if other PAMs computer systems networked with their own computerized information systems (Figure 6.6 and Table 6.8 above). The majority were not networked, while a significant minority (twenty-seven per cent) were networked. It is interesting to note that twelve per cent of the physiotherapy managers were unaware of whether their systems were networked with other PAMs indicating a possible lack of awareness about the overall functionality of their systems.

Q11: Does Your System Interface With Other Systems Within Your Unit?
a) CIS b) PAS c) RMI d) HISS e) Other.

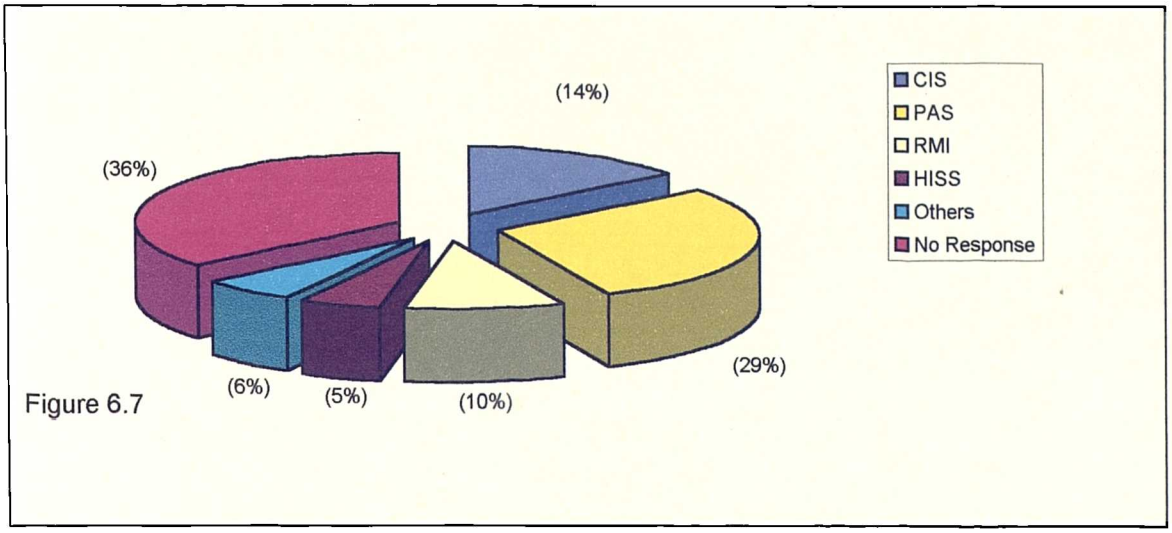


Figure 6.7

Table 6.9	No.	%
Physiotherapy System Interfaceing With CIS	14	14
Physiotherapy System Interfaceing With PAS	29	29
Physiotherapy System Interfaceing With RMI	10	10
Physiotherapy System Interfaceing With HISS	5	5
Physiotherapy System Interfaceing With Others	6	6
No Response	37	36
Total	**101**	**100**

The responses to question eleven, about interfacing arrangements between physiotherapy systems and other systems in use within the units (Figure 6.7 and Table 6.9 above) indicated that interfacing and networking arrangements were not yet fully developed. The highest number of system interfaces being only twenty-nine with Patient Administration Systems. Clearly, there was no uniformity of approach nationally. There was a high percentage of non response to this question. The significance of this is not clear.

Q12: If Your System Does Not Link, Would Such A Facility Be Helpful/Useful to You?

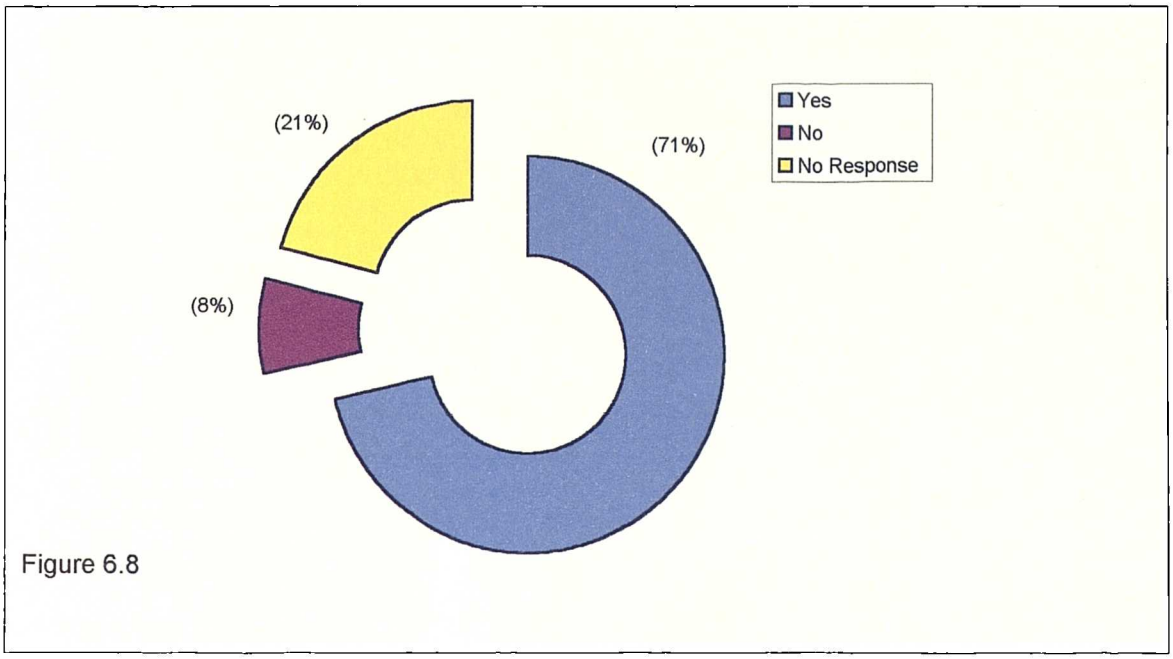


Figure 6.8

Table 6.10	No.	%
Physiotherapy managers who thought a system interface would be useful/helpful	72	71
Physiotherapy managers who thought a system interface would not be useful/helpful	8	8
No Response	21	21
Total	**101**	**100**

In question twelve, the physiotherapy managers were asked whether they felt it would be helpful/ useful to have their systems linked with other systems within their units (Figure 6.8 and Table 6.10 above) .

A high percentage (seventy-one per cent) of the respondents felt that such networking would be beneficial, whilst only eight per cent responded negatively to this.

Q13: Do You Have Computer Department Officer Support For Your System With a) Hardware b) Software?

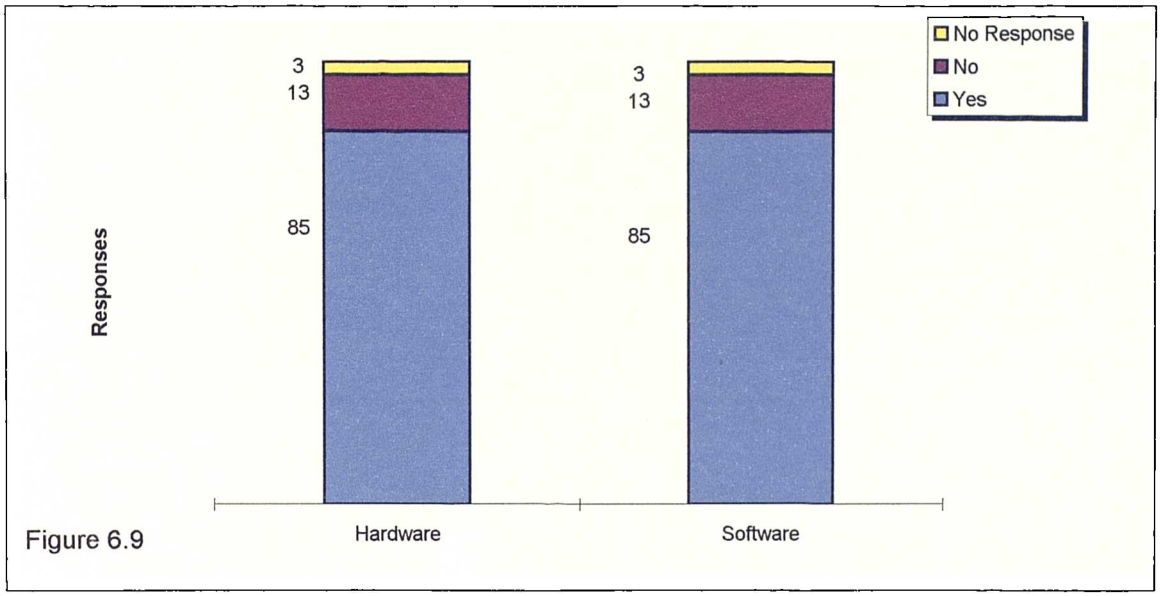


Figure 6.9

Table 6.11	Computer Hardware		Computer Software	
	No.	%	No.	%
No Response	3	3	3	3
No Computer Officer Support	13	13	13	13
Computer Officer Support	85	84	85	84
Total	**101**	**100**	**101**	**100**

Physiotherapy managers generally had limited computer expertise and it would therefore seem reasonable to assume that their services would require specialist computer officer support for the smooth running of hardware and software.

Figure 6.9 and Table 6.11 (above) show that this was usually available (eighty-four per cent) but that thirteen per cent of the physiotherapy managers had to manage without this support.

Q14: Did you: a) Participate in the Design/Specification Of Your System b) Buy a System "Off The Shelf" Following Consultation c) Buy a System "Off The Shelf" Without Consultation d) Was the System Imposed on You?

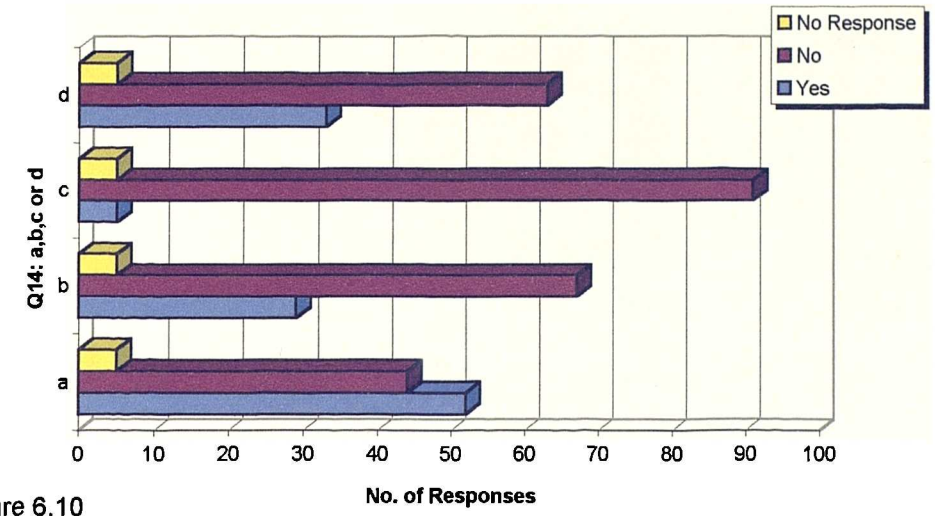


Figure 6.10

Table 6.12	Participated in Design		"Off The Shelf" Consulted		"Off The Shelf" Not Consulted		System Imposed	
No Response	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
	5	5	5	5	5	5	5	5
No	44	44	67	66	91	90	63	62
Yes	52	51	29	29	5	5	33	33
Total	**101**	**100**	**101**	**100**	**101**	**100**	**101**	**100**

The purpose of this question was to elicit the level of participation of physiotherapy managers in the design and specification of their systems. Fifty-two respondents (fifty-one per cent) had been involved while forty-four (forty-four per cent) had had no involvement. Twenty-nine systems were purchased "off the shelf" following consultation, while a total of thirty-eight managers had systems imposed upon them including five who were not consulted. Although those managers participating in decision making about their systems were in the majority - the level of imposition and non-consultation was substantial.

Q15: Are You Permitted to Influence The Future Development Of Your System?
Q16: Would You Wish to be Involved in Future Development of Your System?

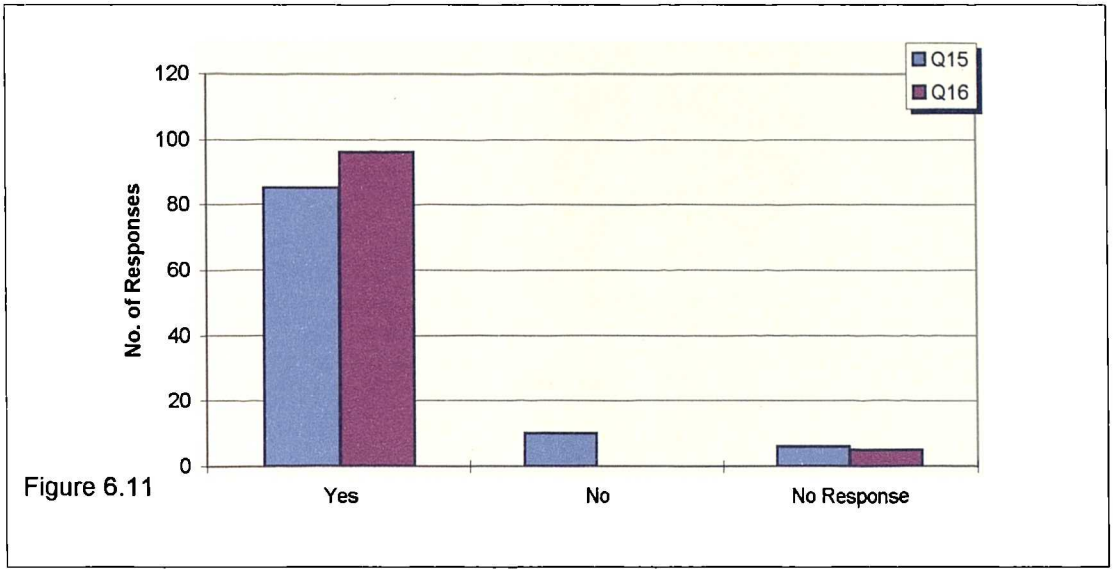


Figure 6.11

Table 6.13	Able To Influence Future Development of System		Want To Influence Future Development of System	
	No.	%	No.	%
Yes	85	84	96	95
No	10	10	0	0
No Response	6	6	5	5
Total	**101**	**100**	**101**	**100**

The responses to questions fifteen and sixteen indicate that the vast majority of physiotherapy managers felt that they were in a position to influence the future development of their systems and all those who answered wanted to be involved. In both cases, a very small number only left the question unanswered. These responses indicate that managers were keen to participate in work relating to computerized information systems for their services, perhaps illustrating the desire for local "ownership"

Ease of Altering Computer Programmes

Q17: Can Alterations be Made Easily in Your Computer Programmes?

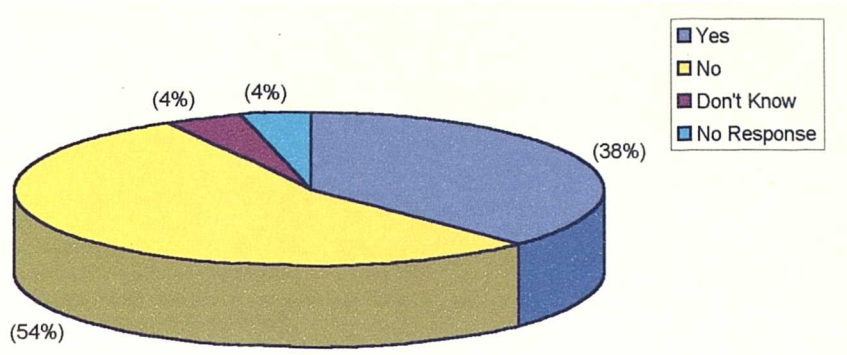


Figure 6.12

Table 6.14	No.	%
Alterations CAN be Made Easily	38	38
Alterations CANNOT be Made Easily	55	54
Don't Know	4	4
No Response	4	4
Total	**101**	**100**

The NHS is a dynamic environment and the demands placed on physiotherapy managers are constantly changing. If computerized information systems are needed to support physiotherapy managers in their work, some flexibility in computer software programmes would be needed. Thirty-four respondents indicated that alterations to their computer programmes could be made easily, while in the majority of cases - fifty-five - such alterations were not possible:

It might be anticipated that such changes could cause problems at a later date.

Q18: Can Alterations In Your Computer Programmes Be Made As Soon As You Require Them?

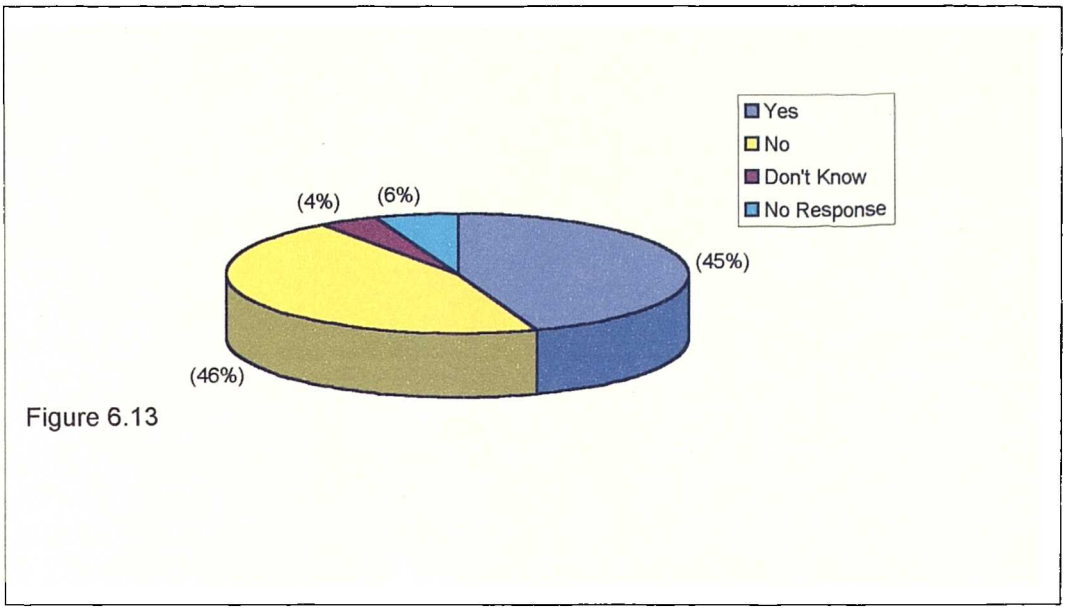


Figure 6.13

Table 6.15	No.	%
Alterations Can Be Made As Soon As Required.	45	45
Alterations Cannot Be Made As Soon As Required.	46	45
Don't Know	4	4
No Response	6	6
Total	**101**	**100**

The physiotherapy managers were asked to indicate whether changes could be made to their software as soon as required. Positive and negative responses to this question were distributed almost evenly, however the responses were somewhat contrary to the responses in question seventeen (above) where only thirty-eight respondents claimed that alterations could be made easily. This might indicate that software choices are crucial as in a changing environment it would seem important that software programmes should be amenable to alteration.

Q19: Do You Have Total Management Control Of Your Computer System?

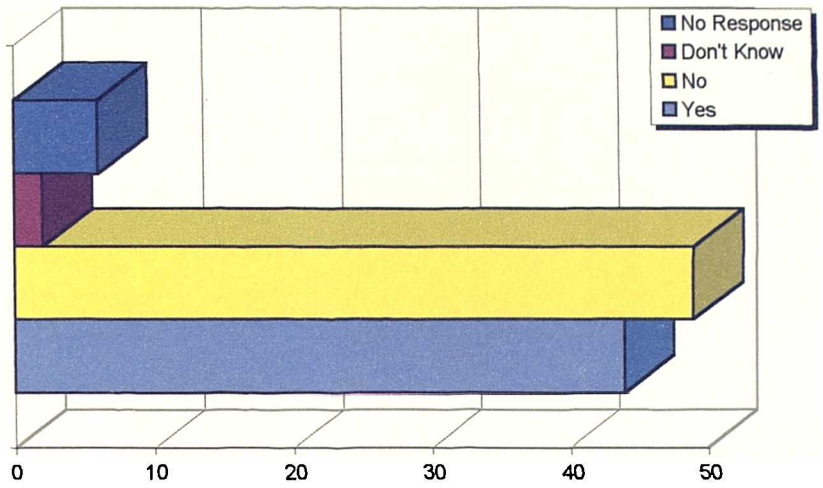


Figure 6.14

Table 6.16	No.	%
No Response	6	6
Dont Know	2	2
Physiotherapy managers who do not have total management control	49	48
Physiotherapy managers who have total management control	44	44
Total	**101**	**100**

The physiotherapy managers were asked whether they had management control of their computer systems to ascertain the level of control and "ownership" . The majority of respondents - forty-eight per cent - did not have managerial control of their systems. However, a substantial minority - forty-four per cent - were in managerial control of their systems. These results might be interpreted as indicating that the majority of managers had limited influence on the direction and use of their systems.

Modification of Clinical Practice

Q20: Has It Been Necessary To Modify Clinical Practice Because Of Your Computer System?

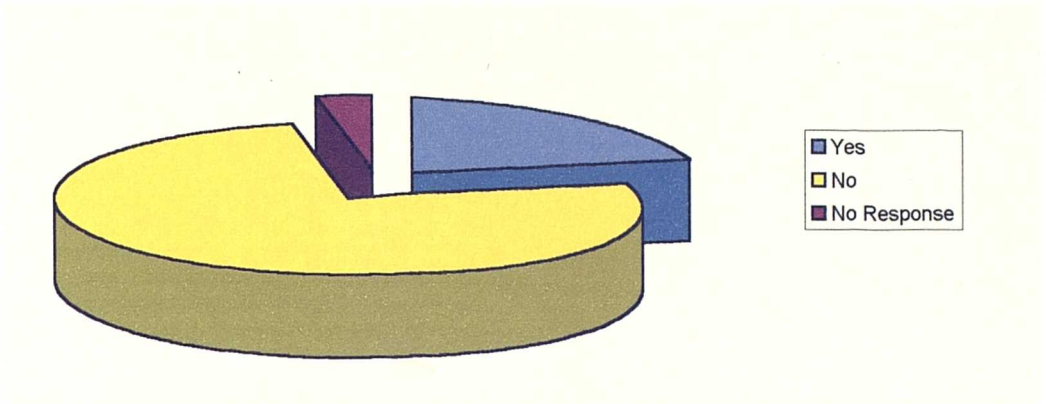


Figure 6.15

Table 6.17	No.	%
Unnecessary to modify clinical practice	20	20
Neccessary to modify clinical practice	78	77
No response	3	3
Total	**101**	**100**

The object of this question was to establish the effect of computerized information systems on clinical working practices. A very large majority - seventy-seven per cent - had found it necessary to modify clinical practice in order to accomodate their information systems, perhaps indicating that in many cases, clinical practice was supporting the information systems to some extent rather than vice versa.

Q21: Do You Have A Designated Physiotherapy Computer Input Officer/Clerk?

Q22: Do Clinical Staff Have To Input To The Computer?

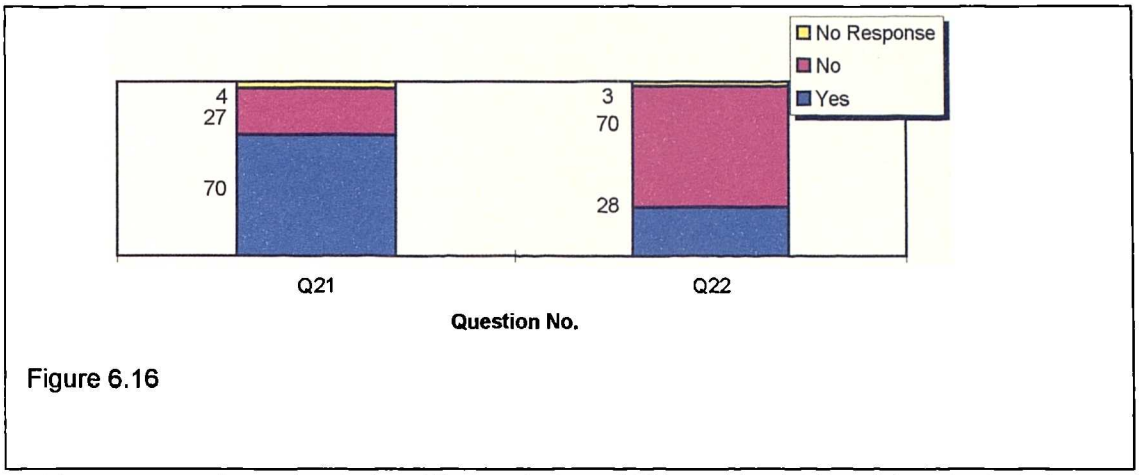


Figure 6.16

Table 6.18	Designated Computer Input Clerk		Clinical Staff Inputting To Computer	
	No.	%	No.	%
No Response	4	4	3	3
No	27	27	70	69
Yes	70	69	28	28
Total	**101**	**100**	**101**	**100**

The purpose of these two questions, was to obtain an overview of actual involvement by physiotherapy clinicians in computer operations in order to draw conclusions about possible erosion of clinical time through this work. In both, specialist computer officer support was available and therefore minimal clinician involvement it is clear that physiotherapy managers were working to minimise the loss of clinical time.

Figure 6.16 indicates that where computer officer support is available (sixty-nine percent of cases) there is no erosion of clinical time through computer operations, but where there is computer officer support (twenty-seven per cent of cases) physiotherapy clinicians were involved in computer operations, therefore, eroding clinical time.

Clinical Time Lost On Computer Operations.

Q23: What is The Approximate Percentage of Clinical Time Lost to Your Service(s) by Clinical Staff Performing Computer Operations?

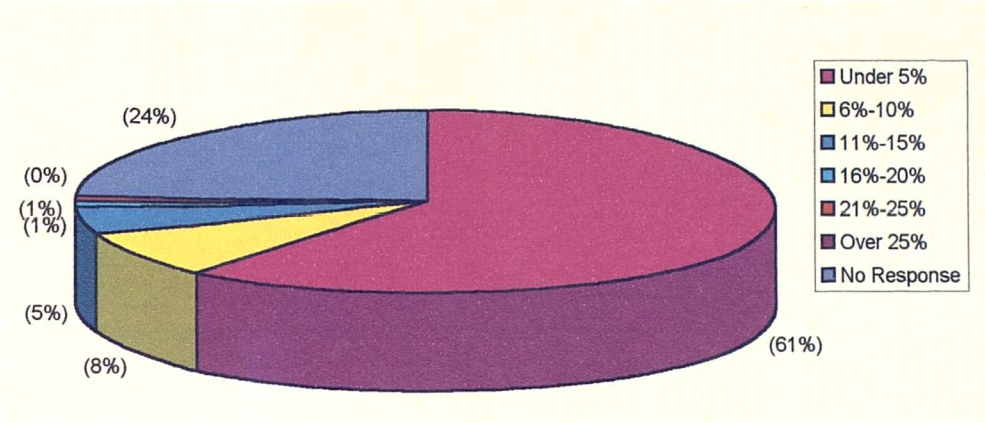


Figure 6.17

Table 6.19	No.	%
Under 5%	62	61
6-10%	8	8
11-15%	5	5
16-20%	1	1
21-25%	1	1
Over 25%	0	0
No Response	24	24
Total	**101**	**100**

The figures (above) confirm that substantial amounts of clinical time were being lost through computer operations. If, for example, approximately five per cent of clinical time was used undertaking computer operations by a physiotherapy staff numbering fifty wte, this would constitute a loss of two and a half wte. in computer operations.

Clinical Time Lost On Computer Operations And Data Collection

Q23 and Q37: What is The Approximate Percentage of Clinical Time Lost to Your Service(s) by Clinical Staff Q23 - Performing Computer Operations: Q37 - As a Result of *Manual Data Collection*?

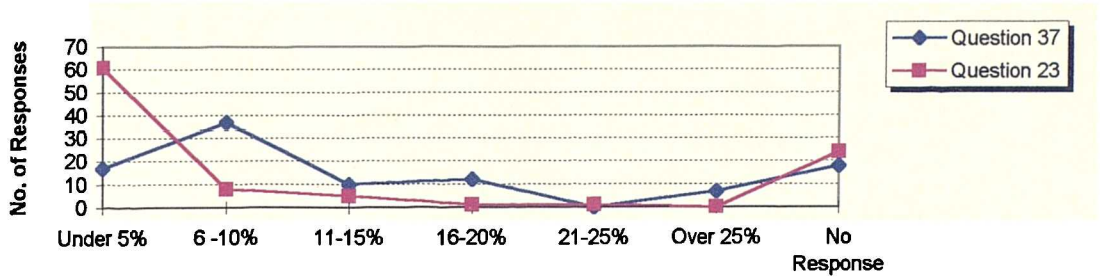


Figure 6.18

Table 6.20	Time Lost To Computer Operations %	Time Lost As A Result Of Data Collection %
Under 5%	61	17
6-10%	8	37
11 - 15%	5	10
16 -20%	1	12
21 - 25%	1	0
Over 25%	0	7
No Response	24	18
Total	**100**	**100**

The graph (above) shows a comparison of results from the two groups of respondents. Those with computer systems (one hundred and one) and those without (sixty). The object was to discover approximateley how much clinical time was lost in data collection by non computer users, in order to establish whether computer use might save any clinical time. The graph indicates that large amounts of time were being saved by computer users.

A conclusion at variance with the findings of the CSP survey (1988) (2.4.3 above) demonstrating a more positive attitude to computer use.

Availability Of Computer Reports

Q25: Are You Able To Take Reports Off Your System As Soon As You Require Them, a) Standard Managerial Reports, b) Standard Clinical Reports, c) Ad Hoc Reports?

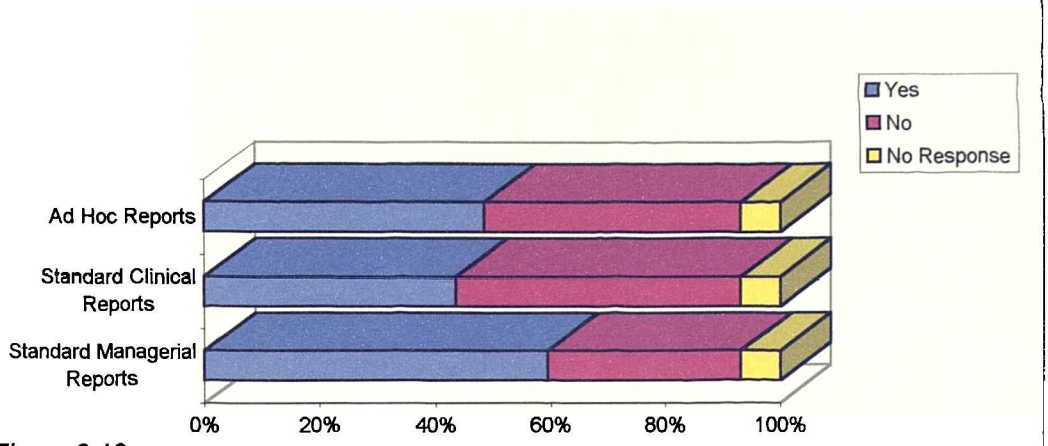


Figure 6.19

Table 6.21	Ad Hoc Reports		Std. Clinical Reports		Std. Managerial Reports	
	No.	%	No.	%	No.	%
No Response	7	7	7	7	7	7
No	45	45	50	49	34	34
Yes	49	48	44	44	60	59
Total	**101**	**100**	**101**	**100**	**101**	**100**

Computer reporting was the subject of this question. The object was to establish whether physiotherapy managers with computer systems were able to obtain ad hoc and standard reports from their systems. Fifty-nine per cent of the respondents were able to obtain standard managerial reports as needed while less than half the respondents were able to obtain ad hoc reports as required and only forty-four per cent were able to obtain standard clinical reports from their systems. These results might indicate that the selection of appropriate computer systems is very important as there is clearly no point in having a system if the users are unable to obtain the reports they need.

Computer Use In Costing And Pricing Physiotherapy Services

Q26 and Q27: Does Your Computer System Support Your Management Of Costing and Pricing? Does Your Computer System Provide Invoices?

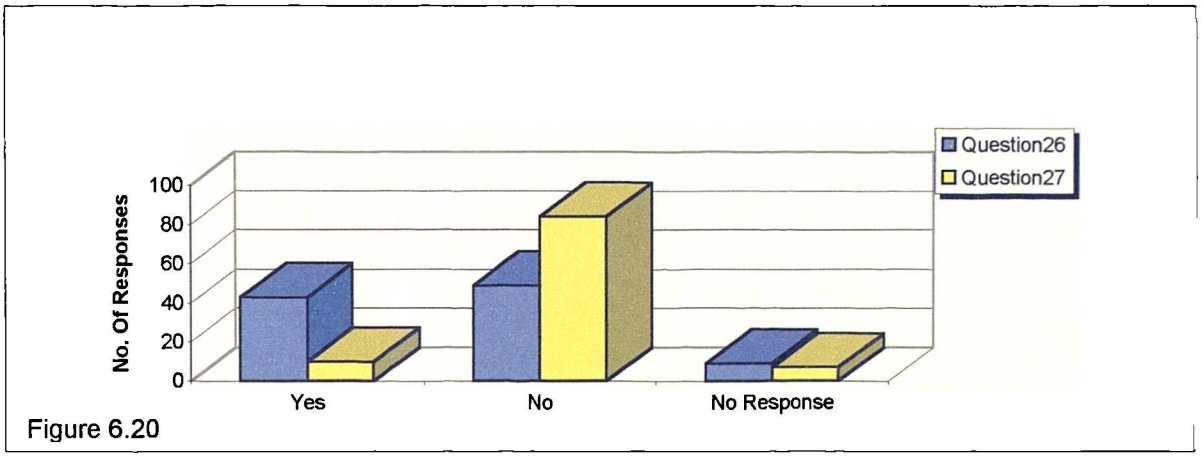


Figure 6.20

Table 6.22	Computer Support For Costing And Pricing		Computer Provision Of Invoices	
	No.	%	No.	%
Yes	43	43	10	10
No	49	48	84	83
No Response	9	9	7	7
Total	**101**	**100**	**101**	**100**

The answers to questions twenty six and twenty-seven about costing and pricing and invoicing indicate that at the time of the questionaire a minority of physiotherapy managers (forty-three per cent) only were using their computer systems for this work. Very few systems (ten per cent) produced invoices. There might have been several reasons for this:-

1.That other departments, such as business and contracts undertook this work using a variety of data

2. That the physiotherapy service was not yet involved in contracts where invoicing was required

3 That manual systems were used because the computer systems were not developed for this work, having been designed before the advent of the "internal market".

Mode of Reporting - Flexibility

Q28: Does Your System Produce Reports In A Variety of Formats Such as a) Statistical Reports b) Bar Charts c) Histograms d) Graphs e) Pie Charts?

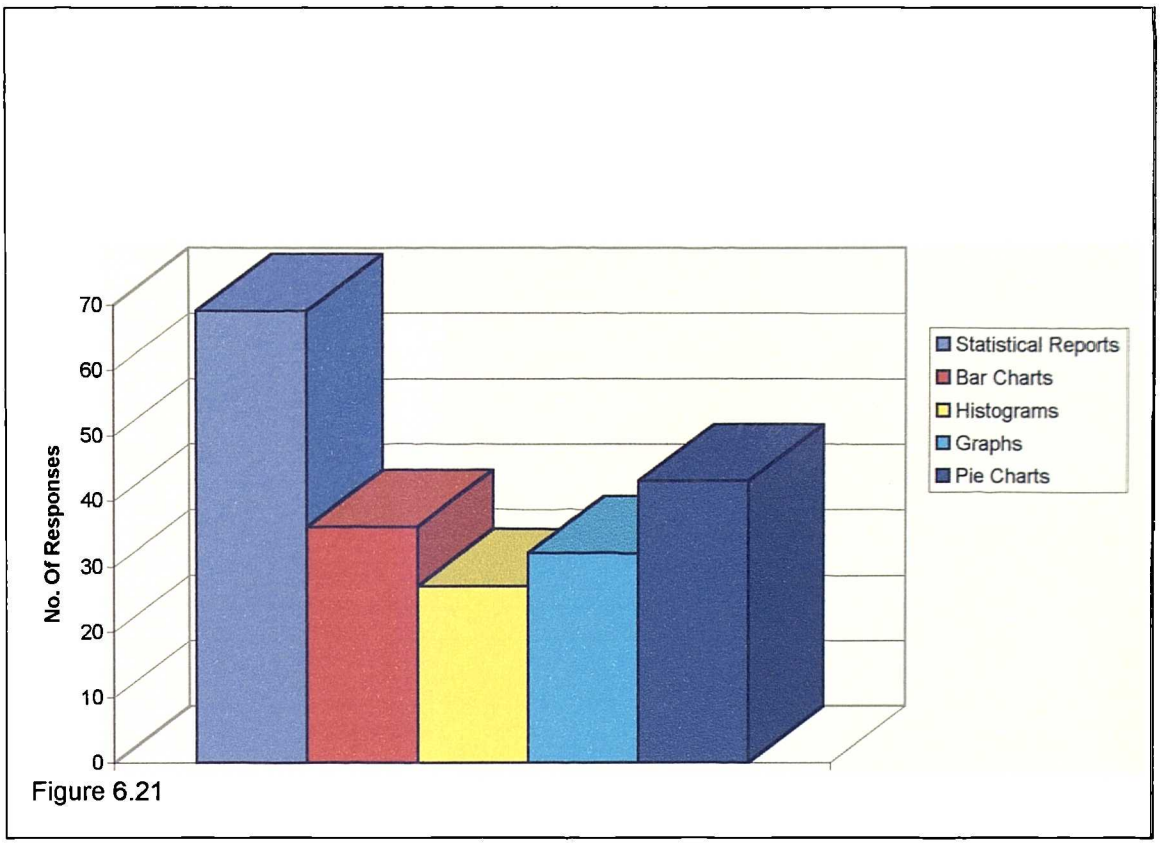


Figure 6.21

Table 6.23	No.	%
Statistical Reports	69	68
Bar Charts	36	36
Histograms	27	27
Graphs	32	32
Pie Charts	43	43

The responses to this question indicate that a range of reporting formats were available to some managers although many computer systems lacked reporting flexibility. As might be expected the largest number (sixty-eight per cent) were able to produce statistical reports.

