Research and Development in Health Service Management: A study of Innovation in New Zealand Acute Health Care Enterprises.

A thesis presented in partial fulfilment
of the requirements for the degree of
Master of Business Studies
in Health Management
at Massey University.

Elizabeth Jane Wall.
1994.

Abstract.

As of 1 July 1993, the New Zealand Government has extensively reformed its health care industry along the lines of managed competition. Amongst other objectives, the reforms were designed to encourage innovation in health service delivery. Innovation is preceded by research and experimental development (R&D). When considered in the context of a service industry such as health, innovation arises from health service management R&D. Health service management R&D encompasses all R&D that improves the efficiency and effectiveness of health service delivery. The purpose of this research was to establish the capability and extent of R&D in health service management within New Zealand acute health care enterprises during the fiscal year, 1 July 1992 to 30 June 1993, i.e. the year immediately prior to the reforms becoming operational. Case study research was then conducted to describe the parameters of health service management R&D in practice. This thesis focused on R&D as an indicator of innovativeness within the New Zealand health industry, innovation being a prerequisite for competitive advantage and business success/survival.

The research design was triangulation. A full population survey of 31 acute health care enterprises was conducted in the first instance, using a survey questionnaire based on the internationally accepted OECD framework for conducting such surveys. The response rate was 29 percent. Only one out of nine respondents conducted any health service management R&D, conducting five R&D projects in total and that organisation subsequently gave permission for the case study research to proceed, waiving its right to anonymity. The organisation was the Wellington Area Health Board and the R&D involved the development of a perinatal management information system- PIMS. The research for this innovation began in the early 1980's, taking a decade to bring into operation. The case study documents that history, illustrating the realities of innovating in an industry undergoing constant change due to environmental forces impacting on it. It also demonstrates the behaviour of an intrepreneurial knowledge worker, Professor Prof. John Hutton, of the Wellington School of Medicine, who joined forces with an entrepreneurial private company of software application developers, Terranova Pacific Services Ltd. Together they championed the idea to the point of successful innovation.

The survey questionnaire highlighted a paucity of health service management R&D being conducted plus identified perceived barriers to innovation and imitation. More importantly, it identified a serious shortage of employees among the responding organisations who had the expertise to conduct such R&D i.e., post-graduate qualifications in health service management. This input deficiency must affect R&D outputs and should be further researched.

Acknowledgements.

In undertaking this research, I have benefited greatly from the advice and support of various individuals. I would especially like to thank the following people: my research supervisor, Ms Nicola North, Senior Lecturer, Department of Management Systems, Massey University; my research advisor, Professor Tony Vitalis, Head of Department, Management Systems, Massey University; Professor Prof. John Hutton, Wellington School of Medicine, Otago University; the Directors of Terranova Pacific Services Ltd., Mr John Stroh, Mr Tim Boyer, and Mr Phil Thompson; the staff of Wellington Area Health Board; the many Librarians who have helped; and the funders who gave me much welcomed financial support, namely Glaxo New Zealand Ltd., Palmerston North for awarding me their Glaxo Scholarship for Research (in health management), the New Zealand Nurses Organisation, and Massey University.

Table of Contents.

Pages.

Pages

Tables.

Figures.

Introduction.

In the current climate of economic restraint, the need to innovate is becoming increasingly important in the New Zealand health industry as demand for health services is rapidly outstripping the Government's ability to meet supply. Innovation is preceded by research and experimental development (R&D). The overall purpose of this research was to establish the capability and extent of R&D in health service management within New Zealand acute health care enterprises during the fiscal year immediately prior to the current set of health reforms becoming operational and once identified, to then conduct case study research to describe the parameters of health service management R&D in practice. This thesis focused on R&D as an indicator of innovativeness within the New Zealand health industry, innovation being a prerequisite for competitive advantage and business success/survival.

This Chapter presents the aims and rationale for the study, outlines recent policy changes underpinning health sector reforms, establishes that these reforms are intended to foster innovativeness, and goes on to review the literature that argues the relationship between innovativeness and business services.

