

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

**Developing a Framework for Marketing
the Services of an Industrial Scientific
Professional Organisation. An Examination
of the Market Leader**

**A Thesis presented in partial fulfilment
of the requirements for the degree of
Masters of Business Studies
in Marketing
at Massey University**

Michael John Sherrard

1994

507,209930688

Wat

DC20

Abstract

The aim of the thesis was to develop a framework to assist in the marketing planning of scientific and industrial professional organisations. The government policy to restructure the Department of Scientific and Industrial Research (DSIR) into Crown Research Institutes (CRIs) provided the impetus for this research. For the purposes of this study two samples were drawn from the scientific and industrial research industry. Employees from all levels and disciplines within the DSIR (n=19) were interviewed, followed by clients of the industry (n=26). The interviews aimed to gain respondents opinions and perceptions of the profession, marketing, the DSIR, and the changing environment. Therefore, a qualitative semi-structure interview format was deemed appropriate. The findings of this study revealed that clients in the industry were dedicated to the advancement of scientific and industrial knowledge for business in New Zealand. However, the respondents perceived that it is the role of the government to fund pure research, and assist in the funding of commercial result oriented research. Resulting from the government policy, it is now imperative for the DSIR to seek commercial funding. This government policy inhibits the development of long-term relationships between the DSIR and industry. Thus, gaining greater revenue from industry is problematic for the DSIR. This study also revealed that both the DSIR employees and industry clients were optimistic about the impending changes to the business environment. This optimism was however, contingent on the change to CRIs to be the last major change resulting from government policy. Although the respondents were optimistic it was implicit from the interviews that they were unsure of appropriate business planning and strategies in the changing environment. These findings suggest the need for marketing strategies to include education and communication elements internally to the professional organisation and subsequently externally to clients within the industry. The major outcome of the study has been the development of a framework to assist this market planning.

Acknowledgements

I would like to acknowledge the assistance of the following people for their contribution in making this study possible:

My supervisor, Associate Professor Norman Marr, for his guidance, patience and willingness to offer invaluable advice and support.

I would like to thank Mr Kevin Duckworth, for the opportunity and assistance to investigate a diverse and very complex industry.

All the Scientific and Industrial researchers and their clients, who gave their invaluable time to participate in my study, and especially to those respondents that added comments of encouragement.

My colleague and friend, Eric, for his help in clarifying my results and offering suggestions in the final stages of the study.

On a more personal note, I would like to thank my partner Cate, and my parents Isabelle and Evan , who instilled me with confidence, enthusiasm, and support to complete this project.

Table of Contents

Abstract	i
Acknowledgements	ii
Table of Contents	iii
	Page
1 Introduction	
1.1 Background	1
1.2 Thesis Objectives	3
1.3 Background to the Extant Literature	4
1.4 Background to the Research	5
1.5 Chapter Development	5
2 Extant Literature Review	
2.1 Introduction	7
2.2 Services Marketing Literature	8
2.2.1 The European Scholars	10
2.2.2 The Marketing Function	11
2.2.3 The Misuse of Marketing Departments	12
2.2.4 Homogeneity of Service Organisations	15
2.2.5 Service Encounter	16
2.2.6 Components of a Service	17
2.2.7 Summary	17
2.3 Professional Services Literature	18
2.3.1 General and Descriptive Research Focus	20
2.3.2 Product Based Strategic Orientation	21
2.3.3 Organisational Dilemma	21
2.3.4 Summary	23
2.4 Marketing Audits Literature	24
2.4.1 Definitions of Marketing Audits	25
2.4.2 Strategic Value of Marketing Audits	25

2.4.3	Components of a Marketing Audit	26
2.4.4	Methods of Measurement in Marketing Audits	26
2.4.5	Service Marketing Audit	27
2.4.6	Marketing Audits and Service Quality	28
2.4.7	Summary	29
2.5	Internal Marketing, Organisation Climate and Culture Literature	29
2.5.1	The Development of Internal Marketing as a Marketing Entity	29
2.5.2	The Internal and External Customers	31
2.5.3	Customer Relations	32
2.5.4	Importance of Promises	33
2.5.5	The Process and Implementation of Internal Marketing	34
2.5.6	Internal Marketing, Organisational Culture and Change	37
2.5.7	Organisation Cultural Consistency	37
2.5.8	Summary	39
2.6	Industrial Scientific Profession and DSIR Specific Literature	40
2.6.1	Summary	43
2.7	Present Study	43

3 Research Design

3.1	Introduction	45
3.2	Research Methodology	45
3.2.1	Procedure	45
3.2.2	Sample Selection	48
3.2.3	Research Instrument	51
3.2.4	Method of Analysis	55

4 Research Findings - Internal Interview Results and Discussion

4.1	Introduction	57
4.2	Employee Beliefs Regarding the Role of the DSIR and its Scientists	57
4.2.1	Introduction	57
4.2.2	Colleague Hesitancy towards a Greater Level of Commercial Work	58
4.2.3	Productivity of the DSIR Resources	60
4.3	Employees' Attitudes of the Impending Change to Commercial Crown Research Institutes (CRIs)	62
4.3.1	Introduction	62
4.3.2	Effects of the Upcoming Change on Respondents' Sections	62
4.3.3	Importance for Respondents' Section to Undertake More Commercial Work	64
4.3.4	Factors Constituting an <i>Ideal</i> Operating Environment for the DSIR	67
4.4	Marketing, Planning, and Change in the Industrial Scientific Profession	68
4.4.1	Introduction	68
4.4.2	CRIs Sustaining Long Term Relationships with Large Clients	69
4.4.3	Appropriateness of Marketing Assistance for the DSIR	71
4.5	Chapter Summary	74

5 Research Findings - External Interviews Results and Discussion

5.1	Introduction	77
5.2	Dedication to Scientific and/or Industrial Research	79
5.2.1	Introduction	79

5.2.2	Research and Development Budget Allocation	80
5.2.3	Importance of Professional R&D Advice	81
5.3	Scientific and Industrial Research Buyer Behaviour	82
5.3.1	Introduction	82
5.3.2	Information Sources	83
5.3.3	Scientific Professional Organisation Choice	83
5.3.4	Comparison of Scientific Professional Organisations Based on Techniques	84
5.4	Awareness of Structural Changes to the DSIR and the Market Environment	84
5.4.1	Introduction	84
5.4.2	Knowledge of Changes	85
5.4.3	Level of Optimism for the Change to CRIs	86
5.5	Image of DSIR an <i>New</i> IRL	88
5.5.1	Introduction	88
5.5.2	Image of the DSIR	88
5.5.3	Market Expectations of IRL	93
5.5.4	Factors Constituting an <i>Ideal</i> DSIR	94
5.6	Market Requirements of Scientific and Industrial Research	95
5.6.1	Introduction	95
5.6.2	Services Demanded by the Market	95
5.6.3	Technology Transfer	100
5.6.4	Foundation for Science and Research Funding	100
5.7	The Market's Perception of the "Client- Company" Relationship with the DSIR	101
5.7.1	Introduction	101
5.7.2	Level of Business Relationship	101
5.7.3	Opportunity for the Development of a Long Term Business Relationship	103

5.7.4	Perceived Expense of Commissioning the DSIR	104
5.7.5	The Level of Personal Contact Between the DSIR and the Market	106
5.8	Chapter Summary	107

6 Conclusions

6.1	Introduction	110
6.2	Limitations of Study	110
6.3	To Investigate Factors that Both Enhance and Inhibit the Transition from a Public Organisation into a Private Enterprise	110
6.4	Determine the Key Factors to Success of the Professional Service	112
6.5	Develop a Framework that will Aid in the Strategic Decision Making Process of Industrial Scientific Professionals	113
6.7	Suggestions for Future Research	115

References	117
-------------------	-----

Appendices	129
-------------------	-----

List of Tables

3		
	3.1	Internal Respondents by Position 49

List of Figures

2		
	2.1	Flow of Literature Review 8
	2.2	Level of Government Funding for R&D as a Percentage of Total Revenue 40
	2.3	R&D Expenditure as a Percentage of GDP (1991) 41
3		
	3.1	Steps in the Research Process 46
4		
	4.1	Respondents' Perception of Colleagues Hesitancy to Undertake More Commercial Work 58
	4.2	Respondents' Beliefs of whether the Resources of the DSIR are used Productively 61
	4.3	Respondents' Agreement that the DSIR should be doing more Commercial Projects 64
	4.4	Respondents' Agreement to the DSIR becoming the 'R&D Arm' of Large Organisations 69
	4.5	Respondents' Opinions as to whether Marketers can assist the DSIR in the Future 72
5		
	5.1	Position of Respondents 78

5.2	Total New Zealand and Overseas Respondent Companies with In-House Research Sections	78
5.3	Respondents' Allocation of Research Budgets and whether they have In-House Research Facilities	80
5.4	Level of Importance Indicated for Gaining Outside Specialised Advice on Scientific and Industrial Matters	82
5.5	Sources of Informational Referral by Respondents when deciding on a Scientific and Industrial Organisation	83
5.6	Level of Respondents' Own Perceived Awareness of DSIR Restructuring	86
5.7	Level of Agreement that the Changes to the DSIR will be Positive	87
5.8	Image of the DSIR by Respondents	89
5.9	Level of Agreement by Respondents that the DSIR is a "State of the Art" Research House	91
5.10	Level of Agreement by Respondents that the DSIR can Change	94
5.11	The Services that Respondents Indicated as Applicable to their Organisation - Part A	96
5.12	The Services that Respondents Indicated as Applicable to their Organisation - Part B	96
5.13	Respondents' Perception of the Style of Business Relationship they have with the DSIR	102
5.14	Level of Agreement by the Respondents that the DSIR Represents Value for Money	105
6		
6.1	A Framework of Key Managerial Considerations for Marketing the Services of an Industrial Scientific Professional Organisation	114

Chapter One

Introduction

1.1 Background

The last eight years have brought some substantial changes in the New Zealand economy. Private industries from telecommunications to transportation have been deregulated, the country has been opened to foreign investment, and government support has either been reduced or discontinued completely to some business sectors.

A resultant area of bold restructuring that has occurred from the economic shift, is that over this time successive New Zealand governments have undertaken an agenda of transforming a number of government departments into competitive, state-owned-enterprises.

There is less than ever before clear boundaries between government agencies and private enterprise. Organisations and their clients are hurriedly attempting to learn how to do business in this new environment where it is increasingly difficult to determine what is now a public good and what is a private good.

These changes have unsettled private and public organisations, but more importantly, the changes have left both types of organisations open to competition. This has required re-assessment of how business plans and operates, and how to establish a basis on which to compete.

Professional Services are a section of business that have been greatly impacted by the changes in the economy. Service Professionals try to identify what may *now* be their key factors to success while they continue to struggle to adapt and implement product marketing models and techniques to their unique business environment.

Industrial Research Limited Historical Background

One research service profession that has been directly affected is the small and specialised industrial scientific profession. One of the latest government departments to be considered for restructuring into a commercial, state-owned-enterprise is the

Department of Scientific and Industrial Research (DSIR). The DSIR is being reformed into ten Crown Research Institutes (CRIs). This quasi-privatisation of the DSIR is causing professionals and their clients within the industry to review their business planning and basis for competition.

The DSIR, was the largest industrial scientific organisation in New Zealand. Since its inception in 1926, the DSIR's role has been to assist New Zealand's development through better understanding and management of resources and application of science and technology to expand and improve industry. This includes pure research work that has no specific end client. Each of its ten divisions is expected to contribute to this aim both through work for the crown and industry. This aim is embodied in the DSIR's mission statement:

"Making Science Work for New Zealand"

(DSIR Industrial Development Divisional Statement of Intent 1990/1991, 1990)

The DSIR employs about 2500 people, and provides scientific Research and Development (R&D) and consultancy services to industry and government bodies. It generates over \$200million of science a year, which corresponds to about 70% of New Zealand's investment in R&D.

In 1987 the DSIR was "commercialised" by the Labour Government, as part of its public sector reform. The public sector reforms were designed to liberate the government of all but essential public sector assets. Then in July 1990 the organisation was restructured again, creating ten "megadivisions" that were characterised by a more horizontal management structure than was previously in place. This reinforced the "User-Pays" system which was implemented in 1985 and introduced commercially-oriented management objectives (such as a comprehensive system of financial controls). The aim of these policies was to make the DSIR divisions more responsive to the needs of New Zealand industry, less dependant on crown funding, and accountable for its activities.

Commercial revenue has been the fastest growing segment of the organisation's business. For example, in 1989-90, the former DSIR earned \$50million from contract work. However, today most of the organisation's funds are still allocated on a contestable basis (on behalf of the crown), by the Foundation for Research, Science, and Technology (FORST).

One of the ten CRIs, Industrial Research Limited (IRL), is expected to continue the tradition of the Department of Industrial Research, as a major influence in the industrial scientific marketplace. Section 3.2.2 provides detailed information on the selection of the Department of Industrial Development for this study.

Recognition of the potential for competitive planning in the industrial scientific profession offered by an effective study of the new market environment and a lack of marketing models to aid in the planning process has stimulated this study of a professional service in New Zealand. Objectives have been developed for the study as outlined in sections 1.2 to 1.4. Section 1.2 presents the overall thesis objectives, section 1.3 the objectives of the extant of literature, and section 1.4, the research objectives.

1.2 Thesis Objectives

Using the work published by recent service marketing authors as a foundation, the research objectives of this thesis are outlined below:

- To investigate factors that both enhance and inhibit the transition from a public organisation into a private enterprise
- Determine the Key Factors to Success of the Professional Service.
- Develop a framework that will aid in the strategic decision making process of industrial scientific professionals.

The research outlined in Chapter One is designed to achieve the above overall research objectives through the following four stage process: a review of the extant relevant literature was undertaken followed by in-depth interviews within the case study organisation and with their clients. Finally, an analysis of the interview transcripts and questionnaire data was undertaken.

1.3 Background to the Extant Literature

The key authors whose work is drawn upon in this study are Christian Gronroos and Evert Gummesson (both from the Nordic School of Management), Christopher Lovelock, Benjamin Schneider, Neil Morgan, Nigel Piercy, and William George. These authors, while not specifically researching the topic area of the present study, have made significant contributions to developing models and philosophies primarily concerned with the management and marketing of service organisations, especially professional and industrial services.

The majority of discussions divided into five main areas:

- Service Marketing Literature.
- Professional Service Marketing.
- Marketing Audit Literature.
- Internal Marketing, Organisational Culture and Climate Literature.
- Industrial Scientific Professional and Department of Scientific and Industrial Research (DSIR) Literature.

The first section briefly reviews the broader area of marketing strategies, plans, models, definitions, and thought developed for service organisations. The next section deals more specifically with the unique marketing needs of the sub-section of services: professional services. Following is the section concerning the method of investigation involved in this services marketing study, marketing audits literature. The extant literature on internal marketing, organisational culture and climate is also important to review, as the scope of the present study includes investigating within the chosen service industry market leader. Lastly, the literature on the privatising of public departments is reviewed, with literature pertaining specifically to the history and changes of the DSIR.

The objectives of the review of the extant literature relating to professional service organisations are to:

- Present the current knowledge and development in each of the key areas of concern in professional service marketing.
- Present the findings of the current research in professional service marketing.
- Identify and compare any similarities and differences in the literature.

1.4 Background to the Research

Using the foundation provided by the extant literature, a primary research study was designed to investigate the marketing management of the Industrial Scientific Profession. In-depth interviews were carried out with employees of the case study organisation. The preliminary results gained from these interviews aided the development of a second round of in-depth interviews with past, present, and potential clients of the case study organisation. The information sought intended to fulfil the following objectives:

- Determine market and employee perceptions and opinions of the Industrial Scientific Profession.
- Determine market and employee perceptions of the *old* DSIR and the *new* IRL.
- Identify DSIR employees' attitudes' and perceptions' to marketing.

1.5 Chapter Development

The conceptual discussion and primary research presented in this thesis consists of six chapters. Chapters Two and Three present the conceptual basis of the research. Chapter Two presents the extant literature on five areas of research that cumulatively develop a basis for the present study. Chapter Three presents the research design for the present study, investigating the DSIR and clients of the industrial scientific profession, and addressing the overall thesis objectives by focusing on the specific objectives of the research.

Chapters Four and Five present the research findings. Chapter Four presents results from discussions with DSIR employees. Chapter Five complements the internal DSIR findings with a presentation of the opinions and perceptions of clients in the industrial scientific market.

Chapter Six concludes the study with a summary of how the research results address the overall thesis objectives. The limitations of the study are recognised and suggestions for further research proposed.

Chapter Two

Extant Literature Review

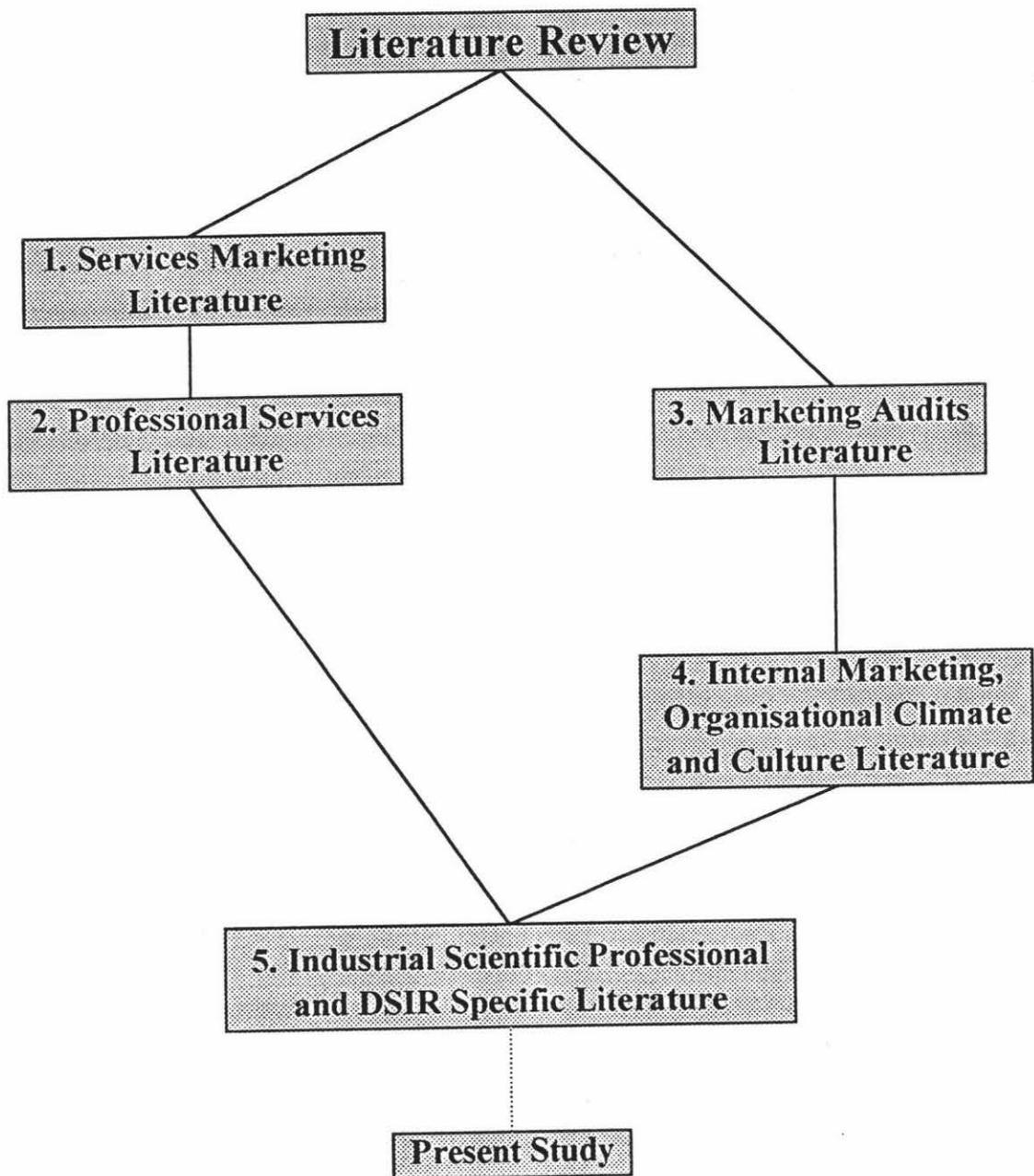
2.1 Introduction

The objectives of the review of the extant literature are to:

- Present the current knowledge and development in each of the key areas of concern in professional service marketing.
- Present the findings of the current research in professional services marketing .
- Identify and compare any similarities and differences in the literature

The review of extant literature for this study is broadly discussed in five sections. The first section reviews the broader area of marketing strategies, plans, models, definitions, and thought developed for service organisations. The next section deals more specifically with the unique marketing needs of the sub-section of services: professional services. Following is the section concerning the method of investigation involved in this services marketing study, marketing audits literature. The extant literature on internal marketing, organisational culture and climate is also important to review, as the scope of the present study includes investigating within the chosen service industry market leader. Lastly, the literature on the privatising of public departments is reviewed, with literature pertaining specifically to the history and changes of the DSIR. Figure 2.1 illustrates the progression of the five sections of literature review.

Figure 2.1. Flow of Literature Review



2.2 Services Marketing Literature

In the late 1970's marketing thinking and practice was moving into the service industries, albeit to a limited extent. It was then that the basis for today's models of marketing in the service sector were formed. Therefore, it is appropriate to begin with a review of the very early theorists in services marketing.