Number Of Systems That Will Accommodate The Read Coding System

Q29: Will Your Computer System Accommodate The Read Coding System

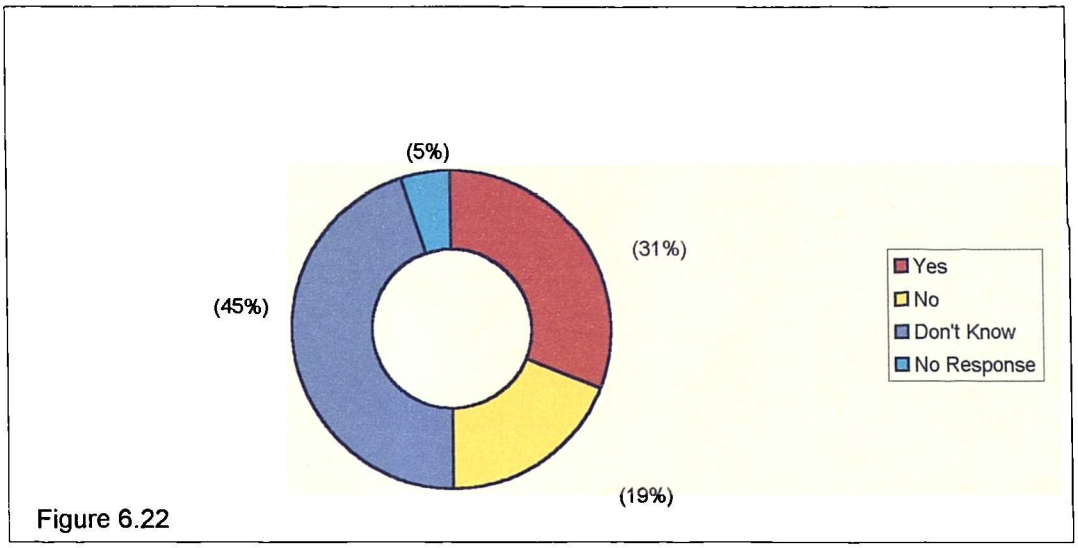


Figure 6.22

Table 6.24	No.	%
Yes	31	31
No	19	19
Don't Know	46	45
No Response	5	5
Total	**101**	**100**

The physiotherapy managers were asked whether their computer systems would accommodate the Read coding system (3.6.1 above). Thirty-one per cent stated that their systems could and nineteen per cent could not. Most respondents (forty-five per cent) did not know whether their systems would accommodate Read coding, however, this might not be significant as the Read Coding Terms Project for physiotherapy was substantially incomplete at the time of the questionnaire.

Manager Participation In Computer User Groups

Q30: Do You Participate In a National or Local User Group For Your Computer System?

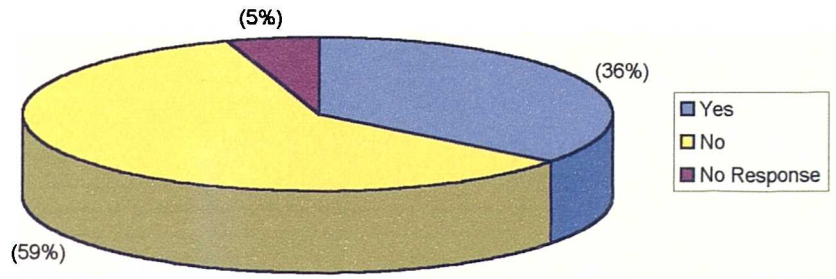


Figure 6.23

Table 6.25	No.	%
Yes	36	36
No	60	59
No Response	5	5
Total	**101**	**100**

The purpose of question thirty was to ascertain the level of mutual support and networking between physiotherapy managers with computerized information systems: Surprisingly, only thirty-six per cent of the respondents were involved in national or local user groups indicating that the majority of physiotherapy managers were working in isolation in this area.

Computer Input Devices

Q31: Does Your System Use a) Direct Computer Keyboard Input b) Hand-Held Computer Input Devices c) Bar Coding Equipment d) Optical Mark Reading Devices?

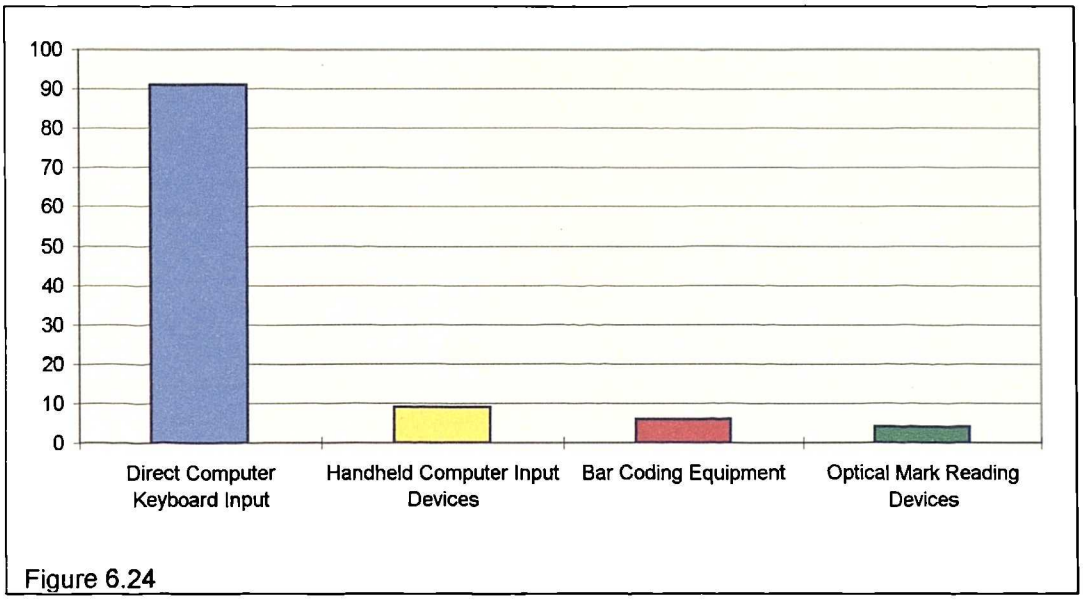


Figure 6.24

Table 6.26	No.
Direct Computer Keyboard Input.	91
Hand-held Computer Input Devices	9
Bar Coding Equipment.	6
Optical Mark Reading Devices	4

Question thirty-one was put in order to establish the mode of input, to gauge the level of technical advancement. It might be that the use of bar coding and optical mark reading devices, for example, would minimize the loss of clinical time whereas the use of hand held input devices might indicate some duplication of data collection (2.4 above), physiotherapists having to keep their paper records as well as inputting through these devices.

Duplication Of Information Collection

Q32: Is There Any Duplication Of Information Collection In Your System; e.g. Handheld Computers as Well as Paper Systems?

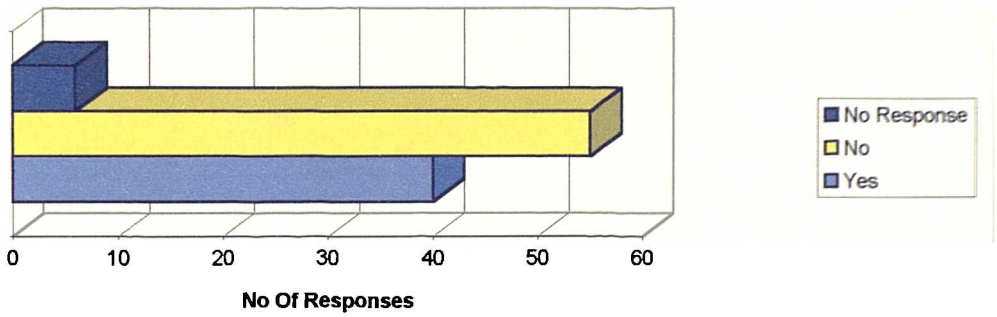


Figure 6.25

Table 6.27	No.	%
No Response	6	6
No	55	54
Yes	40	40
Total	**101**	**100**

As a follow up from question thirty-one, the respondents were asked to indicate the level of duplication of data collection. Forty per cent of the physiotherapy managers stated that there was duplication, indicating that a large number of paper work systems required information to be collected twice as a possible maximum of nineteen respondents were using electronic data transmission (question thirty-one). Under present DoH requirements, it is necessary for paper records to be retained for a period of eight years.

Managers Who Feel That Their Computer System Supports Their Service(s) Or That Their Clinical Service(s) Support The Computer System

Q33 and 34: Do You Feel That Your Computer System Supports Your Clinical Service(s), Or Do You Feel That It Is More Your Clinical Service(s) Supports The Computer System?

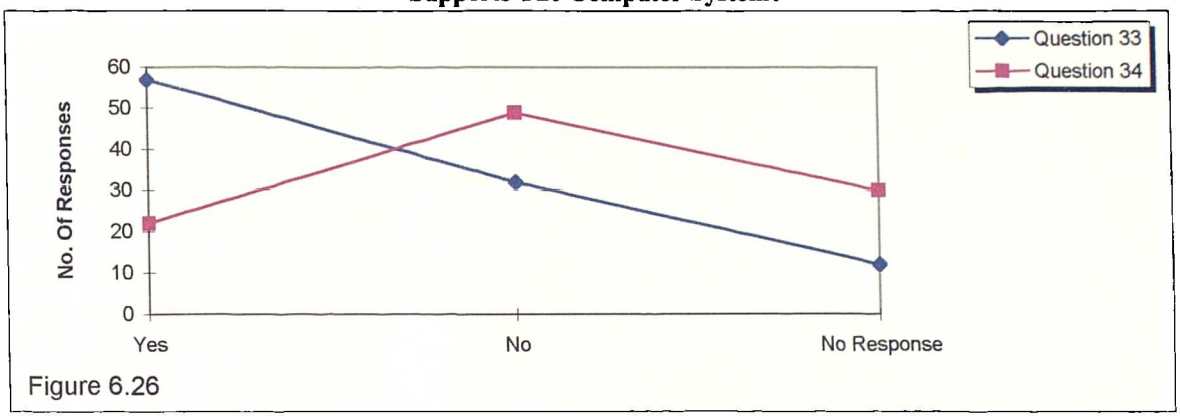


Figure 6.26

Table 6.28	Computer System Supports Service(s)		Service(s) Support Computer System	
	No.	%	No.	%
No Response	12	12	30	30
No	32	32	49	48
Yes	57	56	22	22
Total	**101**	**100**	**101**	**100**

The physiotherapy managers were asked to indicate whether their computer systems supported their services or vice versa. Whilst fifty-six per cent of them felt that their systems supported the physiotherapy service a large number felt that it was more that the physiotherapy service supported their computer systems or did not respond. These answers indicate an unsatisfactory state of affairs as the primary purpose of physiotherapy was the provision of a clinical service.

Managers Wishing To Have A Computer System.

Q35: Do You Wish To Have A Computerized Information System For Your Service(s)

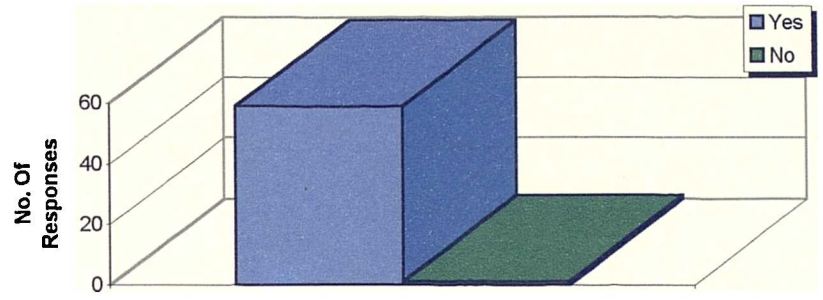


Figure 6.27

Table 6.29	No.	%
Yes	59	98
No	1	2
Total	**60**	**100**

Sixty of the one hundred and sixty-one respondents did not have computerized information systems for their physiotherapy services, 37.3% of the total responses received. These sixty physiotherapy managers were asked whether they would wish to have computerized information systems for their services. Fifty-nine of the sixty managers (ninety-eight per cent) affirmed that they would like computerized information systems, a very substantial majority.

Manual Collection Of Management Information

Q36: Are You Able To Collect All The Information For The Management Of Your Service(s) Manually?

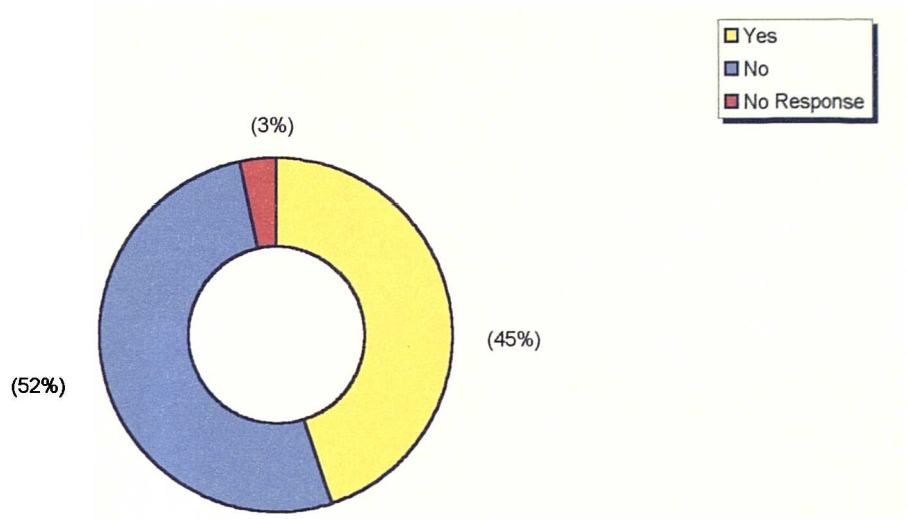


Figure 6.28

Table 6.30	No.	%
Yes	27	45
No	31	52
No Response	2	3
Total	**60**	**100**

The sixty physiotherapy managers without computerized information systems were asked whether they were able to collect the information required for the management of their services by manual methods. Only forty-five per cent of the respondents could collect the information they needed whilst the majority fifty-two per cent could not. These responses reinforced the findings of question thirty-five (above) that nearly all physiotherapy managers without systems identified a need for them.

Clinical Time Lost On Manual Information Systems

Q37: What is The Approximate Percentage of Clinical Time Lost To Your Service(s) As A Result Of Data Collection?

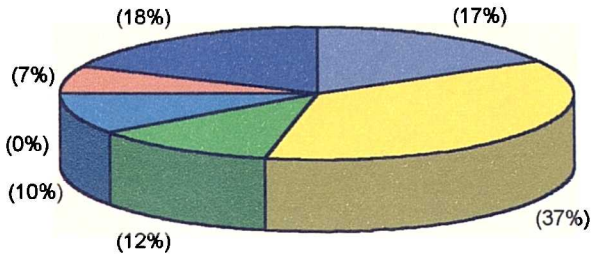


Figure 6.29

Table 6.31	No.	%
Under 5%	10	17
6-10%	22	37
11-15%	6	10
16-20%	7	12
21-25%	0	0
Over 25%	4	7
No Response	11	18
Total	**60**	**100**

The purpose of this question was to ascertain how much clinical time was lost as a result of manual data collection. These figures indicate that significant clinical time was being lost and it seems almost incredible that four of the respondents claimed that more than twenty-five per cent of clinical time was spent on this work. Figure 6.18 and Table 6.20 (above) indicate that computer use saved clinical time.

Collection Of Information For Physiotherapy Management With And Without Computers

Q24 (Computer Users) and Q38 (Non Computer Users): Are You Able To Collect All The Information You Require For The Management Of Your Service(s) On:

a) Statistical Returns
b) Clinical Audit
c) Outcome Measurement
d) Appliance Issuing and Retrieval
e) Statistical Reports To Service Purchasers
f) Activity Reports
g) Case Load Management
h) Reasource Input Measurement
i) Patient Appointments
j) Waiting List Monitoring
k) Stock Control

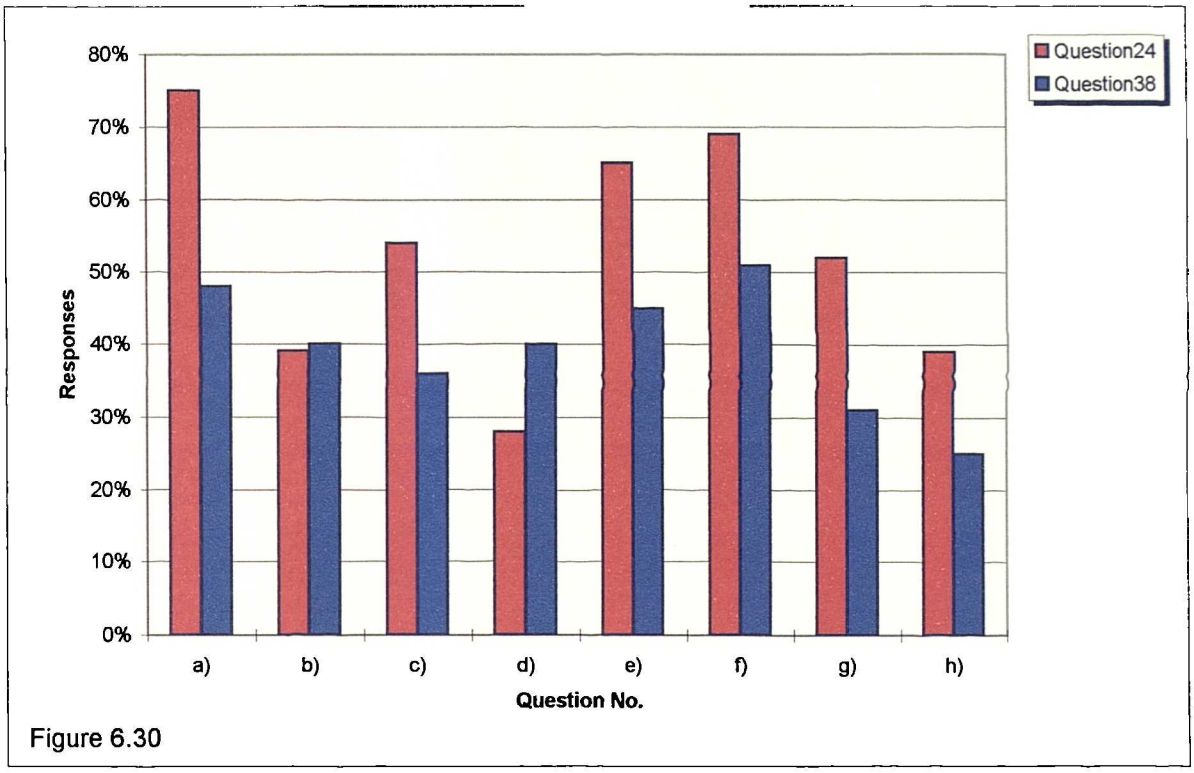


Figure 6.30

NB. Please See Overleaf For Associated Table

Questions twenty-four and thirty-eight enable a comparison to be made between physiotherapy services with computer systems and those without with regard to a range of management requirements. A higher percentage of physiotherapy managers with computer systems were able to collect all the information they wanted in statistical returns; outcome measurement; statistical reports to service purchasers; activity reports; case load management and resource input

Collection of Information For Physiotherapy Management With And Without Computers

Table 6.32	Q24 Data Collection Computer Users		Q38 Data Collection Non-Computer Users	
	No.	%	No.	%
No. Of Responses	101	100	60	100
a) Statistical Returns	76	75	29	48
b) Clinical Audit	39	39	24	40
c) Outcome Measurement	55	54	22	37
d) Appliance Issuing and Retrieval	28	28	24	40
e) Statistical Reports To Service Purchasers	66	65	27	45
f) Activity Reports	70	69	31	52
g) Case Load Management	53	52	19	31
h) Resource Input Measurement	39	39	15	25
i) Patients' Appointments	19	19	45	75
j) Waiting List Monitoring	45	45	44	73
k) Stock Control	14	14	37	62

NB. Please See Previous Page For Associated Bar Chart

measurement. In the remaining five areas listed (above), computer systems would be unlikely to be helpful for example, waiting list monitoring is generally carried out by the physiotherapy manager being aware of the number of referral cards or letters awaiting attention. Physiotherapy computer systems generally have no capacity for stock control. Physiotherapy appointments are generally operated on a diary system, a large number of computers would be required if this were to be undertaken electronically. The figures for clinical audit which indicated very similar results may be at these levels because clinical audit was introduced into therapy services only during 1993. It might reasonably be expected that computer users would benefit from the use of their systems increasingly as the systems were developed to cater for this (Table 6.32 above).

Physiotherapy Services Without Computer Systems- Reasons

Q39 Why Do You Not Have A Computerized Information System?

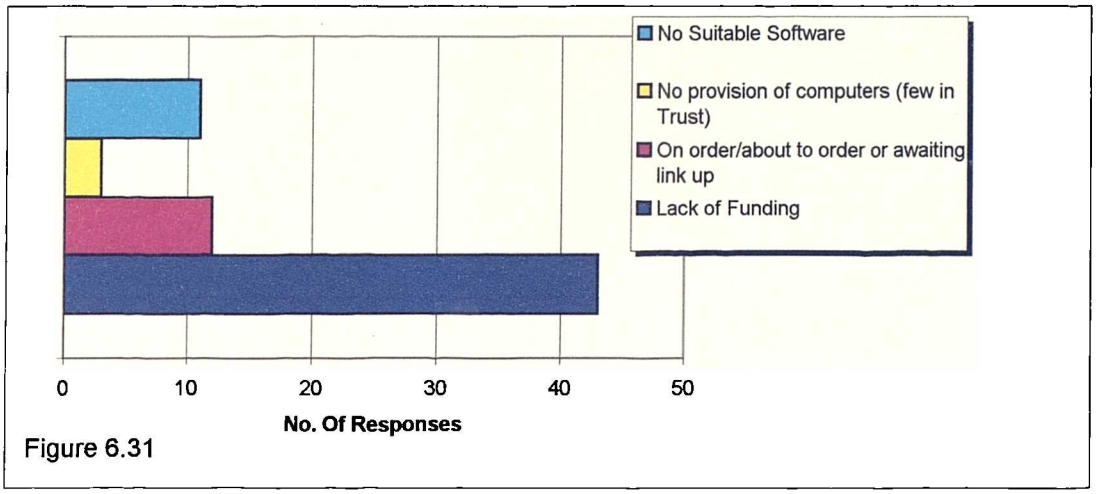


Figure 6.31

Table 6.33 Reason	No.
Lack of Funding	43
On Order/About To Order	12
No Provision Of Computers (Few in Trust)	3
No Suitable Software	11

This group of physiotherapy managers were asked to comment on the possible reasons why they did not have computerized information systems for their services. The majority - forty-three out of the sixty respondents cited lack of funding as the primary reason. Other reasons mentioned included no suitable software availability and no provision of computers as few were available within their Trust. Twelve managers stated that they were in the process of obtaining systems or networking into other systems. Nine respondents of the group gave more than one of the above reasons for not having a computerized information system.

Views On Computer Linkage - Non-Computer Users

Q40: Do You Think It Would Help Your Service(s) To Be Linked To Other Systems In Your Unit a) Managerially b) Clinically

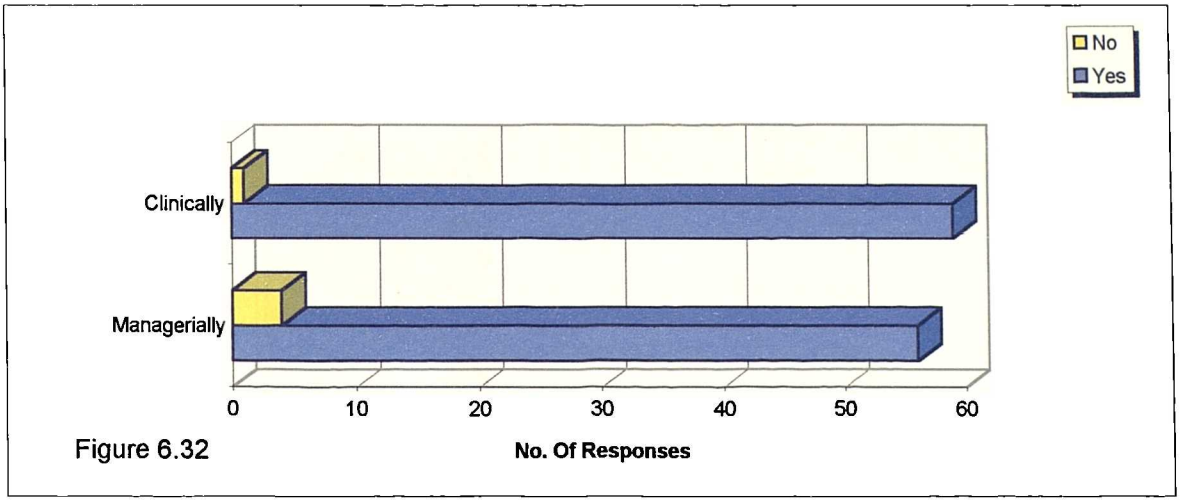


Figure 6.32

Table 6.34	For Managerial Purposes		For Clinical Purposes	
	No.	%	No.	%
Yes	56	93	59	98
No	4	7	1	2
Total	**60**	**100**	**60**	**100**

From the responses to queston forty, it is clear that an overwhelming majority of the non-computer user physiotherapy managers felt that their services would benefit from computer linkage between their own departments and other clinical and managerial systems within their units.

Specification of Computer Needs - Non-Computer Users

Q41: Do You Think That It Would Be Important To Specify Your Own Computerized Information Needs In The Event Of Obtaining A System?

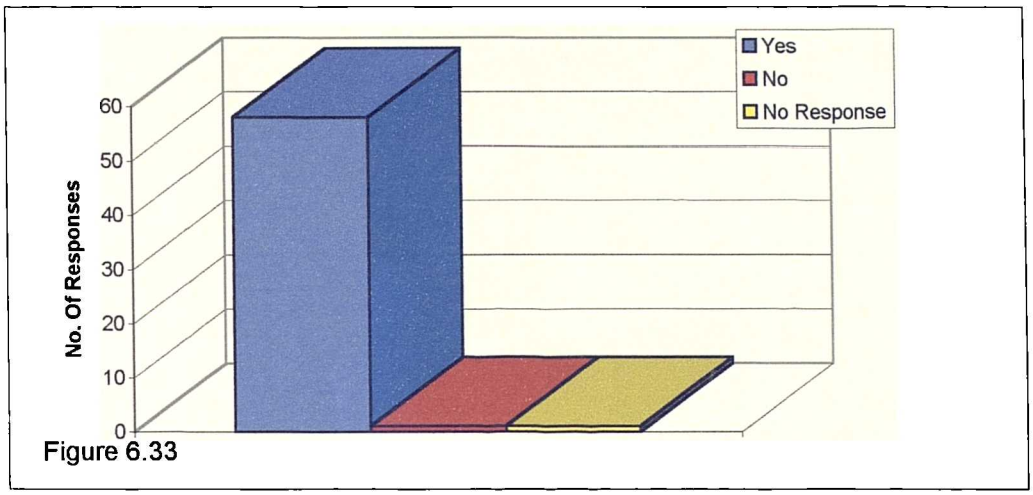


Figure 6.33

Table 6.35	*No.*	*%*
Yes	*58*	*96*
No	1	2
No Response	1	2
Total	**60**	**100**

The responses to question forty-one indicate that the non-computer user physiotherapy managers were substantially in favour of participation in the specification of computerized information systems for their services - (ninety-six per cent). It is reasonable to conclude from these figures that these physiotherapy managers felt that involvement in this work would result in the acquisition of systems appropriate to their needs.

Open Question - Physiotherapy Managers' Comments

Q.42: Please add any comments you feel relevant in the space below

Question forty-two was an open question designed to give all respondents - both those with computerized information systems and also those without - the opportunity to express their views on matters relating to the topics covered in the questionnaire as a whole.

Of the one hundred and sixty one (161) physiotherapy managers completing the questionnaire a total of eighty (80) offered comments. Of these fifty-seven (57) were users of computer systems while twenty-three (23) were not. The comments were therefore analysed in two separate batches, those with computer systems and those without. The results were as follows:

Physiotherapy managers with computerized information systems

A variety of problems were identified which included:

Poor support from software houses and Unit computer departments

Out-of-date hardware with insufficient capacity and slow operation

Time consuming and inappropriate paperwork systems particularly daily diary sheets and duplication of paperwork

Strong complaints about daily diary sheets for recording daily workload

Insufficient finance for hardware, software and support

Computerization of physiotherapy accorded low priority within the Unit therefore resources not made available

Lack of clerical support

System off-the-shelf, inappropriate for needs and method of working

Systems introduced too quickly with very little consultation. Several respondents were abandoning off-the-shelf systems such as COMCARE, CONWAY, WESCOMS and FIP all of which were seen as irrelevant and not meeting their needs

Inadequate reports, out-of-date and nonsensical. In some cases complete lack of report availability

Several physiotherapy managers mentioned that they would like purpose-built systems.

Anecdotal comments included:

'We are locked into FIP. Say no more!'

'There is still potential for further development. That our 'home-grown' system has been an invaluable tool to date'

'Basically we purchased a Prior-Marshall Wright system. The firm went bust. Ospray have picked it up. It is still not working properly, not doing what we want now. The future is uncertain'

'Our system was developed by the physiotherapy department with the hospital information manager. It was an evolving process, firmly 'owned' by our staff. As a result of its success we are very involved in the HISS project and benefits realisation. The vital ingredient to success has been the physiotherapists' ownership'

'The present COMCARE system has been acknowledged as completely useless. I am hoping for an interim partially computerized system until our full information technology strategy is implemented in approximately one year'

These remarks indicate a substantial level of problems and dissatisfaction with computerized information systems. However where 'users' participated in

systems design or were involved in choices or development work the outcomes were clearly more satisfactory. Most of the problems identified arose where 'off-the-shelf' systems were imposed on physiotherapy services without proper consultation and participation on the part of the physiotherapy managers and their teams. Particular problems were experienced by those systems users who were presented with systems not specifically designed for use by physiotherapy services. There were no comments in favour of such systems.

Physiotherapy managers with no computerized information systems

The twenty three responses in this category were broken down into four main areas as follows:

1. Eight respondents stated that they had no computer system because of lack of funding. Seven of these were pursuing a system and trying to persuade their units to make resources available
2. Three respondents were apprehensive about becoming involved in computerization as they thought the work would be time-consuming and complicated
3. Five physiotherapy managers were resisting strongly the imposition of what they believed to be inappropriate systems
4. In one case the physiotherapy manager was unable to persuade the Trust of the need for computerization within the physiotherapy service.

The anecdotal comments put forward by physiotherapy managers without computerized information systems included:

'A previous bought in package was rejected as being too time consuming and complicated for our needs'

'We want to stay a hands on service not a computerized service'

'We desperately need a computerized system and have been making noises for a long time'

'Our proposed Community Trust is hoping to install a system by the end of 1993 but the Acute Trust is broke'

'Our needs have been specified. All we need is money'

The responses to question 42 indicate a wide range of opinions. Some managers were enthusiastic and knowledgeable while others felt that systems were or might be too complicated and time consuming. Those who had been involved in systems design or had been included in specifying their needs or choosing systems, or even participated in the design process for their system, were very positive about the advantages of 'ownership' and 'participation'. The comments offered must be noted with caution as this open question invited anecdotal responses. However it is clear that the views put forward demonstrate substantial diversity of circumstances and levels of satisfaction or otherwise with the state of affairs locally. No clear trend is indicated except that where physiotherapy managers and their teams were involved as 'users' in the arrangements for implementation of computerised information systems responses were much more positive than those not included in this work.

6.4 Resumé and Discussion of Survey Findings

One hundred and sixty one (161) of the two hundred (200) questionnaires posted to senior physiotherapy managers were returned to the researcher

without use of a follow-up reminder letter. This represents 80.5 per cent of the physiotherapy managers invited to participate in the survey. This was considered an excellent response which demonstrated a high level of interest in the subject. The responses to Question one indicate that the most senior physiotherapy manager in all cases (100%) was responsible for completing and returning the questionnaire, indicating total success in reaching what was considered to be the most appropriate person to complete the survey. Questions two, three and four were about the managerial responsibilities of the respondents. The aim of these questions was to establish the nature of the physiotherapy manager role after the NHS reforms. The responses to these questions are reported in chapter 4 (above).

Question five divided the sample into two distinct parts; those managers who had computerized information systems within their services and those who did not. The majority, one-hundred-and-one (101), of the one hundred and sixty one (161) completed questionnaires returned had computerized systems for their services. Questions six to thirty-four were completed by those managers with computerized systems. The questions ranged through all aspects of computerization in physiotherapy including:

Ownership and siting of systems

'Stand-alone' systems and networking arrangements

The relationship with other PAMs systems

The level of computer officer support with hardware and software

Physiotherapy manager participation in choice of computerized information systems and possible future involvement

The possibility of making required alterations in computer programmes

Physiotherapy management control of the system

The effect of computerization on clinical practice

Clerical support

Computer reporting arrangements and modes of reporting

Uses to which the computer systems are put

The facility to accommodate, for example, Read coding, clinical audit, outcome measurement, and research

The possibility of user group participation by physiotherapy managers

Various modes of data input to the computer

Possible problems with duplication of data collected

Whether the computer system was seen as supporting the clinical activity or the physiotherapists supporting the computer system

The non-computer users were asked to complete questions thirty-five to forty-one. In response to the question about whether they wished to have a computer system the vast majority, fifty-nine out of sixty respondents (98.3%) did, and fifty-eight out of the sixty (96.7%) respondents felt that they would wish to specify their own computer needs, an overwhelming majority. Such positive responses indicate very clearly support for participation in specification of needs. These figures match those for the computer user group who by an overwhelming majority, ninety-six (96) out of one-hundred-and-

one (101) responses (95.04%), wanted to be able to influence future developments.

The other questions in the non-computer user section related to the collection of information manually, loss of clinical time through data collection and possible reasons why they did not have computers.

An analysis of question twenty-four and thirty-eight indicates that physiotherapy managers with computers were more able to obtain information for managerial and clinical support of their services in: statistical returns, outcome measurement, statistical reports to service purchasers, activity reports, caseload management and resource input measurement.

For clinical audit both groups were at the same level of achievement. A possible reason for this might have been that clinical audit was a relatively new requirement for physiotherapists and therefore computer users might not have incorporated this into their systems by the time of the survey.

Analysis of question twenty-four shows that the computer users were less able to use their computers for some tasks than non-computer users undertaking these operations manually. The areas included: appliance issuing and retrieval, patients' appointments, waiting list monitoring and stock control.

There were reasons why the computer users found little benefit to support work in these areas. In the management of appointments the majority of physiotherapy services undertook arrangements for appointments using a

paper diary system, each physiotherapist holding an appointment diary in which patient appointments were given on an on-going daily basis. Future appointments to be dependent upon patient assessment and agreement between the physiotherapist and patient as to the frequency and times of appointment. If computer systems were to be used for appointment making there would need to be a substantial financial investment in computer terminals to accommodate the numbers of physiotherapists working in departments or installation of an effective Local Area Network (LAN) to facilitate this. Hospital in-patients are not given appointments but are seen on the ward often several times a day while community domiciliary and school health physiotherapists, for example, would need ready access to computer terminals in a variety of locations, if appointments were to be managed through the use of computers. In the short term, therefore, it would seem unlikely that computers would be a viable alternative for this work.

The monitoring of waiting lists is a straightforward matter. As referrals come into the physiotherapy department they may be registered on to the computer system and are then manually placed on a waiting list. It is straightforward to assess the size and weighting of the waiting list by literally looking at the box of referrals. The waiting list monitoring might therefore be slowed by using the computer system.

Stock control is generally monitored by Trust supplies and purchasing departments, as materials management techniques are more widely used in the NHS. It is unlikely that physiotherapy managers would wish to use their

computers for this purpose as the work can be more easily undertaken by these departments at a satisfactory level of quality.

In the case of appliance issuing and retrieval it is more difficult to draw conclusions. In some cases walking appliances such as crutches, walking frames and walking sticks may be monitored through materials management by supplies and purchasing departments. However, in the experience of the researcher this work is not generally undertaken by supplies and purchasing. It would seem reasonable that appliance issue and retrieval might usefully be incorporated into physiotherapy computerized information systems. The reasons why this was not happening to a great extent are not known.