Aims of the Study.

The research aimed to answer the following three questions:

1. What was the capability and extent of R&D in health service management within New Zealand acute health care enterprises during the fiscal year 1 July 1992 to 1 July 1993?

2. How and why did R&D occur in acute health care enterprises during the fiscal year 1992/93?

3. What were the attitudes of health service managers towards R&D in health service management?

A survey was conducted of all New Zealand acute health care enterprises to answer the first and third questions and case study research was carried out to provide insights to the second question. Both methodologies were employed in order to examine the subject from the widest possible angle within the time frame permitted for the research.

Rationale for the study.

This research set out to document the level of R&D that occurred in the transition period immediately prior to the health reforms becoming fully operational. The argument for researching this period was based on the following assumptions. Clearly the external influences to respond to change were present. Logically, those influences should have generated some internal organisational response. The message from Government was explicit. Even though both the public and private sectors had two fiscal periods in which to prepare themselves for the new commercially competitive environment, by the time the announcement was made on 30 July 1991, public sector annual business plans for the fiscal year 1991/92 were formalised and both capital and service expenditure would have been committed. This factor would have affected the freedom of managers in public health care enterprises to be able to channel extra non-committed funds into new R&D projects during the 1991/92 fiscal year. They would have had to delay any such R&D plans until the following 1992/93 fiscal year. Astute health service managers, be they public or private sector, could reasonably be expected to have begun gearing up their organisations to function effectively within the approaching competitive environment. Clearly those smaller Area Health Boards, which could safely predict they would remain largely unchanged, had a competitive advantage over the larger Area Health Boards which would have recognised, quite correctly, that they were to be split up into smaller business units and would suffer more disruption. As for the health service managers in the private sector, who would probably have had more financial flexibility, one would expect that the astute amongst them would have concentrated more clearly on identifying what advantages the reformed health service might have to offer them and what changes they would need to make within their organisations in order to improve their competitive advantage. Such changes may well have generated the recognition for health service management R&D.

Health Sector Reform in New Zealand.

The public sector of the New Zealand health industry has been undergoing reform for at least the last decade. During that decade there have been a series of ministerial reviews and subsequent reports which have criticised the public sector as being inefficient, ineffective and uneconomic (Scott, Marwick & Fougere, 1986; Arthur Anderson & Co., 1987; Gibbs, Fraser & Scott, 1988; Audit Office, 1989).

In its first term of office, the National Government elected in 1990 immediately set up a ministerial Taskforce to firstly analyse all the above New Zealand reports plus review the research already done on health sector problems. Then, having taken into consideration current overseas solutions, its task was to advise the Government on a preferred New Zealand solution which would provide access to an acceptable level of health to all New Zealanders. The Taskforce reported directly to the Government and on 30 July 1991, budget night, the Government announced its plans to radically reform New Zealand's existing public health services. It proposed that from 1 July 1993 the health industry would be remodelled along lines of managed competition, arguing that New Zealand was well behind the rest of the world in providing innovative health care services such as the increased use of day surgery and outpatient/ community services. It saw these innovations as providing solutions which would reduce both our excessive length of inpatient stay and reduce our high numbers of hospital beds per population. Such changes, it argued, would help to correct New Zealand's excessively high levels of expenditure on hospital based services and in doing so, would provide a much desired, more flexible system, for users, providers and funders.

The stated aims of the reforms were to:

- improve access for all New Zealanders to a health care system that is effective, fair and affordable;
- encourage efficiency, flexibility and innovation in the delivery of health care to the community;
- reduce waiting times for hospital operations;
- widen the choice of hospitals and health services for consumers;

- enhance the working environment for health professionals;

- recognise the importance of the public health effort in preventing illness and injury and in promoting health;

- increase the sensitivity of the health care system to the changing needs of people in our society.

(Minister of Health, 1991, p.3).

Within weeks the Government appointed the National Interim Provider Board (NIPB) to "recommend, within that framework, structures for future public provision of health services" (NIPB, 1992, p.9). The NIPB reported in May 1992, publishing it's recommendations in the document "*Providing Better Health Care for New Zealanders*".