There has been a long debate between academics and practitioners as to the differences

between goods and services. In 1969 Johnson asked whether goods are different than services, initiating the goods versus services debate. Johnson's (1969) dissertation was prompted by three descriptive *Journal of Marketing* articles during the 1960's (Regan, 1963; Judd, 1964; Rathmell, 1966) that are credited with beginning the "service revolution".

Following the intense interest in buyer behaviour during the 1960's, Blois (1974) proposed a model of services marketing based on theory in buyer behaviour. He also commented on the infrequent literature on services.

The debate on whether service marketing differs from product marketing was at its height during the 1970's. The discussion on this topic was regarded as predominantly one-sided, as the new services marketing academics had to defend the legitimacy of their research (Swartz, Bowen & Brown, 1992; Fisk, Brown & Bitner, 1993).

An influential article by Lynn Shostack, in 1977, has been deemed by subsequent scholars, as having altered the course of thinking about services marketing. The article made a series of thought provoking assertions including, "could marketing itself be myopic in having failed to create relevant paradigms for the service sector?". She further commented that "service industries have been slow to integrate marketing into the mainstream of decision making and control because marketing offers no guidance, terminology, or practical rules that are clearly relevant to services" (cited in Fisk et al., 1993, p69).

Research into service, up to and including 1980, identified that a service offering is immaterial and physically intangible (Rathmell, 1974; Kotler & Connor, 1977; Gronroos, 1980). The client cannot see, feel or taste a service and, therefore, he or she will have substantial evaluation problems of the service offering. As the client is not able to evaluate the abstract service they will look for tangible clues in the service offering which can be used as a basis for an evaluation of the service (Gummesson, 1979; Lovelock, Langeard, Bateson & Eigler, 1981). Furthermore, services are often consumed as they are produced. This characteristic creates the emergence of a buyer/producer interaction (Smith & Turnbull, 1990). The service producing firm and its representatives approach the clients.

Finally, services are activities, not things, although physical goods or things may be needed either to support or facilitate the service consumption (Rathmell, 1974). This means that a service is produced in a process which simultaneously *is* the service. The output of the production process, of the service, cannot be separated - more than to a

limited extent - from the process itself. This process takes place in the presence of the consumer and with the consumer's co-operation (George, 1977; Gronroos, 1982; Johnston, 1993).

Since the acceptance of fundamental differences between service marketing and product marketing, one direction of research has been to study the service component that is in all product offerings. This area of investigation is developing to demonstrate the legitimacy and importance of service in gaining customer satisfaction. Quinn, Dorley and Paquette (1991) concluded from their recent study that manufacturers are now able to develop only a limited competitive advantage in terms of the products they offer. The extent to which price and product range are important to gain customer orders is decreasing. The result has been for manufacturers to give more attention to service, including the handling of customer enquiries before, during and after a purchase, and how a product is provided, for the gaining of a competitive advantage.

2.2.1 The European Scholars

Shostack's (1977) contention for the development of new thoughts on services marketing appeared to be influential throughout the world. This is evidenced by the emergence of ideas in the late 1970's, and into the 1980's in Europe, especially Scandinavia. The Scandinavian academics have been termed the "Nordic School of Thought" (Gronroos, 1989; Gronroos, 1991). The Nordic School ideas, derived primarily from two leaders, Evert Gummesson and Christian Gronroos, have had a significant reciprocal impact on the development of ideas in America (Fisk et al., 1993). The research is characterised by a move away from the structure of marketing determined by the 4P's of the marketing mix (consisting of Price, Promotion, Product and Place).

It can be observed how the research approach of the Nordic School has shaped the rapid progression of innovative and revolutionary ideas surrounding services marketing, services quality, internal marketing, and service management, since their inauguration around the late 1970's.

In contrast to the American Network of researchers, the Nordic School of Services, focused upon the development of genuine service-oriented knowledge, adopting a marketing as opposed to an operation's or production perspective. The production orientation of the USA researchers was a concern expressed by Wyckham, Fitzroy and Mandry in their critical review of services marketing in 1975.

In contrast to the traditional, predominantly quantitative statistical survey techniques, the methodology adopted by the Nordic School was also unique. Close relationships between practitioners and academics enabled numerous practical experiments and case studies to form the basis for the continual pursuit of better marketing concepts. This action-oriented, inductive and primarily normative research methodology facilitated the development of major breakthroughs, new frameworks and concepts.

Marketing thought in the academic establishments, as well as among practitioners, is based on the marketing mix approach. Gronroos, explains that "The marketer, who in the organisation structure is placed in a marketing department, plans various means of competition, and blends them into the marketing mix, so that a profit function is optimised" (1989, p53). The marketing mix model is widely considered to be the general marketing model through almost all the Western world. What is easily forgotten is the fact that this model was developed in North America using empirical data concerned mainly with consumer packaged goods and durables. Moreover, the marketing environment is in many respects quite specific, eg a huge domestic market, a certain media structure, for instance, as far as television and radio are concerned, and a non-oligopolistic, highly competitive distribution system (Calonius, 1986; Gummesson, 1987; Gronroos, 1989).

The marketing mix model has been used in environments outside those the empirical evidence behind the model covers, that of the American consumer packaged goods markets. For example, in industrial markets and in the marketing of services, the marketing mix has "... already had a powerful impact" (Gronroos, 1989, p53).

2.2.2 The Marketing Function

This new research, promoted by the European scholars, has focused on the need to develop a greater understanding of the "marketing function" based on the customer relations and marketing situations that exist (Turnbull & Valla, 1987; Gronroos, 1989; Gummesson, 1987; Morgan & Piercy, 1990). The research has been highly empirical but has also been conceptual. It relies heavily on close contact between the researchers and the participant practitioners and on case studies as research method, although quantitative methods have also been used to support the extensive qualitative findings.

One of the key issues in the Nordic School research is the view of the marketing function of an organisation. This function must be firstly distinguished from the

marketing department. Gronroos makes the distinction that "the latter (marketing department) is an organisational solution only, whereas the size and diversity of the former (marketing function) depends on the nature of the customer relations" (1989, p55). Therefore, the marketing function is spread over a large part of the organisation outside the marketing department, and the department cannot be the only specialists to undertake all of the activities that have an impact on the present and future buyer behaviour of the customer.

The outcome of this research has been that many firms have responded to the need for marketing to be an organisational activity and reduced the importance of their marketing departments (Gummesson, 1987; Gronroos, 1989; Morgan, 1990a). The marketing responsibilities have been delegated to areas of operations, resulting in an acceptance that many staff and support functions include elements of marketing in their duties. It is, therefore, appropriate to review the extant literature on research investigating the applicability of marketing departments within service organisations.

2.2.3 The Misuse of Marketing Departments

Product producing companies tend to have a marketing department that historically does not interact much with other departments of an organisation. This means that they are not fully meeting the needs of the market, owing to their lack of co-ordination within the whole firm.

In the literature on marketing, the marketing department is generally suggested as the most developed way of organising for modern marketing (Kotler, 1991). It is also suggested that such an organisational structure will work in many types of service industries, like insurance, health care, retailing and consulting (Kotler, 1991). However, there are a large number of marketing managers and marketing directors that feel frustrated with their role as heads of marketing departments in service organisations (Gronroos, 1983, Sherrard, 1992). Moreover, Gronroos (1983) produced empirical material, from Sweden and Finland, which gives several examples of small and large service firms that do not have any marketing department or unit responsible for marketing activities. Donnelly and Berry go as far to state that "...the marketing department stage, which may be common in many service industries today (1981), may be an unnecessary and even dangerous era for many service firms" (1981, p52).

Industrial companies tend to have more interdependence between the marketing

department and other departments of the organisation (Gronroos, 1980). This is due to the need for the whole organisation to plan, develop and deliver industrial offerings to the consumer, compared to the ability of consumer goods organisations who plan their marketing effort solely in the marketing department (Best, 1990).

Gronroos (1980) feels that the establishment of a marketing department is not a useful means of introducing marketing into a service organisation. Indeed, he claims that successful service organisations often do not have a marketing department, or they are very small departments. More recent research supports this claim by stating that the presence of a department of marketing often causes the other sections of the organisation to feel they no longer have to undertake marketing activities, a task many would prefer to leave well alone (Morgan, 1990c; Morgan & Piercy, 1990). Therefore, if the marketing department is fairly small and top management keep the total marketing responsibility, the other departments of the organisation may accept that they still have marketing tasks to perform, although there are marketing people in the company.

It is important that the small marketing department is concerned with the overall co-ordination of the marketing activities of the organisation and/or is treated as a specialist on some marketing activities, such as advertising, not as marketing specialists responsible for the total marketing function (Morgan & Piercy, 1990). When the rest of the organisation begins to see the marketing department as overall marketing specialists Gronroos fears that "... the movement towards a production-orientation begins" (1980, p503).

Gronroos (1980) feels that the main reason for a service company becoming service orientated instead of marketing orientated, is a failure to see the nature of service marketing. "The marketing of physical goods has been applied to service organisations without noticing that the marketing of services seems to be different" (Gronroos, 1980, p502).

Gronroos' (1983) empirical research has some general findings that were observed for service organisations of varying sizes. Firstly, that the presence of a marketing department may at some time be "useful", but in the long term it becomes a hindrance to the development of a marketing orientation in the service organisation. As long as there are marketing specialists somewhere in the organisation, they are expected to implement marketing, while other departments of the firm do only other tasks. Gronroos (1983) found that the only time this situation did not exist was when the marketing manager was such a personality that he or she overruled the formal

organisation, developing a customer orientation. Otherwise, the marketing manager was likely to be overrun by the organisational constraints. This causes a very strong reliance on, what Gronroos calls "traditional marketing activities" (1983, p518), including personal selling and advertising design, rather than the more desirable interactive marketing (Interactive Marketing defined as "...involving personnel, physical/technical resources and operational routines to interact with the traditional marketing activities, for long run success." (1983, p508)).

Secondly, the responsibility for the planning and implementing of both "the traditional marketing function and the interactive marketing function should be delegated down in the organisation as much as possible" (Gronroos, 1983, p518). Gronroos (1983) suggests to the level of, say, a regional or branch manager, who also has operational responsibilities. He thinks this is necessary as the interactive function of marketing can be monitored by the person who has direct control over the personnel who deal with clients.

Thirdly, at the head office level, Gronroos (1983) suggests that some type of marketing coordination and marketing planning and support is appropriate. This means that each 'unit' of functional marketing activities are still working towards the overall goals of the organisation. This may include the implementation of an internal marketing programme to initiate employees to the benefits and techniques involved in a marketing orientation. This level of marketing planning and development would be classified by Gronroos as the responsibility of a "Marketing Coordinator"(1983, p518).

Finally, Gronroos's (1983) study revealed that the planning of the total performance of the firm is actually undertaken by the marketing coordinator of the organisation. This is because the marketing coordinator is supporting all kinds of marketing activities on the local level and coordinates the traditional and interactive marketing functions as well as the internal marketing throughout the organisation. As was stated earlier by Gronroos (1983), the interactive marketing concept requires that marketing on the interactive level is linked with operations and the use of technology and other physical resources. Therefore, it was concluded that, there is no need for a limited marketing plan that is accompanied by operational or other sub-plans. That the marketing coordinator can be responsible for developing "marketing-orientated corporate action plans" (Gronroos, 1983, p518), which encompass, not only traditional and interactive marketing planning, but also cover operations, personnel, internal marketing, and technology.

2.2.4 Homogeneity of Service Organisations

More recently an extension and re-examination of the services literature up to the mid 1980's has prompted the investigation of the level of homogeneity between various types of service organisations. The results suggest that between service sectors there are large enough differences in business operations and markets to prompt the development of service sector specific marketing styles (Unvula & Donaldson, 1988; McLean, 1994).

It is important to firstly distinguish between the marketing function of an organisation and its marketing department. The marketing function is defined by Gronroos as "... all activities which influence the preference of the consumers towards the offerings and, therefore, also the success of the company and its chance of staying alive in the long run. The marketing department, on the other hand, is the organisational entity which is responsible for some, but not necessarily all, marketing activities performed by the firm" (1980, p502).

In the goods sector, especially consumer goods, the marketing department can plan and implement most of the marketing activities, ie the marketing department is in almost total control of the marketing function. In the industrial sector the situation is somewhat different, owing to greater interdependence between different business units and departments (Webster, 1978).

In the service sector the situation is viewed by many marketing academics and practitioners as very different (Gronroos, 1980; Gummesson, 1978; Webster, 1978). The marketing manager is in a "side-line" (Gronroos, 1980, p502) situation and can control only a minor part of the marketing function. The marketing manager usually does not have the authority or the resources to manage the buyer/seller interaction. Therefore, he/she cannot plan and implement activities within the purchasing and consumption process of the marketing function. These tasks are left to the final provider of the service in the organisation, such as the desk clerk, airline steward or consulting engineer (Kotler & Bloom, 1984; Sherrard, 1992). Gronroos (1980) indicates that people in the personnel section, operations department and other departments are often quite prejudiced against their activities simultaneously being the concerns of the marketing manager.

Consequently, the marketing department is mainly engaged in mass marketing activities, such as planning advertising, designing brochures, personal selling to industrial buyers and possibly market research. This means that under Gronroos'

"Three Stage Model" (1980, p498) of marketing to service customers (Stage One: Creating Interest; Stage Two: Purchase; Stage Three: Guarantee Resale), the marketing departments of service organisations are mainly concerned with the marketing activities to create interest, thus leaving those activities that influence sales to people in the organisation who are not particularly interested in marketing. This highlights the misuse of an organisational structure that has been developed for the goods-producing sector, and not for service organisations that depend on people for the marketing of their offer (Lovelock, 1988; Kelly, 1992). The literature on the reliance and importance of people for the service offering will be reviewed next.

2.2.5 Service Encounter

Although a service is an interaction between a customer and a complex system, a very important element of many services is a person-to-person encounter. However, in the research to date there have been very few models or theories developed for determining the factors of these dynamic interactions between persons (Solomon, Suprenant, Czepiel & Gutman, 1985; Goodwin & Bradford, 1992). Hence the employees of the service providers have been somewhat neglected in service research (Bolton & Drew, 1991).

More recently scholars (Bitner, Booms & Tetreault, 1990) have investigated the buyer and seller interaction that takes place during the purchase and post-purchase period of the service provided by manufacturing organisations, and especially by the non-marketing specialist employees in a service organisation. This interaction is termed the "service encounter" (Bitner et al., 1990, p71), and takes place for service providers when a customer and a service firm employee interact.

The co-ordination of this encounter is very important in service delivery success (Normann, 1991) but, as indicated by earlier research (Gronroos, 1980; Morgan & Piercy, 1990), it is undertaken by employees not typically interested in marketing activities. The importance of this part of the service interaction for gaining customer loyalty is due to the high level of trust and commitment that develops on both sides of the encounter (Morgan & Chadha, 1993). This suggests service quality problems could occur owing to poorly trained or motivated 'part-time' marketing employees.

2.2.6 Components of a Service

The characteristics of the service offering discussed above, lead to some conclusions about what the consumer actually thinks about the service. In 1980 Gronroos identified several components in the service context that will determine the consumer's evaluation of a given service offering's ability to satisfy his or her perceived needs. This early research has become generally accepted over the following decades (Fisk et al., 1993). The dependent components are:

- (1) "The Means of Production: The technological resources and the human resources of the organisation are important. This includes the client's perception of the organisation's facilities and employee behaviour.
- (2) The Production Process: The method in which the production resources are used in order to produce the service. For instance, the capabilities and behaviour of consultants and their way of taking advantage of the other means of production, will have an impact on the client's evaluation of the service.
- (3) Simultaneous Purchasers or Consumers: People who may influence the preference of a given client." (Gronroos, 1980, p497)

The first two components that Gronroos (1980) states determine a consumer's evaluation of a service offering would seem to be very similar. That is, as services are usually produced and consumed simultaneously, it would seem logical to assume that the means of production and the production process are hard for the consumer to differentiate (Rushton & Carson, 1985). For example, both determinants mention the behaviour of employees in the client's evaluation of the service.

2.2.7 Summary

For more than two decades marketing academics have focused on a broad range of issues relating to the marketing of services. It is well established in the literature that services marketing is different than product marketing. Specifically, services have distinct components to distinguish them from products.

The services marketing literature has recently progressed to also include studies of the differences *between* various service sectors. The increasing number of scholars who are investigating these within service differences have developed models on the

marketing of individual service sectors, such as Professional Services.

The European Scholars, especially from the Scandinavian countries, developed strategic initiatives for service organisations based on research that broadened the product based 'Marketing Mix' definition from the United States. The argument for this 'back to basics' approach was that continual reexamination and adaptation of the product based 'Marketing Mix' model would never sufficiently encompass services marketing.

The importance of people in a service offering has prompted several areas of research within services marketing. These include investigations of: the marketing function throughout a service; the relevance of marketing departments in services; and the service encounter during the service marketing exchange process.

2.3 Professional Services Literature

Prior to the 1990's, limited academic research had been carried out in the marketing of professional services. The first research into the marketing of professional services was undertaken in the United States (Wittreich, 1966; Turner, 1969; Kotler & Connor, 1977). Since this early research the literature has developed to determine that professional services need to be considered separately from product and non-professional service marketing, because models and concepts cannot be easily interpreted for professional services (Gummesson, 1979; Bloom, 1984; Lovelock, 1984). Consumer models are of only limited help to industrial and professional service marketers.

Professional services are a subset which is differentiated from other services by being mainly of an advisory nature and being operated by skilled professionals. Early on, Gummesson, developed the following criteria to help distinguish professional services from other products offered in the market:

- The service should be provided by qualified personnel, be advisory, and focus on problem solving.
- The professional should have an identity, ie, be known in the market for his/her specialities and under a specific name such as "architect" or "management consultant".
- The service should be an assignment given from the buyer to the seller.

- The professional should be independent of suppliers of other services or goods. (1978, p91)

A definition of professional status has been developed by Bennion (1989), expanding on Gummesson's (1978) identity criteria of a professional service. Bennion's definition stated that the development of private practice should form a tradition of service and have a governing professional institution, with one of its roles being to enforce specified codes of conduct.

In many professions the idea of marketing has traditionally been foreign and distasteful. While this view is still present in some professions, several developments in the last 15 years are causing professionals to regard marketing as a legitimate management function. These developments include:

- The revision of legal sanctions and ethical standards. Several highly publicised court cases, brought by professionals, United States federal agencies and consumer groups, deregulated the professional body's right to prevent their members using a wide range of marketing communications and promotion tools.
- An oversupply of professions. There is more competition to retain present customers and gain new customers owing to increased numbers in many professions.
- A declining public image. The high esteem in which professionals were held in the past no longer exists, owing to such things as a poor image of professionals portrayed by the media and malpractice suits. This situation has made it both acceptable and practical to use marketing techniques to increase their public image and to increase the satisfaction levels of their clients (Wheatley, 1983; Kotler & Bloom, 1984; Bloom, 1984; Fay & Bell, 1990; Morgan & Piercy, 1990).

Professionals are realising that different styles of marketing can be applied to professional services (Crane, 1989b). One style can be described as the hard sell and "push" technique. Another style is more traditional and avoids advertising and hard selling techniques. Professional services can rely on advertising and selling only minimally, and should concentrate instead on carefully designing services, pricing strategies, and effective distribution networks to achieve profitable results (Kotler & Bloom, 1984; Teas, Dorsch & McAlexander, 1988; Souter & McNeil, 1992).

Societal changes in the past 15 years have made it important for professionals to be

aware of, firstly, what it means to become marketing orientated and, secondly, what professional service marketing encompasses. Kotler and Bloom (1984) define a marketing orientation as:

"A marketing orientation holds that the main task of the organisation is to determine the needs and wants of target markets and to satisfy them through the design, communication, pricing, and delivery of appropriate and competitively viable offerings." (Kotler & Bloom, 1984)

While Kotler and Connor (1977) more specifically define professional services marketing as:

"Professional service marketing consists of organised activities and programmes by professional services firms that are designed to retain present clients and attract new clients by sensing, serving, and satisfying their needs through delivery of appropriate services on a paid basis in a manner consistent with credible professional goals and norms." (Kotler & Connor, 1977., p68)

In New Zealand, similar trends were developing in the middle of the 1980's. Fay and Hoogsteden (1983), and Bell and Wallace (1985; cited in Fay & Bell, 1990) published work which encouraged a marketing orientation by professionals. The Commerce Act of 1986 made it illegal for a profession-wide scale of fees to be charged (Sherrard, 1992). This provided encouragement for individual professionals or their companies to communicate more freely to the market through advertising and promotion.

2.3.1 General and Descriptive Research Focus

In spite of the growing services marketing literature and the recent awareness and demand from professionals for marketing techniques, professional services suffer from a dearth of literature on marketing, especially in New Zealand. It has aroused only limited academic focus and little empirically based study (Morgan & Piercy, 1991). The studies that have been undertaken in professional services are largely US based, general and descriptive (Wittreich, 1966; Turner, 1969; Kotler & Connor, 1977; Gummesson, 1978; Bloom, 1984; Kotler & Bloom, 1984). This literature has generally been of a theoretical nature, attempting to develop conceptual frameworks for the professions through the adaptation of product marketing models and other service sectors into the professional service paradigm (Morgan & Piercy, 1991). As with other professional services, industrial scientific professionals have expressed particular

concern about how to adapt to the present competitive environment (Morgan, 1990c).