That senior physiotherapy managers would require relevant computerized information systems for managerial and clinical purposes and that many of these managers would already be actively working with computerized information systems was supported by the results of the questionnaire survey. The results demonstrated that senior physiotherapy managers felt that they required relevant computerized information systems for managerial and clinical purposes and it was clear that many of them were already working with computerized information systems, were actively engaged in seeking systems for their services or indicated that they wished to do so.

6.5 Overview

The main focus of chapter 6 was the supplementary empirical study. The findings of the questionnaire survey set out in the chapter provide a detailed picture of what was happening in England in the field of computerized

information systems for physiotherapy services. The results of the survey support the view and clearly indicate that physiotherapy managers wish to participate as 'users' in the specification and choice of computerized information systems for their services. There was no support for the imposition of what was seen as inappropriate systems, while local 'ownership' was seen as very important for obtaining successful outcomes.

The supplementary empirical study reported in this chapter shows that computerization in physiotherapy was an evolving and dynamic process and that there was a high level of interest and commitment in this area of work. The results demonstrate that the development and implementation of a computerized information system was and remains relevant to physiotherapy and its management and that the work involved in this is legitimate in terms of the needs of physiotherapy managers and the NHS as a whole. The survey findings indicated that senior physiotherapy managers require computerized information systems for their services within the context of : the imperatives for the development of information systems throughout the NHS; the scope and spectrum of modern physiotherapy practice; changes in the NHS structure, organisation and management and the management needs of physiotherapists and managers throughout the NHS, both service purchasers and providers.

CHAPTER SEVEN

PROBLEM SOLVING PROCESS – THE ACTION RESEARCH - DEVELOPMENT AND IMPLEMENTATION OF A COMPUTERISED INFORMATION SYSTEM FOR PHYSIOTHERAPY SERVICES

7.1 Introduction

The problem situation identified in chapters 2, 3 and 4 and the empirical research, chapter 6 (above) revealed important areas of concern related to computerised information systems provision for physiotherapy services:

> The requirement for detailed, good quality and relevant information resulting from the implementation of the Korner recommendations and other imperatives for more and improved information within the NHS.
>
> The expanding scope and spectrum of physiotherapy practice and services together with the maturation of physiotherapy as a profession.
>
> The managerial, organisational and structural changes taking place in the NHS and the associated developments in physiotherapy management.
>
> The empirical research which confirmed the perceived need on the part of physiotherapy managers for computerised systems capable of fulfilling their requirements.

It was an objective of the researcher – problem solver – to transform the current situation – situation of concern – to a new desired situation through the development and implementation of a computerised information system for physiotherapy services. The researcher was an "insider" throughout the

entire project, leading the working group and taking a full part in the events and interactions; not acting purely as a passive observer, whose only function would have been to record perceptions of the process.

This chapter focuses on two main phases of development work. The first did not provide a satisfactory outcome, whilst the second phase, the development of the physiotherapy management system (PMS) resulted in a successful problem resolution which in turn formed the platform for further multi-therapy systems development. The study is an account of a long term action research project incorporating elements of problem solving by experiential learning and reflection in action and elements from a range of methodologies are adopted throughout the project including; prototyping, the participative user-centred approach and ETHICS, chapter 5 (above). It also reflects the ethos of a "skunkworks", Peters and Waterman (1982 p211), which is 'notoriously pragmatic' and emphasises the role of champions for innovations or development by informal groups.

Having gained a clear understanding of the problem situation, the researcher held the view that effective computerised information system development would be unlikely to take place without the active participation of those people who would use the system. Important factors in this would be to incorporate the users tacit knowledge and skills into the system, Polanyi (1967 p4) and to establish a strong sense of user "ownership". One of the

factors integral to establishing user ownership was judged by the researcher to be the input of physiotherapist's tacit knowledge about their working practices and consequent requirements:

> *"When we go about the spontaneous, intuitive performance of the actions of everyday life, we show ourselves to be knowledgeable in a special way...our knowing is ordinarily tacit, implicit in our patterns of action and in our feel for the stuff with which we are dealing. It seems right to say that our knowing is in our action. Similarly, the workaday life of the professional depends on tacit knowing-in-action".*
>
> *(Schon 1991 p4)*

Since the implementation of the NHS and Community Care Act 1990 there has been a trend towards managing all therapy services within one organisational structure under one manager. In response to this the computerized information system for physiotherapy described in this chapter was further developed to accommodate multi-therapy application (7.8 below).

Chronology of Key Milestones in Action Research Study

Dates	Key Milestones
November 1986	SETRHA Physiotherapy managers working group set up under chairmanship of researcher.
1986/7	Researcher provided background information on CIS development in physiotherapy and researched Comcare.
1987	Establishing the vision and discussion of perceived requirements. Researcher proposed aims and objectives for working group, patient registration data capture paperwork system agreed and designed.
1987	Paperwork system piloted in Eastbourne.
1987/8	New paperwork system promulgated and adopted throughout SETRHA physiotherapy services.
1987/8	Initial coding system for data capture developed by researcher and agreed and modified by working group.
1987	Researcher began discussions with ASL to develop new 'stand-alone' system for physiotherapy (SEPHIT), compatible with Comcare.
1987/8	Design of SEPHIT
1989	Comcare and SEPHIT 'went live' concurrently.
1989/90	Commenced work on outcome measurement for Eastbourne District Physiotherapy Service.
January 1990	ASL taken over by ICL. SEPHIT low priority in company re-organisation.
1990	Researcher negotiated with ICL management at high level to ensure physiotherapy requirements recognised.
1990	ICL moves SEPHIT into subsidiary company Medical Portfolio Ltd.
1990/1	Patient registration document and Körner sample inquiry paperwork updated to reflect NHS reforms.
1991	Development of PMS – researcher worked closely with ICL Medical Portfolio Ltd programmer/analyst.
1991	Research Commenced work on developing research measurement in physiotherapy – The Physiotherapy Input Unit.
1991/92	PMS prototyping.
1992	PMS piloted in Eastbourne and 'went live'.
1992	PMS distributed to other sites regionally and nationally. Researcher set up national user group.
1992/3	Researcher and Medical Portfolio Ltd commenced work on modifying PMS to MTS for use by all PAMs.
1993	Eastbourne physiotherapy service piloted and implemented MTS.
1993	Researcher developed guidelines for CIS in NHS therapy service.
1994	Publication of Guidelines (Appendix 8).
1994	MTS distributed nationally.
1st April 1994	Implementation programme for other PAMs commenced in Eastbourne.
1994	Working group 'wound up'. Focus for MTS national user group, chaired by researcher.
1995	DoH published document and CIS for physiotherapists, written on its behalf by researcher.

Table 7.1

7.2 Initiation of the Action Research Project

As a result of the Körner requirements, (2.4 above) the fifteen district physiotherapy managers in SETRHA set up a small working group in November 1986 to discuss the implementation of information requirements and investigate possible computerised information systems for use within their services. The researcher was asked to lead the work; as chairman of the CSP committees dealing with information systems, management budgeting, resource management and NHS service management from 1984 (1.6 above) he was at the forefront of CSP thinking and debate within the profession and was the group member most familiar with information matters and computer technology. The original membership of the working group was; the researcher (problem solver), two district physiotherapy managers from Brighton and South East Kent, a superintendent physiotherapist from the Eastbourne physiotherapy service and the Eastbourne district information officer. The group members were selected for their interest in the work and willingness to participate, knowledge of physiotherapy practice and management and of the Körner requirements and associated Government initiatives; there was no group member with specialist computer expertise, the level of experience at this stage being limited to the use of micro computers for home use.

The working group met in the researcher's office in the physiotherapy department at Eastbourne. The Minutes of the working group, Working

Group Minutes Folio (1986-1994), show that during the first full year of the action research project, they spent over one hundred hours in meetings discussing their perceived requirements, agreeing objectives, working on the contents and design of the paperwork system and data capture and establishing a vision for what they thought might be the computer support needed. The meetings took place at three to four weekly intervals at this stage. No formal timetable for the project was set out because the group members had no previous experience in computer systems design and were therefore unable to make definite plans about time scales. The minutes of the working group meetings indicate that they continued to meet at least monthly until 1994 when it was agreed that the major objectives had been achieved. Throughout this eight year period the parameters of the project changed many times, the work evolving from simple beginnings – where the researcher and his colleagues were naïve about computer systems development – to a more focused and methodical approach. Input to the group was sought from a range of sources including; other physiotherapy managers and clinicians throughout the region, information officers, computer "experts" and Körner implementation officers.

During 1986, in response to the Körner MDS requirements SETRHA chose a generic computer system called Comcare – community care - for community nursing services and all PAMs within the region to use (2.4.2 above). This was decided by a group of district general managers (DGMs)

within the region; there was no involvement by physiotherapists or PAMs – users – in the decision, no rationale was set out and made known to the physiotherapy working group or PAMs.

In view of this decision, the researcher undertook to investigate Comcare in detail, to update the group (2.4.2 above) and provide a wide range of background information on computerised information systems development in physiotherapy drawing on work in which he was involved nationally (1.6 above).

The researcher investigated the Comcare system through discussion with the software company – ASL – an examination of the data recording systems to be used, by networking with colleagues who were starting to use the system in a number of locations across the UK and by contact with physiotherapy managers and clinicians sending comments into the CSP. The group decided that Comcare would not meet the needs of their physiotherapy services. The reasons cited were:

Input to the Comcare system was to be through Psion hand-held organisers or daily diary sheets both of which required duplication of data collection by physiotherapy clinicians, (2.4.2 above) and Appendix 4 .

The Comcare system demanded the collection of data items which were not part of the Körner MDS for physiotherapy such as daily face to face contacts

with patients, a process which would greatly increase the volume of data collection work for them (2.4.2 above).

The physiotherapists would not be able to obtain computer reports easily as the main frame computers were to be situated in buildings remote from physiotherapy departments and ASL were not willing to develop the system to incorporate the data requirements recommended by physiotherapy managers and clinicians or even the correct Körner return for physiotherapy services (2.4.1 above) .

As a result of these factors the researcher and the working group were determined not to be compelled to accept the Comcare system and this was a strong element in the motivation to work on the establishment of a specification for the design of a new system in accord with the objectives which they had identified. As a result of the researcher's report the group decided that the Comcare system was inappropriate for use within physiotherapy services (2.4.2. above).

At this early stage, the group began discussing the necessity of ensuring "ownership" of data – a novel concept in the NHS in 1986-1987, as very few clinical services had their own computerised information systems. The working group perceived that the DHA and RHA seemed to regard the flow of information as a "one way traffic" from clinical services to the centre.

The study of professionalization (3.3 above) revealed the physiotherapy occupational group well advanced along the continuum of full professionalization and this may also have been a contributory factor in motivating the working group to reject what was seen by them as the imposition of an inappropriate system. A perceptual process is one of the most influential characteristics of the intended problem solver's "mental constructs". It acts as a filter to information from the action world and determines what information is to be significant, Jayaratna (1997). The desire to establish a purpose-built system might have been an unconscious attempt to confirm professional boundaries through strong self assertion; this possibility was, however, never explicit within the group.

7.3 Working Group – Initial Aims and Objectives

The researcher proposed a set of initial aims and objectives for discussion by the working group. A work programme was then discussed and adopted.

7.3.1 *Aims*

In order to ascertain whether it would be possible to transform the current situation to a desired situation, a number of questions would need to be answered: would it be possible to design a computerised information system relevant to the needs of physiotherapists; would it be possible to persuade RHA, DHA and unit interests that such a project was necessary, viable and a satisfactory solution to the information problem for physiotherapy and

perhaps other PAMs and could a system be designed which would satisfy the specific needs of physiotherapists yet allow interface with other information systems. It was agreed that an attempt to find solutions to these problems should be sought.

7.3.2 *Objectives*

The researcher constructed a set of objectives for the development of a computerised information system specific to physiotherapy for adoption within services throughout the Region and perhaps more widely, Working Group Minutes Folio (1986-1994). The objectives were:

> That the system must provide the information required by the DHSS, RHAs and DHAs - Körner return, KT27 for physiotherapy services, (2.4 above)
>
> To obtain information relevant to the management of the district physiotherapy service. This would be for the specific use of physiotherapy managers and clinicians chapters 2-4 (above).
>
> To make the associated paperwork as 'user-friendly' as possible and to ensure that the paperwork was applicable to the whole of the district physiotherapy service, that is, the same system was to be used in hospitals, community domiciliary, special schools and other locations where physiotherapists were working, chapter 3 (above). Physiotherapy record keeping systems had always varied throughout

the region; generally a minimum of clinical information was noted and there was no standard format for recording.

To develop a system which would be acceptable to other Districts and could be used nationally if desired.

To liaise and work with district and regional information and Körner implementation officers and computer departments and to develop links with organisations supplying the computer systems.

To comply with the CSP principles on information and budgeting systems (2.4.3.6 above) and Appendix 2.

To ensure that all information collected was a by-product of clinical activity, chapter 3 (above).

To ensure that there was no duplication of data collection requiring physiotherapists to collect information in a paperwork system and at the same time collect the same information and input this to hand held computers as was required by the Comcare system (2.4.2 above).

To meet the need for increasing demands for accurate, timely and meaningful information implicit in the Griffiths recommendations, chapter 4 (above).

To ensure easy access by users to the computer system and the information produced.

To replace the previously used manual system of data collection for physiotherapy services – the SH3 Return which was inaccurate and limited (2.3 above).

To meet the clinical needs of the physiotherapy service in terms of research, outcome measurement, audit, and activity analysis including the use of time, chapters 2-4 (above).

To assist physiotherapy managers and clinicians by providing a computerised information system to support their work rather than them supporting the requirements of the system.

These initial objectives for the development of a system would themselves be modified and built upon in the light of experience and to take account of further radical changes within the NHS during the late l980s and early 1990s including the Government Reforms, chapter 4 (above) which resulted in the purchaser/provider split and the introduction of an 'internal market'.

7. 4 A New Paperwork System for Physiotherapy

The manual data collection system using the SH3 Return was in use within the NHS for many years prior to the introduction of the Körner recommendations, it would not be possible to collect the Körner minimum data set (MDS) using this (2.3.1 above) Before embarking on the development of a computerized information system for physiotherapy use the researcher decided it would be necessary to develop a new paperwork system to facilitate collection of the raw data by physiotherapy clinicians.

The new paperwork system would have to comply with the objectives which had been agreed by the group (7.3.2 above) ensuring that it was acceptable to the users catering for all the information required.

7.4.1 *The Körner Sample Inquiry*

A major requirement specified in the fourth Körner report, Körner (1984a) for PAMs was the collection of information about staff activity. For all other PAM groups this information was required to be collected on a daily on-going basis but for physiotherapy, a sample period once a year was required only (2.4.1 above). The information to be collected by physiotherapists included details of the exact time spent on a variety of specified activities during the sample period. 'Face-to-face' contact data were required as part of the annual sample; other data to be collected were, time spent in telephone contacts with patients or relatives, undertaking home assessment visits - this does not mean domiciliary physiotherapy treatments but rather assessing the homes of patients with a disability or temporary impairment for adaptions or the provision of appliances prior to their hospital discharge - and 'other' professional activities.

Following consultation with physiotherapy staff at Eastbourne and physiotherapy managers throughout SETRHA, a form was designed for the collection of the sample inquiry data. It was agreed that the information collected would include the Körner requirements on activity together with data which would be useful to physiotherapy managers and clinicians.

The physiotherapy staff felt that it was desirable to break the four categories required by Körner for the sample inquiry - face-to-face-contacts, telephone contacts, home assessment visits and 'other' professional activities - into a broader range in order to give a more detailed and relevant picture of physiotherapists' activity locally. The physiotherapy staff decided that this would be more acceptable to them as they felt that the four broad categories of data required to be collected under the Körner recommendations nationally did not meaningfully reflect their daily work patterns; no specific forms for data collection having been proposed by Körner. Figure 7.1 (below) represents the sample inquiry form drawn up and used as a result of consultation, piloting and repiloting within the Eastbourne district physiotherapy service.

7.4.1.1 *The Körner Sample Inquiry Form*

It was agreed by the working group and the Eastbourne physiotherapy staff that every member of staff would complete a new form on each sample inquiry day and that the sample inquiry would take place for one day each quarter year, that is, a Monday in the March quarter, a Tuesday in the June quarter, a Wednesday in the September quarter, a Thursday in the December quarter, a Friday in the following March quarter and so on. The objective was to provide as full a picture as possible of the pattern of activity throughout the year and over a period of several years. Every member of staff would complete a separate inquiry form for each location in which they

worked; for example, if a physiotherapist worked for part of the day on the DGH wards, and partly at St. Wilfrid's Hospice, two separate forms would be completed.

The form itself included information on the date of the sample, the location in which the member of staff was working, the physiotherapy clinician identifier, the grade of the member of staff and the post occupied by the member of staff indicating the placement in the case of rotational posts.

The main body of the form dealt with the allocation of time throughout the day to a wide variety of activity categories. The form also has spaces for the total caseload carried by that clinician at that time, number of home assessment visits undertaken during the quarter, the reason for absence if applicable on the day of the sample inquiry and the number of contracted hours relevant to the day in question.

For the purpose of the National KT27 return the data items listed on the Körner sample inquiry form were to be aggregated back into the four categories required by the DHSS. On completion of the piloting and consultation phases the form, figure 7.1 (below) was implemented in Eastbourne and adopted by all fifteen districts throughout SETRHA so that all physiotherapists within the region collected the same data on the same days – a unique achievement nationally. This method of activity sampling

EASTBOURNE HEALTH AUTHORITY
DISTRICT PHYSIOTHERAPY SERVICE

Figure 7.1

KÖRNER ACTIVITY SAMPLE

DATE	PROVIDER UNIT	LOCATION	CLINICIAN	GRADE	POST/ROTATION	REASON ABSENT

ACTIVITY LEVEL		HOURS	MINS
FACE TO FACE CONTACTS (INDIVIDUAL)			
FACE TO FACE CONTACTS (GROUP)			
TELEPHONE CONTACTS PATIENT OR RELATIVE			
WARD ROUNDS			
CASE CONFERENCE			
STUDY LEAVE			
LIAISON WITH OTHER SERVICES			
ADMINISTRATION			
MANAGEMENT DUTIES			
HOME ASSESSMENT VISITS			
TRAVEL			
CLINICS			
STAFF/TEAM MEETINGS			
IN-SERVICE TRAINING			
TEACHING	PHYSIO'S		
	STUDENTS		
	HEALTH PROF'S		
	PUBLIC		
CLINICAL SUPERVISION			
OTHER			
TIME TAKEN TO COMPLETE THIS FORM			
NORMAL WORKING HOURS			

No. OF GROUP SESSIONS TODAY	
No. OF HOME ASSESSMENT VISITS THIS QUARTER	
TOTAL CASELOAD	

was designed to facilitate comparison of information between the regional physiotherapy services. All fifteen managers reported that the Körner sample inquiry paperwork was acceptable to their staff and that they themselves felt they would be able to obtain useful information from the process when a computerized information system was in place enabling the data to be input, processed and reported. The acceptability of the paperwork to all users was likely to have resulted from the thorough piloting and consultation procedures which had been followed as the researcher had welcomed and encouraged input from all participants.

7.5 Physiotherapy Patient Registration Document

7.5.1 *Introduction*

Facilitated by the researcher the working group set out to develop a multi-purpose patient registration document that would fulfil DHSS, RHA, DHA and Unit requirements; allow the registration of patients coming into contact with the physiotherapy service; enable computer input of the information at the conclusion of the episode of care rather than at several points throughout the episode and be used as a patient referral card. It would also provide for Problem Orientated Medical Records, and a discharge summary.

An important aim was to create as simple a paperwork system as possible in which all of these purposes were to be incorporated in a single document in order to control the volume of paperwork for physiotherapy clinicians. The

motivation for this had arisen as a result of the researcher obtaining samples of paperwork systems from Comcare, FIP and Paracom for example, all of which used complicated multiple paperwork recording systems (2.4.1 above) and Appendix 4. A further objective (7.3.2 above) was to ensure that it would be possible to achieve good quality record keeping .

The data collection element of the document, Appendix 7, is a three piece carbon set of which the top two slips are detachable from the main card. The detachable slips are the patient registration and discharge computer input forms while the third part is the top section of the POMR card, which is maintained as part of the patient's medical record. The group decided on this format in order to avoid any unnecessary duplication of written work.

7.5.2 *The Data Items - Physiotherapy Registration*

The card was designed so that the following items could be entered when the patient was referred into the physiotherapy service:

Data Items Registration

Number	Item	Remarks
1	Referral Date	
2	First Physiotherapy Appointment	From which it was planned that the computer system would sort 'initial contact' and 'first contact in the financial year'. The difference between the referral date (item 1) and the first physiotherapy appointment (item 2) above would give the waiting time. A count of first physiotherapy appointments would also give the number of episodes of care and first contacts within the financial year – both Körner requirements. The working group also recognised that it was important to know the number of face-to-face contacts within episodes of care; in other words how many times each patient attended in the overall episode of care. These figures would be an important contribution to an assessment of the overall volume of activity taking place within the service. The face-to-face contact data would be collected as part of the discharge data set (below) rather than throughout the episode as it would be logistically impossible to collect without very substantial duplication of paperwork and consequent loss of clinical time 2.... (above).
3	Diagnostic Code	For which ICD9 codes would be used; it was the ambition of the group to use this information as part of audit – before that time audit had not taken place within physiotherapy in the region.
4	Referral Source and Consultant Codes.	Referral source codings were available nationally, for example, 110 Orthopaedics, 300 General Medicine. The consultant code would identify a specific consultant within a referral source or specialty
5	Whether the Patient was an NHS, Private Patient (PP) or Overseas Visitor (OSV) Referral	
6	Patient Classification	Whether the patient was referred from the accident and emergency department, as an in-patient, an out-patient, a community patient or day patient – a Körner requirement.
7	Location Code.	To indicate where the patient has physiotherapy intervention, for example, DGH out-patient department or in the patient's own home.
8	The Reason For Referral	This refers to the physiotherapy reason for referral and not necessarily the medical diagnosis. There were and still are no universally accepted methods of coding and recording physiotherapy reasons for referral. However as the clinical and managerial information systems for physiotherapy and occupational therapy report, CSP/COT/DHSS (1986), suggests it may also be helpful to know the physiotherapy reason for referral as well as the medical diagnosis. It was envisaged that this information would be useful in assessing the types of work taking place in different locations, for example, respiratory physiotherapy, mobility work, health promotion/education and that this would assist managers in determining the appropriate staff skill mix in particular locations. It would not be possible to obtain this specific information from medical diagnosis alone.
9	Patient Identifier Information.	This section was used for the patient's hospital or patient administration system (PAS) code number, the name, address, post code, sex, date of birth, general practitioner and patient's telephone number. This section of the card was designed to accommodate a conventional PAS label to be used wherever possible in order to reduce duplicating written work.
10	Physiotherapy Clinician Code	To enable individual physiotherapy caseloads to be reported on for clinical and management purposes as well as to hold a record of which physiotherapist treated which patient.

Table 7.2

Since the advent of the NHS reforms in 1990/1991, this basic registration information has been updated to include data about the care group, for example, elderly, learning difficulties and paediatrics; the ethnic origin which is not generally used but required as a future data item by the DoH; the provider unit or Trust; the contract number identifier; the patient's NHS

number and the GP practice number and GP identifier, all of which are needed for contract purposes.

When the patient was registered as having been referred to the physiotherapy service and the first contact had taken place the top blue carbon slip (Appendix 7) was to be detached from the card and submitted to the physiotherapy computer clerk for data entry to the system.

7.5.3 *The Data Items - Physiotherapy Discharge*

When the patient completed a physiotherapy episode of care the second, pink slip on the card (Appendix 7) would be completed with the following information:

Data Items - Discharge

Number	Item	Remarks
1	Discharge Date	
2	The Total Number of Contacts	This is the total number of face-to-face contacts with the service during the physiotherapy episode of care; this was therefore collected retrospectively.
3	Discharge Status	This item suggested by the researcher to indicate, for example, whether the patient was discharged to another hospital or district, another condition intervened or was discharged fully recovered. He envisaged that it might be used for registering outcome measurement.
4	The PIU	These boxes were designated for coded information about the measure of physiotherapy resource input during the physiotherapy episode of care. The researcher had started work on devising a system of applying numerical values to this (7. Above)
5	Outcome Measure	Very little work had been carried out in this area at this time, 3.9 (above) presents the method developed by the researcher and his colleagues in Eastbourne.
6	Audit	It was envisaged that the boxes could be provided for audit and research purposes. Various physiotherapy interventions might be coded and the outcomes compared at a later date. No previous work had been undertaken in this area by physiotherapists. This work pre-dated the introduction of clinical and medical audit in the NHS.
7	Number of Home Assessment Visits (HAVs)	(7.4.1 above)
8	Appliances	These boxes were to be used to record codes for appliances loaned to the patient, to facilitate a proper record of what the patient was using and for stock taking and purchase procedures and retrieval, where appropriate

Table 7.3

7.5.4 *The Data Items - POMR*

This section of the document comprised a four sided POMR and referral card. Side one contained the carbon information from the registration and discharge slips, the referral details to be completed by the referring doctor and the physiotherapist's discharge summary were also to be entered on the front of the document (Appendix 7); sides two, three and four comprised a standard POMR format. The physiotherapy referral flow chart, Figure 7.2 (below) indicates the stages of the data collection process as proposed by the researcher and adopted by the working group.

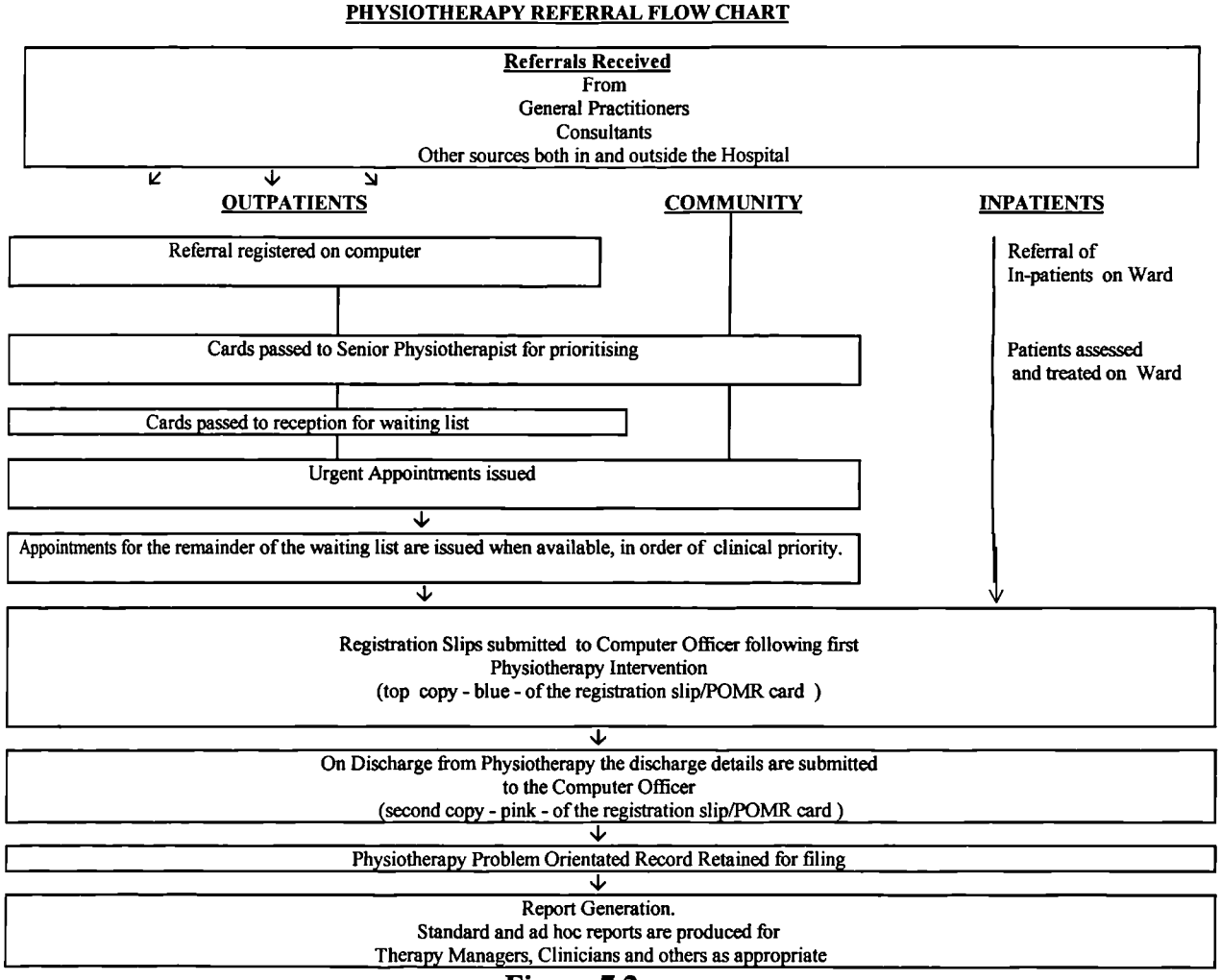


Figure 7.2

7.5.5 *Coding*

The NHS uses a variety of coding systems, (2.7 and 2.3.1 above). The object of coding systems is to provide a common and shared factual language which can be used both by clinicians from all disciplines and managers.

When this paperwork system was designed, no work had been undertaken nationally or locally on coding methods for use in physiotherapy. It was therefore necessary for the researcher and working group to design codes for use with the proposed system for parameters such as physiotherapy reasons for referral, physiotherapy clinician identifiers, outcomes appliances and so on. The data collection system was designed to be computerized and therefore much of the registration and discharge data needed to be encoded for ease of entry to the computer and to minimise physiotherapy clinician writing time. Some codes, however, were supplied by the RHA such as the source of referral and consultant codes.

The paperwork encoding system was drawn up following much debate and piloted by the Eastbourne District physiotherapy staff teams. It was modified several times, agreed and brought into use.

This paperwork system was later adopted by all fifteen districts within SETRHA, as with the Körner sample inquiry paperwork system a unique

achievement in national physiotherapy or PAMs working practices. The paperwork system has since been adopted by a number of other districts outside SETRHA and the carbon principle has been taken up by many others.

The development of the paperwork systems for the Körner sample inquiry and the patient registration POMR document used a "forms view" methodology rather than an approach based on the development of a computer software database. The researcher and his working group colleagues had no knowledge or experience of computer software design and development at this stage and consequently it was necessary to progress the work from a sound knowledge and practice base as being the only "safe" way of proceeding. The working group agreed that the design of software for their use should follow working practices as reflected by the paperwork systems, rather than adjust the working practices and paperwork data capture methodology to the software. Further factors influencing this approach may have been the strong feelings of professional identity within the group, chapter 3 (above); the researcher was taking a leading role nationally, (1.6 above), in the politics surrounding the implementation of Körner and was able to make the working group aware of what was happening at CSP and DoH levels. The group worked together as a cohesive unit being determined to argue the case for a purpose-built computerized system and drive the process forward.

7.5.6 *Outcome Measurement in Physiotherapy*

In 1989/90 a system of outcome measurement was developed by the researcher who led physiotherapy colleagues in Eastbourne through an exercise, the objective of which was to evaluate the end result of physiotherapy intervention on individual clients; there was no other system of outcome measurement in physiotherapy available at the time. As a result of the different modes of working in various sectors of the service it was necessary to devise several different systems of measurement for, out-patients, in-patients and community domiciliary services. These three methods were used for all physiotherapy episodes of care in Eastbourne:

> *'A variety of methods of outcome measurements are currently being devised in units around the country'*
> *(CSP 1993 p775)*

The outcome of a service is:

> *'the end result of its intervention on a client or a population in the short, medium and long terms'.*
> *(Øvretveit, J. 1992 p70)*

In defining professional quality standards each service should :

> *'reach towards defining quality in terms of outcome and health gain as well as in terms of process structure and inputs'.*
> *(Øvretveit, J. 1992 p70)*

7.5.6.1 ***Outcome Measures - Out-patient Services***

The system was based on a measure of efficiency and effectiveness, (4.7.1 above). Effectiveness is measured by using the extent to which the agreed goal or aims of a plan of treatment are achieved. When the patient was discharged from physiotherapy having completed an episode of physiotherapy treatment they were asked subjectively what improvement had been made and to decide on a score between one and seven (below). The physiotherapist carried out an objective assessment which related back to the assessment undertaken at the patient's first attendance. The physiotherapist allocated a score between one and seven. The two scores were then added together and divided by two in order to give an average score.

1. WORSE - refer patient back to doctor
2. NO CHANGE
3. SLIGHT IMPROVEMENT (up to 25%)
4. REASONABLE IMPROVEMENT (up to 50%)
5. MARKED IMPROVEMENT (50% or more)
6. GREAT IMPROVEMENT (80% or more)
7. COMPLETELY BETTER

If the patient failed to complete an episode of physiotherapy treatment, that is, did not attend, unable to attend, transferred elsewhere or died then a score of zero (0) was recorded.

Efficiency was taken as maximum results of improvement using the least resources. In this, the number of treatment sessions in an episode of care were recorded and plotted against the effectiveness measure (above). Data collected within the physiotherapy service for several years enabled the researcher to identify that the average number of treatments in an episode of care for out-patients at that time was six. This figure was, therefore, taken as the number of treatments representing the average on the vertical axis, figure 7.3(below).

Outcome Measures - Out-Patients

Efficiency

Number of Treatments

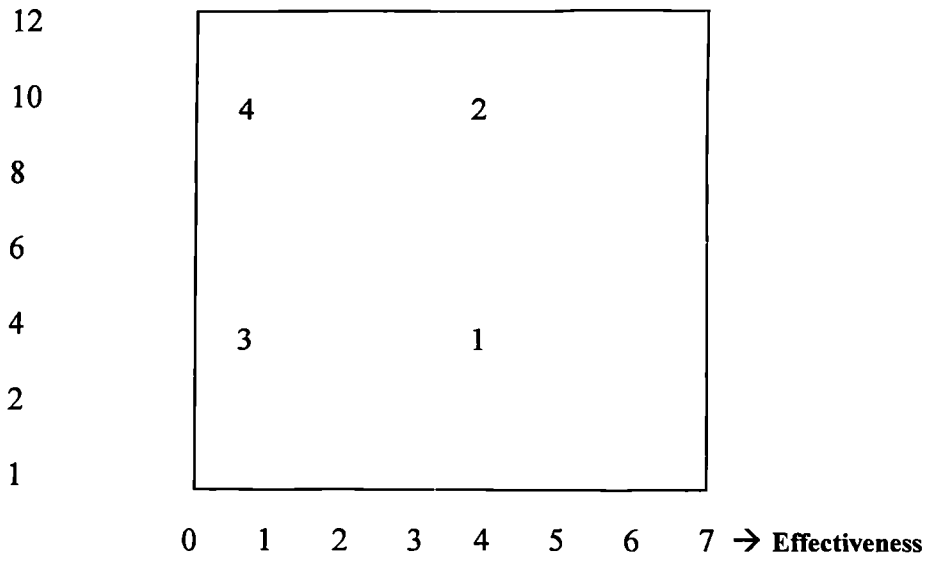


Figure 7.3

0 - Failed to complete physiotherapy episode

1 - The optimum number of treatments with high level of effectiveness

2 - Acceptable but not desirable as satisfactory effectiveness measure, but more than the average number of treatments

3 - Unacceptable outcome as poor response to physiotherapy intervention though less than average number of treatments in episode of physiotherapy care.

4 - Worst result, poor effectiveness measure and more than the avera number of treatments.

7.5.6.2 ***Outcome Measures - In-patient Services***

The basic principles devised for outcome measurement in in-patient physiotherapy services were very similar to those for out-patients. However it was necessary to modify the system in recognition of the different modes of working and other constraints related to in-patient physiotherapy care. Effectiveness was again taken as the extent to which the agreed goals or aims of a plan of physiotherapy treatment were achieved. Target times were set for goals to be achieved and these were recorded. The physiotherapist carried out an objective assessment and allocated a score between one and seven, a similar method to that used in out-patient services.

When the patient was transferred elsewhere or the goal changed due to other medical circumstances or the patient died, a score of zero was recorded.

Efficiency was to gain the maximum possible results using the least resources. The target time for a goal was set and placed on the vertical axis. A point halfway up the vertical axis was marked, Figure 7.4 (below), therefore the top of the vertical axis equalled double the target time.