The accepted view of the policy makers at the time, which was articulated by Sir Ronald Trotter, Chairman of the NIPB, was that competition was "the only way of ensuring, on a continuing basis, constant innovation and best value at optimum quality for every health dollar" (NIPB, 1992, p.8).

The NIPB recommended that public health care enterprises be remodelled on the profit-making business model as opposed to the non-profit model arguing that this model was "more likely to provide the incentives, initiative and innovation to overcome the inefficiencies entrenched in the present system" (NIPB, 1992, p.11). In doing so, they recommended the following eight key principles for the proposed Crown health enterprises (CHE's):

1. Clear commercial objectives;

2. High-quality directors who are replaced if they do not perform;

3. Performance objectives set by shareholding Ministers;

4. An arm's-length relationship between the Government and operational management;

5. Transparent subsidy where the Government wants to provide extra assistance to buy services which would not otherwise be commercial;

6. A competitively neutral environment in which public hospitals have neither advantage nor disadvantage over alternative providers, and win their contracts through efficient delivery of quality services;

7. Managers with the autonomy to make effective use of resources; and

8. Mechanisms to hold them strictly accountable for their performance in meeting Ministers' objectives.

(NIPB, 1992, p.11).

In future, providers, i.e. all health care enterprises, be they public or private organisations, would be subjected to the forces of competition, which in turn, would promote efficiency, effectiveness and ultimately value for money. Health service providers would compete for government funding which would be allocated by government owned regional health authorities (RHA's) who in turn would have capped budgets.

Although the Government was keen to imitate the private sector model, which it saw as preferable, it stopped short of relinquishing its position as the dominant funder of health services opting instead to follow the managed competition model (Minister of Health, 1991). By doing so, it retained its monopsony bargaining advantage which is now favoured by health care policy makers, planners and economists in the western world as being a significant factor in controlling escalating health care expenditure (Bowie, 1992; Evans, 1984).

The objectives for the new Crown health enterprises, as stated in the *Health and Disabilities Services Act 1993*, are as follows:

(1) The principal objective of every Crown health enterprise shall be to -
(a) Provide health services or disability services, or both; and
(b) Assist in meeting the Crown's objectives under section 8 of this act by providing such services in accordance with its statement of intent and any purchase agreement entered into by it- while operating as a successful and efficient business.

(2) Without limiting subsection (1) of this section, every Crown health enterprise shall have the following objectives:
(a) to exhibit a sense of social responsibility by having regard to the interests of the community in which it operates:
(b) To uphold the ethical standards generally expected of providers of health services or disability services, or both, as the case may be:
(c) To be a good employer:
(d) To be as successful and efficient as comparable businesses that are not owned by the Crown.

These objectives are an almost exact duplicate of the objectives laid out in law for New Zealand State Owned Enterprises, with the exception being that the term "profitable" is used in the *State Owned Enterprises Act 1986* as opposed to the term "successful" in the *Health & Disability Services Act 1993*. In the case of the Crown health enterprises, the term "profitable" was initially proposed in the *Health and Disabilities Services Bill* but was eventually deleted as the term became politically contentious. It has not gone unnoticed however that a successful and efficient business must also, be by definition, a profitable business (Bowie, 1993).

While many New Zealand State-owned Enterprises have, since 1986, notched up considerable achievements in successfully operating as profitable and efficient businesses, some have also been criticised for their inability to exhibit a sense of social responsibility in the process (Mascarenhas, 1991). In fact, it has been questioned whether profit objectives are in fact truly compatible with social responsibility objectives (Boston, et, al., 1991). In practice, profit objectives have tended to dominate decision making. NZ Post, Housing NZ and Electricity Corporation of NZ (ECNZ) have all incurred the wrath of some New Zealanders for decisions where management have chosen to place profits before people.