The limited number of marketing concepts and techniques that are easily applied to professional service organisations has been a major barrier to the implementation of marketing within the industrial scientific profession (Benjamin, 1990). Therefore, the use of marketing techniques within the profession is unco-ordinated in nature and there is disagreement as to the most effective method of developing successful relationships with clientele.

This disagreement, it could be suggested, may be due to the inconsistency of the development of the research in the professional service area. An example of the present literature available to service professionals is a study by Crane in 1989. Crane's (1989a) study showed that over 80 percent of clients relied on personal referral when selecting lawyers. While in contrast Babcock (1991), has more recently documented that journal articles prescribe marketing within professional services as including product-based tactics of advertising and sales 'cold' calling. The two types of research conclusions offer very different strategic implications for the service professional. These types of references, disregarding the specific strategic and planning imperatives of professional services marketing (Gronroos, 1990; Morgan & Piercy, 1991), are presently the predominant type of reference available to management in the professions.

2.3.2 Product Based Strategic Orientation

However, academic studies have commonly applied a strategic orientation to professional services marketing, albeit based entirely on the transference of product-based strategies. For example, in a 1988 study by Hensel (1988), a strategic orientation was applied to professional services marketing based entirely on the transference of product positioning strategies to professional services. Shimpoek-Vieweg (1991), applied the 'marketing mix' to the services of libraries, continuing the product-based orientation for professional services strategy development.

2.3.3 Organisational Dilemma

Early research of professional services by Gummesson (1979) investigated the marketing and purchase of professional services. The population sample was 50 people who were interviewed from various professional services. Gummesson (1979) identified an organisational dilemma that occurs in professional service firms. Unlike

product marketing where it is possible to separate marketers from other areas of the organisation, the marketer of a professional service usually takes part in the operation of assignments. Gronroos (1980), concurrently identified this organisational dilemma in consumer service firms through research on banks and travel agencies.

Gummesson (1979) looked at three areas which are affected by the organisational dilemma. Firstly, within the organisational structure, it is common for professionals to spend most of their time doing assignments. Consequently, it is less common for executives in the professions to only do marketing or administration. The dilemma Gummesson (1979) found is that professionals become less effective if they spend less and less time on assignments. These findings have been validated in more recent studies (Morgan & Piercy, 1990; Howard, 1991; Crane, 1993), including the marketing of scientific/high technology goods and services (Rooks & Weinroth, 1993), indicating the need for internal marketing to the professionals within a service firm.

Gummesson (1979) explains the two parts to this dilemma: firstly, as Wittreich (1966) had previously discovered, clients are buying a professional service, therefore, firms must be capable of delivering the professional service. Secondly, "firms need professionals that sell, not professional salespeople!" (Gummesson, 1979, p308). Gummesson (1979) explains that practitioners must not mistake the marketing department for the marketing function of professional service firms, and that the task of marketing must be carried out by the whole firm, and the marketing department (if one exists) is only part of this.

Secondly, the organisational dilemma has implications for the marketing activities of an organisation. Gummesson (1979) found that promotional activities are the major marketing activities for a professional service firm. Except for some aspects of advertising, all areas of promotion are person intensive and often require the involvement of highly qualified professionals. Also, professionals must be near the promotional activities being undertaken, because exhibitions, contests, giving lectures etc, require the professional to attend personally. Gummesson (1979) determined that marketing costs usually equal time costs of professionals as the promotional activities are labour intensive. Alternatively, if a full time marketer is employed by a professional service, Morgan (1990b), and Morgan and Piercy (1990) more recently observed that the marketing responsible employee would not normally have partner or upper level management status. The result is a disempowered marketing co-ordinator within the organisation, who does not have the status to manage the professionals' interactive marketing training and tactics. This result, Morgan and Piercy (1990) suggest, is due to the "widespread ignorance" many professionals have of what marketing is and its

beneficial role in a professional service.

Gummesson (1979), followed by Lovelock (1984), state implications of the organisational dilemma for the determination of marketing costs. Professionals, from all types of industries, did not know their marketing and sales costs or purchasing costs. Gummesson (1979), initially identified two types of marketing costs, the first being costs associated with creating awareness and favourability towards the firm and the second type being sales costs associated with negotiations with a specific client.

The managerial implications of the study by Gummesson (1979) determined that marketing effort should be allocated to specific areas within a professional service firm. Firstly, train all members of an organisation in marketing, as they must be aware of what is expected of them and how to get the most out of a marketing department. Secondly, determine the promotional activities your firm will most probably undertake and work out who shall do what. Lastly, Gummesson (1979) advises professionals not to allocate less time to marketing in busy times. A firm must look to the long term and maintain a fairly constant revenue. Recently academics have cautioned professionals not to base their promotional mix solely on advertising. The results of studies in the professions found that more personal promotional activities are most likely to succeed in appealing to clients of professional services (Hengleson, Brown & Birren, 1990; Hodge, Brown & Lumkin, 1990).

The prescription Gummesson (1979) detailed for professional services has been widely cited, especially in the United States (Fisk et al., 1993). This interest suggests the validity of Gummesson's (1979) work, and the practical relevance of the study's managerial implications.

Research undertaken by Bloom in 1984 in the United States, found that marketing does occur in professional service organisations. He stated that, "Professionals of all types now aggressively use marketing tools" (Bloom, 1984, p102). Kotler and Bloom (1984) stated that marketing has gained widespread acceptance in service organisations, especially non-profit organisations, and that in the mid-1980's professional service organisations were becoming increasingly interested in marketing. These studies are not supported by Morgan and Piercy's 1991 United Kingdom study.

2.3.4 Summary

There is an acceptance of the need to review present sales or marketing techniques of

professional services, to determine what is presently understood as marketing by professionals, and what would improve their marketing effort. Jozefowics, after a review of earlier professional services marketing studies noted:

"It is time for all professional service firms to undertake a systematic review of all basic assumptions about marketing and ask themselves hard questions about the manner in which they are marketing themselves." (1990, p74)

Although this statement offers a worthwhile prescription for professionals, it could be suggested that the varied academic studies on professional services marketing, leading to conflicting strategic implications, could be a major cause for the lack of consistency and strategic orientation within professional organisations. The future research implications, therefore, include the need to develop a unified model of the professional service and consequent strategic marketing implications.

2.4 Marketing Audits Literature

The most significant part of the literature review concerns the extant literature on marketing audits to assess the methods and content included in previous audit techniques. This important review is appropriate as the current professional service research includes both an internal marketing audit and a client audit. However, it must be stressed that the auditing literature is primarily product-based and in some cases is not applicable to service organisations.

In 1959 Shuchman suggested the concept of marketing audits, later developed and formalised by Kotler, Gregor and Rogers in 1977. The year 1977 was also important for the recognition of service marketing as separate from product marketing, with the *Journal of Marketing* article by Shostack (1977): "Breaking Free from Product Marketing." Despite the timely and widespread recognition of both of these areas of marketing, overall the marketing audit and services marketing literature have developed independently (Berry, Conant & Parasuraman, 1991). However, it is germane to review the marketing audit literature and discuss its limitations for service organisations.

2.4.1 Definitions of Marketing Audits

The early definitions of marketing audits have tended to remain as the core of modern definitions (Berry et al., 1991). Kotler et al. (1977) and Mokwa (1986) accept Shuchman's explanation of a marketing audit that focuses on "...a systematic, critical, and impartial review" (1959, p11). More specifically, Shuchman states that "...marketing audits are: (1) programmed appraisals, (2) critical evaluations of the assumptions that underlie objectives and policies, (3) prognostic as well as diagnostic, (4) designed to identify opportunities and weaknesses, and (5) preventative as well as curative medicine" (1959, p18).

Major topics which have been focused on in marketing audit literature include the strategic value of audits, the components and specific questions to be covered, and the methods of measurement in conducting marketing audits (Berry et al., 1991).

2.4.2 Strategic Value of Marketing Audits

Many authors agree with and reiterate Shuchman's (1959, p18) view that a marketing audit is "...both preventative and curative medicine" (Kotler et al., 1977; Berkowitz & Flexner, 1978; Mokwa, 1986; and Payne, 1988). However, these authors extend the possible strategic benefits of marketing audits initially outlined by Shuchman (1959). Kotler et al. (1977), Berkowitz and Flexner (1978), and Payne (1988) discuss the ability of a marketing audit to help create a marketing orientation within an organisation. Mokwa (1986) states that marketing audits can stimulate decision making and awareness by policy makers of the nature of marketing (Berry et al., 1991).

However, if the feature of a marketing audit to be an "impartial review" is considered (Shuchman, 1959, p11), then the auditing may be undertaken by an outside, unbiased party. Consequently, an increased awareness of marketing as suggested by Mokwa (1986), and ultimately, a move towards a marketing orientation may not occur for policy makers or the organisation in general. This is because they have not been exposed to the implementation of a marketing audit, the organisation has just been analysed and presented with the findings. Capella and Sekely (1978), concluded that in the undertaking of marketing audits, a common problem was friction between the auditors and the employees of the organisation. These results, it could be suggested, would not help facilitate a marketing orientation within the audited organisation, as suggested by Kotler et al. (1977), Berkowitz and Flexner (1978) and Payne (1988).

2.4.3 Components of a Marketing Audit

Kotler et al. (1977) and Naylor and Wood (1978) have comprehensively detailed the components and specific questions for the implementation of a marketing audit. The marketing audit is given six major components by Kotler et al. (1977). They are: the marketing environment, marketing strategy, marketing organisation, marketing systems, marketing productivity and the marketing function, whereas Naylor and Wood (1978) propose the four 'Marketing Mix' elements (Price, Promotion, Place, and Product) as four of their seven components of a marketing audit.

The marketing audit literature rarely places any distinction on the difference between tangible goods and services. This is particularly evident when analysing the components that are included in marketing audits. Wilson (1982), identifies 24 audit components, only two of which are concerned with services. These are the "Service Element in Marketing" and "Service Business" (cited in Berry et al., 1991, p256). In 1983, Wheatley developed a marketing audit that was designed for professional services. This audit contained components such as "Practice Environment" and "Service Mix", that are context-specific for professional service organisations.

Since these studies, interest has grown in the need for future research to develop marketing audit components that move away from the product orientated marketing mix and concentrate on the structure and needs of services (Berry, et al., 1991).

2.4.4 Methods of Measurement in Marketing Audits

In 1977, Kotler and colleagues stated that the method of measurement in marketing auditing was not particularly sophisticated. The most popular measurement approach has been open-ended, check list questions (Berkowitz & Flexner, 1978; Naylor & Wood, 1978; Wilson, 1982; Wheatley, 1983; Mokwa, 1986; Payne, 1988). Berry et al. (1991) feel that these types of measurement, while they may stimulate further questions or can be tailored to specific organisations, increase the subjectivity of data interpretation.

Gronroos (1989) and Gummesson (1987), complement the use of open-ended or probing questions with a more interpretable quantitative part to some sections of an audit. Therefore, the respondent is giving an easily measurable answer that is then justified with an open-ended question, such as, "Why do you say that?".

Overall, there has been comparatively little examination of the measurement techniques used in marketing audits (Berry et al., 1991).

2.4.5 Service Marketing Audit

The literature reviewed above reflects the deficiency of information on conducting a service organisation marketing audit. Indeed, most of the studies on marketing audits assume that marketing success factors are the same for goods-producing and service-producing organisations. This could be due to the fact that most of the general constructs of marketing audit literature were developed before service literature became widespread in the 1980's (Shostack, 1977; Berry et al., 1991).

Today, not only has it been accepted that goods and services differ, but also that service organisations can be quite different from one another. Thomas discusses two types of services, "people based" and "equipment based" (1978, p159). Lovelock (1983), describes different strategies that need to be considered within five matrices of service types, while Zeithaml, Parasuraman and Berry (1985) undertook an extensive empirical study and found several differences in marketing orientation and practices among service organisations.

Berry et al. (1991) commented that the marketing audit literature up to the early 1990's has not only omitted sufficient documentation on the service sector and failed to distinguish between service types, but there is little evidence of the inclusion of internal marketing within audit methods. Developments on service marketing audits research have more recently included reviewing the culture and climate within the service organisation, to complement the external audit (Bharadwaj, Varadarajan & Fahy, 1993). As the services offered by an organisation *are* its employees, in the pure service situation, it is critical to manage how the service *will* be offered. To make it possible to achieve this, an understanding of the organisation and the employees' operating style, learning style and how they perceive the service offering process is necessary (Baharadwaj et al., 1993). This is in addition to the traditional external marketing audit of determining how a service or product *is* being received, the second half of the exchange process.

Since services marketing differs from goods marketing, and within services there are differences, the usefulness of the extant marketing audit literature for service organisations is fairly restricted. While the general marketing audit literature does not take into account specific aspects of services marketing, the "context-specific"

marketing audit studies have a restricted scope of application across different types of services and are generally limited in their applicability to specific types of professional services (Berry et al., 1991).

2.4.6 Marketing Audits and Service Quality

An area that is directly influenced by the effectiveness of internal marketing is the quality of service that is provided by an organisation's people. Interest in the measurement of service quality has become popular recently (Cronin & Taylor, 1992). The delivery of higher levels of service quality is the strategy that is increasingly becoming the accepted key to service providers' efforts to position themselves more effectively in the market (Parasuraman, Zeithaml & Berry, 1988). Customers evaluate an organisation's service quality by comparing their perceptions of the service they receive with their expectations of the service (Gronroos, 1982; Parasuraman, Zeithaml & Berry, 1985). Based on previous research with service organisations in 1985, Parasuraman et al. (1988) reduced ten measures of perceived service quality into five specific components: tangibility, reliability, responsiveness, assurance, and empathy. This subsequently became an accepted model of measuring perceived service quality, namely, "SERVQUAL".

However, several researchers have also identified that service quality is both difficult to define and measure (Parasuraman et al., 1985; Bitner & Zeithaml, 1989; Brown & Swartz, 1989; Cronin & Taylor, 1992). Indeed, Cronin and Taylor stated that "... current conceptualisation and operationalisation of service quality (ie SERVQUAL) is inadequate" (1992, p55). Their recent study (1992) results suggest that customer satisfaction should be concentrated on more to achieve long term, repeat purchase behaviour from service customers. More specifically, their findings suggest that (1) customer satisfaction has a significant effect on purchase intentions, and (2) service quality has less effect on purchase intentions than does customer satisfaction.

Another generally accepted aspect of service quality has recently been questioned by Bolton and Drew (1991). In contradiction to Parasuraman and colleagues' (1985, 1988) proposal that higher levels of perceived service quality result in increased consumer satisfaction, they suggest that satisfaction is actually an antecedent of service quality.

Consequently, the service literature has left confusion as to the relationship between customer satisfaction and service quality. This distinction is important to researchers

and service managers because they need to know if their key objective should be to have consumers who are 'satisfied' with their performance or to deliver the maximum level of 'perceived service quality' (Cronin & Taylor, 1992).

2.4.7 Summary

A summary of the marketing audit literature reveals that:

- (1) scholars generally agree on the meaning of a marketing audit,
- (2) the literature is largely conceptual and normative,
- (3) a list of open-ended, probing questions is the most popular and accepted approach proposed,
- (4) that the differences required to audit services, including internal marketing, have been until recently largely omitted.

2.5 Internal Marketing, Organisation Climate and Culture Literature

The centrality of a professional's performance in the marketing efforts of a professional service increases the significance of internal marketing and the development of an appropriate organisational culture. Although internal marketing is a central focus for a professional service, as concluded in the previous section, it has typically been overlooked in the generic marketing audit literature. Therefore, it is appropriate to review the extant literature on marketing within the organisation for this study, to complement the marketing audit literature reviewed. First, the emergence of thinking about internal marketing in the literature is reviewed. Second, studies into the implementation of internal marketing are covered, including extant literature on organisational culture and its importance in service marketing planning and change.

2.5.1 The Development of Internal Marketing as a Marketing Entity

With the development of services marketing theories, marketing is changing (Gronroos, 1990). More emphasis is now being placed on keeping customers and cross-selling to existing customers (Berry, 1983; Gronroos, 1983; Levitt, 1983; Gummesson, 1987). This focus is especially important in industrial markets that are often smaller than consumer markets, with a major investment cost being the development of customer

relationships (Tansuhaj, Randall & McCullough, 1991). The concepts of relationship marketing and interactive marketing were developed to describe marketing planning towards the existing final customers and other stakeholders of an organisation (Christopher, Payne & Ballantyne, 1991). However, to develop and retain long term successful relationships with existing service customers, there must be a consistently desired service offering, that is tautological.

Moreover, the customers of a service firm perceive more than the end result of the service production process (Gronroos, 1985). Customers also perceive the way in which the end result is reached during the buyer-seller interaction, ie the "functional quality of the service" (Gronroos, 1985, p26)). According to empirical research undertaken by members of the Nordic School of Thought (Gronroos, 1983, 1985; Gummesson, 1984), the functional quality of a service can quite often be the most important variable for "competitiveness and marketing success in the long term" (Gronroos, 1985, p126).

An effective interactive marketing performance from employees who do not normally belong to the marketing department of a service organisation, Gronroos (1985) believes, will create excellence in the functional aspect of the service. The concept of internal marketing has been introduced to describe the method of creating this excellence in the functional aspect of a service.

Here the role of the employee is vital. The marketing specialists of the marketing department are not the only human resource in marketing, often they are not even the most important resource (Piercy & Morgan, 1991). During customer contacts these marketing specialists in both product and service offering organisations are often outnumbered by a variety of employees whose main duties are production, deliveries, technical service, claims handling, and other tasks traditionally considered non-marketing. However, the skills, customer orientation, and service mindedness of these persons are critical to the customers' perception of the firm and to future patronage behaviour. This culture is especially important in service organisations as the employee is the *vehicle* by which the organisation's offering is presented to the market (Gronroos, 1983).

The subject of internal marketing has a growing literature base. Some of the studies are general and conceptual (Gronroos, 1981; Gronroos, 1985), while others are more orientated to specific industries (Berry, 1981; George, 1984). A consensus is being reached in this literature regarding the fundamentals of an internal marketing approach (George, 1986). The internal marketing concept holds that employees precede other

customers as the initial market of the organisation (Sasser & Arbeit, 1976; Berry, 1980; George & Compton, 1985). The objective of the internal marketing function is to develop motivated personnel within an environment which supports customer consciousness (Gronroos, 1981; Moeller & Schneider, 1985; Mitchell, 1992).

During the past fifteen years the concept of internal marketing has emerged first in the literature on services marketing and later in the service management literature (Berry, 1981; Gronroos, 1981, 1985; George, 1984). Without using the concept itself, Eigler and Langeard (1976) initially discussed the need for marketing services internally in organisations. Recently, this concept has also entered the literature on industrial marketing (Gronroos & Gummesson, 1985). In the literature on service management, the internal marketing concept has also been included, for example, by Normann (1984), and in the context of managing services in the public sector, by Gronroos (1987) and Gronroos and Monthelie (1988). Heskett mentions this phenomenon, observing that successful service firms have achieved their position "... by turning the strategic vision inward" (1987, p120), they target key employee groups and customers, rather than only customers. This strategic vision, while newly operationalised for service marketers, was initially developed by Drucker in the 1950's (Drucker, 1954). The three intervening decades were the period when marketing, and then services marketing, became established in business literature.

Internal marketing *is* a management strategy. The focus is on how to develop customer-conscious employees (Bowen, 1986). The premise of internal marketing is summarised by Gronroos, he states that "...Internal marketing is that the internal exchange between the organisation and its employee groups must be operating effectively before the firm can be successful in achieving its goals regarding external markets" (1990, p222).

2.5.2 The Internal and External Customers

As the implementation and responsibility for marketing is spread throughout the organisation, research has identified a need for the marketing employees to take on the role of marketing to the organisation (Eigler & Langeard, 1976; Gronroos, 1981; George & Compton, 1985; Gummesson, 1987; Heskett, 1987; Piercy & Morgan, 1991). This has been termed the "internal customers" (Gronroos, 1989, p55) of the marketing responsible employees, who may influence the final customer directly or indirectly. These internal customers must be co-ordinated and taught the benefits and techniques of successfully marketing to the external customers.

The employees involved in marketing-like contacts with the customers, more often than not, greatly outnumber the marketing specialists (Gronroos, 1989). These employees are termed "part-time marketers" (Gummesson, 1987), as their main employment is in another area of the organisation. As marketing tasks are spread throughout the organisation, the marketing specialists can only take care of a part of the marketing function. Therefore, marketing becomes a major part in the planning and decision making of top management, aided by the marketing specialists who may assist in, say, market research, personal selling, and advertising. Therefore, the Nordic School of Marketing concludes that "... it is more correct to view marketing as market-orientated management than as a separate function only" (Gronroos, 1989, p56).

There are two specific areas that the Nordic School of Business (Gronroos, 1989) research has identified as part of the marketing concept. The vital role that customer relations plays in the development of effective long term business profitability, and the role that promises play in customer and sellers' satisfaction fulfilment. These areas will be discussed separately.