Outcome Measures - In-patients

Efficiency

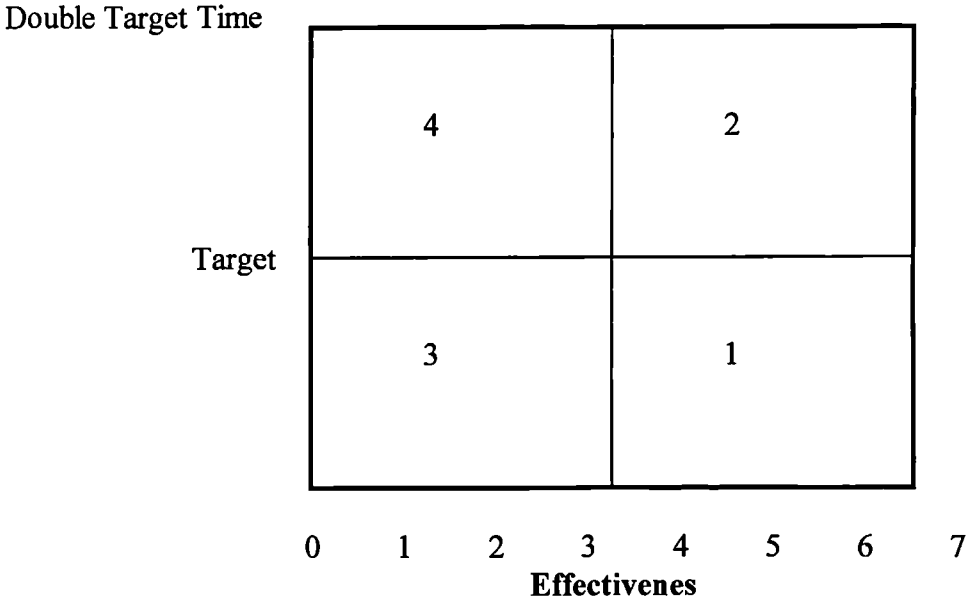


Figure 7.4

The effectiveness score was plotted against the target time on the grid.

0 - Failed to complete treatment/goal changed

1 - The optimum - good effect in a short time

2 - Acceptable - good effect but over target time

3 - Unacceptable outcome - poor effect

4 - The worst - poor effect and extended time

A list of goals and their outcomes was maintained in the physiotherapy record and when the patient was discharged the average outcome was recorded, that is, the outcome measure for each of the recorded goals. For long term patients this was undertaken at agreed intervals for example six weekly in head injury cases.

These outcome measures provided useful guidance although they were not totally accurate due to only manifestly achievable objectives being agreed.

7.5.6.3 ***Outcome Measures - Community Domiciliary***

In community domiciliary physiotherapy the outcome measurement was based on the Problem Orientated Medical Record (POMR) problem list aims and objectives, Kings Fund Centre (1988). For example, three objectives could be agreed at the initial assessment in the physiotherapy episode of domiciliary care. On discharge two of these objectives might have been

achieved. This was then recorded as 'two three' in the outcome section of the patient's physiotherapy notes. Patients and carers were involved in the process as far as possible, however the researcher recognised that this method represented mainly the physiotherapist's assessment. In order to obtain a more accurate recording of the patient's assessment the researcher developed a simple questionnaire which was issued to patients on discharge from the community domiciliary physiotherapy service. In this, numerical values were applied to the patient's view of the result of physiotherapy intervention.

7.5.6.4 ***Outcome Measures - Discussion***

These methods of measuring the outcome of physiotherapy interventions could all be recorded numerically on the registration paperwork (7.5 above) and the results were analysed by physiotherapy teams and individual clinicians to influence the development of physiotherapy interventions. Physiotherapy services in hospital and community trusts undertook large volumes of work each year and it was very difficult to extract outcome measurements for a given population of patients by manual means. The process was arduous and time consuming and the possibility of error high. In order to process large volumes of results the researcher believed that computer support would be helpful enabling the extraction of large volumes of information which might be cross-matched with various other information, such as, outcomes related to or compared with different physiotherapy

interventions. Outcome measurement was and still is used in Eastbourne in the clinical audit process and research projects.

7.5.7 *The Physiotherapy Input Unit – An Apportionment System for Costing and Pricing Physiotherapy*

By early 1990s physiotherapy costing exercises had been carried out in only a small number of districts, Griffiths (1992). One method was to apportion costs to specialties by the volume of referrals to the physiotherapy service from each speciality, calculation then being made to account for the grade-mix and number of staff working in each speciality. The original concept Williams (1991) resulted from requests from the Association of Chartered Physiotherapists in Management (ACPM) was for a method of costing to be developed for use in the NHS 'internal market' (4.5 above); this innovative method was further developed by the researcher in conjunction with Eastbourne finance department.

Costing and pricing mechanisms in the NHS had not yet been refined sufficiently to be used with any degree of confidence in the contracting process. However, the researcher was engaged in negotiations to provide physiotherapy services to a number of non NHS organizations locally and therefore required costing and pricing tools for these contracts. Physiotherapy costs within the NHS had previously been estimated by finance departments on crude staffing costs alone, not taking into account

grade mix, volume of work, use of time or overheads. Other district physiotherapy managers within SETRHA were keen to pick up the method developed by the researcher. The PIU was designated as a basic unit of physiotherapy asssistant time, other grades of staff being multiples of this unit reflecting their skill levels - grading. The PIU was not a pure time measurement costing system - as it incorporated factors of grade and time - but rather an apportionment system which was readily identified with a standard costing system Lock (1995 p199). PIUs were used to record the physiotherapy inputs which were directly allocated to specific patients, not including the general work of a ward or department on behalf of all patients such as ward rounds, administration, record keeping, meetings and staff training, which were costed into overheads together with absence for leave, study, sickness and so on.

For the calculation of costs for treatment pricing purposes, all costs incurred in the provision of an hour of treatment were included in the price, thus by marketing the hours of treatment provided by a physiotherapy service all the costs of the department, the salary bill, share of overheads and capital charges, were recouped. However, the service could only 'sell' treatment hours of the staff who were at work and treating patients. The cost of paid staff hours used for absences - Bank Holidays, annual leave, maternity leave, sickness, study leave and time lost on administration, travelling, having coffee

breaks etc. - was covered in the calculation and incorporated in the price charged for the actual treatment hours.

In order to calculate cost and price the following method was used:

The working week of a physiotherapist is 36 hours

Hours x 52 weeks = 1872 hours which is the yearly paid hours of a physiotherapist

Deduct from this total 20% (below).

From 1872 = 1512 hours.

Körner national absence returns KM44 Williams (1991) indicated that in a typical HA the average yearly absence was unlikely to be less than 19.6% and with maternity leave might be as high as 26%. It was therefore necessary to deduct at least 20% from 1872 hours in order to find the hours that the average physiotherapist was at work in a year. The absence time includes five weeks annual leave plus three extra days after ten years service, ten Bank and statutory holidays plus deductions for study leave, sick leave and other forms of authorised absence. The Körner activity sample which had to be undertaken annually (2.4.1 above) in Eastbourne showed in 1990/91 that physiotherapists spent around 70% of their on-duty time in patient care and 30% on non-treatment tasks, meetings, teaching, form filling, administration, travel, breaks, and others.

The physiotherapy clinical hours available for direct treatment were therefore:

70% of 1512

70% x 1512 = 1058 hours per year

This figure was then used as a measure for calculating the price for one hour of physiotherapy treatment. Overhead costs were shared between all clinical physiotherapists and clinicians throughout the unit as a whole. This calculation included, the physiotherapy department's share of heat, light, laundry, postage, telephones, cleaning, personnel services, management and administrative costs and others. Once calculated these costs were shared between all clinical physiotherapists and included in the price charged for clinical physiotherapy services, that is per physiotherapist treatment hour. The calculation was therefore summarised:

36 hrs x 52 wks = 1872

1872-20% = 1512

1512-30% = 1058 hours per year

Total cost for physiotherapy service divided by 1058 hrs = average cost per physiotherapy hour.

This method devised by the researcher and adopted by the finance department was based on the cost of physiotherapy assistant time which was used as a costing 'building block' as assistants were the basic level of the pay scale. Five minutes of physiotherapy assistant time was represented by two

physiotherapy input units (PIUs), ten minutes - four PIUs, 15 minutes - six PIUs and so on. Staff grade physiotherapy costs were approximately fifty per cent higher than the physiotherapy assistant:

5 mins assistant time = 2 PIUs

5 mins staff physiotherapist time = 3 PIUs

There are two grades of senior physiotherapist, Senior II and Senior I; the mean of these two grades was calculated so that all senior physiotherapists could use the same numbers in recording PIUs. The senior physiotherapist cost was approximately double that of the physiotherapy assistant, therefore 5 mins = 2 assistant PIUs and 4 senior physiotherapist PIUs. The next grade of physiotherapist employed in the Eastbourne Physiotherapy Service was Superintendent II; staff in these posts undertake substantial management workloads as well as a clinical caseload. The calculation showed that the Superintendent II physiotherapist equated to 5 PIUs per 5 minutes.

For group work the number of PIUs input by the therapist or therapists leading the group was divided by the number of patients attending the group. For example, a Superintendent II taking a 'back school' for one hour would input 60 PIUs to the work. If 12 patients attended the group - 60÷12 = 5 PIUs per patient.

All PIUS were assigned to face-to-face contact with patients and entered onto the treatment record. Overhead costs were calculated and added to the PIUs by the finance department for the purposes of pricing.

The researcher created the PIU in such a way that costs were not applied crudely to time input, that is 5 minutes of time equals *n* money, but rather the grade of staff input is also reflected, as higher grades cost more PIUs per unit of time.

The collection and recording of PIU data by physiotherapy clinicians presented no problems for them following presentations by the researcher on the method. This method of apportioning costs was adopted by all PMS users in SETRHA.

7.6 Designing the Computerized Information System

In the NIMSAD (5.2.5.8 above) framework stage six of the problem solving process advocates the design of "conceptual logical models" of the notional system, Jayaratna (1997 p96), where the essential elements for the realization of the notional system are identified. Although the proposed paperwork system was constructed as a practical solution to the data collection needs of physiotherapists, it may also be seen as the conceptual foundation for the physical system. Physical design can be considered as the elaboration and selection of ways and means of realising the logical design and this forms the

seventh stage of the problem solving process. These, the sixth and seventh stages, assist in the development of a comprehensive picture of the requirements of the notional system and changes required to change the current situation into the desired situation, within the constraints of the "economic, social, political, technological and cultural environments", Jayaratna (1997 p100). The researcher – as problem solver – was determined that the notional system should be brought to reality; the success of the problem solving process would be dependent upon the ability of the working group to achieve this.

In response to the SETRHA choice of the Comcare computer systems for the PAMs and community nursing services the researcher entered discussions with representatives of SETRHA to argue the case for the design and development of a system specifically for physiotherapy services within the region. Several meetings took place between the researcher, two information officers from the region, a member of the ASL Comcare team, and the manager of the SETRHA computer centre. As a result of the arguments put forward by the researcher about the perceived inappropriateness of Comcare for use by physiotherapy services it was agreed that the working group would be permitted to undertake work jointly with ASL to develop a specialist system for physiotherapy; this with the proviso that the resulting data should be compatible with Comcare.

7.6.1 *The Computerized Information System Mk1 – SEPHIT*

During 1987 the working group therefore began discussion with ASL - the software writers for the Comcare system. It was agreed that a new 'stand-alone' system would be developed for physiotherapy and would feed necessary Körner data into Comcare. This would allow physiotherapists to obtain specific reports for their own use as well as the Körner information required nationally and by region. It was agreed that ASL would be the company to develop the system in order that physiotherapy data would be fed through to the Comcare system thus in some way keeping physiotherapy within the main stream of computerized information activity.

The researcher proposed that the 'stand-alone' computerized information system that was being developed should be called SEPHIT - South East Physiotherapy Information Technology. The development process took over a year and a further hundred hours of meeting time, Working Group Minutes Folio (1986-1994). The meetings took the form of intensive discussions between the physiotherapists and the software specialists - the ASL employees - with input from the Regional Computer Centre and some input from the Eastbourne Health Authority Information Officer whom were both invited by the researcher to input their expertise and support the work.

The basic constraint imposed on the entire project was the need for data to be fed into the Comcare system. This necessitated numerous compromises to

be made with resultant frustration on the part of the physiotherapists and ASL employees. Nevertheless, there was an attitude of 'partnership' on both sides, working constructively together towards the development of an optimum system albeit within the confines of the overall Comcare specification. The ASL designer was sometimes accompanied at the meetings by a programmer but although paper documentation was used and step-by-step agreements were made on all aspects of the system no section of the programme or prototype (5.2.5.7 above) was ever demonstrated to the group on a computer. Had the researcher been experienced in software design procedures he would have understood the importance of seeing prototypes and suggesting possible modifications thus making a more positive impact on the outcome. ASL assured the group that there was no need to demonstrate the system until it was ready for implementation on the grounds that software demonstrations would be time-consuming and costly. The failure to work on prototypes of the system demonstrated the naivety of the researcher and his working group colleagues particularly in light of what they perceived as sound advice from ASL – 'the experts' - on the best way of achieving a result quickly.

The software was finally available within what was believed to be agreed specifications. There was little documentation to provide evidence of earlier agreements or expectations but ASL decided to market the product and seven districts within the region purchased the system and were encouraged

in this by the researcher and working group who believed that the system would satisfy their requirements. However, the system was not in an acceptable state of readiness in the spring of 1989 when the project was declared complete by the professional technologist involved because it would only produce reports on the Körner KT27 table format (2.4.1 above). There was no possibility of producing any reports on any other parameters which were, however, being input to the system. The researcher and his colleagues had thought they would be able to obtain reports on all aspects on which data was being input to the system, for example, physiotherapists' caseloads, issue of mobility appliances, diagnostic and reason for referral information, waiting lists and waiting times and much else.

The Comcare system and SEPHIT went 'live' concurrently in 1989, both were accompanied by enormous problems as neither had been satisfactorily completed nor tested. Although specifications for SEPHIT had been agreed no presentation was ever provided to the group by the programmer before it was delivered, consequently the programme did not match the expectations of the researcher and his colleagues when they finally saw it. ASL proposed that the software would continue to be developed while it was being used, something the researcher recognised at the time as a dubious premise on which to start using a system. He believed that once the system was being used on a daily basis the logistics of intervening to make changes would be

too difficult particularly as the availability of the software programmer could not be guaranteed.

The Comcare system was simultaneously having its own set of problems. Other PAMs reported that it produced nonsensical reports as well as irretrievable loss of data and as a result the Comcare managers in Eastbourne and SETRHA were overwhelmed with difficulties and therefore, demonstrated no interest in receiving data from the SEPHIT system as required by the RHA. SEPHIT stood in isolation with Körner data being submitted monthly to the District Information Officer by hard copy; ironically, the original objective for a 'stand alone' system had therefore been achieved by default, although this was not the system the group would have specified given a free rein unconstrained by Comcare. Had the possibility of developing a 'stand alone' system been accepted in the first place by the RHA and DHA the outcome might have been different with a *more* satisfactory system specification. The SEPHIT system would only produce standard KT27 reports; the researcher and working group, having had no previous experience, had naively assumed that it would be a straightforward matter to produce ad hoc reports which would provide a wide range of information. This could not be achieved without many more hours of computer programming input which was not going to be available; the software programmer informed the researcher that the programming

language, COBOL (Common Business Oriented Language), did not enable the range of changes to be made that were required by the working group.

In January 1990, ASL health service interests were taken over by ICL, SEPHIT was almost forgotten in the changes accompanying this business transaction. There were many complications for SEPHIT users, it was incomplete, inflexible and was not meeting the identified needs of the users.

The researcher made strong representations to ICL senior management for help and as a result of his contacts with ICL the company recommended a smaller company within the umbrella of the parent; ICL Medical Portfolio Limited, a wholly owned subsidiary of ICL. The object was to revitalise the SEPHIT system or develop an entirely new system.

The original development group lost one member – the district physiotherapy manager from SE Kent who wished to continue with SEPHIT but the remaining members of the group were eager to develop a new system. The one member, although dissatisfied with the software, decided that too much effort and time had been invested in SEPHIT to relinquish it without a further attempt to salvage the situation. He allied with a HA colleague who was a computer expert, to redevelop SEPHIT using Smart an off-the-shelf integrated software package with database, word processor and spreadsheet facilities. The working group, led by the researcher, became involved in the

development of a new system with ICL Medical Portfolio Ltd - Physiotherapy Management System (PMS). The researcher developed positive working relationships with the managing director of ICL Medical Portfolio and his colleagues who agreed that the possibility of a computerized information system for physiotherapy services would be well worth developing for the NHS market. There was no formal contractual agreement between the researcher, the working group and ICL Medical Portfolio. The whole process was based on a 'gentleman's agreement' to work closely together so that the benefit to the Eastbourne district physiotherapy service would be a powerful computerized information system which would satisfy their needs while the benefits to ICL Medical Portfolio would be substantial intellectual property and a system which the company could market nationally.

The catalogue of errors that marked the development of SEPHIT militated against the chance of a successful outcome. The errors covered a familiar range and these emanated from the inexperience in computer systems design of the researcher and his colleagues on the working group and the constraints placed upon the group in terms of having to work within boundaries set out by SETRHA which meant that any flexibility in design options was lost. The errors included:

1. Designing a system that was incompatible with the system into which it interfaced - the proposed link between SEPHIT and Comcare
2. Lack of prototypes or means of ensuring that users were fully aware of how the system was developing - the software was never demonstrated on a computer
3. Accepting a system for implementation before it was complete
4. Developing a system in a language where it was difficult to make modifications - the system was not written in a fourth generation language.
5. The design being led by ASL who assumed total control of the software design process.
6. The researcher and working group members were allowed insufficient opportunity to modify the system through their tacit knowledge of physiotherapy practice.
7. Sample reports which would be available from the system were never prototyped and shown to the group. Consequently, the reports that transpired were not user friendly, being difficult to read and interpret and did not address the stated needs of the physiotherapy services.

These errors are contrasted with the second phase of the case study which was based on the successful user-led development of the subsequent system.

It is also clear that the experience gained from the SEPHIT work significantly informed the next phase of development and therefore was an important learning exercise for the researcher and working group. In essence SEPHIT might be regarded as a de facto prototype.

7.7 The Computerized Information System Mk2 - Physiotherapy Management System (PMS)

PMS is not a system in isolation from the SEPHIT system. The same information needs that were identified as the essence of the first system were as applicable to PMS. The original physiotherapy registration and POMR document designed in 1987-1988 with minor changes formed the basis of the system together with the sample inquiry sheet (Figure 7.1 above) and the data coding methodology. It is described in ICL Medical Portfolio's sales brochure as:

> *'developed by therapy professionals, it is designed to collect, sort, collate, display and report on all information relevant to the management of physiotherapy services and clinical practice'*
>
> *(ICL Medical Portfolio Ltd 1992)*

7.7.1 *The Working Group – The Problem Solving Process*

The researcher worked hard to ensure that he developed strong working relationships with both the computer software programmer and the managing director of ICL Medical Portfolio Ltd. The working group which had been set up by the researcher continued to assist the development process. The

physiotherapy manager from Bexley Health Authority was also invited by the researcher to attend group meetings because of her interest in the system. Group meetings attended by the programmer were held on a regular basis once or twice a month and there was also frequent telephone contact between researcher and programmer.

Some of the group meetings were attended by colleagues from disciplines with relevant expertise in information and computing (7.2 above). These included a district information officer and a representative from the SETRHA Computer Centre who advised on aspects of data set requirements, hardware requirements and procurement and the information needs of the districts and RHA. The researcher decided that it was important politically to involve people with expertise from outside the group at district and regional level and to ensure that the views of other stakeholders were brought in. User involvement was assured through the prototyping process whereby user views were actively sought from the working group on the prototypes. Modifications were built into the system and other changes in associated systems such as paperwork were piloted by staff to test for relevance and user friendliness. The first aspect of the prototyping process was capturing the content of the physiotherapy data specifications from the paperwork system, which had been piloted and repiloted by the physiotherapists. Using this information the input screens and the data capturing functions of the information system were prototyped and presented to the working group for

evaluation. Through the iterative evaluation of the features of these prototypes other elements of the process such as activity sampling were discussed leading to the determination of the final specification for PMS. As a result, the researcher and working group's knowledge and capability to define and articulate their information needs as well as evaluating the system was increased.

The Kolb model (1984) (1.4 above) provides a helpful key to understanding the process within which the researcher and his colleagues worked.

The first premise on which the model is founded - that problem solving is basically a process of experiential learning - was a major facet of the project work. Much was learned from the development of SEPHIT (7.6 above) and the benefits of this experience contributed to the making of PMS. Important elements of learning included, for example, an appreciation by the researcher that a knowledge and understanding of the process of software design and development was necessary for the most efficient and effective outcome to be realised and that it would have been better to start by acquiring this background knowledge. The second premise - 'mind over matter' or the manipulation and control of the external world through one's mental processes - was an important feature of the working method. Choices were made about which lines of thought and action should be pursued in an attempt to control the whole development programme. As a result of the SEPHIT experience the researcher and his colleagues were determined to

achieve a successful outcome, and not be "pushed" into accepting a poor solution to their information systems problem.

Finally, the third premise - that problem solving is by its nature a social process - was clearly integral to the entire project. 'Language, communication, and conflict are central in problem solving', Kolb (1984 p152). It is very difficult to conceive of a problem within an organization that does not in some way involve other people; for example, identifying the problem, obtaining information about it, helping to solve it, and implementing solutions. The participative, user-centred methodology (5.2.5.5 and 5.2.5.6 above) partially followed by the researcher and his working group colleagues throughout the process exemplifies this aspect of the model of problem solving based on the theory of experiential learning. However, the researcher was not consciously applying one specific or combination of methodologies as at this stage of the process he had no experience or knowledge of those available. At that time, he had not undertaken the academic study necessary to acquire the relevant expertise and knowledge and thus implement the most advantageous methodology for the purpose; this was undoubtedly a weakness in the early stages.

It was a dynamic environment involving many aspects within each of Kolb's major premises - problem solving based on experiential learning, 'mind over matter' and the social process. A further important element in the learning

process was exemplified by the model of reflection-in-action Schon (1983) – (1.4 above) - in which reflection on the experience gained with SEPHIT and the ongoing work which incorporated the prototyping approach adopted for PMS took place enabling the group to make greater sense of the situation and thus refine their understanding (7.7.4 below).

7.7.2 *Factors for Consideration in the Design and Development of PMS*

In 1990 when the researcher commenced work on the development of PMS (Table 7.1 above) he drew up a list of objectives (Table 7.4 below) for consideration in the design process, as a result of experience gained through working with the CSP and DoH at a national level and on SEPHIT (7.6.1. above). The experience led him to the conclusion that there were a number of aspects in successful computerized information systems design, implementation and use including: flexible reporting whereby it would be possible to report on all aspects of data input to the system, the use of a modern fourth generation language that had more flexibility and development potential, relevance of information to users, ability to handle the requirements of the NHS reforms taking place, for example, clinical audit, costing and pricing and outcome measurement. He discussed these factors which were agreed by the group and further discussed with ICL Medical Portfolio Ltd as a result of experience gained in the development of SEPHIT where outcomes had been unsatisfactory in all of these areas, chapter 8 (below).

List of objectives agreed with ICL Medical Portfolio for the Development of a stand-alone Computerized Information System for Physiotherapy	
1	The system must be 'owned' by the physiotherapists using it locally and be developed in accordance with physiotherapy clinical and managerial practices by incorporating input from clinical physiotherapists and physiotherapy managers who are not members of the steering group on the functionality of the system. as it was considered that local ownership would result in committed use by users
2	On the advice of ICL Medical Portfolio the software should be written in a fourth generation computer language in order to be up to date and allow for interfacing with other modern systems
3	All information collected must be for identified use and must include the information required nationally, regionally and locally by the DoH, RHA, DHA, Commissioning or Purchasing Authority and Unit – the service providers.
4	The system must be capable of handling a large volume and diversity of data and the computer hardware must have the capacity to cope with a large volume of work and variety of uses
5	The system must be capable of processing data relevant to the management of physiotherapy services and clinical practice including clinical audit, research and outcome measurement
6	The data capture paperwork system must be uncomplicated and 'user-friendly' The paperwork must be uniform across as large a locality as possible – the same paperwork to be used in hospitals, community, schools and every other site where physiotherapists work.
7	The information collected must, as far as possible, be a by-product of clinical activity so that a minimum of clinical time would be lost through data collection
8	The system must be able to interface with other computerized information systems, for example, clinical case mix, resource management and PAS.
9	The system must facilitate the collection of costing and pricing data relevant to physiotherapy practice.
10	Strong links must be maintained with the company writing the software to ensure relevant and desirable development.
11	The system must have the capacity for modules to interface which would permit, for example, electronic mail, word processing, spreadsheets and graphics and other applications.
12	The system must meet data protection requirements laid down in current legislation.
13	The system should provide a full range of standard and ad hoc reports which would be easily accessible when required..

Table 7.4

As a result of the development work with ICL Medical Portfolio Ltd the researcher expanded the work to develop a full set of 'Guidelines for Computerized Information Systems in the NHS Therapy Services', as he believed it would be of benefit to physiotherapists and the wider PAMs group and would fill a gap in the literature as there were no other publications specifically for these groups. The resulting guidelines were published later in the CSP Journal 'Physiotherapy' Jones (1994) (Appendix 8). The guidelines were set out in the form of Standards with each guideline in a specific topic area followed by a number of principles. The topics included were: information use, local ownership, computer hardware and software, system security, data collection, reporting, service agreements, computer system documentation and staff training. All of these were eventually incorporated into the development programme for PMS.

7.7.3 *Standard and Ad Hoc Reports*

There were categories of reports available from PMS - 'standard' and 'ad hoc' reports. The standard reports were pre-defined by the researcher when the computer programme was written while ad hoc reports allow the user to choose or 'mix and match' a variety of criteria. For national and regional statistical returns the computer system needed to generate a number of standard reports, for example, a KT27 return which was required at least quarterly and to a set format. Standard reports enable the information to be taken off the system very quickly and without having to input to the

computer a detailed series of questions. The information for standard reports was calculated by the computer on an 'on-going' basis so that a printed report could be taken off the printer when required as a result of a single computer command.

The ad hoc reporting facility allowed search and extract from the database, that is from the full range of data input on all aspects. Reporting was one of the major problems with the SEPHIT system as only one standard report and no ad hoc reports could be obtained even though a wide range of data was input to the computer. The reports which the researcher specified that PMS should be able to provide as ad hoc reports as well as the standard reports for KT27 and the Körner sample required by the DoH, RHA and DHA 2.4.1 (above) included:

> Individual patient reports - containing information about patient episodes of care; physiotherapy clinician identifier information; number of interventions and so on.
>
> Numbers of 'open' and 'closed' episodes of care – to give an indication of the volume of activity within the service or part of the service such as a team specialty and current caseloads.
>
> Patient age ranges – required for KT27 and for service planning in care groups, for example, child health and elderly.
>
> Waiting times - for waiting list monitoring and reporting
>
> Individual staff case-loads
>
> Breakdown of staff activity – to obtain information on the frequency of various activities and time spent on each.

Comparison of case-load by sources of referral – Consultant, GP or self referral. This was useful when planning new services and in discussions with clinical teams and directorates.

Patient classification – NHS, private patient or overseas visitor; a Körner requirement

Diagnosis or reasons for referrals – information needed for clinical audit purposes and outcome measurement.

Outcomes and audit reports – in aggregated form about groups of patients or to examine interventions with individual patients.

Proportion of GP referrals – to ascertain the use of the open access service by GPs and the volume of work taking place in GP surgeries.

Number of patients referred by particular GP practices – essential in the reporting process for GP fundholders and non-fundholder contacts

Appliances provided and appliances for retrieval – for stock control and planning of appliance purchasing as well as retrieval of appliances no longer required.

Examples of the report are presented in Appendix 5 below.

This list is not exhaustive as it was the intention that ad hoc reports should be available, if required, on any of the data input to the system. Reports such as this would have a wide range of possible uses by physiotherapy managers and clinicians; for service monitoring, forward planning, determination of skill mix, quality assurance, the contracting process and others. The reports would be essential management and clinical tools, not only for physiotherapy itself, but also for stakeholders such as NHS managers and clinicians on both the commissioning and provider side of the "internal market". It was the

view of the researcher that availability of such reports would satisfy many of the requirements for information analysis identified in the situation of concern, chapters 2-4 (above). If these reports could be made easily accessible through a computerized system which was "user friendly" this would be a major contribution toward solving the information problem for physiotherapy services. There were no other computerized information systems available throughout the country for physiotherapy services, capable of reporting quickly and with the variety and depth required; as in 1994 the majority of physiotherapy services had what they regarded as inadequate information systems support, chapter 6 (above).

There were many other possible questions that might be asked of the system using ad hoc reporting facilities. It was identified by the researcher that queries would be made in combination with other questions. It must be possible to cross match a number of parameters within a single report and all data input to the system was to be retrievable in a variety of report formats.

The researcher requested that response times should be minimal. It was important that computer printouts be obtainable when required on request as delay in certain circumstances renders data useless or meaningless and users quickly become disillusioned. This request was put forward as a result of the researcher's knowledge of Comcare, FIP and other similar systems where PAM managers were having to wait several weeks or even months for

specific information, delay which was unacceptable for the PMS development.

The researcher and his working group colleagues had no specialist knowledge of computer programming languages and were dependent upon the recommendations of the programmer working with them. Having captured the information required for PMS the production of reports from the data was discussed and prototyped. Many iterations of the required reports were presented and evaluated in order to ensure that they contained the information required set out in a way which was clear and simple to use. This aspect of prototyping took considerable effort and time, the operations for extracting the reports in the format agreed had to be programmed individually. Verification of the accuracy and reliability of these reports formed an important element of the deliberation between the researcher and analyst. All reports were cross checked for accuracy and validity against manual checks of the input data from the carbon slips. Following in-depth discussions about the functionality required from the system the programmer recommended the use of Dataflex with which he was fully competent and he assured the researcher that all the requirements set out were achievable.

The idea that a wide range of reports would be of benefit to physiotherapy managers and clinicians as well as the other stakeholders was unique in physiotherapy at the time when PMS was created. The only reports which

had been specified for other systems such as Comcare, FIP, Paracom and Conway, chapter 2 (above), were the standard reports KT27 and the Körner sample enquiry specified by the DoH. It is interesting to note in retrospect that all of the reports listed above and contained in Appendix 5 below are accepted as standard by the few software houses producing systems for physiotherapy services today, Ethitec (1998) Street Heaver (1999). All of the reports produced by the system were regarded as a positive contribution to clinical care and management within the physiotherapy service and by other disciplines using them, more than 500 reports being requested by physiotherapy managers, clinicians and other stakeholders during the first year of PMS use in Eastbourne. Feedback from the Trust's IM&T department indicated that the data accuracy and variety of reports available was the best in the Trust. An example of the usefulness of PMS reports was the project undertaken by the DHA in 1994 on stroke services in the district. The only computerized information system within the district capable of providing an overview of the number of patients with stroke admitted to hospital or receiving services as outpatients or in the community was PMS. As recently as 1999 the PMS successor system – MTS – was the only system capable of providing accurate data on the number of fractured neck of femur operations which took place in the Eastbourne District General Hospital, a source of some concern to the IM&T department who consequently set up an audit of the PAS system data collection for orthopaedics and coding procedures. The PMS National User Group

minutes (1994) recorded that all users were very pleased with the reports they were obtaining from the system and all were finding these easy to read flexible and useful.

7.7.4 *Successful Development of PMS*

Involving users (5.2.5 above) took the form of providing them with evidence of progress, assessing the progress and eliciting their agreement to continue the project. In this way users reviewed the work at each stage, progress being dependent on the acceptability of the previous output. This prototyping approach was adopted in the development of PMS where the software was demonstrated to the researcher and the working group at Eastbourne DGH on a regular basis as modifications were implemented and frequent telephone contact was also taking place between the programmer and researcher.

An important example of learning which took place was the need to adopt a prototyping approach. The approach used in the development of PMS incorporated the design of prototypes by which the analyst showed the working group something tangible, inputs, intermediary stages, and outputs, before eventually agreeing the new design. Real data was used throughout the process in order to demonstrate possibilities and potential functionality. The prototypes were not set up as diagrammatic representations, but as actual outputs on computer screens. The content and format of the

development as set out in the prototypes could be changed quickly as the researcher suggested changes - a dynamic working environment. In this way there was direct and active involvement of the researcher and working group in experiencing and contributing to the computer application functions in the evolving situation; an 'envisionment process', Bødker and Grønbaek (1991 p198).

In the first phase of the project - South East Thames Physiotherapy Information System (SEPHIT) - a prototyping approach was not adopted, (7.6.1 above), and this might have been an important reason for the partial failure of this system. An important principal argument in this thesis is that effective computerized information systems development is unlikely to take place without the active participation of those people who will use the system. The two essential elements of incorporating users' tacit knowledge and skills (1.4 above)into the system and establishing a strong sense of user ownership were vital to the success of the system. This action research is a study of an information system developed with substantial input by the users. A development which started with a highly structured and defined paper system progressing via a 'partially failed' computerized system to a successful stand alone system for the physiotherapy service:

> *"If the users are involved in the analysis, design and implementation of information systems relevant to their own work, particularly if this involvement has meant users being involved in the decision making process, these users are more likely to be fully committed to the information system*

when operational. This will increase the likelihood of its success".

(Avison and Fitzgerald 1995 p88)

The working group might not have always seen design and development opportunities that were available due to a lack of clear understanding of what IT could offer. However, this potential problem was overcome by careful work which clarified the opportunities available.

Issues about who the users are and which users are involved in design processes can also be problematic. It is important to involve senior users where strategic decisions are needed and end users rather than user managers where knowledge of the job is required. In the development of PMS the researcher, as problem solver, was also the leading 'user' (1.6 above); however, clinical physiotherapists and the computer input clerical officer were consulted by the researcher and working group members and therefore the clinical staff were content that their manager was taking a leading role in developing a system which they felt would be appropriate to their practice and needs. The close proximity of the researcher to the clinical physiotherapists working within the service ensured that any such problems were minimised or eliminated. One of the working group members was a physiotherapy clinician/manager at Eastbourne DGH with a substantial commitment to treating patients, furthermore as the researcher and other user managers involved in the design were so closely associated with the

physiotherapists and their patients they were fully aware of the social structure that would support any changes brought about by a new system. In contradistinction to ETHICS (5.2.5.5 above) there was no democratic ideal on which the meetings were based, the physiotherapy staff as a whole were not involved in the process other than in piloting and commenting on various aspects of the work.

The suitability of involving various representatives in the design process is discussed by Bødker and Grønbaek (1991). They consider people who have an 'overview of the task domain' but do not know how it is done or do not do it regularly to be unsuitable, further 'dangerous' to design, because their involvement in tasks on an abstract level does not enable a familiarity with the daily tasks to evolve. In this case, however, the members of the group from the DGH were managers and clinicians who had daily involvement in the work processes and were clearly involved in the intricacies of life in the physiotherapy service, bringing their tacit knowledge and skills to the process, thus removing the potential for 'danger'.

A decision was taken, during the early stages of the development, to ensure that only a computer clerical officer based in the physiotherapy department would input data to the system so that physiotherapy clinicians did not have to input, thus preventing loss of clinical time through inputting and queuing for the one machine available. This would also minimise the possibility of

computer inputting errors which might arise as a result of physiotherapists – who were not computer input specialists – having to input. The physiotherapists would enter the necessary data manually on to the carbon slips on the physiotherapy document and these would then be torn off and submitted to the computer officer for input to the system (Appendix 7). The manual recording of data by physiotherapy staff on the tear off slips created minimal extra work, as PAS labels were applied to the document with the necessary demographic and personal identifier details (7.3 above) and much of the remaining information was already being noted in the patients' clinical records although, hitherto in a less methodical way. Some information on the registration paperwork was entered by the referrer, for example, whether the patient was NHS, private or an overseas visitor; diagnosis and source of referral, that is, specialty. It was, and remains, a legal requirement that all PAMs retain their paper clinical records for a period of eight years following the conclusion of the episode of physiotherapy care, chapter 2 (above) DoH (1989c).

The tear off slips were an economical and efficient method of providing data for computer input, as a by-product of the POMR document (Appendix 7).

The required 'standard' and 'ad hoc' reports to come off PMS were specified by the researcher during the design process and a substantial degree of flexibility in them was built into the system in order to accommodate further

changes in the NHS. Examples of this were whether the patient was referred from a GP fundholding practice or from another agency who had a contract with the physiotherapy service, such as the hospice or university sports clinic. Other data items included at this stage were NHS number and ethnic origin. These latter not being required by the DoH or RHA at the time would become required several years later, DoH (1998). All of these items were included in the data collection paperwork the design of which facilitated the collection of data identified as useful by the researcher and working group and was therefore 'in advance of its time'.

The researcher gave presentations at staff meetings and teaching sessions to ensure uniformity of use of the new system where the card, its use and implications were explained. The major factors aiding acceptance of the innovations were: that the card was more useful than its predecessor, having been piloted by physiotherapists; the changes were minimal, the physiotherapist was still only required to use a manual system with a few additional skills; the data collected was largely a by-product of clinical activity and much of it had in any case already been entered on to the predecessor of the new physiotherapy card. The implementation of the new system meant that an inappropriate system would not be foisted upon the department if the new system operated successfully.