There have also been problems of ministerial arms interfering in operational matters which have caused concern for some Chief Executives and others (Boston, et. al, 1991). Such situations, when they occur, simply create further support for the Treasury argument of privatisation following corporatisation. The NIPB have acknowledged the existence of this problem in their recommendations and time will tell as to whether their recommendations can be adhered to without forfeiting Crown ownership.

Crown health enterprises, rightly or wrongly, are now legally required to operate as successful and efficient as comparable businesses that are not owned by the Crown. The issue of comparability raises questions about comparable with what. If comparing by bed state, which for obvious reasons is not preferred, then the largest comparable non-Crown-owned health care enterprise in New Zealand is Mercy Hospital, Auckland, with approximately 168 beds followed by the next largest which is St George's Hospital, Christchurch, with approximately 91 beds. The largest CHE is Auckland Health Care with 1800 beds and the smallest Crown-owned health care enterprise is Wairarapa Health with 181 beds. They are not therefore comparable by size, nor are they comparable by demographics, inputs or outputs and neither are they comparable using international comparisons as the latter are widely acknowledged as being fraught with complicating factors.

Irrespective of whether health care enterprises are modelled on profit or non-profit lines, it is an indisputable fact that they still need to operate profitably. No business can be successful and survive in the long run, if it operates at a financial loss.

In summary, the Government believes that the managed competitive private sector model is more desirable than the pre-reform public sector model and has sought to reposition its public health care enterprises closer towards the free market end of the market continuum. Commercial success in the private sector is achieved by competitive advantage which results in the main from innovation derived from R&D. The health reforms have been designed with the view of promoting more innovation in the health industry. Innovation, when considered in the context of a service industry such as health, arises from health service management R&D, the term 'health service management R&D' being used in the widest sense of the word. Health service management R&D encompasses all R&D which improves the efficiency and effectiveness of health service delivery. In New Zealand, health service management R&D is classified by legislation as a sub-category of public health research, however it also encompasses aspects of biomedical research e.g. new techniques which shorten inpatient stay. Traditionally, biomedical research has taken priority over funding of health service management research. However if the Government is serious about increasing innovation in health service delivery then it must redress this imbalance. In doing so it must also develop some understanding of what influences the rate of innovation and then commit resources to ensure that such R&D occurs. All of the above arguments will be developed further in the following chapters.

Business Success and Innovation.

The New Zealand health industry, like its counterparts in the Western world, is undoubtedly in the midst of resource-lean times and therefore it is now vitally important that innovative solutions to the health industry's problems are found. Kanter (1983, p.21) has noted that in resource-lean times, "the domain for innovation simply shifts to managerial procedures and organizational practice" whereas in resource-rich environments, "emphasis is likely to be placed on potential breakthroughs in technology and extensive research and development activities because the company can afford them".

The product in the health care industry is service. Advances in knowledge and technology aid in the delivery of that service - they do not themselves provide that service. The provision of an efficient, effective health service is clearly linked to efficient, effective health service management and therefore health service management is a valid focus for R&D with the aim of improving health service delivery. Poor quality management in a service industry will result in poor quality outputs and outcomes, irrespective of the inputs that exist to facilitate that service.

The Government, acting on behalf of New Zealanders, requires best value for money and has clearly said it will strive to achieve this goal, in fact it has gone so far as to threaten that persistently poor-performing organisations may not secure further contracts for service. Health service managers will thus need to maintain their competitive advantage by imitating their innovative, successful private sector counterparts if they are to remain competitive. This need to imitate the competitive market model is the central thesis of this study.

Business survival in a competitive marketplace is dependent on maintaining competitive advantage (see Figure 1). According to Porter (1990) competitive advantage is necessary for economic and social well-being and is created through invention and innovation, both of which are derived in the main, from investment in R&D in science and technology. The process of competitive advantage begins when a creative person conceives an innovative idea which is then usually subjected to a formal process of research and experimental development which then results hopefully in an operational innovation. The operational innovation, if successful, then leads to competitive advantage, business success and survival.