2.5.3 Customer Relations

The Nordic research has determined that marketing centres around the relationship an organisation has with its customers, where "... the objectives of the parties involved are met through various kinds of exchanges" (Gronroos, 1989, p54). These exchanges will, it is hoped, develop and maintain long term relationships with clients. This understanding of the centrality of marketing as exchange is not new. Bagozzi, in 1975, stated that "most contemporary definitions of marketing explicitly include exchange in their formulations" (p32) and that the exchange process also involves intangible and symbolic aspects. This view of relationships and the many aspects of exchange is built on by Relationship Marketing researchers: Christopher et al., with regard to "internal clients". They state that "The internal market, the heart of the enterprise, is the subject of all change processes as well as the author of them. The task is to work more cross-functionally, more participatively, more politically in the common interest of customers, staff and shareholders, building a platform on which to grow" (1991, p28).

The development of customer relations is not simply the exchange between two parties, the buyer and the seller, but involves many parties. Often contacts in channels of distribution and supply, financial controllers etc. are involved in the development of a relationship (Kotler, 1991).

2.5.4 Importance of Promises

Calonius (1989), has identified the concept of fulfilling promises as part of marketing exchange. In the establishment and maintenance of customer relations the seller promises certain things. These may include, services, goods, future commitments, and financial solutions. The buyer also gives a set of promises towards the relationship. These promises encompass expectations of the exchange of goods or services and, if these expectations are fulfilled, then future relations are achievable.

The above discussion has resulted in the Nordic researchers (Gronroos, 1989) suggesting a definition of marketing that encompasses all of the marketing mix, emphasised by the American marketing academics, and the new areas that have resulted from the empirical research in Europe. This definition, based on the industrial marketing research need for interaction, the services marketing research need for client relations and the concept of a promise in the buyer behaviour research by Calonius (1989), is articulated as:

"Marketing is to establish, develop and commercialise relationships, so that the objectives of the parties are met. This is done by a mutual exchange and keeping of promises." (Gronroos, 1989, p57)

This approach of a complete re-examination of the definition of marketing also encompasses the client's trust in a firm's resources and, therefore, includes internal marketing to assist in meeting external client promises. This direction of research thought, especially for services, has not been the direction of all research on marketing within the organisation. With the recognition of services marketing as a legitimate autonomous subject, a number of studies on internal marketing (Berry, 1981; Piercy & Morgan, 1991) have focused on the present product oriented 'Marketing Mix' (Product, Price, Promotion, Place), or an adaptation of the 'Marketing Mix' to undertake marketing for the internal customers. Piercy and Morgan summarise this view by explaining: "... (that) internal marketing ... is the development of a marketing programme aimed at the internal marketplace in the company, that parallels and matches the marketing programme for the external marketplace" (1991, p84).

Gronroos (1989) considered that the extant literature on internal marketing viewed the topic too narrowly by using only traditional marketing activities internally. He proposed that it is important that "internal marketing should be viewed as a managerial philosophy, which has strategic and tactical implications throughout the company and

its various business functions" (Gronroos, 1989, p56). Consequently, the first group to target for developing an internal marketing system is the upper level management, not the client contact employees. Then various departments and employees representing different positions in the organisation need to be included, after gaining top management support, in planning and implementing internal marketing.

Although Gronroos (1985) may not agree with the extant literature on internal marketing, his argument is based on a preliminary step in traditional marketing activities. The process of undertaking traditional marketing in all forms of business will always begin with the gaining of support and approval from management. The broad implication for research in service organisations is that there is a need to include auditing and evaluation within a firm, towards effective internal marketing, to complement traditional surveying of the external market. This will result in a greater likelihood of meeting the objectives of both parties in the marketing exchange, including the keeping of promises.

There seems to be debate on the terminology most appropriate for internal marketing. To assist in the clarification of marketing within the organisation, it is appropriate to review the extant literature on the process and implementation of internal marketing.

2.5.5 The Process and Implementation of Internal Marketing

"Marketing for a number of years has been long on advice about what to do in a given competitive or market situation and short on useful recommendations for how to do it within company, competitor and customer constraints experiences, with both managers and students arguing strongly that these parties are often strategy-sophisticated and implementation-bound" (Bonoma, 1985, p26).

"... it appears that our technical literature in marketing is lacking a practical response to the executive's question: 'We know what marketing is, but how do we do it?' " (Piercy & Morgan, 1991, p82-83)

Piercy and Morgan (1991) agree with Bonoma (1985) as to the problem of implementing marketing in business, but also feel that there is a deficiency of relevant language and conceptual models in present marketing literature to deal with the implementation issue. Despite the awareness of this lack of strategies for marketing implementation, at present it is evident that business now understands what marketing is, but not exactly how to use it. This issue is particularly relevant for industrial service

organisations that are made up of professionals, all relatively new areas in marketing literature.

The whole orientation and focus of traditional marketing is on the customers and competitors of the market and on matching organisational resources to be competitive in the market-place. Ohmae discussed the "Competitive Triangle" (1987, p92) in marketing, where strategies must consider Customers, Competitors, and your Company as interrelated. Piercy and Morgan expand on this traditional viewpoint and say that "... while analysing markets and developing strategies to exploit the external market-place remains quite appropriately our central focus, it is frequently not enough on its own to achieve the implementation of marketing strategies" (1991, p83).

Gronroos (1990) identifies two aspects of management processes in internal marketing. First of all the attitudes of employees and the motivation for customer consciousness and service mindedness have to be managed. He describes this as the "Attitude Management" (1990, p224) aspect of internal marketing. Edvardsson, Edvinsson, and Nystrom previously explained this type of management when they observed that "...there is a need for a more pro-active mental management view where service companies create the future rather than adapt to existing conditions" (1988, p168).

Second, Gronroos (1990), explains that managers, contact personnel, and support personnel need information to be able to perform their tasks as leaders and managers and service providers to internal and external customers. He describes this as a "Communication Management" (1990, p224) aspect of internal marketing. More recently, Chorn includes organisational culture and leadership styles in his "Alignment Theory" (1991, p20). Chorn's (1991) research in Europe, the United States, and Australia revealed that superior performance is associated with high degrees of alignment between the above elements, strategy, and the competitive situation. The "Alignment Theory" has proven difficult to operationalise. One insight gained from the concept is the need for internal auditing to assess the fit of the aforementioned elements towards designing internal and external marketing programmes.

Berry (1981) and Gronroos (1983, 1990) have both outlined the overall objectives of internal marketing as being twofold. The objectives are as follows:

- (1) To ensure that the employees are motivated for customer-orientated and service-minded performance and thus successfully fulfil their duties as "part-time marketers" in their interactive marketing tasks; and
- (2) To attract and retain good employees. (Gronroos, 1990, p225-226)

Gronroos later outlines the situations that call for the implementation of internal marketing systems:

- (1) When creating a service culture in the firm and a service orientation among employees, and
- (2) When maintaining a service orientation among the personnel; and
- (3) When introducing new goods and services as well as marketing campaigns and activities to the employees. (1990, p226)

Gronroos (1990) states that a service culture is lacking in most firms today. In such cases internal marketing is often seen as a means of achieving such a culture. Indeed, current literature in both services marketing and organisational culture lead to the argument that a uniform and relevant organisational culture is one of the most important ingredients for successfully marketing services. This is especially appropriate for professional services as the service being offered is generally consistent with the style of the individual professional within the organisation. However, Burack (1991) argues that, at present, after reviewing the research on service culture, there has been too little time or thought devoted to the collection of data to facilitate organisational culture analysis and to establish a foundation for change.

Gronroos (1990) states that most organisations will, at best, be creating a service culture. It is pertinent to review what goals he discusses as important for the first level of internal marketing (ie. Creating a service culture). The goals are:

- (1) To enable employees - managers, supervisors and others - to understand and accept the business mission, strategies, and tactics as well as the goods and services and marketing campaigns of the organisation;
- (2) To develop a service-orientated management and leadership style among managers and supervisors; and
- (3) To teach all employees service-orientated communications and interaction skills. (Gronroos, 1990, p227)

It is essential to achieve the first goal, as employees cannot become marketing orientated if they do not understand the organisation's meaning of marketing orientation. However, the second and third goals, while obviously worthwhile, Gronroos (1990) does not offer any method to teach, train or guide managers to develop a service orientated leadership style and communication and interaction skills

for employees.

2.5.6 Internal Marketing, Organisational Culture and Change

A number of authors have commented on the need to offer some incentives to employees who want to change or adapt to the new style of service-orientation (Berry, 1981; Gronroos, 1983, 1990; Piercy & Morgan, 1991). Incentives often encompass more than just monetary rewards. They may include: added responsibility and decision making; up-to-date information and feedback on the performance of the organisation, and input into the development of the internal marketing programme to help guarantee success (Schneider, 1988).

Zemke (1988) observes that "While it is possible to change the focus and practices of an organisation's culture, it is critical to preserve to a considerable extent what has gone before and build on it to make the change ... Honoring and learning from the past doesn't mean we have to be trapped by it" (cited in Gronroos, 1990, p241). Gronroos (1990) also urges management to move slowly and to make incremental changes, although he does admit that in some cases there is not time to move slowly and change occurs at a very rapid pace. Examples of this rapid change are the many government organisations in New Zealand that are being privatised or becoming State Owned Enterprises.

2.5.7 Organisation Cultural Consistency

In service organisations clear cultural values are particularly important for guiding employee behaviour (Gronroos, 1990). Schneider and Bowen (1985) have found that when employees identify with the values of the organisation, they are less likely to leave the company. Furthermore, customers seem to be more satisfied with the service being offered.

A logical inference is that a strong positive relationship exists between cultural strength and cultural consistency, and between culture and the effectiveness of marketing activities (Webster, 1991; Bowen, 1992). Therefore, as the strength and consistency of an organisation declines so too will the effectiveness of marketing strategies. Webster (1991), advances the notion that employees at all levels of a service organisation should hold consistent views and beliefs of the role of marketing in their organisation.

Research undertaken by Webster (1991), found that even though there is acknowledgement for the need to maintain a consistent culture, there is evidence to suggest that it does not exist in service organisations. Webster (1991) chose four primarily consumer based service categories to investigate for cultural consistency. Her findings highlight that 360 respondent employees, from various levels within the organisations surveyed, have significantly different attitudes regarding the components of the current marketing culture and the desired/ideal marketing culture. However, there is no relationship between the level of the employee within the organisation and the level of agreement with the actual or ideal marketing culture items.

However, the presence of a strong culture is not desired in all situations. If the surrounding environment has changed and new ways of thinking are necessary, a strong culture may impede change (Gronroos, 1990).

A service strategy requires that service concepts related to the business mission and the strategy be defined. If the service concepts are not clearly defined, the firm lacks a stable foundation for discussion of goals, resources to be used, and standards for performance. As previously stated, the service concept states what should be done, to whom, how, and with what resources, and what benefits customers should be offered. If these issues are not clarified, the personnel will of course not understand what they are supposed to do. Moreover, goals and routines do not form a clear and understandable pattern, because there is no clear and well-known service concept to which to relate. If the service concepts are not clearly understood at the middle management level, it will be difficult to perform supervisory duties in a consistent way. Managers as well as the rest of the personnel easily feel a disturbing role ambiguity.

Zemke (1988) observes that if an organisation has to change, the changes should be slow and incremental. Of course, this is not always possible. As discussed above, an organisation may be forced to change suddenly. It must never be forgotten that in all areas, but especially in services, a cultural change means that people have to change.

The impact on people of a change in culture will also affect the strategic capabilities of a service. Bharadwaj et al. (1993), recently proposed that people are an essential asset of a service organisation, and the monitoring and management of their performance and culture is necessary to remain competitive. Their recent study concluded that "the greater the 'people' intensity of a service industry, the greater the importance of culture as a source of competitive advantage" (1993, P92).

2.5.8 Summary

It is generally accepted by scholars that the offering of a consistently desired service will allow for the development of a sustainable long term relationship with clients. The inherent people component of a service offering therefore, creates the need to understand and support employees for success. This internal focus is needed prior to, and during, the period a service offering is being promoted to external clients. Operationally, employees become the 'internal customers'.

The subject of internal marketing has a growing literature base. Some of the studies are general and conceptual, while others are more oriented to specific industries. A consensus is being reached in the literature that the marketing specialists of a service organisation are not the only human resource in marketing, often they are not even the most important resource.

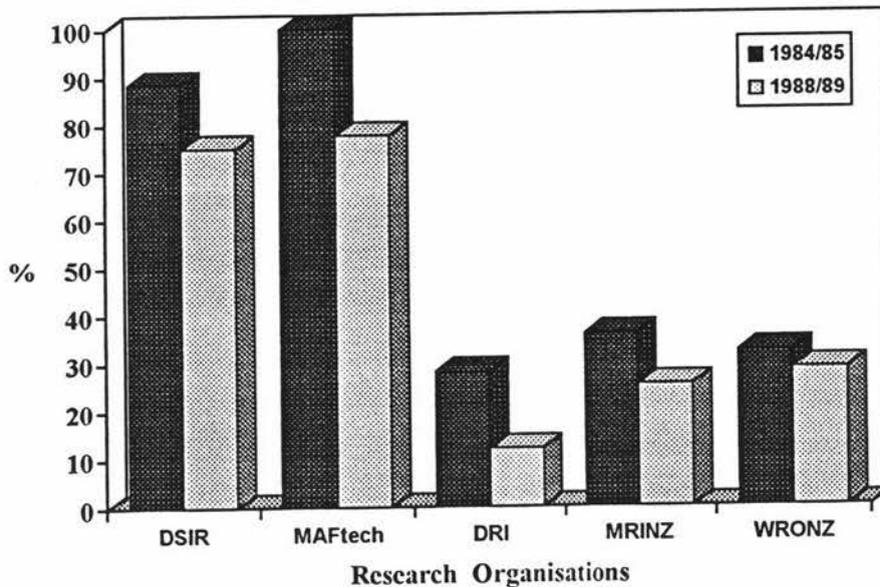
Organisational culture and leadership styles are included in Chorn's (1991) "Alignment Theory". He states that these elements must be aligned to strategy and the competitive environment for a superior performance. Internal and external marketing programmes, Chorn (1991) suggests, should be designed by considering the aforementioned elements through internal auditing.

After reviewing the research on service culture, Burack (1991) concluded that there has been too little time or thought devoted to the collection of data to facilitate organisational culture analysis and to establish a foundation for an effective change, either as a mandate or by choice, in service professionals. The present study is classified as a "people intensive" service investigation, as the industry under examination comprises service professionals. This prescribes the need for the internal investigation of the scientific industrial services, an internal audit.

2.6 Industrial Scientific Profession and IRL Specific Literature

In the New Zealand science and technology 'industry', changes to funding and infrastructure have occurred for more than a decade. Since 1980, the total government investment in research and development (R&D) has fallen in real terms. This continued disinvestment has placed increasing pressure on an already small science infrastructure. During the 1980s, the net fall in public investment was probably around 35% in real terms (Ministerial Scientific Task Group, 1992). As a result, the proportion of government funds received by the DSIR and other government research organisations has decreased steadily, as shown in Figure 2.2.

Figure 2.2 Level of Government Funding for R&D as a Percentage of Total Revenue

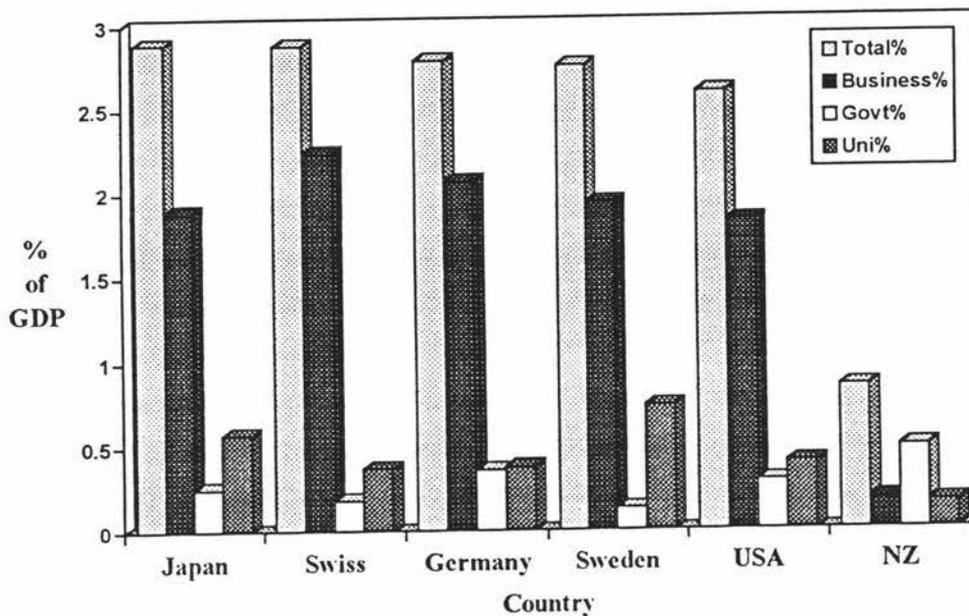


The past Labour and present National Governments' tight fiscal and monetary policies have also resulted in reduced investment by the private sector. Hence, recent spending on R&D by New Zealand organisations has been low, many preferring to reduce costs and lower their investments in high risk R&D departments by closing them down (for example, Phillips (NZ) Ltd and ICI (NZ) Ltd).

The fall in private sector R&D investment in the 1980s, was greater than in the public sector, possibly as high as 50% in real terms (Ministerial Scientific Task Group, 1992). New Zealand's total investment in research, science and technology has thus fallen from about 1.2% of gross domestic product to 0.85% of GDP (a trend unrepeated in OECD or newly industrialised countries). Figure 2.3 details R&D expenditure as a percentage of GDP in the five leading countries in comparison to New Zealand.

Even though scaling down and closure of in-house R&D facilities has resulted in some increases in business for surviving R&D organisations, the net effect of a reduction in the priority of R&D and therefore, a reduction in R&D expenditure, has been tougher competition for the industry.

Figure 2.3 R&D Expenditure as a Percentage of GDP (1991)



(Ministerial Scientific Task Group, 1992)

The New Zealand Association of Scientists believe that the target for R&D expenditure in NZ should be 1.5% of GDP by 1994, and 2% by 1997 (NZ Science Review, 1990). This substantial increase would have to come primarily from the private sector, which funded just 21% of R&D in New Zealand in 1991. In contrast, between 65% and 78% of funds spent on R&D in 1991 by the five leading countries came from the private sector.

The Ministry of Research, Science, and Technology propose that the purpose of the newly established Industrial Research Limited (IRL) Crown Research Institute (CRI) will be to "...conduct research, develop technologies and provide differentiated services which:

- Introduce key new technologies leading to new products, processes, and services and improving international competitiveness.
- Maintain the National Standards of Measurements.
- Make available a large range of mathematical and scientific services to other Crown Research Institutes" (Ministerial Scientific Task Group, 1992)

To develop an understanding of the strategic implications for the DSIR of the changes to Crown Research Institutes, it is important to outline the situation of IRL's predecessor: Industrial Development (which will be referred to by the broader DSIR title).

The DSIR's commercial revenue targets have always been set at the short fall between estimated expenditure and government funded income. Since 1985, crown funds have progressively diminished and the DSIR has been unable to meet its commercial revenue targets. Also, reduction in expenditure has proven difficult because of the inability to lower fixed costs such as the rental of laboratory and storage space (13% of total expenses) and corporate overheads (7% of total expenses). This is compounded by management's decision not to declare staff surpluses (over 40% of total expenses are due to personnel costs). As a result, the DSIR has consistently incurred a large operating deficit over the last few years.

At this stage, IRL's financial position for 1992/93 appears somewhat less dismal. The DSIR has secured approximately 5% more Crown funds than the previous year. The DSIR's personnel costs have reduced due to several resignations and reduced recruitment. The DSIR's property rent has been reduced by 75% as a result of a corporate reassessment of building values. Corporate overheads have also lessened.

2.6.1 Summary

There are some major challenges facing the DSIR as it begins to seek revenue away from the security of the government. These include:

- The tendency of users to see the DSIR as a source of problem-solving expertise which militates against the development of the focus necessary to produce continuous innovation. The efforts of staff seem to be conflicted between short term versus long term research.
- The Ministry of Research, Science, and Technology proposes that the DSIR establish close working relationships with a range of industries which have a large number of disparate and competing companies.
- As a result of gradually diminishing government funds and increased competition for commercial revenue, the DSIR's financial position has deteriorated over the past few years. The staff morale has consequently suffered.
- Maintaining a high quality human resource in an environment of continuous change and declining popularity of science as a career path. Although , as discussed earlier, in the short term, a reduction in the workforce will decrease the DSIR's personnel costs.
- The management's desire and frustration at trying to develop marketing strategies using the present marketing literature that does not adequately meet their individual requirements as a privatised public good, in a competitive professional market.

2.7 Present Study

The Industrial Scientific Profession is facing a unique situation with the privatisation of the market leader, the DSIR. Collectively, the market leader and other research organisations in this industry are unsure of the impact this restructuring will have on the present competitive environment. This uncertainty is compounded by the managers and scientists not knowing what is needed in an effective marketing plan to adapt and compete in their changing market.

The combined extant literature of Services Marketing, Professional Services, Marketing Audits, Organisational Climate and Culture, and Internal Marketing, is of some relevance to the present study. These areas of research do not fully address the present situation of flux the DSIR and other Scientific Industrial Service Professionals are experiencing. More specifically, Services Marketing literature identifies the unique characteristics of services in comparison to products, and the need to integrate marketing within a firm's horizontal and vertical functional areas. However, the Services literature is largely descriptive and deficient of the prescriptive, strategic information necessary for practitioners to understand *how* to market services as distinct from product marketing.