Old Card	New Card
Octavo size, single sheet Insufficient room for POMR	Folded A3 card for POMR, referral details, carbon data collection slips attached to the front (appendix 7) discharge summary.
Multiple paperwork had to be attached; assessment sheet, treatment record etc.	Single card for all purposes (above)
No user involvement in design	Piloted several times by physiotherapy clinicians
Did not facilitate KT27 data collection.	Facilitates KT27 data collection
Insufficient space to write all details required	Space for all information required. Ergonomically set out as result of piloting.
Easy to complete	No additional skills needed to complete new document.
Difficult to file with other relevant paperwork, such as letters and reports.	Letters and reports slip easily into and out of card.
Did not fit standard filing cabinet drawer sizes.	Fits comfortably into filing cabinet drawers.
Each district across SETRHA using different paperwork system Different paperwork system Used in hospitals, community School health etc.	Standardisation of documentation across SETRHA One document for all clinical areas across each district.
Physiotherapists have to write patient identifier and demographic details.	Designed to accommodate adhesive patient administration system (PAS) label with name and demographic details, thus decreasing amount of handwriting required.
Separate paperwork required with card to facilitate managerial data collection. eg attendance record	Facilitates managerial data collection as by-product of clinical record.
No codes used	Facilitates diagnostic coding and agreed codes for other purposes such as physiotherapy reasons for referral and discharge status

Table 7.5

The involvement of the researcher in computerized information systems and physiotherapy management issues at the DoH and CSP, 1.6 (above) ensured

that the development enabled him to incorporate thinking at national and regional levels and that a lead was given locally to advance the system beyond the nationally required MDS. The supplementary empirical study, chapter 6 (above) illustrates the impact of IM&T on physiotherapy services nationally and the aspirations of physiotherapy managers and provides further justification for the development of PMS.

7.7.5 *Infra-structural Support, Resources and Managerial Support*

The need for infra-structural support – management, resources and so on - in developing computerized information systems is discussed by Kling (1987). In this case the support was covert rather than specifically defined. No budgetary allowances were set aside for the development of infra-structural support; much of the development was facilitated through personal contacts and networking; an approach typical of a "skunk works" (7.1 above). This was an unorthodox method of NHS computer systems development, the vast majority of systems being introduced for large scale marketing across the NHS such as ICL PAS, IBM Resource Management and casemix systems by a variety of companies; these developments resulted from large scale investment by the companies concerned. Having contacted several software houses informally by telephone, the researcher was unable to identify any computer systems for NHS use marketed nationally that originated in a similar way to PMS. Although there was no budget within which to work,

time for meetings was allowed with few questions asked and little requirement to report back formally and account for the work officially.

The hardware was obtained through a capital allowance which the researcher had negotiated with the SETRHA Computer Centre when the other PAMs moved onto the Comcare system. The funding was made available from the allowance provided for Comcare for all districts within the SETRHA. A business contract was made between the researcher, as manager of the physiotherapy service, and ICL Medical Portfolio Ltd for procuring the software system and the company agreed to provide the software at no charge with an exemption from maintenance charges. There was however a requirement for the researcher to provide consultancy for other Health Authorities interested in the possibility of purchasing the system. In 1992-1993 the researcher undertook telephone consultations with more than sixty prospective purchasers, twenty of whom came to Eastbourne to discuss and observe the system in more detail, look at the paperwork data collection system, computer work, reporting and talk with physiotherapy staff about the impact on them and use of the system from their perspective.

Some expert assistance was provided to the physiotherapy department from the implementation support officer in the DGH IT Services Department. This officer had a close working knowledge of the physiotherapy department having previously worked as the computer officer on the SEPHIT system.

She also completed a three month MSc project for ICL Medical Portfolio Ltd on PMS and continued working for them on a consultancy basis for a further short period. However there was no formal arrangement between the researcher and Trust IT department defining fixed contact times or meetings for IT staff to advise and assist. This demonstrated a high level of trust and confidence on the part of the Trust's IT department in the ability of the researcher and his team to obtain a successful outcome.

The researcher was afforded a substantial degree of autonomy in managing the district physiotherapy service within the policies of Eastbourne Health Authority. He was accountable to the Unit General Manager, (UGM) now the Chief Executive of the Hospitals Trust, who was always supportive. The UGM encouraged and valued the work done in the physiotherapy service but this did not encompass active support and intervention in the PMS design. A further feature which may have encouraged the support received from the UGM was the arrangement with ICL Medical Portfolio Ltd to provide a computerized information system for this service at no cost for software and support, apart from the consultancy work undertaken by the researcher. The UGM and researcher agreed that the work on PMS undertaken by the researcher constituted a useful contribution to the researcher's personal development plan in the context of Individual Performance Review (IPR) and that the development was worthwhile as part of the overall leadership role within physiotherapy which would assist staff recruitment and retention.

Computerized information systems for physiotherapy services have never been held as a high priority for funding by Units within the NHS, chapters 2 and 6 (above) although they were required to produce a wide range of information particularly after the Körner recommendations and NHS Reforms.

The researcher developed strong personal contacts with ICL Medical Portfolio at the most senior level within the Company having met the managing director and obtained his and his colleagues enthusiastic support for and commitment to the project. It was the intention of ICL Medical Portfolio to recoup the significant investment they put into the development from sales of the completed system. PMS went 'live' at Eastbourne DGH on 1st April 1992.

7.7.6 *PMS a Platform for the Development of a Multitherapy System (MTS)*

The researcher and ICL Medical Portfolio Ltd were both keen to enhance PMS to become a multitherapy system (MTS) if the system could be modified to support the needs of the other PAMs.

As a result of the Reforms radical restructuring was taking place in the NHS in the early 1990s, chapter 4 (above) and in many cases therapy services were

reorganised into single managerial structures often with one of the therapy managers designated as Therapy Services Manager. In 1992 Eastbourne Hospitals separated from the Eastbourne Health Authority to become Eastbourne Hospitals NHS Trust and the Community Unit, a year later, becoming Eastbourne & County Healthcare Trust. Eastbourne Hospitals NHS Trust undertook a restructuring exercise and brought a new structure into place for therapy services in which the District Physiotherapy Manager (the researcher) became Therapy Services Manager with responsibility for the management of physiotherapy, occupational therapy, chiropody/podiatry, dietetics, speech and language therapy and plaster room, appliance and orthotic services. In order to foster closer working relationships and sharing of information and to overcome the problems and dissatisfaction of the other PAMs groups who had been using the Comcare system a move towards MTS therefore, seemed a natural progression from PMS,

During 1992 the researcher and working group started work with ICL Medical Portfolio on enlarging and enhancing the system from PMS to MTS in line with the trends towards multi-disciplinary management, care planning, service provision and the new organisational structures, chapter 4 (above) the further development was a continuation of the work already undertaken. There is an irony in this, the physiotherapists not having accepted a multi-disciplinary approach – Comcare – at an early stage.

In 1992 the researcher submitted a bid to SETRHA to obtain money from the Medical Audit Fund for a terminal that could be connected to the Eastbourne DGH computer network and Case Mix Management System (CMMS), in order to participate in the wider information sharing within the Trust, for example, to make a contribution to multi-disciplinary clinical audit. There were more than one hundred bids for resources and in the event the researcher's was one of only twenty successful applications; this was the only bid put forward by the Eastbourne Hospitals NHS Trust to be successful. Together with the purchase of hardware the grant was large enough to employ a computer officer for nine months to input data, format reports and generally enable the link to become effective.

Although the PAMs differ from one another in clinical function their information requirements were similar, for example, all were required to collect the Körner MDS as laid down in the fourth and sixth Körner reports, chapter 2 (above). Each of these professions was required to provide the relevant Körner table (KT statutory return). In addition to this all were required to collect activity information and increasingly to provide costing and pricing information for use within the new contracting arrangements, chapters 2 and 4 (above).

In the functional specification for MTS ICL Medical Portfolio 1993 gave an outline description of MTS:

"The Multi Therapy System will provide PAMs with an integrated suite of software providing facilities for the collection of demographic referral and clinical data and provide both the standard statutory returns and ad hoc reports on any aspect of the data. In addition the export of data to other systems will be facilitated. Patient demographic data can be captured from a patient administration system (PAS) or entered together with therapy specific data through the keyboard. Considerable flexibility is to be provided to allow for the different requirements of the individual PAMs and also of specific units. The reporting procedures will allow user control of the production of statutory reports and also full flexibility for ad hoc reporting through a table driven reporting module. Once a standard set of reports have been specified their regular production will require minimal user intervention. The purpose of the system is to provide a tool for data collection, storage and analysis for staff and management of therapy departments. It will be able to stand alone within a department or serve several departments and will be capable of interfacing to other systems for exchange of information."

(ICL Medical Portfolio 1993 p3)

During 1993 MTS was implemented in the physiotherapy department for piloting at Eastbourne DGH and on 1st April 1994 the occupational therapy service was integrated into the system. The chiropody/podiatry service was incorporated three months later and the speech and language therapy service included on 1st January 1995. The orthotic and plaster room services were integrated later in 1995, and the nutrition and dietetic service on the 1st April 1996.

MTS is fully networked into the hospital computer room and the links with the PAS system and CMMS have been implemented.

The design of MTS using the functionally of PMS as the foundation was a perhaps an inevitable progression. The system was designed and continues to develop, taking account of the individual requirements of all the user professions within the context of continuing change in the NHS, multi-disciplinary team working, care planning, service planning, and integrated approaches where these are relevant.

MTS is now marketed nationally by ICL Medical Portfolio and Eastbourne continues as the pilot site and demonstration centre. There is a national MTS User Group of which the researcher has been chairman for many years and the process of systems development continues. There are fourteen Trusts nationally using the system and currently the maximum number of disciplines in any one site is eight. PMS was a solid foundation for the development of MTS and in this context PMS was a successful development. The functionality of MTS was expanded to include the specific requirements of the other PAMs professions such as fields for diet and nutrition programmes, occupational therapist patient discharge destinations and telephone contacts with occupational therapists, podiatry procedures, splinting procedures undertaken in the plaster room and many others. Care was taken by the researcher and ICL Medical Portfolio to ensure that the system catered for all

the needs identified by PAMs. Since the completion of the MTS development, it has been enhanced to include a bar coding module and daily diary system for appointment making.

7.8 Overview

Resolving the information systems problem for the physiotherapy service and moving to a 'desired situation' was a complex process involving many stages, tasks and people; problem solving is by its nature a 'social process', Kolb (1984).

The problem solving process, which involved problem formulation, solution design and design implementation, Jayaratna (1997), resulted in a greatly enhanced system. The implementation of and agreed solution to the identified problem situation ensured the ownership and acceptance of PMS and also provided a platform for the progressive development of MTS -in response to the changing NHS environment.

Eastbourne system users were an acceptable surrogate for physiotherapy services nationally because the development of PMS took place within both acute and community settings of a large district physiotherapy service which included the majority of services and specialities within the scope and spectrum of modern physiotherapy practice, chapter 3 (above).

The project was sequential and cumulative each step acting 'as a springboard to the next, McNiff (1988). It evolved longitudinally allowing the observation of events unfolding, over a period of time, within this particular organisational setting. The study is informed by the theoretical perspectives discussed in chapter 5 (above), using a range of elements from socio-technical schools of thought in computerised information systems design. A participative, user-centred approach which was dependent on prototyping for PMS and MTS phases proved to be a comfortable 'fit' with the action research approach and Schon's reflection in action.

It illustrates the potential effectiveness of systems development where participation by users with tacit knowledge and skills of their own work systems takes place. There are many research lessons to be abstracted from the exercise and these are explored in chapter 8 (below).

CHAPTER EIGHT

CRITICAL EVALUATION, OUTCOMES, CONTRIBUTION TO KNOWLEDGE AND THE FUTURE

8.1 Introduction

The problem solving process is not complete until well-structured critical evaluation has been undertaken. Problem solving or transforming a situation needs to be evaluated in order to determine success or failure and is accomplished through the process of evaluation of the effectiveness of the problem solving process and the intended problem solver within a particular problem situation:

> *"It is the evaluation which helps us to measure the effectiveness of the problem solving process and the problem solver in the problem situation – unless this element is considered, there is no way of establishing that the 'problems' have been successfully resolved."*
>
> *(Jayaratna, 1997 p108)*

Using the NIMSAD framework, the basis for effective evaluation is the problem situation, the intended problem solver, and the problem solving process, the first three elements of the NIMSAD framework, each perspective providing a viewpoint of the elements and their constituent parts which impact upon the resolution of the problem. This chapter focuses firstly on the evaluation of these three elements.

A key element which affected the outcome of the action research project and the transformation of the problem situation was the involvement of the researcher as problem solver. However, it is essential to examine the learning issues from a research perspective despite the eventual success in resolving the identified problems to the satisfaction of the working group, users and stakeholders.

The researcher was directly involved in the problem solving process as researcher, problem owner, user, facilitator and project leader and thus not independent. Many demands were placed on him in these roles by the working group, users, other stakeholders and himself which meant that the role of problem solver dominated over the specific research role. The research process itself was adversely affected by his over riding involvement as an intended problem solver with strong motives to succeed. The differentiation between the roles of researcher and problem solver might have been more clearly defined and there might have been more objectivity if an alternative research method had been adopted. However, had the researcher not assumed the role of problem solver, being totally involved in the project, the project would not have taken place.

In the context of this research a model or framework was needed to enable the abstraction of the research issues that arose from the situation, and which were undisclosed when working in a problem solving mode. The use of the NIMSAD framework facilitated the researcher's understanding and enabled him to draw lessons from the resolution of the problem through critical evaluation

of the intervention at a conscious level.

Post intervention evaluation of the three elements is the area of greatest significance to this research. NIMSAD constitutes an evaluative framework for examining the reasons for using methodologies for problem solving; the three stages are: before intervention, in order to maximise efforts and effectiveness; during intervention because of the dynamic nature of the elements; and after intervention so that lessons can be learned about the three elements.

The Physiotherapy Management System (PMS) is evaluated in this chapter in terms of its usefulness as a management tool for physiotherapy in the NHS today. This is conducted through an examination of what the system will do and whether and how the system satisfies the managerial and clinical needs of the physiotherapy service itself. It is also evaluated in the context of whether it fulfils the information requirements of other managers, clinicians and departments within the NHS and outside it.

In this chapter, the PMS project is evaluated from a number of perspectives in order to assess the level of success or otherwise in meeting the original objectives laid down by the researcher set out in 7.7.2 and Table 7.5 (above). The completion of PMS provided a 'springboard' for the development of the multi-therapy system - MTS (7.7.6 above) - the work having continued as a

natural progression from one to the other. Work on the further development of MTS continues today.

The contribution to knowledge and publication by the researcher together with the many lessons learned from the outcomes of this research are presented in this final chapter. The chapter concludes with a summary of the salient points in the Government's information strategy "Information for Health" DoH (1998) and the relationship of this to the research.

8.2 Evaluation of the Problem Situation

An essential task for this evaluation was to understand the reasons for the situation of concern, chapters 2-4 (above). In order to solve a problem it is necessary in the first place to perceive and accept that a problem exists. The context of the problem situation involved the many facets and nature of the organisation, whilst the content demonstrated those elements within the situation that contributed to the problem.

The problem situation was perceived as a complex entity made up of many elements interacting dynamically with each other and with the environment. Reflection of the problem situation within which the research was carried out helped to shed some light on the nature and magnitude of the organisational context and its impact upon the perceived problems and also provided an assessment of the dynamics and interactions of the different elements of the

problem situation. Checkland and Scholes (1990) maintain that the strength of the perception is influenced by the rigour of the investigation into the context and content of the problem situation. A thorough knowledge and understanding of this, chapters 2-4 (above), was gained and elucidated through in depth probing of the concerns and the exploration and analysis of a wide range of issues. The elements examined included data collection, information use and computerised information systems in the NHS, the significance to physiotherapy services and the physiotherapy response which were discussed in chapter 2 (above). Secondly, the possible impact of the continuum of the professionalisation process on the attitudes and approaches adopted by physiotherapists to computerized information systems provision, development and use and the scope and spectrum of contemporary practice, chapter 3 (above) and thirdly the changing structure, organisation and management of the NHS and management of physiotherapy, together with an analysis of Government initiatives, chapter 4 (above). Exploration of these issues in the problem situation demonstrated that there were many imperatives for a computerised information system specific to physiotherapy needs to be developed; that is, that there were valid and relevant reasons for the identification of a new "desired situation" and this view was also held by the working group. This is also borne out by the empirical study, chapter 6 (above), in which physiotherapy managers' views and involvement were analysed. However, these reasons were not initially strong enough to enable the researcher to successfully advocate to SETRHA and Eastbourne DHA the

development of a 'stand-alone' system specific to physiotherapy needs because of the constraint laid down by the RHA that the development work must dovetail with the Comcare system (7.6 above).

During intervention, the characteristics of the problem situation may sometimes change causing modifications to be made to the planned actions for problem solving and this was the case throughout the period in which the action research project took place. The NHS reforms from 1989 onwards, with the associated developments in IM&T and the requirement for physiotherapy services to respond to these developments managerially and clinically, chapters 3 and 4 (above) were some of the external changes in the "action world" Jayaratna (1997 p111). These changes were not under the control of the researcher and working group. They impacted significantly on the content of the problem situation ensuring that the researcher and his colleagues adopted a proposed solution capable of evolving in harmony with the changing environment. Within the NIMSAD framework the problem situation refers to the organisation within which problems are perceived to exist by the problem owner – also in this case the researcher. Undoubtedly, the researcher's perception and understanding of the situation of concern – problem situation – influenced the selection and application of the problem solving process to the resolution for the perceived problem. The methodology adopted might have been more efficient and effective if he had had more knowledge of and expertise in software development processes.

Although the researcher undertook an in-depth study of the elements in the problem situation, the range of possible solutions was limited by his lack of experience in the systems development field. It would have been advantageous if he had acquired a greater knowledge before selection and use of particular methodologies, chapter 5 (above).

8.3 Evaluation of the Intended Problem Solver

> *"This is the second most important evaluation, but one that is not advocated in any problem solving process or methodology. This evaluation should help us to understand our strengths and weaknesses. It should also assist us in identifying training needs and ways in which we can improve our competence; yet very few problem solving processes and methodologies alert us to the need for this".*
>
> *(Jayaratna 1997 p113).*

Jayaratna (1997 p119) proposed a list of questions using the "mental construct" model to assist the evaluation and enable us to become more effective and competent problem solvers. Problem solvers are influenced by their personal characteristics which together form their "mental constructs" and govern their decisions and actions. The "mental constructs" comprise the perceptual processes, values and ethics, motives and prejudices, reasoning ability, experiences, skills and knowledge, structuring processes, roles and models and frameworks and these together influence decision making activities. There is dynamic interaction between these characteristics which are affected by external factors and critical self evaluation, Jayaratna (1997 p63) enabling

the derivation of new meanings from the situation.

In the NIMSAD framework the attention of the problem solver is focused upon himself. This is intended to assist him examine his own "mental constructs" and prepare for the task ahead.

The NIMSAD framework was not available when the researcher embarked on the action research project and unfortunately he was unaware of the framework until the conclusion of the research. Use of the framework would have assisted the researcher's thinking and actions throughout. The retrospective application of NIMSAD to this research caused the researcher to approach his evaluation of the work in a much more methodical and objective manner. This was a painful process, it having been necessary to completely restructure and thence rewrite the work, including critical self evaluation and reflection throughout.

The role of the "intended" problem solver is crucial as he should select and apply appropriate methodologies for resolving the problem situation. Jayaratna uses the term "intended", as although the problem solver intends to solve problems, whether they are resolved or not can only be established through evaluation. The "intended" problem solver may be either external or internal to the organisation. The researcher fulfilled several roles throughout the research; as "intended" problem solver, problem owner, system user as

well as researcher. The intended problem solver is directed by his "mental constructs" which are derived from his personal characteristics, which in turn, guide his decisions and actions within the problem situation. An examination of the "mental constructs" of the 'intended' problem solver provides a way of understanding the philosophical, psychological and intellectual frameworks that are the foundation of the decision and actions and the manner in which the problem solving process is carried out.

8.3.1 ***Perception***

The perceptual process is one of the "most influential characteristics of the "intended" problem solvers "mental constructs", Jayaratna (1997 p65). It acts as a filter to information from the action world and determines what information is to be significant; as each person perceives reality in different ways. When SETRHA decided that physiotherapy services within the Region would use the Comcare system, (2.4.2 and 7.6 above) the researcher identified a number of deficiencies and problems associated with the use of that system which meant that it would be incompatible with the needs of physiotherapists as perceived by him and physiotherapists nationally and locally, chapters 2-4 (above). The perceptions of SETRHA were that the needs of all PAMs – including physiotherapists – and community nurses would be met by the provision of a single system. This would be less expensive than providing separate and specific systems and would, they thought, enable them to satisfy the Körner requirements. However, no attention was paid to the way in which

the physiotherapists would collect the data, the effects that this might have on their mode of working or to the detailed data collection requirements contained in the software. There was divergence of perceptions between the researcher and SETRHA. The perceptions of the researcher were influenced by: his work at national level; the fact that he was a physiotherapist himself and a physiotherapy manager with personal characteristics who would not accept the "conventional wisdom" without question as he had diagnosed what he saw as a serious cause of concern.

As a result of positive dialogue with the representatives of SETRHA it was not difficult for the researcher to persuade them of the distinct needs of physiotherapy services. If the researcher had been a computer expert as well as a physiotherapist this process of persuasion might have been easier.

*8.3.2 **Motives***

The personal motives of the researcher played a critical role in constraining and directing the actions and the emphasis he placed on the resolution of the problem situation was to the detriment of the research process itself. His motivation was to sort out the problem and demonstrate capability, save money and take a lead within the region and nationally. As problem owner, he felt an over riding need to satisfy the requirements and expectations of the working group through resolution of the perceived problem.

8.3.3 *Experience*

The researcher had accumulated a wide range of experience as a physiotherapy clinician, service manager and at national level as a CSP Council member over many years (1.5 above). These experiences equipped the researcher for team management and provided him with the skills needed to lead and facilitate the working group, negotiate with stakeholders and to adopt a broad approach to problem solving, enabling him to bring a wide ranging perspective to the situation of concern. The analysis of the problem situation, chapters 2-4 (above) utilised all of these experiences and from them a possible solution was deduced, and thus proposals for the resolution of the perceived problem. At the outset, the researcher's knowledge and experience with computerized information systems was limited. He had no previous experience in the development of systems and his knowledge related only to practical issues about system use gleaned from his work with the CSP and DoH. The researcher's managerial and clinical experience together with the opportunities provided by his involvement at national level and his in-depth study of relevant issues, chapters 2,3 and 4 (above) afforded him insight into the constituent elements of the problem situation, out of which he was able to envisage a possible solution to the information systems problem for physiotherapy. However, his lack of expertise and knowledge about developing information systems meant that basic mistakes (7.6.1 above) were made particularly in the early stages of the project, and the work took longer than might have otherwise been the case.

8.3.4 *Models and Frameworks*

Models are defined as:

> *"Complete and coherent sets of concepts which can underpin understanding and actions, while frameworks are defined as meta-models through which a range of concepts, models, techniques and methodologies can either be clarified and/or integrated."*
>
> *(Jayaratna 1997 p69)*

Several possible frameworks or models may be considered to have been employed in the research project. The major framework adopted for the research was an action research approach contrived by the researcher. This incorporated direct involvement by the working group participants in the resolution of the problem. The aim was to contribute to knowledge and understanding of information systems development for physiotherapy services within the organizational circumstances. The research concept adopted by using action research methods, problem solving by experiential learning and reflection in action (5.2.1 above); this implied the application of the problem solving, participative model used in the project. The frameworks and models were not explored in detail by the researcher during the project, and therefore the problem solving models applied reflected the thought processes and motivations of the researcher supported by the implicit use of a participative approach achieved through prototyping which also drew on the involvement of the working group and other stakeholders. The research and the problem solving project did not follow a precise sequence of actions towards resolving

the problem situation. With the benefit of hindsight and in the light of experience gained through the research, the researcher now appreciates the importance of adopting a more precise, explicit framework or model for use in the research and problem solving process. The action research process takes place when the models are used for directing action. Reflection must be facilitated by critical debate during the research process, if not, the researcher may become enmeshed in concerns about his own mental constructs or personal needs and the activities of the working group. In order to conduct analysis and evaluation following intervention, models and frameworks must be used to structure the process:

> *"Modelling helps to develop one's reasoning abilities"*
>
> *(Jayaratna 1997 p70)*

A post intervention evaluation and reflection was undertaken using the NIMSAD framework. However, a much earlier application of the framework during the research would have set out clear guidelines on the process of intervention and abstraction of lessons throughout the project.

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8.3.5 *Values and Ethics*

> *"Values are beliefs that we consider to be good without question. We inherit some of these from our parents, peer groups and the media, and form others from our own life experiences and observations"*
>
> *(Jayaratna 1997 p65)*

While ethics relate to:

> *"the standards which we and others place on a person's expected behaviour"*
>
> *(Jayaratna 1997 p66)*

The particular set of values and ethical standards of the researcher have been substantially influenced by his culture, upbringing, experiences in life, and in the context of the research, his professional background. The researcher's life experiences as a blind person have impacted enormously on his determination to achieve success in whatever he attempted. Having been sent to a special boarding school for blind children, with an extremely harsh regime White (1999 pp 30-65) at the age of five years, the researcher developed a strong independent streak and the strength of character to overcome obstacles and difficulties, pursue a course of action to its conclusion and take on a wide variety of challenges. This background contributed significantly to the researcher's dedication, determination and motivation to successfully complete the project. The acceptance of responsibility to the working group, his employer, and the physiotherapy profession as a whole were also important values and ethical standards to the researcher. The need to take responsibility and to achieve a successful outcome influenced his actions, consequently his roles as problem owner, problem solver and researcher were often blurred. During the process, the researcher failed to reflect adequately on the nature of these roles, but even if he had fully understood the significance of each, he believes that his values and standards might have created considerable difficulty in role distinction and clarity of action.

A clearer understanding of the various roles of the researcher and of the other stakeholders in the process and the use of a rigorous intellectual research

framework at an earlier stage would have been beneficial within the research process as well as the success that was achieved in resolving the problem situation.

8.3.6 *Roles*

Jayaratna (1997 p69) defines roles as:

> *"...the explicit behavioural characteristic sets that can be attributed to someone responsible for performing a set of task. By virtue of holding a position of responsibility and authority, we assume a set of role characteristics."*

A number of different roles were assumed by the researcher throughout the project and included:

Facilitator; enabling the working group to work in harmony, identify problems and arrive at solutions.

Negotiator; liaising with all involved to resolve conflicts and achieve the best possible solution for all stakeholders.

Leader; providing motivation and guidance for the working group.

Educator; teaching users about the system at various stages of the development.

Manager and change agent; instigating and taking responsibility for managing the process of change, whilst continuing to manage the district physiotherapy service.

These roles were supported by his developing technical knowledge, knowledge and expertise as a physiotherapist and manager and by the working group and

physiotherapy staff as a whole.

In the early stages he identified and researched elements of the situation of concern, chapters 2-4 (above). Together with the experience gained with the CSP at national level (1.5 and 2.4.3 above) this influenced his initial actions. Early in the process he assumed the roles of problem owner and problem solver, with the objective of moving the problem situation from its existing state to a new desired state. Fulfilling these multiple roles meant that he unconsciously emphasised the role of problem solver rather than researcher – proceeding to critical evaluation of the case study later - to that of problem solver resulting in concentration of effort on the practicalities of the development in terms of the functionality and usability of the system. It is clear on reflection that the researcher – operating at a less abstract level – had over emphasised the problem solving role at the expense of the research role resulting in the application of the post intervention evaluation approach. The researcher was able to influence the development of the system, lead the working group and take responsibility for negotiating with the computer company. This may be attributed to a number of factors including: his strong personal motivation; experience gained from his work at national level (1.6 above) and as an physiotherapy clinician and manager, deeply enmeshed and committed to physiotherapy as a growing profession, chapter 3 (above) and with a thorough knowledge of NHS organization and culture, chapters 2-4 (above).

As the NIMSAD framework illustrates, situations are dynamic, placing changing demands on problem solvers. These demands would have been better understood at the time, had the researcher received more appropriate guidance from his then supervisor. The guidance provided was adversely affected by having a supervisor who was not a specialist in the computerized information systems subject area or physiotherapy. A further factor was the change of supervision at a late and crucial stage of the research. The transfer to a supervisor with greater expertise in IT - whilst realising many positive benefits for the researcher and the quality of the research outcome – was a very painful process as he was led to realise the inadequacies of his original submission and the heavy workload involved in reworking the thesis particularly at a time when he was Chair of the CSP with many national and international commitments. The lack of a role model impacted disadvantageously on the ability of the researcher to fully understand the roles expected of him. He might have addressed these issues in a more effective way if he had adopted a more explicit thinking mode and critical self-evaluation at a much earlier stage.

8.4 Evaluation of the Problem Solving Process

Problem solving is, in essence, a mechanism by which a situation may be transformed from its current, to a desired state. Jayaratna (1997) defines a problem as "the difference between the perceived 'reality' and the perceived

expectation, with the desire to make the perceived expectation become reality". The problem solving process set out within the NIMSAD framework, comprises three phases; problem formulation, the solution design and the solution implementation. In turn these three phases are expanded into eight detailed stages (5.2.5.8 and Table 5.2 above) and through the use of this problem solving tool - which Jayaratna states is applicable to any problem solving process – a conceptual means of understanding the problem solving process is available. The researcher has adopted a post intervention evaluation application of the research using the NIMSAD framework as this was not available to him at the start of this work. *The adopted problem solving* approach did not adhere to all of the stages set out in NIMSAD, however, the post intervention evaluation of the problem solving approach highlights a number of specific research issues.

8.4.1 *Situation of Concern*

This stage relates to the domain of the problem situation, chapters 2-4 (above). It enables the identification of areas of concern and provides a boundary to the situation.

The research was not based on a single methodology, but incorporated elements of many – action research, problem solving by experiential learning, reflection in action, ETHICS, participatory design, prototyping (1.4 and chapter 5 above) and also incorporated "double-loop learning", described by Argyris and Schön (1978) as when organizational error is detected and

corrected in ways that involve the modification of underlying norms, policies and objectives. People act on information; debate issues and respond being prepared to change. They learn from others and in this way a circle emerges of learning and understanding.

This resulted in an interventionist approach in which the researcher was fully involved as an integral element to the understanding, project initiation, development and resolution of the information systems problem within physiotherapy. If an alternative method of research had been used – for example a case study – the intervention of the researcher would have been in a relatively passive mode. However, in the circumstances relevant to this research, the researcher was of necessity integral to the process as "intended" problem solver, problem owner, system user, physiotherapy service manager and working group leader. It would not, therefore, have been possible for him to adopt a wholly objective role although application of the NIMSAD framework facilitated this to some extent. The use of NIMSAD enabled the researcher to take into account issues about his personal attributes and roles and this is also relevant in that he was responsible for expressing and defining the problem situation. A possible weakness resulting from his substantial involvement and personal commitment to the resolution of the perceived problem in a particular way, was his focus on the rapid development of a computerized information system which he believed would be appropriate rather than addressing the problem purely as a research issue. However in the

context of action research this approach was justifiable.

The researcher identified many elements within the situation of concern which contributed to his definition of the problem. He perceived the situation of concern as on the one hand, the conflict between the perceived computerized information systems needs of physiotherapy services in the context of imperatives for the development of such a system and on the other, SETRHA, requiring a system that would be compatible with and integral to the Comcare system, (2.4.3 above).

As a result of the researcher's experience and involvement in the problem situation, chapters 2-4 (above) and his personal motives and presumptions, he believed that the problem situation was well defined and structured. However, at the initial stages of the development work he made no attempt to apply a properly structured approach, due to his lack of knowledge and expertise in the computerized information systems development field. His failure to apply a specific methodology or set of methodologies at an early stage was an important limiting factor to the success of the development of the first computerized system – SEPHIT (7.6.1 above). This was a serious weakness in the researcher's problem solving approach, together with other factors such as the unwillingness of ASL and SETRHA to permit a less constrained approach to the computerized system specification and development; their principal constraint being that the physiotherapy system should be compatible

with and integrated into the Comcare development. The earlier use of elements from the methodologies adopted in the later stages for the development of PMS and its successor system MTS might have clarified the roles of the participants, enabled a proper understanding of requirements, procedures and expectations and enhanced the quality of the SEPHIT system.

*8.4.2 **Diagnosis and Prognosis***

The second stage of the problem solving process, Jayaratna (1997) is the diagnosis. That is, the explicit projection or expression of the understanding gained from the investigation. This is followed by stage three – the prognosis – which is the expression of the desired situation. The main focus of the researcher was the development of a computerized information system for physiotherapy services in the light of the need to satisfy the many imperatives which he had made explicit in setting out the problem situation, chapters 2-4 (above) – as substantiated by the empirical study undertaken at a later stage, chapter 6 (above) and this represents essential elements in the diagnosis and prognosis. In his wide ranging roles (8.3.6 above) he had a broad appreciation of the situation and was thus able to develop both a diagnosis and a prognosis. The researcher was able to provide an understanding of the political, professional, organizational and management issues relevant to the proposed development. While this was undoubtedly an advantage in the context of developing a computerized information system, his lack of objectivity was an important factor in the formulation of his own prognosis. The researcher's

diagnosis and prognosis reflected the difference between his and the working group's "mental constructs" as opposed to those of the other stakeholders, SETRHA and ASL.

8.4.3 *Defining Problems and Deriving Notional Systems*

Stages four and five of the problem solving process, Jayaratna (1997) are defining problems and deriving notional systems. These are the stages in which an attempt is made to understand what is preventing the current state from changing to the desired state. This mapping exercise is incomplete until a relevant notional system is identified:

> *"These are 'systems' that can be formulated from our 'mental constructs' as being relevant, and if designed, built and become operational, are believed to eliminate the identified 'problems'."*
>
> *(Jayaratna, 1997 p88)*

A computerized information system for physiotherapy services, with the associated data collection paperwork system, was identified by the researcher and working group to be the means by which the perceived problem would be resolved. The problem area identified by the researcher was an unwillingness on the part of the RHA and ASL to invest in a purpose built system for physiotherapy, (7.6 above) and the decision by them to permit only the development of a system constrained by the requirement to "download" data into the Comcare system. Comcare had been identified by the researcher as inappropriate for use by physiotherapy services (2.4.2 and 7.6 above) Despite in depth discussions taking place on a regular basis between the researcher and

representatives of the RHA and ASL, he was unable to convince them of the necessity to develop a 'stand-alone' purpose built system. In the view of SETRHA and ASL there were valid reasons for proceeding as they required, including the necessity to control costs by developing one system for all community nurses and PAMs; regional access and control of reports; lack of time and manpower to do anything different, and the idea that the basic requirement laid down in Körner (2.4 above) would be fulfilled and therefore, there was *no need to do anything more.* *Consequently,* the development of SEPHIT was considered to be the "notional system" (5.2.5.8 above) for the problem resolution because the researcher and his working group colleagues were left with no other option in the political, economic and managerial situation, chapters 2-4 and 7 (above). In some cases a selected methodology may fail to deliver the expected solution due to its incompatibility and unsuitability of the methodology to the situation characteristics. However, this partial compromise – the development of SEPHIT (7.6 above) - was an important step forward toward the eventual successful outcome. The strong desire on the part of the researcher to make the development of a completely new system become reality – although not shared by the RHA and ASL – meant that he was able to persuade them of the benefits to be derived from developing a partially 'stand-alone' – compromise – a system compatible with Comcare including a number of physiotherapy specific requirements.

8.4.4 *Design of Conceptual/Logical Models and Performing the Physical Design*

The sixth stage of the problem solving process encompasses the designing of conceptual logical models of the notional system in which the identification of essential elements for the realisation of the notional system take place. Performing the physical design – the seventh stage – may be considered as :

> *"the deliberation and selection of ways and means of realising the logical design".*
>
> *(Jayaratna, 1997 p100)*

Stages six and seven are crucial to the overview of requirements of the notional system and the changes necessary to transform the "current" to the "desired" situation within the numerous constraints integral to the problem situation. The success of the problem solving process is dependent upon the willingness and ability of the stakeholders to be involved in and to implement the design of the notional system. A major difficulty in the development of this computerized information system was the incongruity between the vision of the researcher and that of the RHA and ASL and the need to work within boundaries defined by the Comcare system. The physical design process must take into account the political, economic, social and technological environments in which the proposed "design models" are expected to perform:

> *"we need to address such questions; how do we translate the logical models into a physical form within a given set of resources, facilities and other environmental factors"*
>
> *(Jayaratna, 1997 p100)*

However, within the physical design stage (7.4-7.6 above) there was no attempt to create a physical design model but the physical constraint of decisions already having been made about the nature of the finished system were adhered to.

There were many lessons to be learned from the partial success of the SEPHIT development, (7.6.1 above). The difficulties encountered in the functionality and use of this system and the change in software house enabled the researcher and his colleagues to embark on the development of PMS (7.7 above).

8.4.5 *Implementing the Design*

The final stage of the problem solving process – stage eight – is implementing the design, Jayaratna (1997 p102):

> *"The resolution of problem issues or the measurement of success or failure of the outcome of the problem solving process can be demonstrated only if this stage is completed and managed successfully."*

The implementation encompasses the realisation of the physical design for the "notional" system within the context of the situation of concern. The implementation stage brings about both planned and unplanned physical changes in the situation of concern. Following the difficulties encountered in the implementation of SEPHIT (7.6.1 above), a number of methodologies were adopted in the development of PMS and its successor system MTS (7.7 above); a prototyping approach was adopted within the context of the action

research study, encompassing elements of other methodologies (8.4.1. above).