In private industry the competitive model is based on the innovative process which is as follows;

It starts with	**A CREATIVE NEW IDEA**	i.e. an invention
usually in response to a need or a problem	⇩	
which is then usually subjected to	**RESEARCH**	
which may be formal or informal,		
to acquire new knowledge to perfect the invention	⇩	
which is then subjected to	**EXPERIMENTAL DEVELOPMENT**	i.e. systematic work either to develop a new, or to substantially improve an existing, product, process, system, or service.
	⇩	
the end result of R&D hopefully, leads to	**INNOVATION**	
	⇩	
which leads to	**COMPETITIVE ADVANTAGE**	
	⇩	
and	**BUSINESS SUCCESS/SURVIVAL**	

Figure 1. The Competitive Model.

The organisation may then commercialise the innovation and over time, there will therefore be diffusion of the innovation throughout the marketplace as competitors and other industries adopt or adapt the innovation to suit their needs. There may also be further refinement of the innovation or reinvention by either the originator of the idea, their competitors, or others. This process occurs through further R&D and so the cycle of invention leading to innovations, leading to competitive advantage and subsequent commercial/ economic progress, continues. Exploring the extent of R&D therefore is useful in that it provides an indicator of innovation.

Figure 1 incorporates the Organisation for Economic Co-operation and Development (OECD) framework as outlined in *The measurement of scientific and technological activities: Proposed standard practice for surveys of research and development "Frascati Manual" 1980,* which was published in 1981. This document formed the basis for the development and design of the questionnaire used in this research. New Zealand became a signatory to the OECD in 1973 and in doing so, adopted as its standard, the OECD definitions for R&D. In 1974 the OECD expanded their R&D definition to include both the Social Sciences and Humanities, building on their previous definition which only covered the Natural Sciences and Engineering (OECD, 1981). The following are the OECD definitions of research and development (R&D):

> **Research and experimental development (R&D)** comprise creative work undertaken on a systematic basis to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications. R&D covers three activities: basic research, applied research and experimental development.
>
> 1. **Basic Research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.
> 2. **Applied research** is also original investigation undertaken to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.
> 3. **Experimental Development** is systematic work, drawing on existing knowledge gained from research and practical experience that is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed.
>
> (OECD, 1981, p.25).

Structure of Thesis.

Research and development occurs in context. The above introductory section has outlined the recent health reforms in New Zealand and discussed the relationship of innovation to business success. It has argued that in the reformed climate, New Zealand health service managers now need to maintain their competitive advantage by imitating their successful private sector counterparts. Given that such competitive advantage is achieved in the main from successful R&D, and given that the health industry is clearly a service industry, then it follows that R&D needs to be focused on service delivery, and more specifically on health service management R&D as the outputs and outcomes of health service delivery are both driven and dependent on, the quality of health service management.

This argument will be developed further using the following sequence. Chapter 1 will set the scene providing a brief overview of the theoretical framework that includes both market and diffusion theories which together underpin this thesis. Thereafter the relationship of invention to innovation will be discussed and further definitions added, followed by an exploration of the role of creativity in innovation. A discussion of the environmental forces which effect organisations will then be followed by consideration of resistance to health service management innovations. The section concludes with a discussion of innovation in public service industries.

Chapter 2 discusses the approaches, perspectives and usage's of R&D. Health service management is defined and the difference between appropriable and non-appropriable research clarified. R&D in general as it occurs within New Zealand is then discussed followed by more specific discussion of health service management R&D and discussion of the legal perspective regarding intellectual property rights. Finally an outline of the extent and nature of health service management in the anglophile world is presented. Chapter 2 concludes with a summary section which draws together the issues as presented up to this point and sets the direction for which the rest of the thesis will follow.

Chapter 3 describes this study, the research design, the methodology and the approach used for the case study research. This chapter concludes with a discussion of the ethical issues and a description of the research process and problems experienced.

The results of the survey questionnaire are presented in Chapter 4. This is followed by reporting on the case study in Chapter 5 which illustrates health service management R&D in practice.

Finally, Chapter 6 presents the conclusions and recommendations for both the health industry and for further research.