The extant literature of Professional Services marketing is varied in direction, and it is suggested that this variation has caused the resultant conflicting strategic implications for Service Professionals. The future research implications include the need to develop a unified model for Professional Service marketing and consequent strategic implications.

The Marketing Audit literature revealed that the differences required to audit services, including internal marketing, have been until recently largely omitted. However, the literature suggests that a list of open-ended, probing questions is the most popular and accepted approach proposed, if an investigation is undertaken.

The inherent people component of a service offering creates the need to understand and support employees in order to successfully offer a sustainable and desired service to clients. The present study may be classified as a "people intensive" service investigation, as the industry under investigation comprises service professionals. This prescribes the need for the internal audit in the present study of the Scientific Industrial services. The investigation of the Scientific Professionals will complement the external, client investigation, and it is hoped, result in the formation of a model to understand the strategic implications of Professional Service marketing.

Chapter Three

Research Design

3.1 Introduction

The research objectives of this thesis are repeated below for convenience:

- Determine market and employee perceptions and opinions of the industrial scientific profession
- Determine market perceptions of the case study industrial professional service
- Determine employee attitudes and perceptions to marketing

The research design outlined in this chapter has been developed to achieve the research objectives through the testing and validating of the professional services marketing models outlined in Chapter Two.

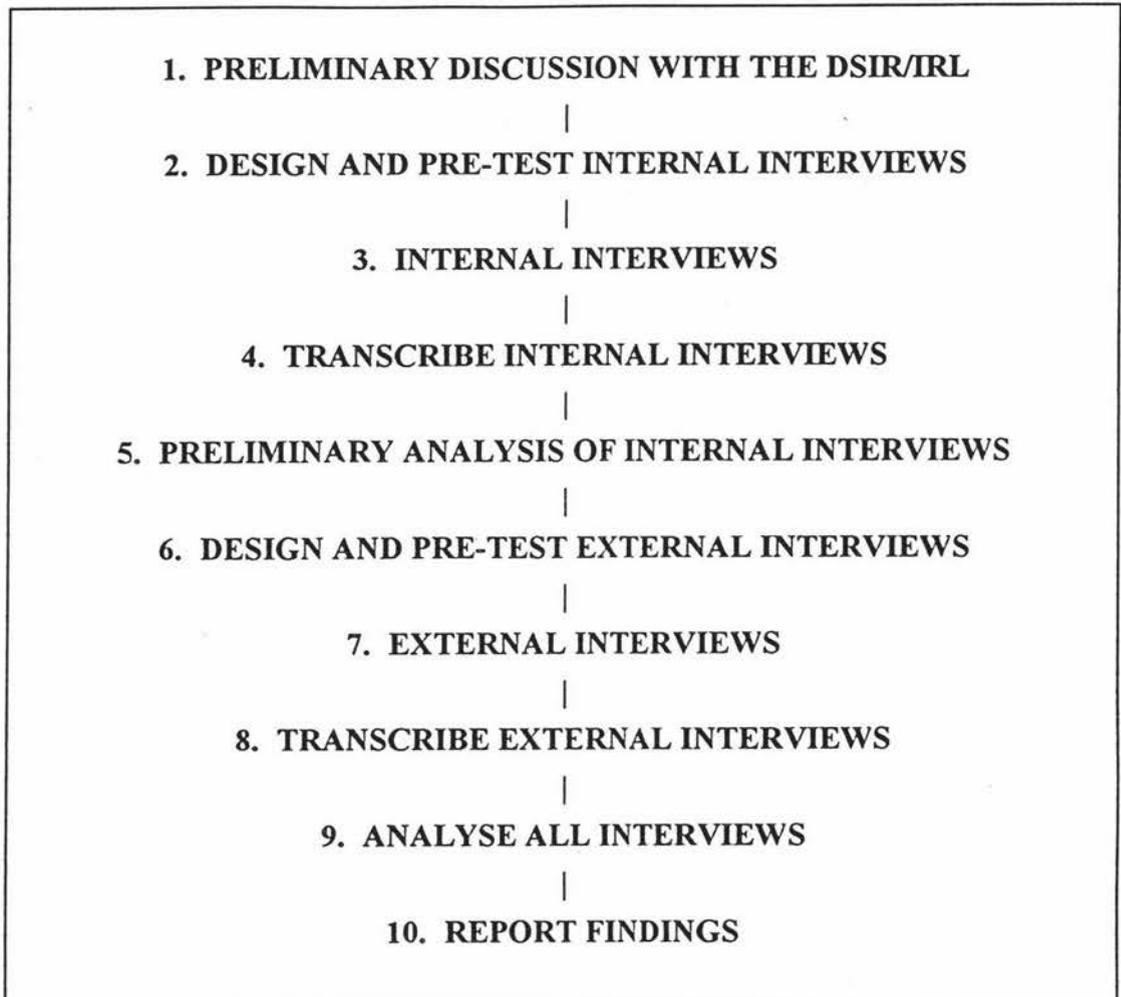
3.2 Research Methodology

3.2.1 Procedure

There were ten parts to the research, as illustrated in Figure 3.1.

Part One: Preliminary discussions were undertaken with management of the case study industrial professional service (DSIR) to define the central management problem that existed concerning the restructuring and development of a marketing plan for Industrial Development Limited. The management problem was then translated into a feasible research problem.

Figure 3.1 Steps in the Research Process



At this stage in the research it was deemed appropriate to study both internal and external perceptions of the Case Study organisation. To date the extant literature on Professional Services has focused either within or outside the organisation (Kotler & Connor, 1977; Gummesson, 1979; Bloom, 1984; Brown & Swartz, 1989; Crane, 1989b; Morgan, 1990a; Piercy & Morgan, 1991). The literature and the preliminary discussions with management highlighted the need to investigate both the perceptions and potential barriers to marketing from the employees that comprise the service offering, and the importance of monitoring the market's needs and perceptions of the professional service as it restructures and begins to have a planned market focus.

Part Two: A review of relevant literature was undertaken to establish the depth of research in the topic area and to determine any inconsistencies and complications that

have arisen in undertaking research into industrial scientific professional services of this nature.

Part Three: Using knowledge gained in the first two stages of the research, the next section relating to the investigation within the organisation was designed and then pre-tested and refined with the assistance of DSIR employees. The employees who assisted in the pre-testing of the questionnaires for the in-depth internal interviews, consisted of three employees from different levels within the organisation. This assisted in the elimination of any bias caused by the questionnaire not allowing *all* respondent employees the full expression of their opinions and perceptions on the research topic.

Parts Four and Five: In-depth interviews with employees of the DSIR were taped on audio cassettes and transcribed to gauge the preliminary findings, before progressing to the interviews of the industrial scientific clients.

The internal section of the study was considered appropriate at this stage, as analysis of the interview transcripts aided in the development of the questionnaire for the external interviews, inasmuch as it was important to have an understanding of the DSIR's culture and comprehension of the market before approaching the industrial scientific clients. Therefore, the external respondents' answers complemented the internal responses to enable a greater understanding of the steps that would need to be taken by an industrial scientific professional organisation to maintain long term profitable client relationships.

Parts Six and Seven: In-depth interviews with past, present and potential clients of the DSIR were designed and pre-tested. The seventh part of the study involved undertaking the external interviews.

Parts Eight to Ten: All the interviews (both internal and external) were transcribed and examined, initially by undertaking a content analysis. This gave a framework around which to structure the reported findings of the study. Concurrently, the statistical computer package Minitab was used on the data in the questionnaires to quantify the findings of the interview transcripts.

3.2.2 Sample Selection

Inasmuch as this research aimed to develop a framework of key marketing success factors for the industrial scientific profession (resulting from investigating the DSIR and their past, present and potential clients), it is appropriate to identify firstly, the reasoning for investigating *this* specific organisation, and then to discuss the process of internal and external sample selection.

Why the DSIR Departments that will constitute the CRI Industrial Research Limited (IRL) were chosen for this research.

The organisation was chosen, as the centre for an investigation of the industrial scientific profession and marketplace, for the following reasons:

- The DSIR is the largest Industrial Scientific Professional Organisation in New Zealand (including New Zealand subsidiaries of multinationals) and, therefore, offers great scope in developing an overall understanding of the industry.
- The DSIR undertakes government and commissioned consultations throughout New Zealand and other regions of Australasia. This means that the employees of the DSIR have developed viewpoints of the market situation in multiple regions, and clients in these many regions have concurrently developed viewpoints of the DSIR throughout its restructuring and history.
- The sections of the former Department of Scientific and Industrial Research (DSIR) that will form IRL have many service offerings. These include both Scientific and Industrial services from the routine Calibration of Equipment through to the Mathematical Modelling of Processes and on to the complete re-designing and re-engineering of a factory. Therefore, the respondents in the study included employee scientists of the impending IRL and clients from a range of Scientific and Industrial disciplines.
- The New Zealand Government is the owner of the DSIR. This overcomes the bias that New Zealand subsidiaries of multinationals have, with their Head Office in another market environment directing their marketing activities in New Zealand. All effort to develop a marketing strategy for the DSIR comes from within the local industrial scientific market. This indicates that the opinions and

perceptions of the marketplace by the DSIR, and the strategies they develop in response, are directly testable by the market. This is in contrast to the subsidiary organisations which have limited local content to their marketing strategies.

- The DSIR has been undergoing restructuring since the mid 1980s and is likely to continue for at least another year. This has caused the organisation to struggle in its marketing efforts, indeed even to begin planning towards a marketing focus. Therefore, there was a need to undertake this study for IRL's marketing planning in the future and for an understanding of the greater industrial scientific market and how marketing *fits* this environment.

Internal Sample Selection Process

At this stage in the research, before the external interviews, it was important to develop an understanding of the *overall* perception and comprehension the Case Study Industrial Scientific Organisation - the DSIR - has of the marketplace. Therefore, it was important to interview respondents from all levels and disciplines within an organisation of 300 employees.

Table 3.1 lists the positions of respondents from the DSIR. All levels of the organisation have contact with clients, but especially the Scientists/Technicians and Business Development Managers who have daily contact with client organisations. The respondents were representative of the organisation throughout New Zealand (Number of respondents at each location: Auckland = 7; Wellington = 8; Christchurch = 2; Service Areas = 2).

Table 3.1 Internal Respondents by Position

Position	Number of Respondents
Chief Executive Officer (of IRL)	1
Divisional Managers	3
Laboratory Managers	4
Scientists/Technicians	8
Business Development Managers	3
TOTAL	19

External Sample Selection Process

The information sought from clients in the industrial scientific marketplace had two main areas. Firstly, it was important to develop an overall picture of clients' opinions and perceptions of the entire market and secondly, more specifically, how clients perceive the DSIR in the marketplace. Therefore, the respondents had to be familiar with the DSIR and have a viewpoint on the overall industrial scientific market. Appendix A lists the variety of respondent organisations in the study, and the interviewee's position as the person responsible for the contracting of scientific and industrial assistance.

The population list from which the sample was drawn was obtained from the DSIR. The list contained 32 suitable people to be interviewed. They were sent an introductory letter to the research (Appendix B), by facsimile, and were telephoned two days later to obtain an interview. This resulted in 26 in-depth interviews with clients of industrial scientific professionals throughout New Zealand.

There were three primary types of respondents desired so as not to bias the results in a favourable or not so favourable manner towards the DSIR. It was necessary to gain both respondents that had contracted work from the DSIR in the past but now did not, and those that are presently undertaking projects with the DSIR. The third category of respondent was potentially desirable clients to the DSIR and other scientific industrial professionals in the market that had never contracted work from the DSIR, desirable clients being determined as those which undertook a pre-determined level of scientific and/or industrial research, that could become project work for one of the organisations in the profession.

Although it was important to have respondents from each of these three categories of industrial scientific clients, they are not mutually exclusive. As most clients in this market are considered large organisations (Approximate Turnover of \$100 million per annum or higher), with more than one specialist area of potential project work, they may be currently a past and present or future client of the DSIR (for example, the different functional areas of Watties NZ Ltd or the New Zealand Dairy Board).

3.2.3 Research Instruments

Introduction

The study sought to measure *the* position of all the respondents in the samples and how strongly they felt about each issue. Therefore, the most appropriate instrument design includes dimensions of attitudes along which respondents can be positioned and most importantly an opportunity to express their rationale for this position.

The design of the instruments for the internal interviews (within the DSIR) and external interviews (with the market) have a high level of commonality, and the similar parts are discussed in the introduction, then information regarding the specific design of the questionnaires for each of the two samples is discussed. Appendix C provides a sample of the Internal Questionnaire Guide, and Appendix D is a sample of the External Questionnaire.

The interviews were undertaken at the respondent's place of work to make them feel at ease in familiar surroundings, and to aid in their willingness to appoint enough time to undertake the full interview without the need to travel.

Each interview was taped with permission. The structure of the interviews was dictated by a comprehensive questionnaire and, for the external interviews, supplementary information cue cards. However, if it was felt the respondents could supply additional information that was appropriate to the study, the questionnaire allowed for these departures and the respondents were invited to proceed.

The respondents were asked both dichotomous questions and to indicate on a five-point Likert Scale, Itemised-Category Scale, or five-point Semantic-Differential Scale to quantify their response, then probing questions were asked to qualify why they had given this response. Research suggests that a five-point attitude scale with a mid-point is most readily comprehensible to respondents and enables them to express their views (Worcester & Downham, 1986; Aaker & Day, 1990).

It was important when undertaking exploratory research in this previously undocumented professional service to gain preliminary rankings of the responses from the sample, but more importantly to gauge the overall opinions and perceptions of the DSIR and its market with regard to the organisation, its competitors, and the services offered. Therefore, the qualitative data gained from the interviews

comprises a major focus for analysis in this study.

The Nordic School of Business' Gummesson (1987) and Gronroos (1989) used similar methods in their professional service audit research, combining quantitative and qualitative questions. Their studies were some of the extant literature on marketing audits following this method (Cronin & Taylor, 1992; Berry et al., 1991; Payne, 1988). They found that five-point Attitude Scales, as used in this study, had the highest validity in testing for opinions and perceptions in professional services studies. However, they kept the two styles of research mutually exclusive in their studies (Gummesson, 1987; Gronroos, 1989), thereby not gaining the benefit of both types of data from the same question, where the respondent may indicate a preference on a scale then have to explain why they recorded that preference. This not only forces the respondent to be thoughtful when selecting their initial quantitative response as they will have to justify it, but also gives an opportunity to both expand and clarify exactly what the respondent intended by their initial response. The second type of qualitative information, the respondent's *intention*, often reveals their true opinions and perceptions, which add validity and are central to this qualitative study.

The repetition of some key areas in the investigation, through duplicate questions worded slightly differently in the questionnaires, added to the validity of responses. This was deemed necessary because, during the piloting of the questionnaires, some respondents, when discussing their answers in retrospect, admitted to giving reserved and partial answers to some topics rather than their true thoughts. The small size of the industry and familiarity of colleagues could be a possible cause for this result.

Internal Interview Instrument

The objectives of the interviews were to gain employees' attitudes and perceptions of the DSIR and the industrial scientific profession, and secondly, their perceptions' of marketing.

The interviews were probing the respondents' opinions and perceptions and, therefore, a sufficient level of rapport had to be developed with each respondent. This required in-depth interviews of one to one and a half hour duration.

The questionnaire for the internal in-depth interviews had 15 probing questions

obtaining mainly qualitative information (Appendix C). There was no defined structured format for the questionnaire. As the study aimed to gain respondents' viewpoints, it was important to conduct the interviews in a discussional manner and only to refer to the questionnaire for guiding topic areas.

External Interview Instrument

The objective of the external interviews was to gain an understanding of the respondents' opinions and perceptions of the DSIR, their feeling on the recent changes in the organisation structure and to determine their present and future needs in scientific and industrial research.

The in-depth interviews had a one to one and a half hour duration and were chosen as the most appropriate method due to the need to seek opinions and perceptions of the respondents on the scientific and industrial profession.

The questionnaire was held by the researcher during each interview. As the questions contained both scales and organisation lists for the respondents to indicate their preference and detailed information for the interviewee to sort regarding the services provided by the DSIR, it was deemed appropriate to supply 'cue-cards' for the interviewee's reference. These cards gave them a sense of inclusion and clarification in the interview process and helped to retain their complete attention. Within the questionnaire in Appendix D are the scales and organisation lists, and in Appendix E is the list of service 'cue-cards'.

The researcher was involved in a previous study gaining similar information regarding members' views of services provided by their Association. When 'cue-cards' were used it was found that the members liked to see each card in front of them. They could then undertake the task asked of them in the interview regarding the services, and not have to rely on recall. The present study not only contains several scales and organisation lists, but there is also a section where 20 services of the DSIR need to be fully understood, compared, sorted and discussed. Therefore, the 'cue-cards' were deemed appropriate as there is too much information expected at one time to gain meaningful responses from the samples' recall (REINZ Unpublished Report, 1992).

The questionnaire for the external in-depth interviews had 30 questions obtaining

both quantitative and qualitative information. The questionnaire for the interviews was composed of three sections:

The demographic questions were the first section. There are three reasons to explain the rationale for the design and placement of this section here:

1. To gain background information on the respondent organisations.
2. To determine how long the respondents had been in the particular industry. This was because the DSIR has undergone a large amount of structural change over the past five years and it was important to know if the respondents had had dealings with the past traditional government department of DSIR, or whether they had only dealt with the more recent, fee charging, privatised organisation.

The information on the recency of the respondents to the industry was also relevant with regard to their opinions and perceptions of scientific and industrial organisations other than the DSIR. Since competitors from other government departments (for example, the Ministry of Agriculture and Fisheries or the Dairy Research Institute) and the universities have undergone restructuring over the past five years and have also begun to change their fee structures, review the services they offer, and how they market the services.

3. The in-depth questions on the scientific and industrial profession were too focused to begin with as the interviews were undertaken in the offices of the respondents. Therefore, taking a few minutes for the respondents to detach themselves from their work environments and become suitably relaxed to discuss their views on the industry when they had completed the demographics section.

The second section contained questions on the scientific and industrial research profession as a whole. This included:

- Respondents' dedication to scientific and/or industrial research
- Scientific and Industrial Research Buyer Behaviour

The final section of the study concentrated specifically on the DSIR. It was necessary to have this section preceded by the industry wide questions to reduce bias, as the respondents needed to answer section two without the DSIR as the most

recent and predominant organisation in their memory.

The structure and content of the questions in this section, more specifically on the DSIR and *new* IRL, were to gain information in the following areas:

- Awareness of Structural Changes to DSIR/IRL and Market Environment
- Image of the DSIR and *new* IRL
- Market requirements for Scientific and Industrial Research
- The Market's Perception of the "Client-Company" Relationship with the DSIR.

3.2.4 Method of Analysis

The present study is primarily a Humanist-based qualitative study, inasmuch as the study seeks to know more about people. Humanists believe that all knowledge is relative to the knower (Gabriel, 1991), therefore, 'people-based' techniques are required in this study.

This qualitative investigation has a relatively small number of participants who are not sampled on a probabilistic basis. The study is not attempting to draw hard and fast conclusions in this newly researched profession. Instead, it is employing qualitative methods of analysis that are impressionistic rather than definitive. The study aims to gain an understanding of the meaning of what people are saying, and to understand how the area of study looks to them, rather than putting a major emphasis on the calculation of exactly how many respondents agreed or disagreed with a statement.

It is important to formalise how the transcripts and memories from the interviews become reliable and useful statements. Gabriel (1991) suggests three tests that are appropriate for this style of study: credibility, transferability, and confirmability.

In applying the credibility test the respondents were presented with the preliminary findings and their reactions noted. A report was submitted to the DSIR and later discussed with clients. This resulted in a reaction of acceptance to the interpretation

of the research that not only affirmed the results, but also showed the need for this study to aid in planning efforts within the industry (Appendix F).

The transferability test is satisfied when results show similar findings among similar groups. The present study samples contain respondents from similar industries, locations, and positions. For example, in the external interviews Research Managers from public producer boards and from private industry were interviewed. While within the DSIR, respondents from similar positions from throughout New Zealand were included.

Confirmability is the third of the validity and reliability tests in the Humanist methodology. This involves the use of auditors who monitor all aspects of the research process. This study has passed confirmability from two monitors. The first is the academic supervisor for the study who reviewed all aspects of research design and assessed the results and conclusion as the most reasonable to obtain from the data. The second is the management of the DSIR, who were consulted throughout the design of the research and provided guidance and input.

A content analysis was undertaken on the interview transcripts. It was deemed appropriate to employ some method of cross validation to offset the intrinsic subjectivity of qualitative research. Therefore, the combining of quantitative sections with many of the external interview questions, as a check on the subjectivity of content analysis, was designed and concurrently analysed.

Chapter Four

Research Findings

Internal Interviews Results and Discussion

4.1 Introduction

The main objective of the interviews was to gain DSIR employees' attitudes and perceptions of their organisation, the industrial scientific profession, and marketing. Therefore, establishing a level of rapport that would find out the viewpoints of the respondents was more important than strictly following a structured questionnaire format.

Despite the exclusion of a structure for the interviews and interview questionnaire guide, the results have evolved into three interrelated sections which will be discussed respectively:

- 4.2 Employee Beliefs Regarding the Role of the DSIR and its Scientists.
- 4.3 Employee Attitudes of the Impending Change to Commercial Crown Research Institutes (CRIs).
- 4.4 Marketing, Planning, and Change in the Industrial Scientific Profession.