In order to facilitate a prototyping approach the researcher restricted the size of the working group to a small number of users and the software developer representative (7.7.1 above). Representatives from the RHA and DHA were not included as core members of the working group. This shift in emphasis from Region to the researcher, users and developer alone, may have contributed in part to the successful development of the PMS-MTS solution through a more focussed approach.

An important result of the prototyping method used in the design and implementation of PMS was that the modelling of the system requirements was based on the perceived needs and expectations of the researcher and users; in contradistinction to the approach adopted in the earlier development of SEPHIT when the lack of knowledge and skill on the part of the researcher and working group impacted adversely on the design of that system.

By frequent demonstration of the evolving PMS system to the working group, prototyping was an essential communication tool as well as a learning instrument. It was central to the verification and translation of the user requirements into a system which satisfied the needs of both the users and the software developer, resulting in a feeling of local "ownership" and commitment to the system. The involvement of the researcher and working group in the

system design process contributed to a long-term interaction and good working relationship between the researcher and software developer, which facilitated an ongoing interchange of ideas and opportunities for mutual learning and sharing of experience. This trusting and positive working relationship and the mutual wish of the parties to work in harmony was a major factor in achieving a successful outcome.

Swanson (1988) argues that systems realisation is necessarily a process of collaboration between client, designer and implementer and that integration of the roles in the systems realisation often enhances the prospects for success. In the development of PMS the collaborative, participative approach enabled the richness of the situation to be encapsulated in the end product, providing opportunities to refine the model bringing in a wider range of information.

The post-intervention evaluation highlights issues of research interest. The successful resolution of the perceived problem is dependent on the recognition of and inclusion of the stakeholders' immediate needs in the problem solving process.

As a problem solving exercise the eclectic approach eventually adopted by the researcher is considered to be a success, incorporating the management of information systems development with prototyping as a mechanism for knowledge transfer between researcher, working group and software

developer. The perceived problem was eventually resolved through a continuous evolutionary approach. Before using a methodology it is necessary to acquire knowledge as to what situation it will be suitable for, how it is to be used, and most importantly how the benefits can be measured.

8.5 PMS – Evaluation

At the conclusion of the piloting phase of PMS, the system was implemented throughout all service locations within Eastbourne Health Authority District Physiotherapy Service. The researcher undertook an evaluation of the system to assess whether it was 'fit for purpose' using the objectives drawn up as a framework at the outset of the development (Table 7.5 above) and taking into account economic and other considerations.

8.5.1 Evaluation of Objectives

8.5.1.1 Objective 1- Local "Ownership"

Local "ownership" of PMS was achieved through the researcher and user group actively involving physiotherapy staff at all stages of the PMS development. The staff piloted and re-piloted the paperwork systems and were invited to input their observations and ideas for improvements. The researcher gave regular presentations to staff meetings about progress on the development and the views of staff were sought on possible clinical and managerial uses for the system which were incorporated. Examples were: the production of individual patient reports off the system, recording mobility appliances loaned

to patients and ensuring that the system facilitated taking reports off for clinical research projects and clinical audit. Staff members were also keen to be able to obtain detailed caseload reports about their own clinical input and basic outcome measurement (7.5.6 above). All of these reports were available from the PMS system. The physiotherapists agreed the data collection methods at all stages of piloting and were thus committed to ensuring data accuracy. The researcher and working group members worked with staff to create a feeling of participation and that all views and ideas were welcome. The researcher always reassured staff that the computerized information system should serve their clinical and managerial needs rather than that they should become subservient to the demands of the system.

8.5.1.2 *Objective 2 – Computer Language*

ICL Medical Portfolio Ltd., assured the researcher that the software would be written in a modern flexible language compatible with other packages which would allow changes and additions to be made easily. As an "open" and trusting working relationship had developed between the Company and the working group, the researcher accepted this advice particularly since as prototypes of the software became available and it became apparent that changes and up-dates could be made without too much difficulty.

8.5.1.3 *Objective 3 - Data Collected – Identified Use*

Only data for identified use was collected for input to the system. This

included that required nationally by the DoH, regionally by SETRHA and locally by Eastbourne Health Authority and the provider units within the DHA area. The data collected was agreed by the working group and physiotherapy staff and included managerial and clinical items (7.4 and 7.5 above).

8.5.1.4 *Objective 4 – System Capacity*

Advice was sought from ICL Medical Portfolio Ltd., on the size, capacity and overall suitability of computer hardware required to satisfy the range of purposes identified. As a result, the system was immediately capable of handling the volume and diversity of data and achieving all functions identified during the specification phase.

8.5.1.5 *Objective 5 – Processing and Accessing Managerial and Clinical Data*

Physiotherapy management and clinical practice are inextricably linked. Physiotherapy managers make decisions which relate to clinical care and therefore many of the uses which could be identified for PMS reflect either purely managerial requirements, clinical requirements or as was most often the case a mixture of the two.

PMS was capable of accepting and processing all data identified by the researcher and his colleagues which had been incorporated into the patient registration and Körner activity sample documents. A wide range of reports were made available through PMS, Objective13 (below) and Appendix 5.

Physiotherapists in Eastbourne recorded outcome measures (as described in

7.5.6 above) and this information was available in whatever way the user wished to access it from the system, for example: individual patient reports including outcome measurement, aggregated outcome measures reported per staff member for a given period of time, outcome measurement by source of referral and diagnosis and average outcome measures for an entire staff or team.

PMS could be used in support of a wide variety of possible research projects. All aspects of clinical data input to the system were cross-matched in whatever way required to assist in the analysis of clinical work for inclusion in research projects.

PMS was used to assist clinical audit; coded information could be assigned to the audit boxes on the patient registration card (7.4 above) and Appendix 7 and this data was then input to the system for collation and presentation (3.8 above). The audit boxes were used for any aspects of clinical care which the user chose to define.

8.5.1.6 ***Objective 6 – Universal Uncomplicated Paperwork System***

Having been designed and piloted in Eastbourne the paperwork system (7.4 above) was adopted by all fifteen districts in SETRHA which indicated an optimum level of acceptance by physiotherapy managers and clinicians alike. A single paperwork system used by all physiotherapy services within an entire region was unique in the UK. The paperwork was equally applicable in all areas of service provision, for example, hospitals – in and out-patients,

community domiciliary and special schools.

8.5.1.7 *Objective 7 - Data Capture – a By-product of Clinical Activity*

Any data items required for managerial use only were double checked by the researcher and working group to ensure that such items were required for identified purposes, for example, KT27 (2.4.1 above). All of the managerial and clinical data collected "fell out" of the clinical record and therefore clinical time was not lost through the collection of irrelevant information. Each data item was collected only once as a result of the carboned data collection slips developed by the researcher (7.4 above) and Appendix 7.

8.5.1.8 *Objective 8 – PMS Interface with Other Systems*

PMS was one of the feeder systems into the clinical information system (CIS) and resource management system locally (2.6 above). Through this interface, physiotherapy information was made available to managers and clinicians in many disciplines throughout Eastbourne Hospitals.

A link with the Patient Administration System (PAS) was also successfully developed. This facilitated the interchange of information between the two systems expediting data input in the case of PMS, in that demographic and diagnostic data held in the PAS system could be downloaded to PMS, minimising the input of some information needed for the PMS system and the time spent on repetitive computer input tasks.

8.5.1.9 ***Objective 9 – Costing and Pricing***

In chapter 4 (above), new aspects of physiotherapy management work since implementation of the NHS reforms and 'internal market' were discussed including service costing and pricing (4.7.2 above); tendering for contracts (4.7.3 above) and service specifications (4.7.4 above). In all cases relevant reports were obtainable from PMS. If, for example, the Physiotherapy Input Unit (PIU) (7.5.7 above) was used to assist service costing, reports could be taken off the computer giving details of: PIUs by specialty, PIUs for the physiotherapy service as a whole, PIUs related to the number of new patients and patient contacts or PIUs per individual staff member. A wide range of information was required in the tendering process, such as, patient throughputs, waiting times, average numbers of contacts per patient within a diagnostic category, and so on. Many of these elements were also used in the development of service level agreements (SLAs) and specifications. Discussion between the researcher and software developer took place to ensure that the system of PIUs devised by the researcher was incorporated into the software. This resource input measurement system was introduced into the Eastbourne physiotherapy service and later adopted by all other services using PMS.

8.5.1.10 ***Objective 10 – Future Development***

Following the successful implementation of PMS the researcher and ICL Medical Portfolio Ltd., were both keen to undertake further work to enable

PMS to become a multi-therapy system for marketing nationally. The work then progressed with the Company on the further development and prototyping of the system, (5.2.5.7 and chapter 7 above).

It was agreed that the new system (MTS) should have at least the same level of functionality as its predecessor (PMS), that the system must be capable of use as a networked system rather than stand-alone only, and that there should be a number of enhancements. The proposed enhancements would include an improved archiving module for the storage of data no longer required on a regular basis - data possibly several years old - a bar-coding module for data entry purposes, an export facility to software packages such as Microsoft Excel, a standard letter writing module for medical reports and other correspondence with patients and a facility to print reports in batch mode - such as overnight - rather than in real time. The new system must include modules for all of the PAMs enabling it to become a fully networked and integrated multi -therapy system.

PMS was an excellent 'platform' for the development of MTS, all the foundation work for a multi-user system was in place.

During 1993 MTS was successfully piloted within the physiotherapy services in Eastbourne and on 1st April, 1994, the first non-physiotherapy services were incorporated; occupational therapy in Eastbourne and Dietetics in Bradford –

who had purchased the system. Since that time, all other therapy services in Eastbourne have been incorporated on to the system; podiatry, dietetics, plaster room and orthotic services, and speech and language therapy. All of the enhancements listed above have been developed including the bar-coding module which was also piloted by the researcher in Eastbourne.

The design of MTS using PMS as the foundation was a natural and perhaps inevitable progression. Undoubtedly, PMS was a solid foundation for the development of MTS and in this context also, PMS proved to have been a very successful development.

8.5.1.11 ***Objective 11 – Incorporation of Other Applications***

Facilities to incorporate electronic mail, word processing, spreadsheets, graphics and other applications were all developed and brought successfully into use when the MTS system was put in place in Eastbourne.

8.5.1.12 ***Objective 12 - Security***

PMS was a secure system meeting all requirements of the Data Protection Act of Parliament (1984). The system was protected by a regime of passwords laid down in a hierarchical structure. Mechanisms for password use, changes and updating were made explicit in a systems security policy Medical Portfolio Ltd. (1993).

8.5.1.13 *Objective 13 – Computer Reports*

The required reports specified to be produced by the computer system during the design process were all available from the system as planned. The standard reports for KT27 could be "pulled" off the system within a few minutes through the use of a simple computer command. Ad-hoc reports in which any parameter input to the system could be cross matched with any other parameter(s) and reported on were also available from the system within a few minutes. The system design facilitated a wide range of reports to be specified and "run off" in batch mode during "down" times such as over night. In Appendix 5, a range of sample standard and ad-hoc reports are presented together with a set of explanatory notes.

8.5.1.14

In summary, the system was used to produce information within the contracting and service specification process; for information about patients and other service users, outcome measurement, activity analysis, costing and pricing mechanisms, research, clinical audit and for a wide range of other managerial and clinical purposes. The system fulfilled all of the specified objectives including national, regional and local requirements. PMS was a powerful, flexible, dynamic and useful management and clinical tool within physiotherapy.

8.5.2 *Software Quality*

Gillies (1997 p3) considered a wide range of definitions of 'quality' with

particular relevance to software quality. He stated it would help: "if quality was an easily defined and unambiguous concept" and that quality is "generally transparent when present, but easily recognized in its absence". The Little Oxford English Dictionary (1986) defines quality as: 'a degree of excellence' while Kitchenham (1989) cited by Gillies (1997) suggests that "quality is hard to define, impossible to measure, easy to recognise".

Throughout the action research study the question of software quality was not explicitly addressed by the researcher as a specific element of the development process. However there were many elements in the objectives which the researcher proposed, (8.5.1 above) that accorded with attributes of software quality discussed in the literature. The international standards organisation (ISO) (1986) defined quality as:

> *"the totality of features and characteristics of a product or service that bear on its ability to satisfy specified or implied needs."*
>
> *(Gillies, 1992 p175)*

It was the aim of the researcher to ensure that the outcome of the project would be a system which fully satisfied the objectives and functions that he had identified.

McCall (1977) listed eleven criteria of quality, ten of which were about conformance to specification. The other criterion – usability – related directly to the concept of fitness for purpose. McCall's work formed the basis for

'much of the work carried out since' Gillies (1993 p392).

A central theme of the researcher's thinking was that the computerized information system should support physiotherapy managers' and clinicians' needs and those of other stakeholders rather than them supporting the system. This was expressed as an overriding imperative which was held by the researcher to be of paramount importance, Jones (1994). The researcher believed that the software would be fit for purpose if the information system matched the users' needs as expressed through the objectives (8.5.1.1-8.5.1.13 above). The aspect of quality made explicit by the researcher was about giving physiotherapy services and other stakeholders what they needed and wanted. As a result of the researcher's analysis of the 'problem situation' chapters 2-4 (above) lessons learned from the first phase of development – SEPHIT – (7.6.1 above) and his own experience (1.6 above) he was able to express a clear view about what was required whilst taking the technical requirements of the software development for granted leaving this aspect to ICL Medical Portfolio – the experts in software writing. This model of software development might be appropriate for professionals to adopt in similar situations. The researcher's understanding about 'quality' during the systems development work accorded with that set out by Gillies (1997 p13) that fitness for purpose or the user based view of quality "will be determined by the quality of the match between their requirements and the design". In these terms the quality requirements were achieved because, on implementation, the system satisfied all the demands

placed upon it. In retrospect it is clear to the researcher that software quality is a major issue in its own right. However, as a result of having developed a working relationship, built on trust, and the acknowledgement on the part of the researcher and developer of each other's expertise and skills a quality outcome was achieved.

The approach adopted throughout the development of PMS and its successor system – MTS - was to acknowledge the paramount importance of people, the researcher always taking care to involve them throughout the process. This approach was in line with that advocated by Gillies, (1997 p14) that:

> *"fundamentally software quality is about people.... It is people and human organizations who have problems to be tackled by computer software. It is people who define the problems and specify the solutions. It is still currently people who implement design and produce code. It is still people who test code. It is people who use the final systems and will make judgements about the overall quality of the solution. Tools, processes and quality management systems are all aids to enhancing quality, provided that the people are capable and motivated towards their effective use".*

*8 5.3 **Economic Considerations***

In order to run PMS the minimum hardware requirement was an IBM compatible 486 PC, however, the speed and functionality of more powerful machines was advantageous.

In recognition of the researcher's commitment, original thinking, systems specification, contribution to design and development, testing, piloting and implementation, the software and on site work was provided free of charge

to Eastbourne Physiotherapy Service by ICL Medical Portfolio. Perhaps in retrospect the researcher was naive in not driving a 'harder bargain' in terms of obtaining financial recompense for the work involved. However the objective was to obtain a system for the physiotherapy service which was acceptable to physiotherapists, thus avoiding having to use an inappropriate system with all the attendant problems this might bring, chapter 2 (above). This objective was achieved. The PMS solution was regarded by physiotherapy managers, clinicians, the unit general manager, information managers and the finance department as an economical solution to the information demands of the Service and other user groups.

Much was learned within the physiotherapy service in Eastbourne about how to identify information needs and pursue an appropriate response to them. A number of factors can be identified which assisted the development process. There were few time constraints in that the final product was not required within a set time scale, for although the manual system in use was inadequate to meet the demands placed upon it, there was never a critical situation in which a system was required urgently. There was very little commercial pressure on the researcher and this meant that possible tensions which might have flowed from a more commercially conscious venture were minimized.

The working group were fortunate in benefiting from an extensive knowledge of physiotherapy within its membership and the researcher also brought

particular expertise in information systems and management from his experience nationally and regionally (1.2 above). Together with this the members had the social and personal skills to form close working relationships within the working group with the external technologists and with others involved in the project. Ehn's (1988) view of participative design is relevant in this context, in that he believes that much emphasis should be placed on the skills and creativity of the users.

Although the researcher and his working group colleagues invested significant working time into the system development, some time input would have been required whatever system was eventually provided. The cost of software to districts purchasing the system was set by ICL Medical Portfolio at £30,000 plus the cost of hardware. Therefore the provision of a "free" system for Eastbourne represented a significant cash saving.

A modest income was generated for the Eastbourne physiotherapy service from the sale of code books which had been developed by the researcher for data capture (7.5.5 above). A code book was sold to each of the fifteen districts within SETRHA at a cost of £30 per book. Other districts from around the UK also purchased the code book, a total of thirty-eight books being sold. The code books were not advertised for sale, but other district services became aware of their availability through "word of mouth". It was not the intention of the researcher to develop this aspect of the system. Therefore the small

income obtained was a welcome "spin off".

8.5.4 PMS in Other Physiotherapy Services Nationwide

PMS was developed by ICL Medical Portfolio Ltd with the intention of exploiting the opportunities of the market for computerized physiotherapy systems in the NHS. During the first year following successful piloting in Eastbourne the system was purchased by eight other Trusts : Hastings, Bexley, Canterbury and Thanet, Guys Community, Airedale, Yorkshire, Addenbrookes, Cambridge and Greenwich. Representatives of all these services joined a national user group chaired by the researcher and hosted three times a year by ICL Medical Portfolio Ltd.

During 1997 year the researcher personally took more than sixty enquiries and twenty site visits from physiotherapy service managers around the country, indicating substantial interest in the system. This level of interest demonstrated the potential success of the project from a commercial as well as from a user viewpoint. More Trusts have purchased the successor system - MTS - (fourteen 'on-line' by 1998) and there have been many more expressions of interest to purchase with six further Trusts in the process of negotiating purchases for their Therapy Services.

8.6 *Research Lessons and Contribution to Knowledge*

A central theme of the research was the need for a continuous reflective

approach in which action and critical evaluation were inextricably linked in an ongoing cycle, reflection-in-action, Schon (1983) (1.4 and 7.7.1 above). This approach enabled the researcher to learn lessons which were not about new concepts, but rather the importance of maintaining a balance between theoretical idealism and pragmatic realism.

8.6.1 ***Lessons***

An important lesson to be drawn from the research was that a thorough understanding of the context of the 'problem situation' was obtained, chapters 2-4 (above) before any action was taken so that the process of problem solving could be achieved. The researcher gained an in depth understanding of the 'problem situation' through a thorough study of the history, concepts and models within the NHS organisation which highlighted the cultural, political, structural, social, physiotherapy professionalisation and technical and managerial aspects which had a bearing on the situation. This approach resulted in a multitude of perspectives from which a solution could be derived. The desire to undertake action must not obscure the need to fully explore the reasons why action is needed. Important lessons were, therefore, that before any action can be taken the researcher must have a thorough understanding of the context of the problem situation and fully explore the validity of its definition. The problem situation was dynamic and therefore its ongoing evaluation provided the researcher – problem solver – with a variety of perspectives on the areas of concern: the focus of the problem solving process

changed as the requirements altered, chapters 2-4 (above).

A further lesson was that the researcher in perceiving the problem situation from his own perspective was undoubtedly influenced by his background, environment and his own particular needs (8.3 above). Inevitably his personal perceptions as problem solver must have influenced the problem solving process.

It is essential that the researcher, as problem solver should understand the particular needs and values and consequently agendas of different stakeholders. These stakeholders included physiotherapy clinicians and managers, other managers, the DoH, RHA, DHA, information officers and IM&T departments and the software developer. An understanding of the needs of these different interests facilitates the use of a more flexible and wide ranging approach and enhances the effectiveness of the problem solver. Similarly, an appreciation of social aspects within the problem situation enables the problem solver to understand and progress human aspects of the problem. The inclusion of the working group in the problem solving process facilitated wide 'ownership' of the problem and increased the likelihood of a successful outcome. The working group were encouraged to input their own ideas and experiences which supported the researcher through the process. The researcher was also aware of the political situation within the organisation so that he had an awareness of his own function within the overall power structure and therefore an

appreciation of the likely impact of his actions. This understanding assisted the researcher in achieving the desired outcome through adopting suitable tactics and the appropriate use of any power which stemmed from his own position within the political structure of the organisation.

The need to understand the cultural, social and professional dimensions of the NHS in general and the physiotherapy service in particular was another important lesson. Physiotherapists have a particular professional ethos, core skills, knowledge base and practice, chapter 3 (above) and in common with many disciplines in the NHS lacked the expertise, knowledge and skills to fully exploit information management and technology.

At the outset of the development the researcher was persuaded by the software developer that the solution to the problem situation would be straightforward and provided largely by technology rather than through an integrated approach in which all aspects of the problem situation were considered. In the early stages of the project and in particular in the development of SEPHIT the focus was biased towards a possible technical solution - in which the software developer took a dominant role - rather than other important considerations such as people, task, process and information and the needs of physiotherapy managers and clinicians. It rapidly became clear to the researcher that the scope of the problem solution encapsulated much more than a simple technical answer with minimal attention to the perceived needs of users.

Much was learnt by the researcher during the process of PMS development. The amount of learning that took place within the physiotherapy service was also substantial. However, that learning has not percolated through into the rest of the organisation. Apart from informal discussions, no knowledge has been passed on to the accumulated mass of experience that exists within the Trust. No formal mechanisms have yet been set up either by the Trust or researcher to ensure that the lessons learned can be passed on in a structured way.

The action research was conducted during a period of rapid and radical change within the NHS. In consequence a crucial lesson was that the problem solving process is dynamic, not fixed at a specific point in time, but rather the process needs to continually shift focus in accordance with the changing nature of the internal and external environment, chapters 2-4 (above). There must, therefore, always be a willingness on the part of the researcher to adapt and change the focus of the problem solving process as well as to continually re-evaluate the impact on the perceived problem.

The use of NIMSAD, Jayaratna (1997), as a post intervention evaluation led the researcher to understand the importance of reflecting upon himself as problem solver (1.6 and 8.3 above). Another lesson to be drawn from the research was that the personal characteristics of the problem solver had a

paramount influence over the eventual selection and application of the problem solving process. Matching the problem solving process to the problem situation was influenced by the problem solver's understanding and interpretation of the problem situation.

The learning process was enhanced in the development of PMS by the use of prototyping which stimulated the researcher, user group and developer to continually reassess the needs, functionality and expected outcomes. Prototyping was used to demonstrate the widest possible uses of the data captured and facilitate learning and increase awareness and understanding through the iterative evaluation and re-evaluation of the prototypes. The process of learning was made explicit through the prototyping approach which facilitated the sharing and transfer of expertise, knowledge and skills from the developer to the researcher and vice versa. This sharing of knowledge and skills was an explicit element of the problem solving process.

The importance of the role of the facilitator - in this case undertaken by the researcher - was stressed by Hirscheim and Klein (1989). The role of the researcher as project facilitator and problem solver was to ensure that all those involved worked collaboratively. It was necessary for the researcher to obtain support from his manager to liaise with all members of the team in order to assure good communication by acting as mediator and negotiator as necessary and by involving and teaching the wider staff group.

One of the most important lessons to be drawn from the research was the necessity to use a structured framework for the critical evaluation of the problem situation, problem solver and problem solving approach. The principal research method was the adoption of an action research approach incorporating problem solving based on experiential learning and reflection in action. Through the process of reflection and post intervention evaluation and extension of understanding the process of problem solving was achieved; together with an understanding of the attributes that might contribute to the effectiveness of a problem solver. It became clear to the researcher that the four stages of the NIMSAD framework – problem situation, problem solver, problem solving process and evaluation – could be used in the identification and examination of problems "in any problem solving context", Jayaratna (1997 p73).

An important personal lesson from the research was the benefit and gain that could be derived from critically evaluating and reflecting on actions. At the outset the researcher's limited perception about his contribution to knowledge lacked depth and rigour in the context of research. His initial view was that the end result would be the development of a computerized information system for physiotherapy services rather than the eventual outcome which was the achievement of robust research encompassing critical evaluation with tangible outcomes such as the publication of refereed articles and guidelines (8.6.2

below). The main learning outcomes were therefore achieved towards the end of the research when he was led to understand the importance of engaging in critical evaluation using various concepts, ideas and frameworks. Had the researcher realised this at a much earlier stage the process would have been more efficient and a much less painful experience. However this knowledge and understanding has now become integral to the attributes of the researcher and will be valuable in the future. The researcher now realises that a vital part of his contribution may be summarized as: that which I now know and understand and wished I had known and understood then.

8.6.2 ***Publications***

8.6.2.1 ***PMS Handbook***

When PMS became fully operational in the physiotherapy service at Eastbourne, ICL Medical Portfolio produced a handbook for the system. The researcher was invited to contribute the preface and this introduces and summarizes the attributes of the system:

> *"The physiotherapy management system (PMS) is a computerized information system which has been designed and developed to support physiotherapy clinical and managerial activities.*
>
> *Eastbourne Health Authority Physiotherapy Services and Medical Portfolio have collaborated closely on the planning, development, piloting and implementation of the system. There has been close support from the District Physiotherapy Service in Bexley Health Authority and the system draws heavily on the work of the South East Thames RHA Physiotherapy Information Systems and Resource Management Group.*
>
> *The collection and processing of information*

has a cost in time and effort but as far as possible this activity should be the by-product of clinical activity. It is important that data is timely, accurate and easily accessible for physiotherapy managers, clinicians and others to use and that the computer reporting system is flexible, enabling thorough and cross-matched presentation in a wide variety of formats. The PMS fulfils these objectives in supporting physiotherapy management and practice.

Physiotherapy is in a dynamic environment with the development of many new systems including audit, outcome measures, costing and pricing, contracts and so on. PMS encompasses all of this.

Undoubtedly there will be further developments in the future. For example, attention is already being directed to interfacing with other systems such as resource management clinical information systems and PAS (Patient Administration System). Although the PMS has been developed with particular reference to the requirements of physiotherapy services, the system may also be applicable to other services within the Professions Allied to Medicine.'

(Medical Portfolio 1993)

8.6.2.2 ***Refereed Publications***

The researcher has published papers for physiotherapy and the professions allied to medicine as a direct consequence of this research. The most important of these are "A View for Physiotherapists – Focus on Information and Computing in the NHS" Jones (1994a) and the "Guidelines for Computerized Information Systems in NHS Therapy Services" Jones (1994b); Appendices 8 and 6 respectively.

"A View for Physiotherapists..." The researcher was commissioned by the NHSE IMG to write an overview of the main principles and initiatives of

the national IM&T strategy as it related to physiotherapists. The document was posted to all physiotherapists working in the UK. This was the first publication to be funded by the DoH to be targeted specifically at physiotherapists.

The "Guidelines for Computerized Information Systems in NHS Therapy Services" were written as a direct result of the research; in particular they reflect the objectives for the development of PMS (7.3.2 above) and the experience gained by the researcher throughout the study. The "Guidelines" were targeted at all of the PAMs groups and published widely. Both papers represent original work by the researcher and made an important contribution to literature within therapy services; there being very little specific to their needs at the time or since. Both publications were well received; the "Guidelines" being reprinted as a stand-alone paper, were requested by physiotherapists in many parts of the world. The "Guidelines" continue to be used within therapy services and are cited in a number of recent publications for the PAMs, for example, Garner (1999).

When the researcher searched relevant computer databases for more recent relevant publications during 1998, his own contributions were still the only papers and articles in this specific area for NHS therapy services.

In 1991 the researcher published his book "Management in Physiotherapy"

Jones (1991) which draws substantially on this research. The book includes chapters on management, the process of professionalization in physiotherapy, the growth of autonomy and the design and use of computerized information systems in physiotherapy. The print run for the book was two thousand copies for the first edition and there is now interest in a rewrite for a second edition. "Management in Physiotherapy" is the only title in this subject area specifically written for physiotherapists. While the book was targeted at physiotherapists in the UK, it has been well received throughout the world.

As a result of these publications the researcher has been invited to lecture both in the UK and abroad. A full list of publications by the researcher, relevant to this research, is provided at Appendix 1.

8.7 Information for Health – An Information Strategy for the NHS – The Future

In September 1998 the Government published its information strategy for the "Modern NHS", 1998 to 2005, NHSE (1998). The Secretary of State for Health – Frank Dobson – stated in his foreword to this strategy:

> *"Up to now the use of IT in the NHS not been a success story. Far from it. Lots of money has been wasted. Some important data has not been collected and used. Other data has been collected but not used...the NHS can only face the challenges of the new century if it has the most modern information technology and systems in place.... Senior clinicians and managers throughout the NHS and senior members of professional bodies will have to show leadership and commitment".*
>
> *(DoH, 1998 p5)*

The Strategy aims to enable NHS professionals to have the information they need to help patients receive the best possible care and to facilitate the improvement in public health. It also aims to ensure that patients, carers and the public have the information necessary to make decisions about their own treatment and care and to influence the shape of health services.

The main developments outlined in the Strategy are:

Lifelong electronic health records for every person in the country

Round-the-clock 'on-line' access to patient records for relevant healthcare professionals

'On-line' information about best clinical practice

A national electronic library for health to keep clinical professionals up-to-date with the latest clinical research and best practice at the time they need it

Integrated care for patients through GPs, hospitals and community services by the sharing of information across the NHS internet

Fast and convenient public access to information, advice and care through 'on-line' information services and tele-medicine

The Strategy is aimed at ensuring that clinicians provide better care by making available to them up to the minute details of the patient's clinical history and current treatment and immediate access to the latest clinical research and recommendations for best practice.

An objective of the document is to ensure the availability of accurate information for managers and planners and thus to support local health improvement programmes (HIMPs) and the "National Framework for Assessing Performance", both important strands of the Government's health *policy as set out in the* White Paper "The New NHS : Modern, Dependable"

DoH (1997).

The Government information strategy is far reaching and forward looking; it is extensive and will be very demanding for all NHS staff. It constitutes a substantial programme to be achieved within tight time scales.

The computerized information system which was central to this research successfully achieved the objectives identified by the researcher – problem solver. The system will be a platform for future work in providing a tool which could be used in making a full therapy services contribution to the overall NHS information strategy.

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CSP DISCUSSION DOCUMENT

PRINCIPLES ON INFORMATION AND BUDGETING SYSTEMS

The Chartered Society of Physiotherapy suggests that in considering proposals for information and budgeting systems, Chartered Physiotherapists should be guided by the following principles:

A Basis of Practice of Physiotherapy

I. Physiotherapists are clinicians in their own right, making decision which are based upon professional education, skills and experience. In doing so they use their own clinical judgement on what treatment or intervention, if any, is appropriate for each patient.

II. Cases are referred to physiotherapists by consultants, general practitioners and other clinicians. Physiotherapists also undertake work, including patient care, not the subject of referral by other practitioners.

III. Physiotherapists are legally responsible for all their professional decisions and for the manner in which they carry them out. Their decisions significantly affect the development and use of resources. The referring practitioners does not control the type or volume of the physiotherapist's intervention.

IV. Physiotherapy heads are clinicians who manage a clinical service. As such they are primarily concerned with clinical outcomes and the maintenance of standards. It is their responsibility to ensure that physiotherapy services are used to the best effect.

V. The performance of a physiotherapy service depends on the quality and effectiveness of its clinical outcome. It cannot be judged solely by efficiency measures described in terms of costs and quantity.

B Implication for Information Systems

VI. Information systems should contain sufficient data to enable physiotherapists, both as clinicians and as managers, to monitor input, and clinical outcomes, and to examine and improve their clinical effectiveness. Such data must be easily and rapidly accessible.

VII. The workload imposed by data collection and analysis should not detract from patient care. In most cases, data for information systems should flow from the clinical records that are maintained as part of good professional practice.

VIII. The Society notes the national minimum data set of items recommended by the Körner reports, as implemented in return KT27; and performance indicators, based on that return, related to national manpower and population censuses. It has endorsed the Report on the CSP/BAOT/DHSS working party.

IX. As a profession body, the Society is concerned that external demands for additional data may be excessive and inappropriate; for instance, counting the total number of patient contacts, which is meaningless. It believes that any measurement of physiotherapy services performance most cover clinical outcomes. It therefore recommends that its members should not agree to any schemes which measure physiotherapy inputs alone, such as timed units or modality costing. It would not, however, object to the measurement of inputs in the context of *clinical* research into the outcomes of physiotherapy intervention, where full agreement has been obtained, both from staff and from the CSP centrally. Such research will usually be limited to particular modalities or client groups.

X. Costing of physiotherapy services should be on the basis of gross apportionment of costs without requiring the collection of data additional to the minimum data set.

C Resource Management

XI. It is important that Resource Management systems should recognise physiotherapy heads as holding clinical budgets and not as selling services to other clinicians. If recharging is to apply this would only be acceptable if the system:

a) treats physiotherapy costs as indirectly influenced by admitting consultants, (and not as directly controlled by them):
b) is applied on a similar basis to that applied to medical consultants in non-admitting specialties (eg anaesthetists); and
c) recharges costs only pro-rata to the proportion of total physiotherapy cases that emanate from each speciality group.

Physiotherapy managers must have primary budget responsibility for the remaining work of physiotherapy, particularly services provided to, or in, the community (including referrals byGPs under open access arrangements).

Re-produced from 'Physiotherapy' October 1987, Vol 73 No 10 page 525

Appendix 3

The Chartered Society of Physiotherapy

14 Bedford Row, London WC1R 4ED Tel: 01-242 1941 Fax: 01-831 4509

PATRON HER MAJESTY THE QUEEN

30 November 1988

District (or Senior Superintendent) Physiotherapists in England, Wales and Northern Ireland

Dear Physiotherapy Manager

SURVEY ON DATA COLLECTION

The Society's Working Party on Management Budgeting and Workload Measurement have been discussing the arrangements made by the NHS for the implementation of the Korner recommendations. They are concerned that the cost in staff time of data collection has greatly exceeded the initial estimates, and that there has been a lot of duplication in the development of systems.

They therefore felt that we should undertake a survey of physiotherapy managers to evaluate the current arrangements. In addition to replies to the specific questions in sections a-d, we would be very interested to have your general comments on the degree to which you regard your system as successful, and in particular whether any data you collect, beyond the minimum data set of initial and first contacts, is helpful to you.

I know we do send you a lot of questionnaires: but we usually get an excellent response and we do feel it is useful to be able to back up our concerns with data. It would be very nice if you could let us have your response by the end of the year.

Yours sincerely

Toby Simon
SECRETARY

Name of district .....

Which RHA? .....

A. DATA COLLECTED

Do you (in addition to initial and first contacts) ask staff to record every contact they make for statistical purposes? **1.** YES/NO

If so, do they have to record the name of the patient (or unique identifier) again for each contact? **2.** YES/NO

Do you ask staff to record the pattern of their activities (e.g. face-to-face contacts, visits, telephone calls): (please tick) **3.** YES/NO: if yes:

(a) continuously
(b) sampled:
period of sample .....
how often repeated each year .....
(c) in other ways: specify

B. DATA ANALYSIS

Do you have a computerised system **4.** YES/NO

If so, is it one of the following (please tick) **5.** (a) COMCARE
(b) COMWAY
(c) FIP
(d) PARACOM
(e) TIARA
(f) LOCALLY DEVISED
(g) OTHER (please name)

Do your staff use hand-held computers? **6.** YES/NO
Does the system meet your needs? **7.** YES/NO

C. TIME TAKEN

Please make a rough estimate of the number of minutes a day spent by each physiotherapist in data recording, over and above the compilation of the primary clinical record for each patient **8.** ..... mins.

What is your total qualified staff in post? **9.** ..... wte.

Have you been allotted additional clerical time to undertake Körner analysis? **10.** YES-new funding/YES-existing budget/NO

If yes, how much (in hours per week)? **11.** .....

Continued...

D. FEEDBACK

Have you yet had statistics returned to you based on the figures collected? **12.** YES/NO

Were these figures helpful to you

(a) You and your superintendents **13.** YES/NO

(b) Your clinical staff **14.** YES/NO

E. ANY COMMENTS ON THE KÖRNER PROCESS?

Results of CSP Körner Survey

	Yes	No	Unspecified	Total
Q.1	117	37	3	157
Q.2	44	71	2	117
Q.3	97	34	26	157
Q.3(a)	14	-	83	97
Q.3(b)	57	-	40	97
Q.3(c)	1	-	96	97
Q.4	86	63	8	157
Q.6	10	124	23	157
Q.7	33	59	65	157
Q.12	80	68	9	157
Q.13	50	25	5	80
Q.14	27	46	7	80

Q.5

Systems	Number
COMCARE	16
COMWAY	5
FIP	10
PARACOM	0
TIARA	5
LOCALLY DEVISED	26
OTHER	15
unspecified	9
Total	86

Q.10

	Number
yes new funding	26
yes existing budget	11
no	96
unspecified	24
Total	157

RESULTS OF CSP KÖRNER SURVEY

The Questionnaires were sent to all the District Health Authorities in England, Wales and Northern Ireland and Special Health Authorities.

There was a 76.0% response rate (157/207).

This analysis is based on 4 sections of the questionnaire.

A : DATA COLLECTED

Q. 1 / 2 The survey shows that in 75% of districts, staff record every contact for statistical purposes. From these 38% (28% of whole sample) have to record the name of the patient.

Q. 3 97 (74%) of those who responded to the question have to record the pattern of their activities. Of these 14 (15%) record it continuously and 57 (58.5%) take a sample. For those who take a sample the weighted average sample time was 12 days per year. Only one health authority used other ways of recording the activities.

B : DATA ANALYSIS

Q. 4 / 5 55% of DHA's have a computerized system. Systems that were devised locally, COMCARE and FIP systems were among the popular replies; 17.4% have chosen other systems.

40% of DHA's either don't have a computerised system or are in the process of implementing one.

Q. 6 There were only 10 districts which use hand-held computers.

Q. 7 21% of District Physiotherapists found the system met their needs, 38% did not and as many as 41% did not answer this question.

C : TIME TAKEN

Q. 8 / 9 A rough estimate of the number of minutes a day spent by each physiotherapist in data recording was asked for the various replies ranged from one minute to a maximum of 120 minutes. The median was 20 minutes. The weighted average time per WTE spent in data recording was 13.6 minutes.

I would like to point out that there were lots of misunderstandings about this question. For instance there were numbers of replies which referred to numbers of new patients a day and some reponses were minutes per patient.

Q. 10 61% of HA's did not allocate any additional resources to undertake any Körner analysis. 24% did get more staff, either being given new funding or using their existing budget. (The remainder did not reply to this question).

Q. 11 The minimum additional staff time was 1.50 hours per week and the maximum 37 hours. (Median was 15 hours per week).

D : FEEDBACK

Q. 12 About 51% of District Physiotherapists had received statistics based on the figures collected from which 62% (32% of whole sample)
Q. 13 said that these figures were helpful to themselves as well as
Q. 14 their suprintendents and 34% (17% of whole sample) said that clinical staff found the figures helpful too.

NUMBER OF WTE QUALIFIED STAFF IN POST BY REGION:

REGION	WTE* covered by survey	Total WTE March 88	% covered
NORTHERN	521.2	849.4	57.5%
YORKSHIRE	407.2	537.0	66.9%
TRENT	313.9	845.9	34.0%
EAST ANGLIA	206.6	382.6	53.9%
NORTH WEST THAMES	402.3	616.0	60.6%
NORTH EAST THAMES	469.7	722.8	64.9%
SOUTH EAST THAMES	547.4	650.7	78.5%
SOUTH WEST THAMES	397.7	514.8	71.3%
WESSEX	508.1	508.1	100.0%
OXFORD	223.5	383.6	50.9%
SOUTH WESTERN	452.2	522.6	78.7%
WEST MIDLANDS	593.3	973.6	58.2%
MERSEY	310.6	443.0	63.1%
NORTH WESTERN	577.4	665.5	73.1%
WALES	118.0	414.8	22.1%
NORTHERN IRELAND	39.8	333.5	11.9%
SPECIAL H.A.	91.0	N/A	

* Note - These figures are based on 76.0% response rate

H22206

STAFF REGISTRATION FORM

Staff Number: ⌊_⌊_⌊_⌊_⌊_⌊_⌋ Action (N/A/D): ⌊_⌋

N - New Staff Member
A - Amend Staff Details
D - Delete Staff Details

Staff Group: ⌊_⌊_⌋

Staff Team: ⌊_⌊_⌋

Surname: ⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋

Initials: ⌊_⌊_⌊_⌋

Forename: ⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋

Title: ⌊_⌊_⌊_⌊_⌋

Standard Hours per week: ⌊_⌊.⌊_⌊_⌋
h h m m d

Car Reg. No.: ⌊_⌊_⌊_⌊_⌊_⌊_⌊_⌋

Engine CC: ⌊_⌊_⌊_⌊_⌋

Home t Base Mileage: ⌊_⌊_⌊_⌋

NOTES:

AMENDMENT ☐

PATIENT ID

D D M M Y Y Y Y S C N N N

Day Month Year Sex Name

AMENDED INFORMATION ONLY

D D M M Y Y Y Y S C N N N

Day Month Year Sex Name

Surname		
Initials		
Title		
Forename		
Date of Birth	D D M M Y Y Y Y	D D M M Y Y Y Y
Sex (M/F)		
Address		
Post Code		
GP Code		
Social Support		
CREATING GROUP DETAILS		
Staff Group		
Staff Number		
Source Referral		
Patient Category		
RESEARCH	☐ ☐ ☐ ☐ ☐ ☐	

V6B5

COMMUNITY HEALTH SERVICES DAILY ACTIVITY SHEET

NAME

STAFF No

DATE: d d m m y y

Start Mileage
Finish Mileage
Base Mileage
Mileage Claimed
Rate Claimed
Passenger Mileage
Passenger Names

DAILY TIME SUMMARY

ABSENCE				
DATES		CODE	DESCRIPTION	DURATION
from	to			

OTHER ACTIVITIES

	CODE	DESCRIPTION	LOCN	HOURS
1				
2				
3				
4				
5				
6				

RESEARCH

1 2 3 4 5 6

GROUP SESSIONS/CLINICS

	CODE	DESCRIPTION	LOCN	HOURS	TRAVEL	ATTEND		
1								
2								
3								

	Date of Birth	Sex	Init	Surname	1	2	3	Code	Time H M	Time H M	Code	1	2	3
1									:	:				
2									:	:				
3									:	:				
4									:	:				
5									:	:				
6									:	:				
7									:	:				
8									:	:				
9									:	:				
10									:	:				
11									:	:				
12									:	:				
13									:	:				
14									:	:				
15									:					

DISTRICT NURSING SERVICE

PATIENT REGISTRATION

Date Discharged:

Reason for Discharge:

If Code D N S . Nurse Name _____ Date __/__/__ Pnum .

New Registration ☐ Re-registration ☐ Amendment ☐ Reinstatement ☐

SNAME ☐ MARITAL STATUS ☐ TITLE ☐ SEX ☐

FNAME ☐ DATE OF BIRTH ☐ TEAM ☐

☐ GP Y/N ☐ GP NAME OR CODE ☐

DRESS ☐ GP ADDRESS

☐

☐ GP TEL. No.

☐ RELIGION ☐

CODE ☐ SOR H? ☐ ☐ ☐

No. ☐ ☐ DIAGNOSIS ☐

☐

TREATMENT ☐

☐

KT OF KIN

NAME ☐

FNAME ☐

DRESS ☐

☐

☐

LATIONSHIP ☐

TEL. NO. ☐ ☐

CONTACT

SURNAME ☐

FORENAME ☐

ADDRESS ☐

☐

☐

RELATIONSHIP ☐

TEL. No. ☐ ☐

DISTRICT NURSING SERVICE
DAILY DIARY SHEET

Call Code | | | | | | | Nurse Name _____ Date / / Evening Y/N

Individual Patient Detail	Sex M-F	Nursing Treatment Codes 1	2	3	4	Time	✓ If	Loc	RN FV	✓ F
PNUM or Name										
Address										
PNUM or Name										
Address										
PNUM or Name										
Address										
PNUM or Name										
Address:										
PNUM or Name										
ess:										
PNUM or Name										
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PNUM or Name										
Address:										
PNUM or Name										
Address:										
PNUM or Name										
Address:										
NUM or Name										
Address:										

OTHER ACTIVITY	
CODE	DURATION (mins.)

MILEAGE DETAILS	
START MILEAGE	
FINISH MILEAGE	
OFFICIAL MILEAGE	
NUMBER OF PASSENGERS	
PASSENGER MILES	
TOTAL PASSENGER MILES	
HIRE OR CROWN CAR (Y/N)	

Tick if continuation sheet used

ONS 2

APPENDIX 5 COMPUTER REPORTS
EXPLANATORTY NOTES

5.1 KT27 Report required annually and quarterly by the DoH.
This Körner Table comprises four parts:
Part 1 initial contacts by sources of referral. This represents the number of physiotherapy episodes of care within each specialty area.
Part 2 shows initial contacts (episodes of physiotherapy care broken down by patients' age, sex and source of referral).
Part 3 – indicates first contact in the financial year by the patients' age and sex. First contacts are the first contacts in the financial year, that is, each patient can only have one such contact with the physiotherapy service during a financial year however many episodes of care the patient may have. Therefore, the report shows how many people have used the service during this period.
Part 4 of the report was not a requirement for physiotherapy services. The Körner Tables for the other PAM professions were required to be produced daily to indicate the number of individual face to face contacts which took place with patients.
Part 5 – shows the number of Home Assessment visits undertaken by physiotherapists. These visits are undertaken to ascertain the suitability of the patient's home for return following serious illness or injury and whether modifications or adaptations are required. Physiotherapists undertake very few of these visits - most being undertaken by occupational therapists.

5.2 The Körner activity sample report was required both quarterly and annually. This report shows the amount of time spent by physiotherapy staff undertaking a wide range of activities. The survey was undertaken on one day every quarter in order to provide a 'picture' of activity throughout the year. Using PMS it was possible to obtain a wide range of information such as time spent on various activities by different grades of staff. This could be used for many purposes such as indicating the average caseloads undertaken by staff in different grades compared with time spent on duties such as supervising students or time undertaking patient contact work compared with administration or travelling. Comparisons could be made between any of the activities listed or the report could be used together with other reports such as outcome measurement related to caseload or seniority. This report also gave details of caseloads undertaken by each member of staff.

5.3 A graph using the Körner sample inquiry reports over a two year period showing a comparison between caseloads of the Senior I and II grades. Although Senior I grade have a wider range of responsibilities, being the more senior of the two grades, their patient throughputs are greater. The duties undertaken by Senior I physiotherapists include student clinical education, supervision of more junior staff, increased administrative responsibilities, leading clinical teams and teaching other disciplines.

5.4 This report shows physiotherapy activity for one quarter in the acute hospital by source of referral. The number of patients referred and the number of contacts within episodes of care are shown together with the percentage of referrals i.e. contacts in the relation to the whole. A useful report when planning new services.

5.5 A report taken from the successor system to PMS – MTS indicates the distribution of occupational therapy input provided by the acute Hospital Trust. The report was 'run off' as a result of requests from a number of divisions within the Trust to be given an overview of where occupational therapy interventions were taking place.

5.6 Physiotherapy Sports Injury Clinic Report. This report was "run off" for use in discussions with the Sports Council about the possibility of a specialist physiotherapy sports clinic being set up in Eastbourne DGH physiotherapy department and the possible provision of specialist equipment. The report was also used by the Senior physiotherapist undertaking sports work as part of a clinical audit. The report is one of a series; this one indicating the main diagnoses, number of patients and treatment

contacts per condition, the total number of patients treated in the financial year and total treatment contact for this group.

5.7 A physiotherapy report for a nine month period indicating reasons for patient referral rather than medical diagnosis. Information used in publicity material and general information to give a 'broad brush' indication of reasons of important areas of intervention.

5.8 An overview of patients referred by one rheumatology consultant indicating primary diagnosis. This report was used to assist in the development of proposals to introduce rapid referral clinics within physiotherapy for rheumatology patients. The report was used in combination with other reports to obtain 'waiting list' monies.

5.9 This report was used by the physiotherapist leading cardiac rehabilitation for a clinical audit project which she was undertaking within the cardiac rehabilitation programme. The report was also used together with a series of other reports on various aspects of cardiac rehabilitation in physiotherapy to assist the Health Authority in a needs analysis for funding a further cardiac rehabilitation group.

5.10 A project was undertaken within the region to ensure effective use of resources in the provision of back care programmes. This diagnosis report was used as part of a suite of reports indicating the main medical diagnosis within the overall back pain category for patients referred to physiotherapy. The report was also used to assist in a physiotherapy clinical audit project.

5.11 This report indicates the workload undertaken by one physiotherapy clinician during one year. The physiotherapist worked in a rotational post spending some of her time in the in-patient service and some in the out-patient department – such reports are made available to all physiotherapy staff and managers for audit purposes, for managerial use within the service and service monitoring. The member of staff undertook a caseload of 502 patients in the year and 2564 treatment contacts. This shows an average of approximately five contacts per patient episode which was in line with the physiotherapy service average for all staff during this period.

5.12 A report of one patient's episode of care, print out of one screen only from this multiple screen report. A wide range of information is shown indicating location of physiotherapy intervention (Green Street GP surgery), wait days and other referral details together with discharge information including outcome measure.

5.13 This report indicates the level of physiotherapy resource input, using the physiotherapy input unit (PIU). PIU reports were used on a regular basis by the finance department to assist in cost apportionment. The report relates to out-patient physiotherapy services for one year.

5.13.1 A bar chart showing the physiotherapy activity at Princess Alice Unit – a day hospital for elderly people. The report was one of several which were included in a document about the use of and volumes of work in the day hospital at a time when the Trust were undertaking an option appraisal on day services for elderly people with a view to possible closure of the Unit. The Unit remained open partly as a result of the evidence provided through these reports.

5.14 This report was also used for the Princess Alice Unit document.

from 01/04/1997 to 31/03/1998

Source of Referral	Line No.	Total Number of Initial Contacts
Hospital Specialties:		
Trauma/Orthopaedic	110	3244
General Medicine	300	1762
Geriatric Medicine	430	1962
Mental Handicap	700	0
Mental Illness	710	276
Other:		
CARDIOLOGY	320	214
OBSTETRICS P/N O/P	520	57
OBST.PAT.HOSP.BED	501	1074
GENERAL SURGERY	100	893
RHEUMATOLOGY	410	618
GYNAECOLOGY	502	586
ACCIDENT & EMERGENCY	180	292
DERMATOLOGY	330	26
OBSTETRICS A/N O/P	510	638
UROLOGY	101	295
OTHER CONSULTANT	991	38
PAEDIATRICS	420	96
ANAESTHETICS	190	72
OCCUPATIONAL MEDICIN	901	29
GASTROENTEROLOGY	301	5
ENT	120	33
NEUROLOGY	400	45
HAEMATOLOGY	303	20
ORAL SURGERY	140	1
OPHTHALMOLOGY	130	5
CHEMICAL PATHOLOGY	822	1
ENDOCRINOLOGY	302	2
PALLIATIVE MEDICINE	315	34
ORTHODONTICS	143	1
General Practice	010	2098 *
Other Medical	020	0
Self Referral	030	257
Other Source	099	251
No Data		15
Total		14940

PART 2: INITIAL CONTACTS - AGE, SEX AND SOURCE OF REFERRAL

from 01/04/1997 to 31/03/1998

Male

Source of Referral	Age: 0-4	5-15	16-54	55-64	65-74	75-84	85+	All
Hospital Specialties:								
Medical Group								
Psychiatry Group								
Surgical Group								
Other		5	99	33	15	7	4	163
Other Sources	44	107	1778	545	891	1214	544	5123
Total	44	112	1877	578	906	1221	548	5286

Female

Source of Referral	Age: 0-4	5-15	16-54	55-64	65-74	75-84	85+	All
Hospital Specialties:								
Medical Group								
Psychiatry Group								
Surgical Group								
Other		9	100	41	26	21	5	202
Other Sources	33	122	4034	826	1282	1842	1313	9452
Total	33	131	4134	867	1308	1863	1318	9654

from 01/04/1997 to 31/03/1998

Sex	Age: 0-4	5-15	16-54	55-64	65-74	75-84	85+	All
Male	46	118	2070	629	968	1302	581	5714
Female	34	144	4381	945	1448	1991	1401	10344
Total	80	262	6451	1574	2416	3293	1982	16058

from 01/04/1997 to 31/03/1998

Total	0

MTS v1.02g — EASTBOURNE HOSPITALS NHS TRUST — 02/08/1995
MARTIN — PHYSIOTHERAPY - ACTIVITY SAMPLE REPORT — PAGE 1

Sample Dates	15/06/1995 to 15/06/1995
Provider Unit	All Provider Units
Location	All Locations
Team	All Teams
Grade	All Grades
Clinician	All Clinicians
Sample Size	36
Absentees	4

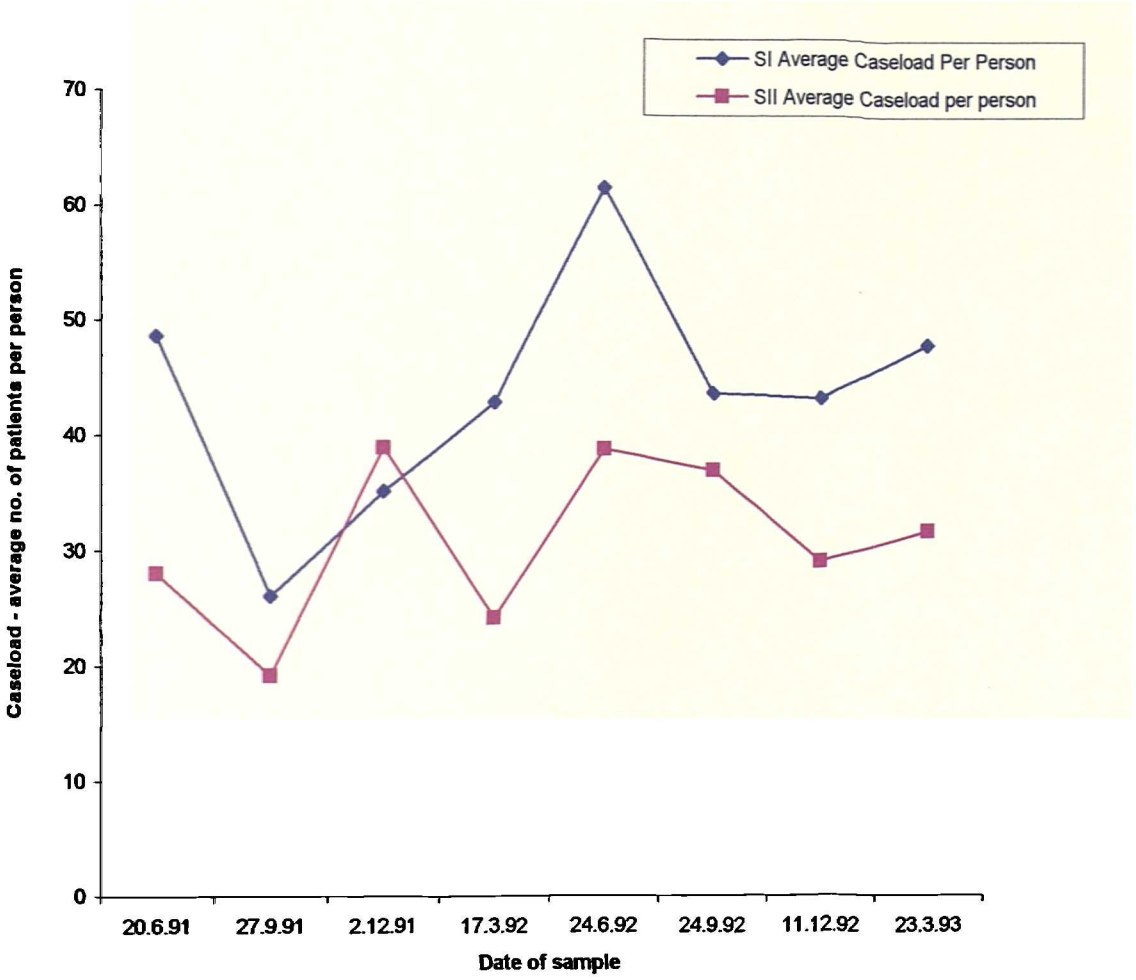
Activity	Total Time	Avg Time	% Time
Patient Based Activity:			
Face To Face Contacts (Individual)	113:30	3:32	49.9%
Face To Face Contacts (Group)	7:55	0:14	3.4%
Telephone Contacts (Patient or Relative)	3:35	0:06	1.5%
Ward Rounds	1:50	0:03	0.8%
Case Conference	0:50	0:01	0.3%
Study Leave	5:00	0:09	2.1%
	132:40	4:08	58.3%
Teaching/Training:			
In-Service Training	1:05	0:02	0.4%
Teaching - Physios	0:30	0:00	0.2%
Teaching - Students	1:55	0:03	0.8%
Teaching - Health Professionals	1:20	0:02	0.5%
Teaching - Public	2:25	0:04	1.0%
	7:15	0:13	3.1%
Other Professional Activity:			
Liaison with Other Services	12:05	0:22	5.3%
Administration	28:15	0:52	12.4%
Management Duties	5:55	0:11	2.6%
Home Assessment Visits	0:00	0:00	0.0%
Travel	7:35	0:14	3.3%
Clinics	0:00	0:00	0.0%
Staff/Team Meetings	12:30	0:23	5.4%
Clinical Supervision	1:20	0:02	0.5%
Other	15:11	0:28	6.6%
Form Filling	4:41	0:08	2.0%
No. of Group Sessions	0:00	0:00	0.0%
No. of Home Assessment Visits	0:00	0:00	0.0%
	87:32	2:44	38.4%
Totals	227:27	7:06	
Standard Working Hours	222:10	6:56	

Sample Dates	15/06/1995 to 15/06/1995
Provider Unit	All Provider Units
Location	All Locations
Team	All Teams
Grade	All Grades
Clinician	All Clinicians

Sample Size	36
Absentees	4

Additional Information	Total	Average
No. of Group Sessions Today	5	0.1
No. of Home Assessment Visits Quarter	0	0.0
Total Caseload	1159	36.2

Eastbourne Hospitals NHS Trust
Sample Data Inquiry 1991-1993



EASTBOURNE HOSPITALS NHS TRUST

09/03/2000

Physiotherapy

Source of Referral Patients & Contacts

First appointment 01/10/1999 to 31/12/1999

Source of Referral		%	Total Pats.	%	Total Contacts
100	GENERAL SURGERY	5.1	187	5.5	746
101	UROLOGY	2.0	71	1.8	251
110	TRAUMA/ORTHOPAEDIC	20.5	743	24.1	3288
120	ENT	0.5	17	0.4	58
140	ORAL SURGERY	0.1	2	0.1	11
180	ACCIDENT & EMERGENCY	1.9	70	1.4	195
190	ANAESTHETICS	0.6	23	0.5	66
300	GENERAL MEDICINE	13.7	496	12.5	1705
301	GASTROENTEROLOGY	0.7	25	0.9	120
302	ENDOCRINOLOGY	0.0	1	0.1	9
303	HAEMATOLOGY	0.1	3	0.0	6
315	PALLIATIVE MEDICINE	1.0	35	0.8	105
320	CARDIOLOGY	3.2	117	4.3	592
330	DERMATOLOGY	0.1	5	0.1	10
400	NEUROLOGY	0.2	6	0.2	25
410	RHEUMATOLOGY	3.0	108	2.5	345
420	PAEDIATRICS	0.5	19	0.4	55
430	GERIATRIC MEDICINE	14.9	541	20.6	2814
501	OBST.PAT.HOSP.BED	7.2	263	3.3	448
502	GYNAECOLOGY	3.6	129	2.2	306
510	OBSTETRICS A/N O/P	3.2	117	1.6	221
520	OBSTETRICS P/N O/P	0.7	24	0.5	62
710	MENTAL ILLNESS	0.9	31	2.1	283
901	OCCUPATIONAL MEDICIN	0.5	19	0.4	58
991	OTHER CONSULTANT	0.1	5	0.1	17
CHA	CHASELEY TRUST	0.3	10	0.6	80
GP	GENERAL PRACTICE	13.5	490	11.4	1560
MD	MIDWIFE	0.6	20	0.2	22
OSD	OTHER SOURCE OUTSIDE E/B DISTR	0.6	22	0.6	80
OT	OTHER	0.0	1	0.0	1
PH	PHYSIO	0.1	5	0.2	25
SF	SELF	0.0	1	0.0	1
SIC	SPORTS INJURY CLINIC	0.7	26	0.5	69
Total			3632		13634

EASTBOURNE HOSPITALS NHS TRUST 28/02/2000

Occupational Therapy

Appointment Location

First Appointments from 01/10/1999 to 31/12/1999

Appointment Location		%	Total Patients	%	Total Contact
BER	BERWICK WARD	4.0	26	2.7	72
BOU	BOURNE WARD	3.6	23	3.6	95
BRI	ALBERT BRIGGS WARD	4.6	30	4.9	131
CHA	Chaseley Trust	0.8	5	1.1	28
CUC	CUCKMERE WARD	0.9	6	0.7	19
DEV	DEVONSHIRE WARD	3.9	25	8.0	213
DIC	DICKER WARD	3.7	24	2.5	67
DOT	DGH OCCUPATIONAL THERAPY DEPT.	4.5	29	1.6	42
ENH	EASTBOURNE ANS NURSING HOME	0.8	5	0.5	14
FOL	FOLKINGTON WARD	4.3	28	2.1	55
FRI	FRISTON WARD	0.3	2	0.2	4
GLY	GLYNDE WARD	0.6	4	0.5	12
H2	HAILSHAM 2 WARD	0.2	1	0.0	1
H3	HAILSHAM 3 WARD	0.5	3	0.1	3
H4	HAILSHAM 4 WARD	1.4	9	1.8	48
JEV	JEVINGTON WARD	3.1	20	1.8	48
LAN	LANGNEY WARD	4.3	28	3.7	97
MEA	MEADS WARD	3.3	21	3.7	99
MIC	MICHELHAM UNIT	1.7	11	1.3	34
PAO	PRINCESS ALICE DAY HOSPITAL O.	13.2	85	29.5	782
PEV	PEVENSEY WARD	3.4	22	1.2	33
PNH	POLEGATE ANS NURSING HOME	0.6	4	0.3	9
POC	PRE-OP ASSESSMENT CLINIC	13.6	88	11.6	307
S1	SEAFORD 1 WARD	13.6	88	10.6	282
S2	SEAFORD 2 WARD	4.6	30	3.6	96
S3	SEAFORD 3 WARD	1.1	7	0.6	15
S4	SEAFORD 4 WARD	0.8	5	0.4	11
WIL	WILMINGTON WARD	2.6	17	1.4	36
Total			646		2653

28/03/2000 EASTBOURNE HOSPITALS NHS TRUST Page 1

OUTPATIENTS

Main Diagnosis Summary

SPORTS INJURY CLINIC

First Appointment from 01/04/1998 to 31/03/1999

Main Diagnosis		Number of Patients	No. of Contacts
715	OSTEOARTHROSIS (O.A)	1	4
717	INTERNAL DERANGEMENT OF KNEE	1	8
717.7	CHONDROMALACIA PATELLA	7	32
723.1	CERVICAL PAIN	5	23
724.5	BACK/LUMBAR PAIN	7	35
726.3	TENNIS ELBOW/BURSITIS	3	15
726.7	ACHILLES TEND/CALCANEAL S/METATAR	1	5
726.9	TENDONITIS	1	10
728.7	PLANTAR FASCIITIS	1	3
729.1	MYALGIA	1	4
732.4	OSTEOCHONDROSIS/OSGOOD SCHLATTER'	1	3
840	SPRAINS/STRAINS SHOULDER & UP-ARM	16	58
841	SPRAINS/STRAINS ELBOW & FOREARM	1	3
842	SPRAINS/STRAINS WRIST & HAND	1	4
843	SPRAINS/STRAINS HIP & THIGH	24	84
844	SPRAINS/STRAINS KNEE & LEG	31	118
844.9	SHIN SPLINTS	5	24
845	SPRAINS/STRAINS ANKLE & FOOT	13	67
Total Patients		120	500

EASTBOURNE HOSPITALS NHS TRUST 21/03/2000

Physiotherapy

Reason for referral Patient Numbers & contacts

First **Appointment** from 01/04/1999 to **31/12/1999**

	Reason for Referral	%	Total Patients	%	Total Contacts
	* No reason for referral*	0.0	2	0.0	8
AC	AMPUTEE CLINIC	0.2	18	0.1	44
AD	ADVICE ONLY	0.1	12	0.0	16
AG	ANTENATAL GROUP	2.8	312	1.3	624
AM	ANXIETY MANAGEMENT	0.0	1	0.0	1
AO	ASSESSMENT ONLY	0.9	101	0.5	250
AS	ANKYLOSING SPONDYLITIS GROUP	0.0	4	0.0	15
CG	CHANGE CAST	0.0	1	0.0	1
CH	CHEST	11.4	1263	14.0	6899
CR	CARDIAC REHABILITATION PROGRAM	1.9	207	2.6	1293
ED	EDUCATION	0.2	25	0.1	33
FD	FOOT DEFORMITY	0.0	1	0.0	1
FP	FOOT PROBLEMS	0.0	1	0.0	3
HC	HOSPICE CARE	0.5	56	0.4	211
IA	F.A. AND EARLY INTERVENTION	0.0	1	0.0	12
IC	CONTINENCE TRAINING	1.7	189	1.1	553
IR	F.A. AND CONTINUING REHABILITA	0.2	26	0.3	142
MA	MAINTENANCE	1.0	108	1.1	530
MB	MOBILITY	27.8	3095	29.6	14539
MC	MODIFIED CONSISTENCY	0.0	1	0.0	1
ML	MUSCULO-SKELETAL	30.7	3419	28.2	13847
MU	MULTIPLE REASONS	0.3	38	0.3	146
OT	OTHER	0.0	2	0.0	7
PA	PAIN MANAGEMENT	0.7	76	0.7	335
PG	POSTNATAL GROUP	0.7	77	0.4	221
PR	PROPHYLAXIS	11.1	1232	5.0	2481
PRC	PULMONARY REHAB CLINIC	0.1	14	0.1	37
PS	PSYCHIATRIC	1.3	145	1.7	836
RA	RA EARLY INTERVENTION PROGRAMM	0.0	1	0.0	2
RE	REHABILITATION	6.1	681	12.1	5937
SK	SKIN TREATMENT	0.1	10	0.2	121
ST	STAIR ASSESSMENT	0.0	4	0.0	4
			11123		49150

29/11/1999 EASTBOURNE HOSPITALS NHS TRUST Page 1

OUTPATIENTS

Main Diagnosis Summary

RHEUMATOLOGY

First Appointment from 01/04/1996 to 31/03/1997

Main Diagnosis		Number of Patients	No. of Contacts
343	CEREBRAL PALSY	1	6
356	NEUROPATHY - PERIPHERAL	4	15
436	C.V.A.	2	10
696.0	PSORIATIC ATHRITIS	2	9
710.0	SYSTEMIC LUPUS ERYTHEMATOSUS	1	0
710.1	SCLERODERMA	1	3
714	RHEUMATIOD ARTHRITIS	52	198
715	OSTEOARTHROSIS (O.A)	74	386
717.7	CHONDROMALACIA PATELLA	1	3
719.7	WALKING, DIFFICULTY WITH	4	19
720	ANKYLOSING SPONDYLITIS	29	114
721.9	SPONDYLOSIS UNSPECIFIED SITE	3	14
723.1	CERVICAL PAIN	130	710
723.5	TORTICOLLIS	1	6
724.1	THORACIC PAIN	4	22
724.5	BACK/LUMBAR PAIN	106	520
725	POLYMYALGIA RHEUMATICA	4	23
726	CAPSULITIS OF SHOULDER	19	114
726.1	ROTATOR CUFF SYNDROME	4	20
726.3	TENNIS ELBOW/BURSITIS	1	12
726.7	ACHILLES TEND/CALCANEAL S/METATAR	3	16
726.9	TENDONITIS	1	8
727.0	TENOSYNOVITIS	10	68
728.5	HYPERMOBILITY	1	8
728.7	PLANTAR FASCIITIS	6	38
728.9	DIVARIFICATION OF RECTII/MUSCLE	1	4
732.4	OSTEOCHONDROSIS/OSGOOD SCHLATTER'	1	11
733	OSTEOPOROSIS	3	7
737.3	SCOLIOSIS	1	1
780.7	M.E.	3	3
840	SPRAINS/STRAINS SHOULDER & UP-ARM	17	92
841	SPRAINS/STRAINS ELBOW & FOREARM	1	6
842	SPRAINS/STRAINS WRIST & HAND	11	72
843	SPRAINS/STRAINS HIP & THIGH	4	32
844	SPRAINS/STRAINS KNEE & LEG	20	67
845	SPRAINS/STRAINS ANKLE & FOOT	7	31
846	SPRAINS/STRAINS SACROILIAC REGN	1	1
847	SPRAINS/STRAINS BACK & NECK	4	26
847.0	WHIPLASH	1	3
953	NERVE INJURIES - NERVE ROOTS	1	14
E819	R.T.A.	1	7
W39	ARTHROPLASTY-TOTAL HIP REPLACEMEN	3	8
Total Patients		544	2727

EASTBOURNE HOSPITALS NHS TRUST 06/01/2000

Reason for Referral = CARDIAC REHAB

First Appointment from 01/04/1999 to **30/09/1999**

Physiotherapy

Main Diagnosis summary

MAIN DIAGNOSIS		%	Total Patients	%	Total Contacts
410	MYOCARDIAL INFARCATION	26.6	38	24.0	214
413	ANGINA	0.7	1	0.8	7
K01	CARDIAC SURGERY	53.8	77	55.9	499
K41	CORONARY ARTERY BYPASS GRAFT	16.1	23	16.6	148
L71	ANGIOPLASTY	2.1	3	2.5	22
NG	DIAGNOSIS NOT GIVEN	0.7	1	0.2	2
			143		892

CONSULTANT Source of Referral
First Appointment from 01/04/1997 to 31/07/1997
OUT-PATIENT
BACK PROBLEMS SUMMARY

Main Diagnosis		No of Patients	%
721.9	SPONDYLOSIS UNSPECIFIED S	5	2.6
724.1	THORACIC PAIN	9	4.7
724.5	BACK/LUMBAR PAIN	167	86.5
737.3	SCOLIOSIS	1	0.5
756.1	SPONDYLOLISTHESIS	1	0.5
805	FRACTURE - VERTEBRAL COLU	1	0.5
847	SPRAINS/STRAINS BACK & N	6	3.1
953	NERVE INJURIES - NERVE RO	1	0.5
V33.1	LAMINECTOMY	1	0.5
V33.7	DISCECTOMY	1	0.5
		193	

EASTBOURNE HOSPITALS NHS TRUST

22/03/2000

Physiotherapy

Appointment Clinician 7431

(First appointment 01/04/1998 to 31/03/1999)

Diagnosis Summary

MAIN DIAGNOSIS		PATS.	%	CTS	%
332	PARKINSON'S DISEASE	1	0.2	1	0.0
436	C.V.A.	2	0.4	4	0.2
496	C.O.A.D	2	0.4	41	1.6
519.8	CHEST INFECTION	3	0.6	38	1.5
562.1	PERFORATED DIVERTICULUM	1	0.2	2	0.1
696.0	PSORIATIC ATHRITIS	1	0.2	6	0.2
715	OSTEOARTHROSIS (O.A)	10	2.0	41	1.6
717	INTERNAL DERANGEMENT OF KNEE	1	0.2	1	0.0
719.4	ARTHRALGIA	1	0.2	1	0.0
719.7	WALKING, DIFFICULTY WITH	4	0.8	13	0.5
723.1	CERVICAL PAIN	99	19.7	547	21.3
724.0	STENOSIS - SPINAL	2	0.4	19	0.7
724.1	THORACIC PAIN	13	2.6	87	3.4
724.5	BACK/LUMBAR PAIN	138	27.5	608	23.7
726.3	TENNIS ELBOW/BURSITIS	4	0.8	16	0.6
726.7	ACHILLES TEND/CALCANEAL S/METATAR	1	0.2	10	0.4
728.7	PLANTAR FASCIITIS	2	0.4	9	0.4
729.2	NERVE PAIN	2	0.4	17	0.7
733	OSTEOPOROSIS	1	0.2	6	0.2
737.3	SCOLIOSIS	1	0.2	1	0.0
788.2	RETENTION OF URINE	1	0.2	1	0.0
812	FRACTURE - HUMERUS	3	0.6	9	0.4
813	FRACTURE - FOREARM	2	0.4	22	0.9
813.4	FRACTURE - COLLES/SMITH'S	1	0.2	5	0.2
820	FRACTURE - NECK OF FEMUR	1	0.2	3	0.1
824	FRACTURE - ANKLE	3	0.6	64	2.5
840	SPRAINS/STRAINS SHOULDER & UP-ARM	53	10.6	221	8.6
841	SPRAINS/STRAINS ELBOW & FOREARM	8	1.6	41	1.6
842	SPRAINS/STRAINS WRIST & HAND	5	1.0	16	0.6
843	SPRAINS/STRAINS HIP & THIGH	17	3.4	90	3.5
844	SPRAINS/STRAINS KNEE & LEG	72	14.3	346	13.5
844.9	SHIN SPLINTS	3	0.6	18	0.7
845	SPRAINS/STRAINS ANKLE & FOOT	19	3.8	62	2.4
846	SPRAINS/STRAINS SACROILIAC REGN	3	0.6	12	0.5
847	SPRAINS/STRAINS BACK & NECK	2	0.4	14	0.5
847.0	WHIPLASH	3	0.6	32	1.2
977.9	DRUG OVERDOSE	1	0.2	2	0.1
997.1	CARDIAC COMPLICATIONS	1	0.2	5	0.2
998.5	SEPTICAEMIA	1	0.2	7	0.3
G27	GASTRECTOMY	1	0.2	5	0.2
M61	PROSTATECTOMY	1	0.2	3	0.1
W39	ARTHROPLASTY-TOTAL HIP REPLACEMEN	1	0.2	1	0.0
W45	ARTHROPLASTY- OTHER JOINT REPLACEM	2	0.4	10	0.4
W74	LIGAMENT REPAIR	3	0.6	48	1.9
W77	ROTATOR CUFF - REPAIR	1	0.2	6	0.2
W87.9	ARTHROSCOPY	2	0.4	12	0.5
W91	MANIPULATION UNDER ANAESTHETIC	1	0.2	4	0.2