4.2 Employee Beliefs Regarding the Role of the DSIR and its Scientists

4.2.1 Introduction

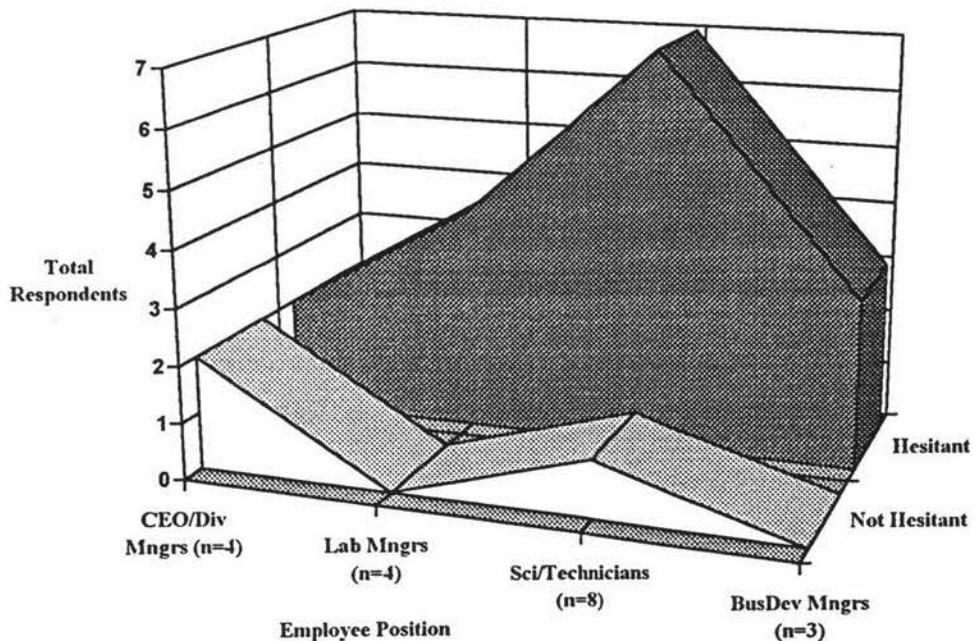
This section of the study investigates the respondents' opinions on how suited the DSIR human and physical resources are to undertake a greater level of industrial projects. After the respondents discussed the suitability of their organisation to becoming more commercial, they were asked what type of organisation they thought the present DSIR is in comparison to the forthcoming CRIs.

4.2.2 Colleague Hesitancy Towards a Greater Level of Commercial Work

Respondents were asked to project their thoughts as to whether their colleagues would be hesitant to undertake more commercial work. Overall, as illustrated in Figure 4.1, respondents are pessimistic about their colleagues' willingness to undertake commercial work. Figure 4.1 shows that the respondent upper level management (Chief Executive Officer and Divisional Managers) are equally split in how hesitant employees are to carry out commercial work. The managers who have daily contact with the scientists and technicians at the DSIR, the Laboratory Managers and Business Development Managers, agree that all employees will be hesitant. These results are supported by only one of the Scientists/Technicians interviewed feeling optimistic about their colleagues undertaking commercial work.

The pessimistic stance of the Business Development Managers may be explained by their positions which require continuous contact with clients and industry. This, therefore, gives these managers an understanding of the full extent of the transition employees will need to go through in order to successfully market their services.

Figure 4.1 Respondents' Perception of Colleagues Hesitancy to Undertake More Commercial Work



In Figure 4.1 the respondent Scientist/Technician and Upper Level Managers who are optimistic, qualified their answers by stating that while there are some scientists who *actually* enjoy "industrial problem solving" and "liaising with customers", these scientists are a minority in the DSIR. These descriptions, while optimistic in nature, also highlight the difficulty and antagonism of undertaking commercial work, by repeatedly citing marketing and sales as commercially oriented functions that scientists greatly oppose implementing. Therefore, it appears that only a few employees are willing to undertake commercial revenue generation tasks. In contrast, these tasks are perceived by the majority of scientists to be not only undesirable but inappropriate for their profession.

The respondent Divisional and Laboratory Managers were asked to explain why they thought some colleagues enjoyed "commercial problem solving". In contrast to the Scientists/Technicians and Business Development Managers, they stated that some scientists had already been "forced" to undertake commercial work and learnt that "industrial problem solving is very invigorating and rewarding due to the feedback from industrial clients". This result suggests that the apprehension and fear of relying less on government revenue and more on commercial revenue could be reduced by an educational programme for the DSIR. The scientists who enjoy undertaking commercial work could contribute to the programme by offering advice and peer encouragement from their experiences of gaining commercial revenue.

Howard proposed that "... managing change in professional service firms has always been problematic" (1991, p.111). Thus, the change required for a commercial focus in the professional culture of the DSIR would be slow and need guidance and support from management. The organisation has undergone almost continual restructuring over the past decade and employees would need to understand the benefits of the impending change. If this is not achieved then the service offered by the scientists will create less satisfaction for clients than if the scientists felt positively about their role in the industry.

The following comments from respondents summarise their overall pessimism towards their colleagues' ability to undertake more commercial work:

- "Some scientists that (*sic*) are very good at the 'sales' of their services, while others hate it. I do it (marketing) but don't like it."
- "They (Scientists) think it is their god given right (*sic*) to do research and don't add too much to society. They are very stubborn and will not like

leaving their labs to sell their ideas."

- "There is a resentment to the need to do commercial work by many scientists, however, they are becoming realistic to the situation of needing to do commercial work."
- "Another problem is that there are very capable scientists at DSIR, but they are neither salesmen nor marketers."

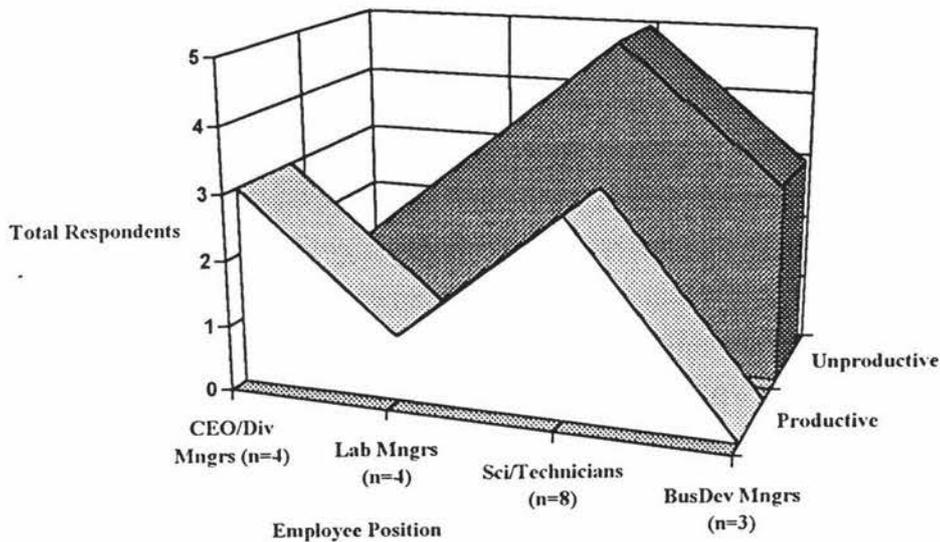
4.2.3 Productivity of the DSIR Resources

The role of the DSIR and its ability to successfully gain revenue from more commercial work, although very reliant on personnel, is also dictated by the productivity of the equipment and facilities of the organisation. Two thirds of the respondents felt that the physical resources are unproductive. Figure 4.2 illustrates that these respondents are mainly the Scientists/Technicians and Laboratory Managers who work daily with the equipment. All respondent Business Development Managers perceive the equipment as unproductive. This could be a result of the positions of both groups of respondents requiring them to continuously liaise between scientists and the clients. Consequently, these respondents keep informed about the full scope and ability of the organisation's service offering.

Employees who work daily with the equipment of the DSIR perceive that the R&D facilities are becoming unproductive, as commercial projects do not take full advantage of the scientific scope of the facilities. They state that commercial work is less complex than pure scientific research. Two respondent Laboratory Managers explain this situation:

- "We are getting to the situation that they (the Scientists) often do commercial work with equipment, but don't do much actual scientific research on them (*sic*) any more. So we have very expensive, complex facilities that no one wants to use, especially if they have to pay (for them)"
- Now you can take the 'S' (Scientific) out of DSIR. They are basically a contract company and an organisation will contact them to say set up some new overseas technology in their processes, which is great technology transfer, but is not really furthering R&D or giving the scientists challenging problems."

Figure 4.2 Respondents' Beliefs of Whether the Resources of the DSIR are Used Productively



Three-quarters of the upper level management respondents who were interviewed maintain that resources are productive. This opinion may be due to the DSIR management's rationalising of resources over the past few years. This may have resulted in the perception by these managers that after both reducing and monitoring the efficiency of resources, they will now be productive.

The discussion of resources with employees included the view that not only do three-quarters of all respondents perceive the resources as unproductive, but they also feel the facilities are no longer state-of-the-art. However, this is not seen as a major problem as respondents conceded that the move to commercial projects will result in less demand for complex scientific research equipment. This shift is seen as a great loss for the country and a demotivating factor for the DSIR scientists. This view is summarised by two respondents who stated that:

- "A lot of the equipment at the DSIR is no longer state-of-the-art. This isn't a real problem, especially for people doing work for companies, they (the Scientists) don't complain it holds them back."

- "Companies mainly don't need complex research (undertaken)."

4.3 Employees' Attitudes of the Impending Change to Commercial Crown Research Institutes (CRIs)

4.3.1 Introduction

This section investigates the respondents' attitudes towards the government decision to restructure the DSIR into Crown Research Institutes (CRIs). In contrast to the previous section which reviewed respondents' beliefs about the role of the DSIR, the respondents' attitudes to the impending changes will be explored. Respondents discuss how the change to CRIs will affect their Department of the DSIR. Then, with the requirement for more funding to be generated from commercial projects, respondents indicate how important it is, specifically, for their Departments to undertake more commercial work. The respondents then outline factors that would constitute an ideal operating environment for the DSIR.

4.3.2 Effects of the Upcoming Change on Respondents' Section

The respondents were divided in their discussion on the effects that the upcoming changes would have on their specific sections. The change to CRIs was not seen as a major structural adjustment for one group of respondents who consisted of mainly management. They compared the forthcoming changes with their experience of the recent changes they have already undergone towards a commercial orientation. The level of previous change was regarded as substantial, prompting one respondent Laboratory Manager to ask, "How much more change can we actually go through?".

With respect to Industrial Development, one respondent suggested that they will, "... not perceive a particularly large change as they have been changing over the last few years. Not particularly (notice the change), because they are the industrial section of the DSIR, but because they have all been forced to move down the road to a commercial orientation already".

In contrast to the above perspective of the change, the remaining respondents, who were mainly Scientists and Technicians, discussed the CRIs in relation to the DSIR

operations of more than ten years ago. This second group of respondents' historical point of reference could suggest a desire for the DSIR to return to the original government department of more than ten years ago because of dissatisfaction with the past decade of changes. The outcome of this historical comparison, not explicitly regarding the recent changes, has resulted in this group of respondents perceiving the restructuring to CRIs to be major changes. Specifically, they discuss changes to the types of research that will be funded by government and demanded by industry, and the methods the new CRIs will be required to follow to gain this funding:

- "Big changes, as DSIR 15 years ago did research in whatever area they wanted and did not regard industry at all."
- "Soon the longer, not as particularly industry viable (pure) research or presently useful research, will not be funded (by the government) or wanted by companies."
- "Going to CRIs means that we will have to be a lot more aggressive in getting not just Crown money, but especially industry funds. This would involve persuading industry that the longer term research will be of use to them."

Overall, after discussing the impending changes, the employees admit to not understanding fully the effect the changes will have on their specific sections of the DSIR. This resulted in some respondents projecting their knowledge of the previous changes to their organisation in an attempt to comprehend the extent of the forthcoming restructuring. They explained their lack of understanding as a result of the initiative for the restructuring coming from the government, not from within the DSIR. The absence of a sense of control and knowledge of the changes was repeatedly mentioned by the respondents:

- "The overall feeling is that the government restructuring (to CRIs) will not be good, in the past there has been a lot of redundancies."
- "The changes will have to go through a settling in period, as no-one here really knows what the result will be."
- "There won't be any magical overnight successes because of the change, as the majority of scientists don't know what is expected of them yet, or if they will be able to comply (with the changes)."

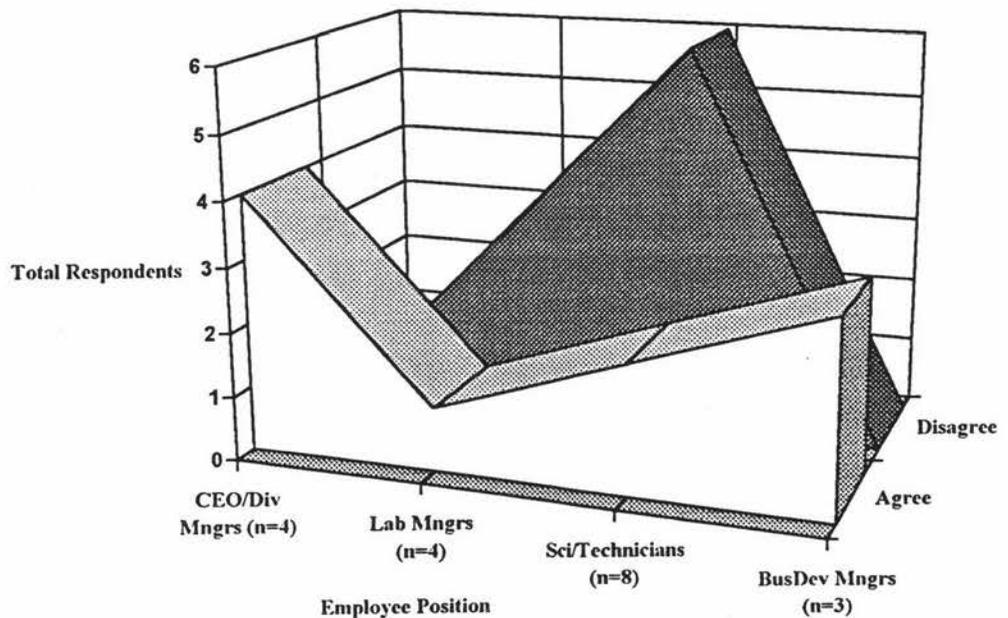
These results suggest the need for an education programme on the changes for the employees. The programme would aim to create a greater awareness of how the

changes will effect employees and, therefore, attempt to achieve a greater level of compliance for the changes.

4.3.3 Importance for Respondents' Section to Undertake More Commercial Work

With the changes to CRIs requiring a greater percentage of funding generated through work with industry, respondents discussed how important it is specifically for their departments to undertake more commercial work. Figure 4.3 highlights a distinct difference in the level of agreement for commercial projects. This difference is not between departments of the DSIR, but between Administrative and Development Management and the Laboratory Managers and Scientists/Technicians.

Figure 4.3 Respondents' Agreement that the DSIR should be doing more Commercial Projects



The managers who agree with more commercial projects described the reality of the DSIR moving away from total research and development and, as one Divisional

Manager explained, "towards a greater amount of fusion and diffusion of technology". The other managers who agree with an increase in commercial projects are the Business Development Managers. Their positions have been developed in the DSIR to increase the level of commercial clients. Therefore, their job descriptions are based on the aim of generating more commercial revenue.

These results suggest that the Managers feel it is important to undertake more commercial work while Figure 4.3 illustrates that the majority of Scientists/Technicians and Laboratory Managers who are responsible for implementing projects disagree. Therefore, a possible dilemma arises whereby the project workers may either undertake the extra commercial work under duress or refuse and become inefficient at commercial work. Either way a possible solution is the education of employees as to the overall benefits of commercial work.

The greatest comments on the topic of commercial revenue levels came from Scientist/Technician and three-quarters of the Laboratory Manager respondents. Their responses may be categorised into two areas of concern, the ratio of public to private revenue sources, and the concentration of effort on project proposals.

At present the DSIR gains over 70% of revenue from the Government's Foundation for Research, Science, and Technology (FORST). The Scientist/Technician and Laboratory Manager respondents feel that this is the right level of public funding. Their concern is that if fewer projects are publicly funded and more revenue is generated from industry then, "... it becomes very difficult to do good scientific work". When the respondents were asked why this would occur, they felt that the type of research that the Government would fund is pure/fundamental research with, "... no specific outcome required". This is in comparison to industry projects that have expected outcomes and often do not add to the body of scientific knowledge. Pure/fundamental research is the "... ground work for all other types of scientific research to be based on". These respondents accept that investment in this type of pure/fundamental research has an associated high level of risk. Therefore, it is difficult to get commercial funding for such work.

The DSIR Management are aware that the FORST funding they historically relied on will be less accessible because of Government philosophy on R&D in New Zealand and more specifically, the impending changes to CRIs. In contrast, the FORST funding is regarded by Scientist/Technician and Laboratory Managers as easier to gain and more reliable than commercial funding. Their beliefs are due to the fact that the

DSIR has developed a long term relationship with this Government agency. Scientist/Technician and Laboratory Manager respondents state that:

- "Industry wants to know about processes that will help their productivity, not the fundamental, abstract type science."
- "The 30% of commercial funding is good, but it should not reach any higher. As DSIR will spend too much time on this work if it is increased on a disproportionate amount."
- "The funding from the Crown is 'safe' while you have to work hard for the commercial dollars."

This result illustrates the need for effective communication channels within the DSIR. A responsibility of upper level management should be to inform employees of changes in government policy that will affect the way the DSIR operates. Part of this dialogue should be an invitation by Management to employees for suggestions of how to successfully adapt to the changes. This will work towards making employees feel part of the strategic planning of the organisation and, therefore, possibly result in less employee resistance to change.

The other area of concern to the Scientists/Technicians is the level of time and effort allowed for proposals to gain FORST funding for projects. These respondents feel that although this area is the major source of revenue for the DSIR, and that proposals are the method for gaining research funds, very little investment is put into creating successful proposals. These respondents have several concerns regarding proposals:

- "The people who decide if we get the (FORST) money ... rely heavily on their referees to assess each project proposal. These referees are known by us and, therefore, it depends on our relationship with these people as to the level of funding, if any, (the DSIR receives)."
- "Lobbying towards foundation referees is crucial and deserves more attention."
- "DSIR are still not handling the writing (of proposals) very well."
- "Everything here is recorded in 'P' numbers, which allocates time to a specific project ... if you cannot allocate the writing of a proposal to a present account then you have no time to do it."
- "Scientists are not particularly good at writing up proposals."

The results and comments indicate a need to train and assist scientists in the preparation of proposals. This includes time and budget allocations from Management. Concurrently, the Business Development Managers and Upper-Level Management could lobby FORST referees to increase the likelihood of funds being granted. These suggestions alleviate the concerns of Scientists/Technicians and Laboratory Managers. However, the difficulty of gaining more commercial revenue, considered as the present problem for the DSIR by the remainder of Management respondents, would not be part of these strategies. Therefore, it could be suggested that gaining FORST funding should be considered, along with planning, for commercial revenue. This may result in the DSIR increasing profits from concentrating on present and future sectors of potential revenue.

4.3.4 Factors Constituting an *Ideal* Operating Environment for the DSIR

Following on from the discussion of the impending changes and resultant shift in revenue generation towards commercial project work, respondents describe factors that would help constitute an ideal operating environment under the new CRIs.

All respondents, except three upper level managers (CEO or Divisional Managers), discuss a need to modify the present system for allocating DSIR funds for research. They believe that a system of funding that allowed for the "expected 40% failure of scientific research", is more important than the recent increases in administrative budgets. A solution to this problem, as discussed in the last section, could be to seek FORST funding on the more risk-prone pure research that has a high possibility of producing no useable results, and then to package any useable results as future research for commercial clients.

The respondents highlight two major areas for improvement:

1. Budget Allocations

Respondent Laboratory Managers and Scientists/Technicians perceive a problem of the 'non core service' area of administration being over funded, in comparison with the 'core research service', within the DSIR. One respondent explains that many employees who work in the laboratories believe that the DSIR has a proportionately large administration in comparison with the funding and number of scientists. He states that, "... there seems to be too many managers with too much money, while we

(the Scientists) have to make do (*sic*) with small budgets."

2. Management Focus

Owing to the past restructuring of the DSIR, respondents expressed the need for upper level management to have opinions on the DSIR's business environment, "take control", and have a clear focus for the entire organisation to follow. They consider that the past changes, resulting in short term managerial appointments and "care-taker" management, have resulted in the organisation lacking direction. One respondent explains that, "It is better to have drive in the wrong direction than not to move at all!" Respondents observe that the lack of management focus has caused employees to be less motivated, which is compounded by the difficulty that scientists are experiencing in gaining funds for research.

Despite these concerns respondents feel optimistic about the change to CRIs, as the new structure will it is hoped bring a "much needed stabilising influence" on the employees and a chance to develop a clear cultural identity.