EASTBOURNE HOSPITALS NHS TRUST

Physiotherapy

Appointment Clinician 7431

(First appointment 01/04/1998 to 31/03/1999)

Diagnosis Summary

MAIN DIAGNOSIS		PATS.	%	CTS	%
150	LAPAROTOMY	2	0.4	37	1.4

Total Patients = 502 CTS = 2564

TS v1.4 EASTBOURNE HOSPITALS NHS TRUST 23/03/2000
TS210.2 PHYSIOTHERAPY - PATIENT REFERRAL MAINTENANCE

MTS No 00513533 Episode 0001 Name

Episode Status: Discharged Wait Days: 39 Age at First Appt: 46

Refer Date	21/09/1998		
Appointment: Date, Time	30/10/1998	0 :00	
Mode			
Location	PGS	GP SURGERY PHYSIO	
Clinician	7431		
Transport			
Care Group			
Patient Category	N	NATIONAL HEALTH	
Purchaser			Contract No:
Provider Unit	P	~~OUT-PATIENT~~ TEAM	
Patient Classification	O	OUT-PATIENT	

LAST SEEN BY AT GP SURGERY PHYSIO

CONTACT SUMMARY

No	Date	Contact Type	Clinician	Conts	Wrk Ld (PIUs)
2	02/03/1999	Face-to-Face Contact		7	0
1	30/10/1998	Face-to-Face Contact		1	0

Totals for this Episode: Contacts 8 Workload (PIUs) 0

Source of Referral	GP	GENERAL PRACTICE
Consultant	000000	NOT CONSULTANT REFERRAL
Reason for Referral	ML	MUSCULO-SKELETAL
Main Diagnosis	843	SPRAINS/STRAINS HIP & THIGH
Site/Laterality		
Subsidiary Diagnosis 1		
Subsidiary Diagnosis 2		
Surgical Procedure 1		
Surgical Procedure 2		
Surgical Procedure 3		

Projected outcome
AUDIT FALLS

Discharge Date	02/03/1999	
Discharge Status	MI	MAXIMUM IMPROVEMENT ATTAINED
Case Weighting: Estimated	0	
Actual	0	
Clinic Follow-Up Appointment		
Episode Outcome:	1	The optimum R'x with good effect
Destination code		

EASTBOURNE HOSPITALS NHS TRUST

11/11/1998

Physiotherapy

OUT-PATIENT

Referral Source Patient Numbers / Contacts / P.I.U'S

First Appointment from 01/04/1996 to 31/03/1997

Referral Source		%	Total Patients	%	Total Contacts	%	Total P.I.U.
100	GENERAL SURGERY	0.6	35	0.9	255	0.7	1470
101	UROLOGY	0.9	50	1.1	295	0.6	1396
110	TRAUMA/ORTHOPAEDIC	22.3	1291	25.7	7026	22.7	49125
120	ENT	0.1	7	0.1	26	0.1	116
130	OPHTHALMOLOGY	0.0	2	0.0	1	0.0	0
150	NEUROSURGERY	0.0	1	0.0	3	0.0	0
160	PLASTIC SURGERY	0.0	1	0.0	0	0.0	0
180	ACCIDENT & EMERGENCY	4.9	282	4.4	1213	4.4	9626
190	ANAESTHETICS	0.9	54	1.1	293	1.2	2649
300	GENERAL MEDICINE	2.8	162	2.9	799	4.0	8597
315	PALLIATIVE MEDICINE	0.0	2	0.0	3	0.0	0
320	CARDIOLOGY	1.1	63	1.8	495	0.3	613
330	DERMATOLOGY	0.2	14	2.0	546	0.5	1114
400	NEUROLOGY	0.8	47	1.8	498	3.1	6793
410	RHEUMATOLOGY	9.4	544	10.0	2727	10.5	22767
420	PAEDIATRICS	0.1	4	0.0	9	0.0	96
430	GERIATRIC MEDICINE	0.5	30	1.6	436	4.9	10686
502	GYNAECOLOGY	2.1	124	1.4	381	1.1	2378
510	OBSTETRICS A/N O/P	9.5	550	3.6	981	2.0	4301
520	OBSTETRICS P/N O/P	2.1	124	1.1	301	0.7	1427
710	MENTAL ILLNESS	0.0	2	0.2	54	0.0	0
901	OCCUPATIONAL MEDICIN	0.4	23	0.5	127	0.4	770
991	OTHER CONSULTANT	0.5	27	0.5	127	0.5	995
GP	GENERAL PRACTICE	32.1	1856	31.3	8532	36.2	78348
OSD	OTHER SOURCE OUTSIDE E/B DISTR	1.3	75	1.8	496	1.4	2975
OT	OTHER	0.1	4	0.1	18	0.0	60

Appendix 5.13

EASTBOURNE HOSPITALS NHS TRUST

11/11/1998

Physiotherapy

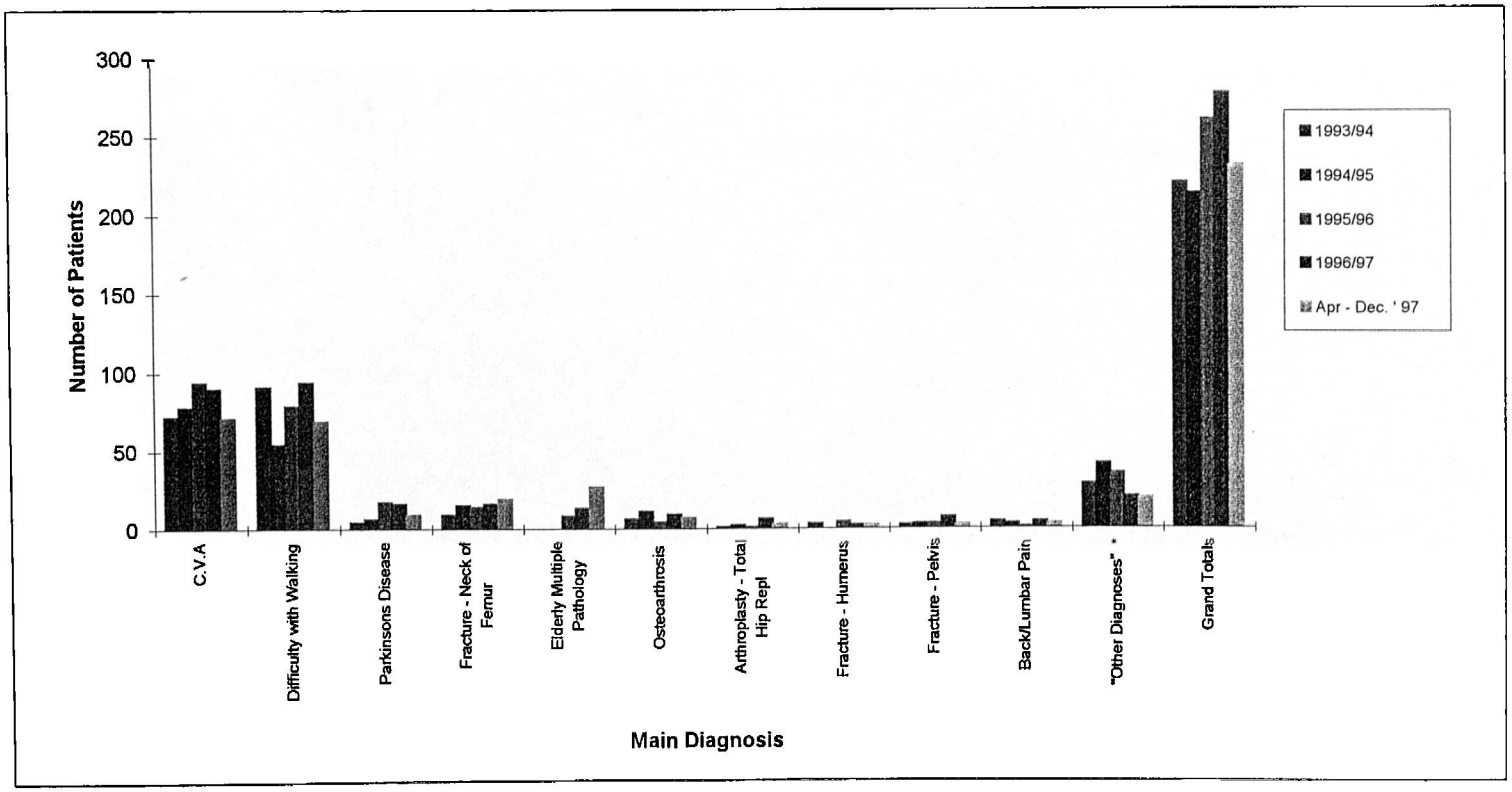
OUT-PATIENT

Referral Source Patient Numbers / Contacts / T.I.U'S

First Appointment from 01/04/1996 to **31/03/1997**

Referral Source		%	Total Patients	%	Total Contacts	%	Total T.I.U.
PH	PHYSIO	0.0	2	0.0	2	0.0	0
SF	SELF	4.1	239	2.6	698	1.4	3011
SIC	SPORTS INJURY CLINIC	2.9	165	3.5	952	3.2	6997
SS	SOCIAL SERVICES	0.0	2	0.0	4	0.0	87
			5782		27298		216397

Princess Alice Day Unit
Total Number of Patients treated
Summary of Main Diagnosis



Main Diagnosis	1993/94	1994/95	1995/96	1996/97	Apr - Dec. ' 97
C.V.A	72	78	94	90	71
Difficulty with Walking	91	54	79	94	69
Parkinsons Disease	4	6	17	16	9
Fracture - Neck of Femur	9	15	14	16	19
Elderly Multiple Pathology	0	0	8	13	27
Osteoarthrosis	6	11	4	9	7
Arthroplasty - Total Hip Repl	1	2	1	6	3
Fracture - Humerus	3	0	4	2	2
Fracture - Pelvis	2	3	3	7	2
Back/Lumbar Pain	4	3	1	4	3
Sub - Total (Top Ten codes)	**192**	**172**	**225**	**257**	**212**
"Other Diagnoses" *	28	41	35	20	19
Grand Totals	**220**	**213**	**260**	**277**	**231**

* For breakdown of "other diagnoses" - see attached sheet

PHYSIOTHERAPY

Princess Alice Day Unit

Total Number of Patients treated

Main Diagnosis

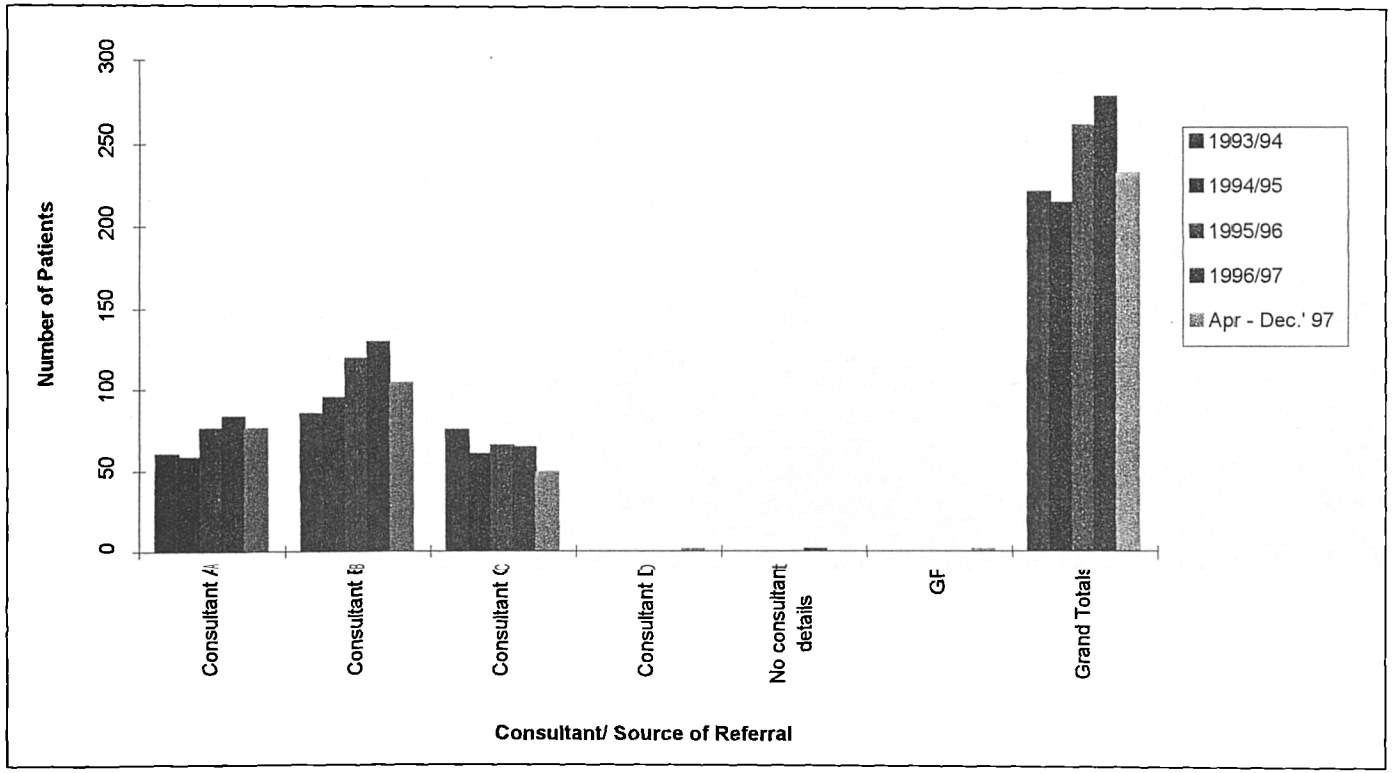
Other diagnostic codes:					
	1993/94	1994/95	1995/96	1996/97	Apr-Dec 97
Polyneuropathy,Peripheral	0	0	3	0	0
Oedema	3	0	3	0	0
No code	0	0	2	0	0
Diagnosis Not Given	0	1	2	0	0
Arthroplasty - Total Knee Repl	1	1	2	3	2
Arthroplasty - Excision	0	1	2	0	0
Arthroplasty - Other Joint repl	1	0	0	0	0
Amputation - above knee	3	1	2	1	1
Amputation- below knee	1	3	2	1	1
Carcinomas-Stomach	0	0	1	0	0
Dementia	0	1	1	0	0
Spinal Cord Diseases	0	0	1	0	0
Tetraplegia	0	0	1	1	1
Deep Vein Thrombosis	0	0	1	0	0
Cervical Pain	1	1	1	0	0
Polymyalgia Rheumatica	0	0	1	1	0
Pagets Disease	0	0	1	0	0
Spondylolisthesis	1	1	2	1	1
Ataxia	0	0	1	2	1
Diagnosis Unknown	1	0	1	0	0
Fracture - Forearm	0	0	1	1	0
Fracture - Colles/Smith's	0	0	1	1	1
Fracture - Patella	0	2	1	0	0
Fracture - Ankle	0	3	1	1	0
Fracture - Clavicle	1	0	0	0	0
Fracture - Vertebral Column	0	1	0	0	0
Fracture - Tibula & Fibula	2	5	1	1	3
Fracture - Shaft of Femur	0	0	0	2	2
Rheumatiod Arthritis	0	1	0	2	3
Osteoporosis	2	1	0	1	0
No diagnosis details	2	2	0	1	0
Alcoholism	0	0	0	0	1
Hemiplegia (not CVA)	0	0	0	0	1
Laminectomy	0	0	0	0	1
Multiple sclerosis	1	2	0	0	0
Peripheral Vascular Disease	1	1	0	0	0
Lymphoedema	1	0	0	0	0
Haemarthrosis	1	0	0	0	0
Sprains/Strains Shoulder & upp	2	2	0	0	0
Sprains/Strains Knee & Leg	1	0	0	0	0
Sprains/Strains Ankle& Foot	1	0	0	0	0
Spains/Strains Wrist & Hand	0	1	0	0	0
Sprains/Strains Sacroiliac regio	0	1	0	0	0
Nerve Injury Shoulder Girdle	1	0	0	0	0
Nerve Injury Pelvic Girdle	0	1	0	0	0
Nerve Injuries -Spinal Cord	0	1	0	0	0
Bell's Palsy	0	1	0	0	0
Transient Ischaemic Attacks	0	1	0	0	0
Asthma	0	1	0	0	0
Prolapsed Intervertebral Disc	0	1	0	0	0
Divarification of Rectii/muscle	0	1	0	0	0
Amputation	0	1	0	0	0
Prosthetic replacement of bone	0	1	0	0	0
Total "other diagnoses" (excl. top ten)	**28**	**41**	**35**	**20**	**19**

PHYSIOTHERAPY

Princess Alice Day Unit

Total Number of Patients Treated

Consultant / Source of Referral



Consultant / Source of Referral	1993/94	1994/95	1995/96	1996/97	Apr - Dec.' 97
Consultant A	60	58	76	83	76
Consultant B	85	95	119	129	104
Consultant C	75	60	65	64	49
Consultant D	0	0	0	0	1
No consultant details	0	0	0	1	0
GP	0	0	0	0	1
Grand Totals	**220**	**213**	**260**	**277**	**231**

Appendix 5.15

A View for PHYSIOTHERAPISTS

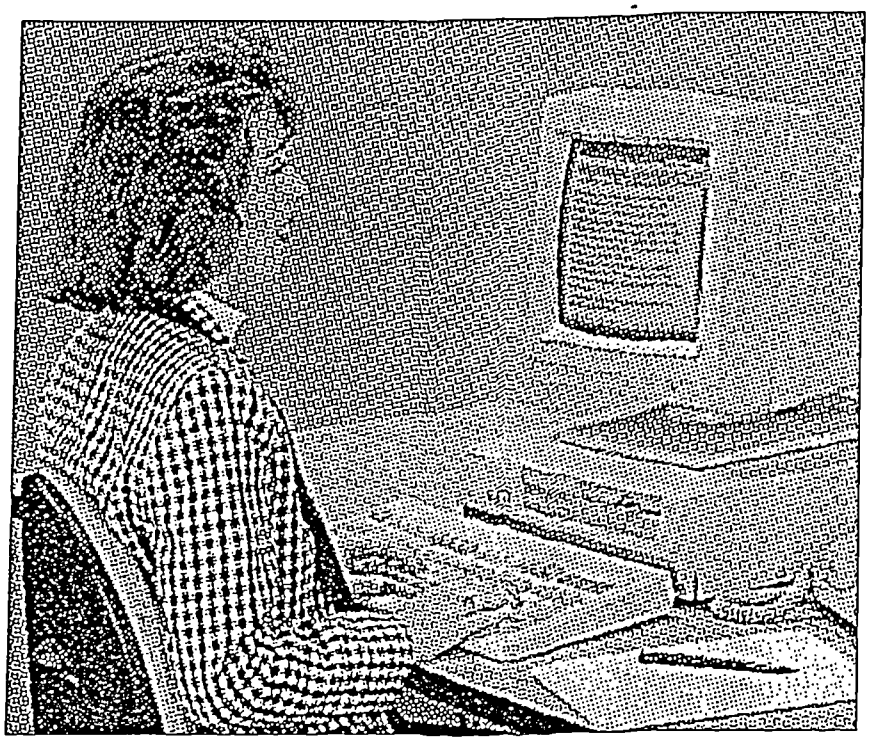
Information Management Group

September 1994

Focus on information and computing in the NHS

A1021

This information sheet explains the national Information Management and Technology (IM&T) Strategy and provides an overview of the main principles and initiatives that will affect you. It also gives details of contacts and publications that will help you to find out more.



Key issues for Physiotherapists

All physiotherapists working today will be very aware of the wide-ranging, rapid and radical changes taking place within the National Health Service as a result of the NHS and Community Care reforms. The requirement to provide more detailed and relevant information than ever before is fundamental to these reforms, as is the way in which health services, including physiotherapy, are purchased and provided.

Physiotherapists are now required to participate in writing Service Specifications and agreeing contracts. Information in healthcare is power and the use of information systems in physiotherapy will enable physiotherapists to make their own particular contribution to the contracting process. Therefore, physiotherapy reports need to include all the information required for patient care, contracting and management purposes. In conjunction with this it is necessary to develop methods and approaches to many important and demanding procedures, for example clinical audit and case mix.

The scope of modern physiotherapy practice is diverse, the service may be provided in many settings, within hospitals and across the wider community and primary care teams. Data collection and recording, sorting and collation, reporting, storage and sharing information are complex issues. There is a whole new language to learn together with many new skills and methods. However, none of this can be progressed without powerful and relevant computerised information systems which are sensitive to both clinical and management needs. Information systems and the better use of information are also powerful tools to help you to provide the most effective service to patients.

Please consider the implications for yourselves. Take the time to read this information sheet and save it for future reference.

Front Page Contributed
R.J. Jones

NHS Executive

SOUTH EAST THAMES REGIONAL HEALTH AUTHORITY

PHYSIOTHERAPY PATIENT REGISTRATION

Appendix 7

REFERRAL DATE	CARE GRP.		NHS No.																	
	NHS	PP	OSV	CONT. I.D.	Mr / Mrs / Miss / Ms	SURNAME								H.No.						
PHYSIOTHERAPY APPT.														SEX	D.O.B.					
	E.O.			PR.U.		FORENAME														
	A&E	I.P.	O.P.	COM.	DAY	PERMANENT ADDRESS								G.P.						
														No.						
DIAGNOSTIC CODE			REASON FOR REF.											PRACT.						
						POSTCODE								TEL.						

ONS	CLINICIANS	CONTACTS	P.I.U.'s	OUTCOMES	AUDIT

DISCHARGE DATE	DISCHARGE STATUS	H.A.V.'s	APPLIANCES

CLINIC FOLLOW-UP APPT.	CONSULTANT	OCCUPATION	HOSPITAL TRANSPORT	CAR		WALKER	
				CHAIR		STRETCHER	

REFERRED BY: WARD:

DIAGNOSIS AND DATE OF ONSET:

X-RAY REPORT:

MEDICATION:

HOME SITUATION/SUPPORT:

RELEVANT MEDICAL HISTORY:

PHYSIOTHERAPY DISCHARGE SUMMARY

SIGNATURE

DATE	No.	PROBLEM LIST	DATE RESOLVED	SIGN

DATE	No.	GOALS/PLANS	GOAL TIME	DATE ACHIEVED	SIGN

No.	S.O.A.P.	DATA BASE/PROGRESS NOTES			SIGNATURE

DATE	No.	S.O.A.P.	DATA BASE/PROGRESS NOTES			SIGNA

Guidelines for Computerised Information Systems in NHS Therapy Services

Robert J Jones

Reprinted from

Physiotherapy, Journal of the Chartered Society of Physiotherapy, April 1994

14 Bedford Row, London WC1R 4ED

Guidelines for Computerised Information Systems in NHS Therapy Services

Robert J Jones

For many years computerised information systems have been developed so that organisations might be more aware of their own state, and the state of the environment within which they operate. The growth of this concept continues to take place within the National Health Service, in common with other organisations. During the last two decades the environment for the provision of health care within the United Kingdom has undergone wide-ranging and radical changes and the process of developing information systems and technology has gathered momentum throughout this period. This process continues as further changes take place both within and alongside the service.

The requirement to provide more detailed and relevant information than ever before is fundamental to the many changes brought about by the National Health Service and Community Care Act 1990. Physiotherapy and other therapy services now participate in the service specification process and agreement of service contracts and in conjunction with this it is necessary to develop methods and approaches to many demanding systems such as quality assurance, audit and the determination of outcome measures, service costing and pricing, case-mix and resource management initiatives. In order to be able to achieve all this; to be able to show what we are doing and how much of it, how effective and efficient we are and how much it all costs, therapists need powerful computerised information systems capable of bringing together clinical and managerial information.

Since the mid 1980s — in common with several other NHS physiotherapy services nationwide — we in Eastbourne have specified, tested, piloted and used computerised information systems for a wide variety of clinical and managerial purposes. We have worked closely with physiotherapy colleagues in the South East Thames Regional Health Authority area in devising appropriate methods of data recording, methods of collection and systems specification. Throughout this period we have also worked on the entire computerised information system development process with a number of computer companies and this has enabled us to gain valuable experience in this field.

During the past few years there have been scores of inquiries from physiotherapists and people from a wide range of other disciplines and backgrounds within the NHS and these guidelines are a result of this. They are intended to help therapists embarking on, or already participating in, this field of work. They are *not* intended as 'standards' which must be adhered to. The guidelines highlight major areas for consideration to help those working on further development of existing computer systems and those new to information technology.

Guidelines for Computerised Information Systems

Guideline 1 — Information Use

All information collected should be for identified and agreed use.

PRINCIPLES

Computerised information systems should:

- Provide the information required for clinical and managerial purposes within therapy services locally.
- Provide all information required nationally — KT27 returns for physiotherapy.
- Provide information required by the Regional Health Authority.
- Produce information required locally by purchasers and within the provider units (directly managed units and trusts).

Guideline 2 — Local Ownership

The computerised information system should be specific to the clinical and managerial needs of the therapy services locally.

PRINCIPLES

- Systems should be 'owned' by the therapy services using them locally wherever possible.
- Information contained within the system should be 'owned' by the therapy service.
- Therapists should be involved in the choice of appropriate information systems for their own services.

Guideline 3 — Computer Hardware

Therapy services should have appropriate computer hardware to support their information systems.

PRINCIPLES

- The system hardware has the capacity to handle the quantity of data required at present and be capable of expansion to meet future needs.
- The system hardware needs to be capable of supporting a wide variety of applications.
- The system hardware needs to be able to support a variety of input devices and terminals.
- The therapy system hardware needs to be compatible — as far as possible — with hardware used by other services and departments locally.
- The computer hardware may need to support a variety of data collection modes such as bar coding, optical mark reading, etc.

- The computer must operate at the highest speed commensurate with the size of the information system locally.
- The computer system should be able to process data in both 'real' time and 'batch modes'.

Guideline 4 — Computer Software

Computer software for therapy information systems should be appropriate to clinical and managerial practice.

PRINCIPLES

- Software should be specific to therapy requirements.
- Software should be written, where possible, in a fourth generation language, or at least there should be a fourth generation language interface for the production of *ad hoc* reports and inquiries.
- The software should be compatible with other programmes used locally in order to facilitate interfacing: eg patient administration systems (PAS) and clinical information systems (CIS).
- The software design must enable archiving and retrieval of archived data.
- It may be helpful if software is capable of incorporating a variety of other applications such as:

  Staff training records
  Manpower
  Travel records
  Personnel records
  Costing and pricing
  Other programmes to local requirements

- The software should interface easily with other packages such as:

  Programmes for clinical purposes
  Word processing
  Spreadsheets
  Graphics
  Mail merge (including address labels)
  Other databases

- The software package should be capable of being updated in line with changing requirements.
- The software should be designed to accommodate the Read Coding System.

Guideline 5 — System Security

Therapy systems must be secure so as to protect the confidentiality of patients, staff and others about whom data are held.

PRINCIPLES

- Data must be collected, processed and stored within the requirements of the Data Protection Act 1986.
- Entry to the therapy information system should be governed by a hierarchical series of passwords.
- Computer discs containing information about patients, staff and others must be kept securely locked away when not in use.
- The computer hardware and software must be housed at a distance away from physiotherapy electrical equipment which might corrupt or erase data.
- There should be regular production and safe storage of 'backup' copies of all essential data.

Guideline 6 — The Data Collection

All information collected by therapists should, wherever possible, be a by-product of clinical practice.

PRINCIPLES

- All patient episode data items are collected once only if possible.
- The data system should facilitate the collection, processing and reporting of a wide range of locally agreed clinical and managerial information as well as that required nationally and regionally.
- The data system should facilitate the collection, processing and reporting of information about the use of therapy resources in:

  Direct contact with patients
  Indirect patient activity
  Non-patient-related activity

- Whenever possible, data should be input to the computer system by clerical staff, although it may be advantageous for therapists to be able to undertake this task in some circumstances.

Guideline 7 — Reporting

PRINCIPLES

The computer system should be capable of providing standard and *ad hoc* reports for therapy clinical and managerial purposes, as well as meeting the agreed requirements of others.

- Computer reports should be accessible to therapy managers and clinicians.
- It is helpful if computer reports are available from the system in a variety of modes, for example:

  Statistical
  Bar charts
  Pie charts
  Graphs
  Spreadsheets

- It should be possible to take reports off the system as quickly and as frequently as required.
- The system should facilitate the design and generation of *ad hoc* reports by therapy managers and clinicians.

Guideline 8 — Service Agreements

There should be service agreements with the computer companies supplying the therapy information system.

PRINCIPLES

- There must be service agreements for the computer hardware and software with agreed call-out response times. These agreements should include dealing with, for example:

  Systems failure
  Maintenance
  Support
  Trouble-shooting
  Further development

Guideline 9 — Computer System Documentation

There must be full documentation for the computer system hardware and software.

PRINCIPLES

There must be:

- Full documentation on the operation of the computer hardware.
- Comprehensive manual on the therapy information system software.
- User manuals for the computer operating system and also other software packages in use.

Guideline 10 — Staff Training

Training, at various levels, in the use and operation of the computerised information system must be available.

PRINCIPLES

- Training in the use of the computer and relevant software needs to be provided for clerical staff.
- Therapy staff are trained in hardware and software procedures and use, as appropriate to their agreed needs.

Acknowledgments

Many thanks to my colleagues in Eastbourne Hospitals NHS Trust; to those with whom I have worked closely in the South East Thames Regional Health Authority and to the Chartered Society of Physiotherapy Service Management Group which I was privileged to chair in its various forms from 1984-1993. Also to Deborah Smith, Business Development Officer at the Chartered Society of Physiotherapy; and to ICL Medical Portfolio Limited.

Author and Address for Correspondence

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Information Systems for Physiotherapists

The information officer and the business adviser at the CSP are considering ways of improving access for members to information on computer systems, principally software, suitable for physiotherapists.

Part of this activity will involve discussions with those already using computers on a regular basis or with a specific interest in or knowledge of computer systems. Some individual members are already known to the Society, but we would welcome contact by others who have special knowledge that they are prepared to share. If you believe you could be of assistance please write to Maureen Muir (information officer) or Deborah Smith (business adviser) with the following details:

- Contact name and address.
- Systems in use, both at work and at home.
- Specific expertise or knowledge.

COMPUTERIZED INFORMATION SYSTEMS IN THE MANAGEMENT OF PHYSIOTHERAPY SERVICES

QUESTIONNAIRE

1.(a) Name of Trust or D.M.U. .....

(b) Title of your post .....

Please delete as appropriate

2. Do you manage:

a) Physiotherapy Only Yes\No

b) Physiotherapy and Other PAM's Yes\No

c) Physiotherapy and Other Services Yes\No

3. Do you manage the budget for your service(s) Yes\No

4. Are you responsible for the Management of:

a) Statistical Returns Yes\No

b) Clinical Audit Yes\No

c) Outcome Measurement Yes\No

d) Appliance Issuing and Retrieval Yes\No

e) Statistical Reports to Service Purchasers Yes\No

f) Activity Reports Yes\No

g) Case Load Measurement Yes\No

h) Physiotherapy Resource Input Measurement Yes\No

i) Patients Appointments Yes\No

j) Waiting List Monitoring Yes\No

k) Stock Control Yes\No

5. Do you have a computerized information system for physiotherapy service Yes\No

IF YES TO QUESTION 5 PLEASE CONTINUE,
IF NO, PLEASE TURN TO QUESTION 35.

6. Is your computer system:

   a) Specifically for your Service — Yes\No

   b) Shared with Other Disciplines — Yes\No

7. Where is your computer system sited?:

   a) In the Physiotherapy Department\Base — Yes\No

   b) Within your Unit Premises — Yes\No

   c) In Premises Outside your Unit — Yes\No

8. Is your computerised information system:

   a) 'Stand Alone' — Yes\No

   b) Part of a Networked System — Yes\No

9. Do other PAM's have computerized systems — Yes\No

10. If other PAM's have computerized systems do your systems 'Network' — Yes\No

11. Does your system interface with other systems within your Unit such as:

   a) Clinical Information Systems (CIS) (Casemix) — Yes\No

   b) Patient Administration System (PAS) — Yes\No

   c) Other Resource Management (RMI) — Yes\No

   d) HISS — Yes\No

   e) Other, Please Specify .....

12. If your system does not link, would such a facility be helpful\useful to you — Yes\No

13. Do you have computer department officer support for your system with

   a) Computer Hardware — Yes\No

   b) Computer Software — Yes\No

Please comment if you wish .....

.....

14. Did you:

a) Participate in the design\ specification of your system — Yes\No

b) Buy a system 'Off the Shelf' following consultation — Yes\No

c) Buy a system 'Off the Shelf' without consultation — Yes\No

d) Was your system imposed upon you — Yes\No

15. Are you permitted to influence the future development of your system — Yes\No

16. Would you wish to be involved in the future development of your system — Yes\No

17. Can alterations be made easily in your computer programme — Yes\No

18. Can alterations in your computer programme be made as soon as you require them — Yes\No

19. Do you have total management control of your computer system — Yes\No

20. Has it been necessary to modify clinical practice because of your computer system — Yes\No

If 'yes' please specify: .....

.....

21. Do you have a designated physiotherapy computer input officer\clerk — Yes\No

22. Do clinical staff have to input to the computer — Yes\No

23. What is the approximate percentage of clinical time lost to your service(s) by clinical staff performing computer operations — % Time Lost [%]

24. Are you able to collect all the information you require for the management of your service(s) on:

a) Statistical Returns Yes\No

b) Clinical Audit Yes\No

c) Outcome Measurement Yes\No

d) Appliance Issuing and Retrieval Yes\No

e) Statistical Report to Service Purchasers Yes\No

f) Activity Reports Yes\No

g) Case Load Measurement Yes\No

h) Resource Input Measurement Yes\No

i) Patients Appointments Yes\No

j) Waiting List Monitoring Yes\No

k) Stock Control Yes\No

25. Are you able to take reports off your system as soon as you require them:

a) Standard Managerial Reports Yes\No

b) Standard Clinical Reports Yes\No

c) Ad Hoc Reports Yes\No

26. Does your computer system support your management of costing and pricing Yes\No

27. Does your computer system produce invoices Yes\No

28. Will your system produce reports in a variety of formats such as:

a) Statistical Reports Yes\No

b) Bar Charts Yes\No

c) Histograms Yes\No

d) Graphs Yes\No

e) Pie Charts Yes\No

f) Spread Sheets Yes\No

29. Will your system accommodate the Read Coding System — Yes / No / Don't Know

30. Do you participate in a national or local User Group for your computer system — Yes\No

31. Does your system use:

a) Direct Computer Keyboard Input — Yes\No

b) Handheld Computer Input Devices — Yes\No

c) Bar Coding Equipment — Yes\No

d) Optical Mark Reading Devices — Yes\No

32. Is there any duplication of information collection in your system; e.g. handheld computers as well as paper systems — Yes\No

33. Do you feel that your computer system supports your clinical service(s) — Yes\No

OR

34. Do you feel that it is more that your clinical service(s) supports the computer system — Yes\No

PLEASE GO TO QUESTION 42

PLEASE ANSWER THE FOLLOWING QUESTIONS IF YOU DO NOT HAVE A COMPUTERIZED INFORMATION SYSTEM

35. Do you wish to have a computerized information system for your service(s) — Yes\No

36. Are you able to collect all the information for the management of your service(s) manually — Yes\No

37. What is the approximate percentage of clinical time lost to your service(s) as a result of data collection — % Time Lost [%]

38. Are you able to collect all the information you require for the management of your service(s) on:

a) Statistical Returns — Yes\No

b) Clinical Audit — Yes\No

c) Outcome Measurement Yes\No

d) Appliance Issuing and Retrieval Yes\No

e) Statistical Reports to Service Purchasers Yes\No

f) Activity Reports Yes\No

g) Caseload Management Yes\No

h) Resource Input Measurement Yes\No

i) Patient Appointments Yes\No

j) Waiting List Monitoring Yes\No

k) Stock Control Yes\No

39. Why do you not have a computerized information system:

Please Specify .....

.....

40. Do you think it would help your service(s) to be linked by computer to other systems in your Unit:

a) Managerially Yes\No

b) Clinically Yes\No

41. Do you think that it would be important to specify your own computerized information needs in the event of obtaining a system Yes\No

42. <u>PLEASE ADD ANY COMMENTS YOU FEEL RELEVANT IN THE SPACE BELOW:</u>

District General Hospital,
Physiotherapy Department,
Kings Drive,
Eastbourne,
East Sussex.
BN21 2UD

28th July 1993

Dear Colleague,

Re: Research Project - 'Computerised Information Systems in the Management of Physiotherapy Services'

I am at present undertaking some research as part of a PhD thesis on the use of Computerised Information Systems in the management of physiotherapy services.

I should be most grateful if you could kindly find time to complete the enclosed questionnaire. The information you give will be used in aggregated form only and no individuals or places will be identified in the analysis. I would appreciate your reply before Tuesday, 31st August and have enclosed a stamped self addressed envelope for your reply.

Very many thanks for your help.

Yours sincerely,

Robert J. Jones