4.4 Marketing, Planning and Change in the Industrial Scientific Profession

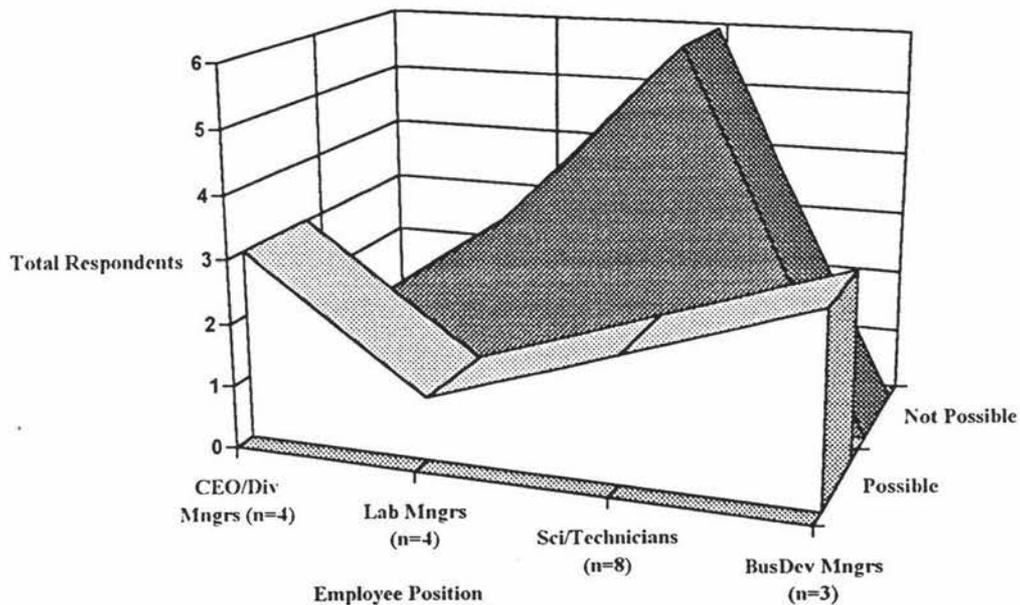
4.4.1 Introduction

This section focuses on DSIR employees' opinions of how to survive in the new business environment as a consequence of the impending restructuring. Of major interest to the Government Task Force on Science, set up to develop the CRIs, is the ability of the CRIs to become 'research-arms' of large organisations. The respondents' opinions about their organisation becoming 'research-arms' to large clients are discussed, including their views on possible strategies and barriers to this focus on large organisations. Then the respondents explained, from their perception of the industry, the appropriateness of employing marketers and business specialists to assist and plan towards the change to CRIs.

4.4.2 CRIs Sustaining Long Term Relationships with Large Clients

The possibility of the CRIs becoming the 'research-arms' of large organisations, as illustrated in Figure 4.4, created a mixed response of opinions. The respondent upper level managers and Business Development Managers fully agreed that it was possible to become 'research-arms' of large organisations, while nine of the twelve respondents, Laboratory Manager and Scientist/Technician, respondents disagreed that this focus was possible.

Figure 4.4 Respondents' Agreement to the Possibility of the DSIR Becoming the 'Research-Arm' of A Large Organisation



The optimism shown by the Business Development Managers may be due to their positions being developed by management, which focuses on business growth strategies for the organisation. This suggests that the upper level management, who created these development positions owing to their investment in gaining long term relationships with large organisations, inherently agree it is feasible. One Divisional Manager explains that although there is a possibility for these relationships, "Business Development Managers will have to work hard to secure them, as R&D is a product

that is not particularly popular or desired, because commercial clients can't see a short term gain from the research. Therefore, getting them (the Clients) to pay us over the long term is very difficult".

When the respondents were prompted to explain why they felt this strategy was possible or not possible, they began discussing potential barriers to gaining the long term client relationships. This also included the managers who were initially optimistic about the possibility of becoming 'research -arms' of large organisations.

Previously, Scientists/Technicians and the majority of Laboratory Managers stated they did not want the DSIR to undertake a greater level of commercial work, explaining that it was against the philosophy of the organisation. They reiterated the pure science philosophy of the DSIR. These respondents described that commercial clients would not want to develop long term relationships with their organisation because they do not see the benefit in commissioning research (research is defined by these respondents as pure and fundamental research). Owing to the predisposition of these respondents, they felt pessimistic towards the possibility of long term relationships with industry to undertake pure research:

- "Companies cannot see the return on their investment."
- "(Clients) prefer the DSIR to be the fire-fighters, not fault prevention or efficiency monitors. These types of R&D take time and industry doesn't want to pay over the long term."

The Laboratory Managers specifically, described the human resource and internal problems that they thought would limit the CRIs developing long term relationships with clients. These areas of concern included factors such as making each scientist accountable for project work and the demotivating influence commercial work can have on scientists:

- "Management's aim to make everyone accountable for all that they do has actually made DSIR very unproductive due to the extra pressure of paper work. Scientists are not particularly suited to the extra tasks involved in being accountable and the team leaders become disillusioned."
- "A lot of the scientists that were into long term work have had to adapt to shorter term work. But unfortunately this causes the scientists to decrease their level of ability in doing research. They are not really challenged."

The management respondents that initially felt optimistic about gaining long term relationships with clients, described problems in industry that would create barriers to the formation of these relationships. The industry barriers described by these respondents include the lack of importance the market places on commissioning work from scientific and industrial professionals:

- "Most boards of directors, in industry, don't have a large scientific representation. The outcome of this is that there is an ignorance to the need and benefit of research and technology."
- "Many have heard of DSIR on a public level, but they have not heard of DSIR to do a project for them. They see DSIR as doing DNA testing or sending things into space, not doing jobs in their field."
- "Industry is looking to survive at present, not to develop new "products", therefore, they don't want more than one off-jobs at present."

The barriers outlined by the respondents suggest the need to implement educational programmes in the DSIR's planning. Employees need to be aware of the merits of commercial work and ways to undertake it. This would be satisfying to themselves, as employees of the DSIR, and satisfying to the clients. Externally, the market has to be educated on the benefits of scientific and industrial research, and more specifically, why investing in project work with the DSIR will be worthwhile.

One Business Development Manager was the only respondent who offered any solution to the barriers. This respondent supported the need for an education programme for the market by stating that, "... there needs to be some education role that will mean industry people will come to DSIR to learn what we do."

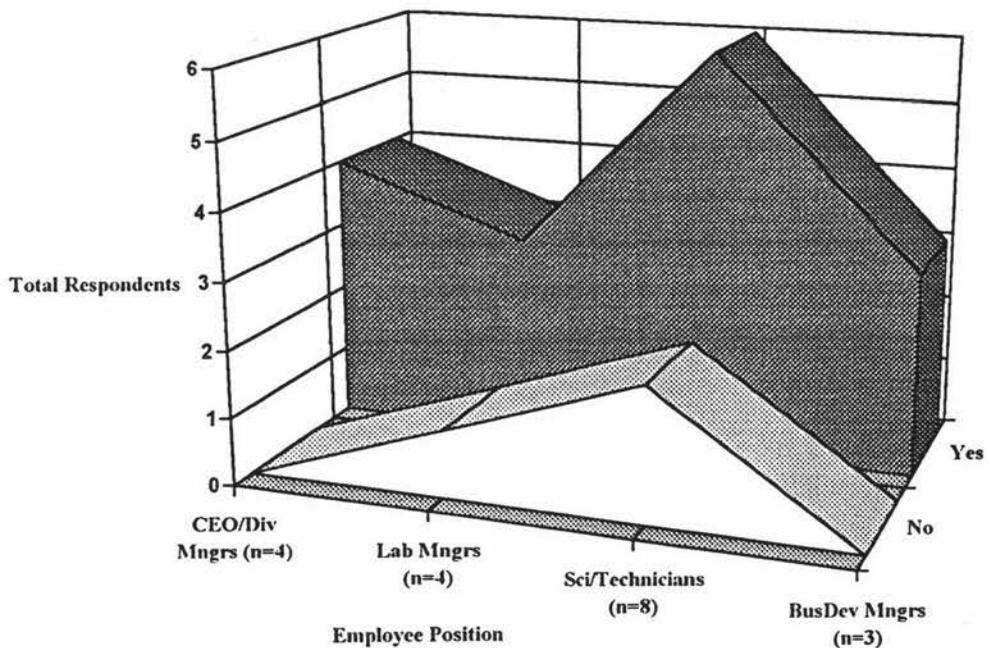
4.4.3 Appropriateness of Marketing Assistance for the DSIR

The employees of the DSIR generally perceive the role of their organisation as one of a public service aiming to further New Zealand's ability in Science and Technology. Employees do not want the present 30% level of commercial funding to increase, because a greater emphasis on pragmatic, industrial projects would not challenge the DSIR Scientists, and would result in a lower standard of output in the country's R&D. This outcome suggests that the respondents would prefer to concentrate less on commercial funds.

However, the changes to CRIs and expectations of lower levels of funding from the Government, prompt all respondents to assert that concentration on generating more commercial funding is inevitable. Overall, there is agreement from the respondents that Marketers will be able to assist with this focus on commercial funds. Figure 4.5 displays the agreement from 16 respondents, from all levels of employment within the DSIR, to the benefit of Marketing assistance.

The Business Development Managers and upper level management are in full agreement with Marketing assistance. This could result from these Managers having a marketing emphasis in their daily activities. For instance, Business Development Managers have a sales component in their job, while the majority of upper level management have been recruited from industry where companies have an inherent commercial orientation.

Figure 4.5 Respondents' Opinions as to Whether Marketers can Assist the DSIR in the Future



The Business Development Managers and upper level managers were asked to discuss the present level of marketing activities in the DSIR. The techniques that the respondents described as marketing activities currently utilised in this professional

organisation included: cold calling on prospective clients; telephone canvassing; travelling salespeople; advertising, and non-direct mail outs. Respondents commented on how effective they perceived these activities to be:

- "Scientists have both an aversion to, and are not very good at, doing cold calling."
- "A lot of money has been spent on publicity and mail outs but, from what I understand, the response was minimal."
- "The scatter-gun approach to marketing is not very effective. It seems to be taking a long time, and a lot of trial and error, to decide what (marketing techniques) will help us (the DSIR) the most."

To gain a greater understanding of what the DSIR employees understand marketing to include, all respondents were prompted to specifically discuss the activities they believed would be necessary for their organisation to undertake if they implemented a marketing strategy:

- "It takes a special sort of person to be a marketer or a salesperson. A scientist is a very cautious person, while a marketer totally disregards caution and is very able in persuading people to buy their goods!"
- "Scientists don't like to go door-knocking."
- "We've (the DSIR) travelled around the country trying to gain new clients, but people don't want to commit if you just turn up on their door step."
- "Our (the DSIR's) present allocation of time to (do) marketing is not sufficient, many Scientists prefer doing 'block' marketing. Then when we are free we can rush out and 'do' marketing."

The respondents' general perception is that marketing and sales activities are synonymous. The response from Scientists is that they do not want to undertake sales activities. There is also an understanding by the respondents that 'generally accepted' (Kotler & Bloom, 1984) marketing activities for fast moving consumer goods (FMCGs), including a concentration on such activities as advertising and sales calls, constitute an appropriate marketing 'mix' for the DSIR. In consideration of these results, it could be suggested that internal marketing may aid in educating the employees about the difference between marketing and sales, and also the benefit of a marketing implementation.

There is a general feeling that the present marketing activities described by the

respondents are not very effective in generating commercial revenue. These respondents and the respondent Laboratory Managers explain this is caused by the DSIR Scientists being neither able nor willing to effectively participate in the previously mentioned marketing activities for the DSIR:

- "If the Scientists knew they would have to market their expertise when they first joined the DSIR, they would never have agreed."
- "The follow-up of marketing activities is very difficult. As there might be some initial scouting about for clients by Scientists, then they can't follow them up, as they run out of time."
- "Valuable Scientists are employed in less effective business areas where they don't know what they are doing."

These results and comments indicate that the present 'mix' of marketing activities and techniques are not successful for the industrial scientific profession. There is an aversion by the Scientists to participate in these specific marketing activities, as they do not want to dedicate the time or effort to be able to implement marketing strategies. This result is compounded by the present administrative structure of the DSIR which inhibits employees from fully participating in marketing activities if they desire.

4.5 Chapter Summary

The employees of the DSIR generally perceive the role of their organisation as *the* scientific and industrial research leader in New Zealand. They believe the DSIR's responsibility should be to advance knowledge in industry by concentrating on pure scientific research. Although this has been the aim of the DSIR since its inception in 1926, the employees feel that concentrating on pure scientific research is now in conflict with the needs of the organisation's newly expanding source of revenue; the commercial/private market.

Managers and clients see that commercial work is low level scientific research, which does not make full use of the capacity of the facilities. Paradoxically, the Market and Government still want the DSIR to do pure scientific research. While the Government is saying that less and less will be publicly funded, the Market does not want to fund this style of scientific study because it is perceived as a public good.

The resources of the DSIR are viewed by the employees as 'out-of-date', while the market feels the DSIR's resources are at least as advanced technologically as other industrial scientific professionals. The employees critical view could be due to the scientific professionals striving for quality and therefore demanding quality equipment. The clients only require facilities that are sufficient to supply practical and applied answers to commercial problems not the pure, highly precise, research standards that the scientists have previously aimed to achieve.

The scientists of the DSIR generally believe that a change in the type of research activities they undertake, towards a commercial orientation, is a major concern. The respondents perceive this to be a more important consideration than the effect on the DSIR's image due to the shift towards commercialism. One respondent Laboratory Manager summarised this view of the organisation by stating that, "No, it is not really its (the DSIR's) image at stake, more the actual scientific base of the country at risk." This view demonstrates that possibly the DSIR scientists are introspective in their thoughts on the role of the DSIR, as they discuss what they think is best rather than what the clients may demand. This is a perspective that could be indicative of a professional service. It can also be suggested that the present technologically advanced image of the DSIR is due to the academic reputation of the organisation portrayed by the market.

Respondents were strongly divided concerning both undertaking a greater level of commercial work, and how this may be achieved. The results suggest that gaining commercial revenue is complementary to gaining FORST funds. The DSIR employees may determine potential future areas of research for commercial clients and try to develop these research problems into viable projects for FORST funds. This would enable the DSIR to present clients with packaged service offerings, in the form of pre-tested viable projects, that have already undergone the pure scientific abstract, higher risk stages of testing and analysis. At present, there is a low level of financial investment in proposals and no allocation of budget funds to enable scientists to be proactive, investigate possible client problem areas, and develop these into FORST funded projects. This results in the DSIR being unable to specifically target client demands through offering the market a packaged concept for investigation.

Respondents agree that the DSIR has altered from its original pure science base to adopting a more commercial emphasis. Although the appropriateness of this repositioning has created mixed responses from the employees, the respondents are nevertheless both resigned to the shift and keen to successfully shift towards a greater

commercial emphasis. A major barrier to a successful change for the DSIR is, however, evident as the employees do not know how to gain more commercial revenue. The Scientists perceive that upper level management direction for this change is not present, resulting in the employees waiting optimistically for the CRIs to solve their problems and give direction.

The employees in the DSIR dislike participating in the present marketing activities practised by the organisation. Scientists would prefer Business Development Managers to do all the business activities and leave them to specialise in their laboratories. The techniques described by the respondents generally do not seem appropriate for a professional service (Kotler & Bloom, 1984). For instance, while the market wants business relationships built through communications that are not only industry specific but project specific, this differs from general advertising, cold calling, or telephone canvassing. The clients also prefer to have a package of services or concepts presented to them in contrast with presently having to imagine whether the investment in R&D will be worthwhile.

The results from the interviews with employees of the DSIR suggest the need for an educational programme through the implementation of a framework for internal marketing within the organisation. This would inform the employees of the possible benefits to a greater commercial focus, their roles in this change, and how to change successfully. However, the results advocate a need by management to understand the 'culture' of the DSIR, before considering an internal marketing programme.

Chapter Five

Research Findings

External Interview Results and Discussion

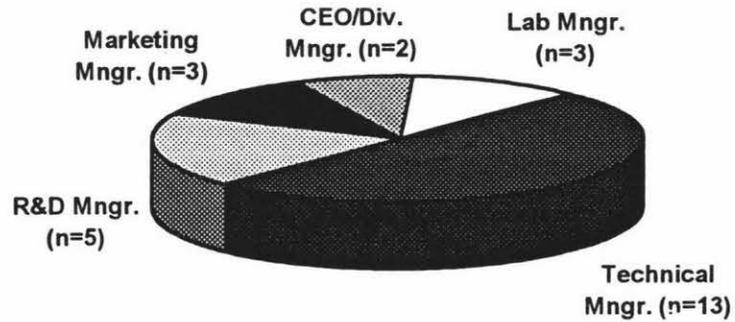
5.1 Introduction

The first two research objectives of this study included determining the market's opinions and perceptions of the Industrial Scientific Profession, and more specifically, the DSIR. This section concentrates on these opinions and perceptions of the profession, the upcoming changes, and the DSIR as a competitive organisation within the market.

In-depth interviews were undertaken with twenty six past, present and potential clients of Industrial Research Limited. The objective of the interviews was to gain an understanding of the respondents' perceptions of (the past) DSIR, and to determine their present and future needs in scientific and industrial research.

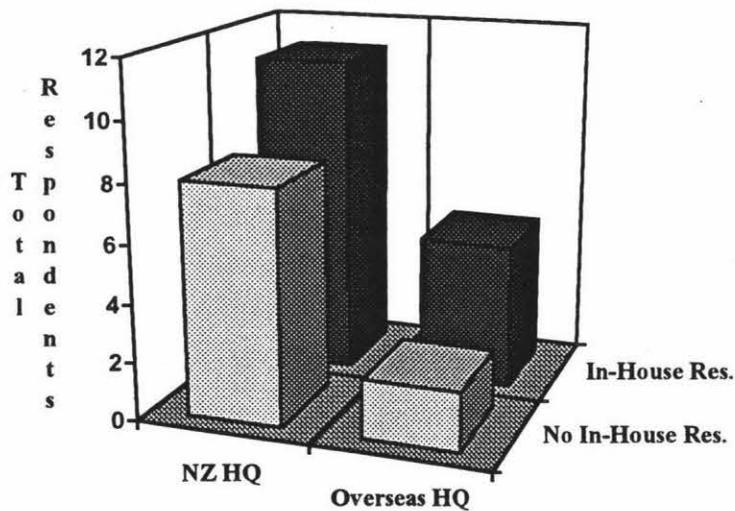
Figure 5.1 shows that almost two thirds of the respondents are either Technical or Research and Development Managers with the majority having over ten years experience in their respective industries. Over two thirds of the respondents are from large (over 100 employees) New Zealand based organisations, established more than 30 years ago (This includes several "Producer Boards" which have undergone restructuring over the past five years).

Figure 5.1 Position of Respondents



There are 16 respondent organisations that have in-house scientific and/or industrial research facilities. Ten of these are based in New Zealand, the remaining 6 organisations gain research information from parent companies or joint ventures overseas. Figure 5.2 illustrates the total number of respondent organisations with their head office in New Zealand or Overseas that have and do not have in-house

Figure 5.2 Total New Zealand and Overseas Respondent Companies with In-House Research Sections



research facilities.

There were two main foci in the interviews with the market: (1) respondents' opinions and perceptions of the scientific and industrial market generally, and (2) the opinions and perceptions of the DSIR specifically in this market.

The sections on the general Scientific and Industrial market begin by investigating the level of respondents' dedication to Scientific and/or Industrial research. Then the styles of purchasing behaviour, by respondents when commissioning research, is analysed.

The sections specifically concentrating on the DSIR in the market review the level of awareness the respondents have about the restructuring of the DSIR into CRIs. Then respondents discuss the image they believe the DSIR has in the market and how this image may alter with the restructuring to CRIs. The respondents continued by outlining the types of R&D services they require and believe the new CRI Industrial Research limited should supply. This section, although primarily referring to the services of the DSIR, is relevant to the services that are demanded from the complete Scientific and Industrial research profession. The final section identifies the style of business relationship respondents presently have with the DSIR; whether this style brings the greatest level of satisfaction from respondents, and how the DSIR might maintain or develop long term relationships with clients in the future.

5.2 Dedication to Scientific and/or Industrial Research

5.2.1 Introduction

A major concern that surfaced during the interviews with the DSIR employees was the level of commitment business has to the commissioning of scientific and industrial research. DSIR employees commented that New Zealand businesses do not see a need to undertake research on scientific and industrial projects at a high enough level to maintain a technological and innovative business sector. This area of concern is the major function of the DSIR, as directed by the government.

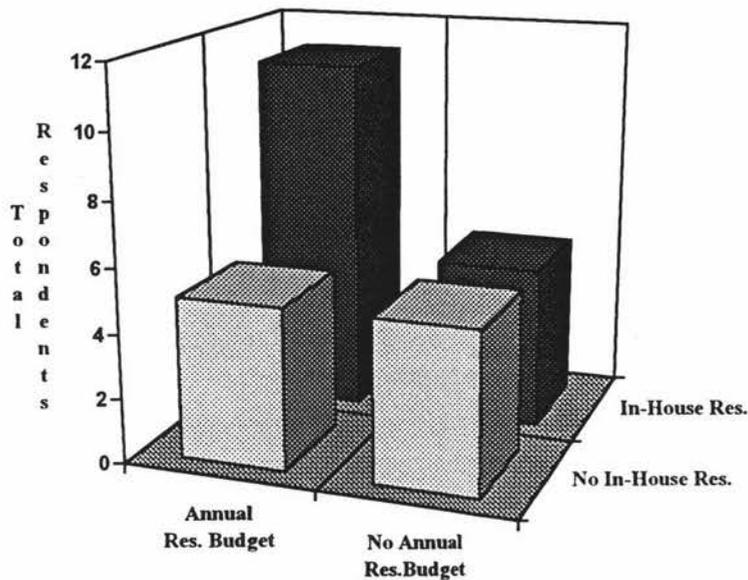
This section does address this issue, by developing an understanding of the level of funds that respondent's organisations commit to research, whether the funds are

allocated on a continuous basis or ad hoc, and their rationale for this stance.

5.2.2 Research and Development Budget Allocation

The respondents were asked if they allocate a budget for scientific and/or industrial research on an annual basis. As shown in Figure 5.3, 16 respondents stated they did, of which 11 respondents mentioned they already have in-house research facilities. Of the remaining 10 respondents who did not allocate funds on an annual basis, five have in-house research facilities.

Figure 5.3 Respondents' Allocation of Research Budgets and whether they have In-House Research Facilities



This result suggests that organisations which invest in their own research facilities will be more likely to understand the need for seeking outside specialised advice from professionals such as the DSIR. This is because these organisations will already be actively participating in scientific and industrial research activities during the year.

The five respondents that do annually allocate funds to research, but do not have in-house research facilities are all government boards. These organisations, which include Producer Boards, are primarily administrative boards that undertake project work with research organisations on behalf of their members.

When the respondents who allocate research funds specified how much they spend annually, nine indicated more than \$100,000, while five of these organisations actually allocate more than \$2 million annually.

Seven of the 10 respondents that indicated they do not allocate research funds annually still undertake research projects. When asked to explain how they provide for funds for research projects, five respondents specified that ad hoc budgets for each project were developed, while the remaining two seek funds from an overseas parent company.

The three respondent organisations that do not allocate any funds to research, when explaining their stance, began to discuss other methods of gaining scientific and/or industrial research besides personally paying for it. These included returning to a producer of machinery to utilise their expertise, as illustrated by respondents' comments such as:

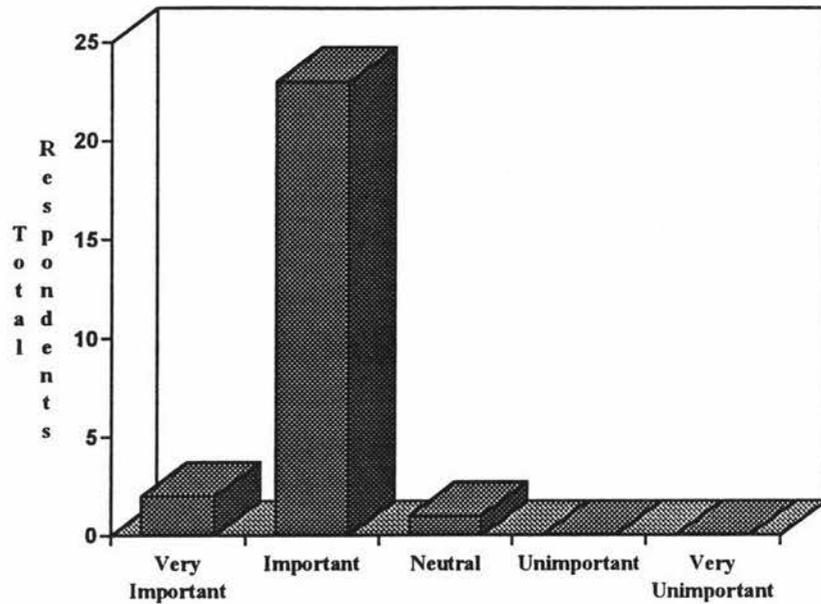
- "We go back to the producer."
- "We don't do pure research, rather we go to the producer of the machinery."

5.2.3 Importance of Professional R&D Advice

The initial concerns of the DSIR employees that New Zealand business does not value scientific and industrial research it appears, is not caused by a lack of interest and investment in the research industry. Figure 5.4 demonstrates that respondents regard seeking outside specialised advice on scientific and industrial research matters as important. This includes the organisations that have in-house researchers as one respondent stated,

- "We can't always have all the expertise in-house ourselves, we can't afford to."

Figure 5.4 Level of Importance Respondents Indicate for Gaining Outside Specialised Advice on Scientific and Industrial Matters



Since these results demonstrate a dedication to research in the market, there is a need for the DSIR and other research professionals to maintain a relationship with their clients. This includes continually reminding clients of the services that they offer and how they are appropriate to each organisation. This strategy is a behavioural method of client learning called Instrumental Conditioning, where communications is used as a reminder to the satisfaction that is gained by each subsequent project undertaken.

Therefore, it is important to understand what factors influence client satisfaction when aiming to develop long term relationships with clients. The following sections of this research help to clarify the true opinions and perceptions the market has regarding their relationships to this profession, and specifically to the DSIR.

5.3 Scientific and Industrial Research Buyer Behaviour

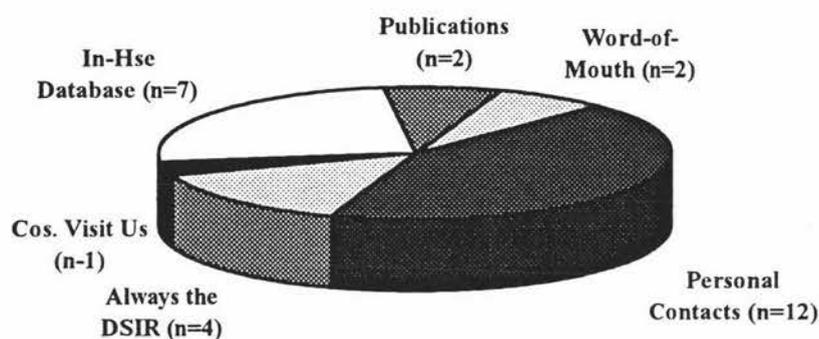
5.3.1 Introduction

To be able to establish successful relationships with clients, it is initially important to investigate the way in which clients buy scientific and industrial research. This section determines the method in which organisations source information when

deciding on a scientific and industrial research professional to undertake project. Then the professional organisations respondents would specifically contract for more in-depth work than technology transfer are discussed. These responses are compared to how-up-to-date each professional in the industry is perceived to be by the market.

5.3.2 Information Sources

Figure 5.5 Sources of Information Referral by Respondents when Deciding on a Scientific and Industrial Organisation



Personal contacts and 'word-of-mouth', as illustrated in Figure 5.5, are used by over half of the respondents when making a decision on the commissioning of a scientific and industrial research organisation. Therefore, it is important for professional organisations to maintain a positive image in the industry and keep the industry well informed of their latest achievements.

5.3.3 Scientific Professional Organisation Choice

Respondents were asked which scientific and industrial research organisation they would consider for changes in a technical process or to optimise a technical process, that includes all research work more complex than the transference of technology from other industries or processes. The majority of respondents indicated the DSIR

would be one of their choices. Over a third of respondents would also gain in-house assistance before seeking outside specialised advice. This group of organisations consists of all but two of the respondents who had stated previously that they have in-house research facilities. This result could be due to some in-house facilities only consisting of operations to assist in technology transfer or be overseas in their parent company. Of the respondents that chose research organisations other than those listed, half said they would approach their equipment suppliers for assistance.

5.3.4 Comparison of Scientific Professional Organisations based on Techniques

The respondents generally perceive industrial scientific professionals to be equally up-to-date with the latest research techniques. Only one Producer Board and small private consultants are seen as less up-to-date than the other professionals. This result, when compared to the high number of respondents that source information personally and by word-of-mouth, suggests that the DSIR is discussed in the market as a modern and experienced organisation. However, this positive position of the DSIR is also where the majority of other research organisations are placed in the mind of the industry clients. This represents that these research organisations have reached the minimum standard of technical expertise demanded in the market and must consider other factors for developing a competitive advantage.

5.4 Awareness of Structural Changes to the DSIR and the Market Environment

5.4.1 Introduction

One of the objectives of this study is to investigate factors that enhance and inhibit the transition from a public organisation to a private organisation. In this section of the interviews specifically on the market's perception of the DSIR, is important to initially establish the level of awareness the respondents had to the structural changes occurring for the DSIR. This included any apprehensions and expectations the respondents had to the changes.

5.4.2 Knowledge of Changes

The respondents were prompted by the following statement to determine primarily if they were aware of the upcoming government restructuring of the DSIR:

" On the 4th of July the DSIR will become 10 Crown Research Institutes.

The new Industrial Development CRI (Industrial Research Ltd.) consists of:

- DSIR Industrial Development (AIDD, IPD, SIDD)
- Physical Sciences (PEL, AMD)
- and Chemistry

Are you aware primarily, of what this may mean in terms of the services they provided?"

Figure 5.6 shows that at first, 21 of the respondents felt that they were aware of how the services of the DSIR Industrial Development will change. When asked what the actual changes will mean 14 of the respondents who initially stated they were aware acknowledged that they actually knew nothing of the details of the change.

Two respondents summed up the feeling of being unaware of the details of the future changes by commenting that,

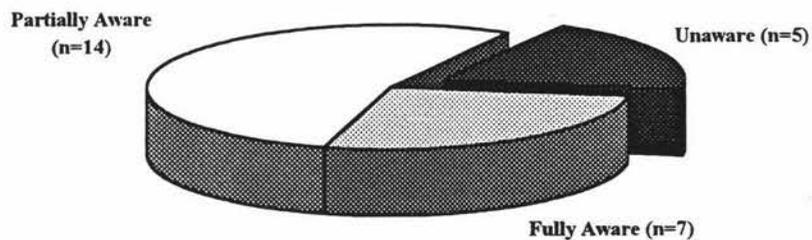
- "I know something is happening, but I don't know what."
- "The DSIR have done zero work on public relations with this transition. We still don't know what is going to happen."

There were only five respondents who stated they knew nothing of how the structural changes to the DSIR will affect the service offering. Of these respondents, four have not had a long association with the DSIR and have worked within their respective industries less than five years. This is in contrast to 20 of the 21 respondents, with varying degrees of awareness of the structural changes and service offering of the DSIR, having been in their respective industries more than 10 years. This group of respondents will have observed many of the previous structural changes the DSIR has undergone during their association with the industrial scientific profession over the last decade. The indication by this group of aware respondents, may denote that they actually know the DSIR has undergone a great deal of change, but it is hard to distinguish if their responses indicate awareness of the restructuring to CRIs.

One of the respondents, who is aware of the changes and has been in dealing with research professionals for over a decade, summarised the feelings of many respondents by commenting that,

- "It is only going to be a good change if it is the last change. They (the DSIR) seem very transient."

Figure 5.6 Level of Respondents Own Perceived Awareness of DSIR Restructuring

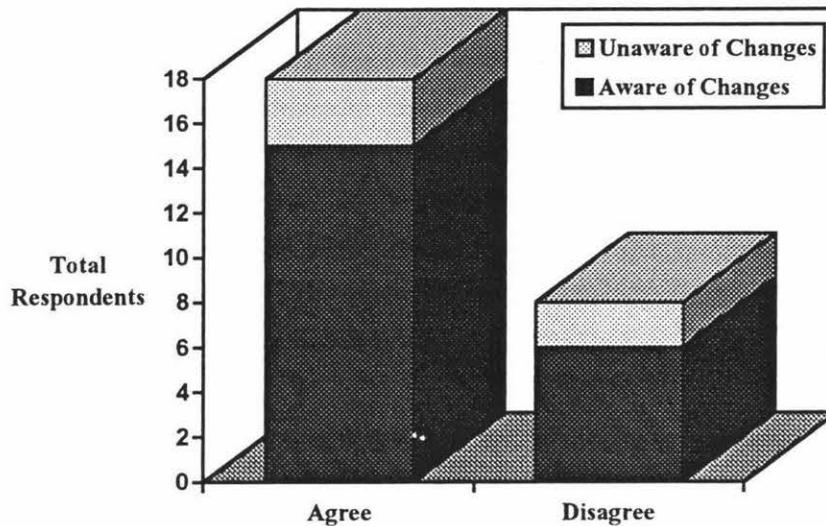


5.4.3 Level of Optimism for the Change to CRIs.

All the respondents were then asked to indicate whether they felt the structural changes to the DSIR will be positive. In Figure 5.7 which illustrates these responses, it can be seen that there were 18 respondents who said they felt positive about the changes. Three of these respondents had nevertheless previously indicated that they did not have any degree of awareness of how the changes would effect the DSIR's service offering.

The positive feelings of these 'unaware' respondents, could be a result of their optimism that the DSIR's restructuring will improve the level of satisfaction they have gained from undertaking business with them.

Figure 5.7 Level of Agreement that the Changes to the DSIR will be Positive



Despite only a quarter of the respondents stating they were fully aware of the future changes to the DSIR's service offering, almost three quarters of all respondents felt positive about the changes. When the respondents who felt the changes are going to be positive, were asked why, almost all began describing situations where the DSIR had either let them down or will let them down in the future, in contrast to their initial positive response. This result could be due to the fact that the clients are initially optimistic of the outcome of the restructuring, one respondent even commented that, "...it can only get better." Other responses of these initially positive respondents to the changes included,

- "(The changes) will bring a more commercial element that they (the DSIR) have lacked."
- "It will make them more dynamic."
- "I think probably it will give some short-term gains to New Zealand, but what really worries me is the future opportunities for long-term innovativeness."

However, when asked to justify their comments, by recalling their past involvement with the DSIR, they then became unsure of a positive outcome from the changes,

- "They (the DSIR) will probably lose sight of what they are there to do, and that is to do science."

- "Scientists are not trained to think of clients as clients. They have no concept of a market driven scenario."

In comparison eight respondents, from the beginning, felt that the changes would not be positive. When the respondents were asked why they gave this answer, their explanations included a regret that the changes would result in a loss of creativity by the scientists at the DSIR as they would spend less time in the laboratories. This anticipated move for scientists out of the laboratories was also seen as a change that will create some resentment from within the DSIR. This fear is illustrated by comments such as,

- "These changes are going to be of long lasting detriment to the country if some of their (the DSIR's) very good scientists become administrators."
- "I am not certain about Industrial Development's reaction (to the changes), there are some pretty strong characters within that department."

5.5 Image of the DSIR and *new* IRL

5.5.1 Introduction

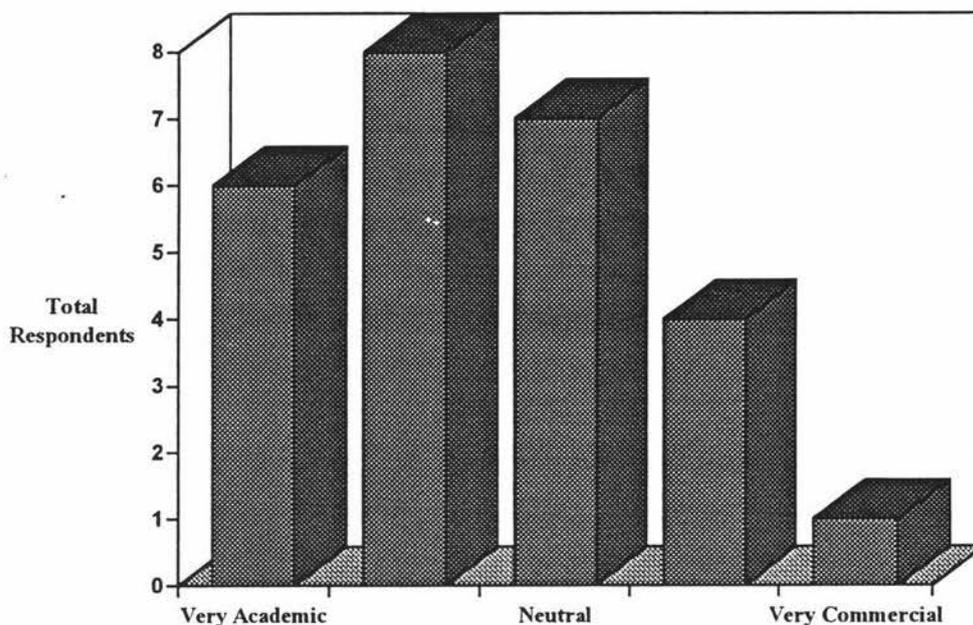
After the respondents' understanding of the changes to the DSIR and the market environment had been established, it was important to find out the image the DSIR had in the market. Respondents were asked to compare their opinions of the DSIR and their perceptions of the *new* Industrial Research Limited (IRL) against their descriptions of an *ideal* scientific and industrial research organisation. IRL is one of the new CRIs, comprising all of the DSIR sections that are defined by the government Ministerial Scientific Task Group (1991), as having an inherent commercial focus.

5.5.2 Image of the DSIR

Figure 5.8 represents a scale which indicates whether respondents perceive the DSIR to be more Academic or Commercial. The figure illustrates that respondents perceive the DSIR as fairly academic. However, a number of respondents

commented that they see the DSIR moving along towards commercialism over the next few years, with the development of IRL, and consider that this will be a positive change as long as they do not forget their pure science heritage.

Figure 5.8 Image of the DSIR by Respondents



When the respondents were asked to clarify what they meant by the degree of "Academic" or "Commercial" orientation of the DSIR, some underlying feelings became apparent. There is an acceptance that the DSIR needs to become more commercially oriented, or at least be more responsive to client needs, although there was a fear that the *new* IRL would lose sight of their present strength of their ability to undertake pure scientific and industrial research. Respondents believe that if the *new* IRL becomes too commercial they will end up reducing the costly long term research projects in favour of more lucrative short term "fix-it" jobs for clients.

The commercialisation of the DSIR also led to concerns by respondents, as to the focus of the organisation in the future. The increased level of accountability for research was seen by several respondents as moving in the wrong direction. One respondent commented that, "the DSIR has a mentality that they must make money to survive. That is not being commercial, that is making money. Being commercial is actually working with those people who have got the knowledge and accountability for commercialising things. That is a distinction which many scientists

ignore".

The respondents' opinions are summarised by the following interview quotes:

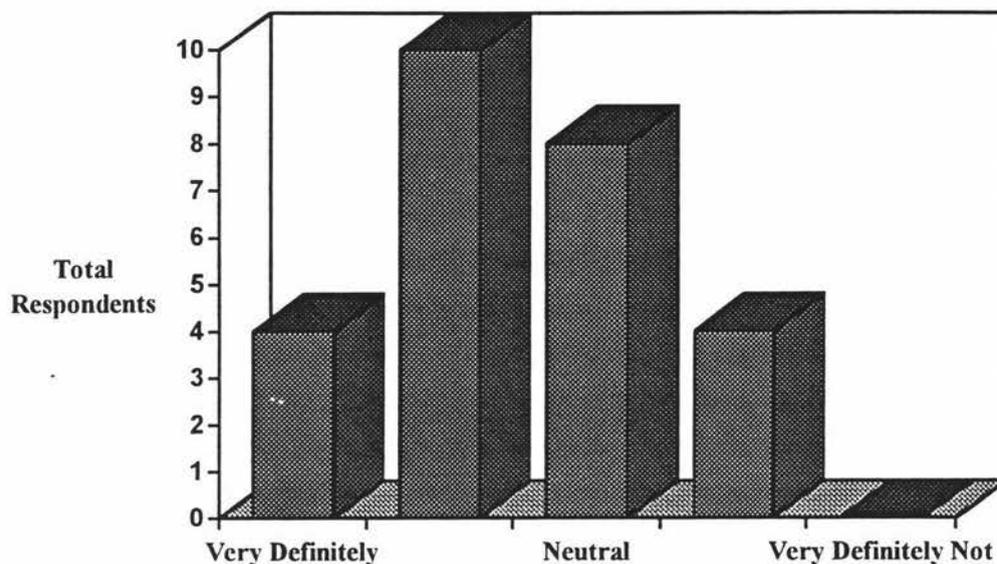
- "I want good scientists to remain good scientists, rather than worrying in the short term about making enough dollars."
- "Difficult for the DSIR to be commercially oriented."
- "It would be terrible if they got to 5 (Commercial)."
- "Less academic than in the past although commercial changes are only lip service."

To develop a comprehensive understanding of the image of the DSIR, it was also important to ask respondents about their perception of the level of quality and technical expertise of the DSIR. Figure 5.9 outlines respondents' opinions on how "state of the art" they perceive the DSIR as a research organisation.

Over half of the respondents view the DSIR as a state of the art research house. Of the respondents that do not hold this view, several described the frustrations of dealing with the administrative structure of the DSIR, as their main reasons for their stance. Rather than actually giving examples of poor quality equipment or scientific research causing the absence of a "state of the art" image. The statements below from respondents help to clarify their reasoning:

- "The DSIR name has a positive image."
- "The scientists are the best. The equipment is very up-to-date."
- "Old equipment, but they do the job adequately."

Figure 5.9 Level of Agreement by Respondents that the DSIR is a "State of the Art" Research House



The link to the structure of the DSIR influencing whether or not it is perceived as a "state of the art" research house, is best explained by one respondent who said,

- "...For the good of science you have got to have good people who have the ability to explore. If the new system can identify those people and give them the scope they need, so that they are not constrained, then science may flourish. But the way they have got it at the moment, it is going to kill any innovativeness"

All reservations that came forward from the respondents regarding the image of the DSIR referred to specific people they had dealt with in the DSIR. This result emphasises the fact that a professional organisation such as the DSIR must concentrate its commercial activities firstly on the presentation and ability of employees to be able to interact effectively with clients, the internal market. After this is at an level acceptable to the client, then other aspects of commercialisation, such as communication programmes with the market, can be implemented more successfully. One respondent summed-up this feeling, "I think the DSIR need an internal marketing system. It would do wonders for some of the scientists who see dealing with commercial customers as a scary experience."

Another aspect of the image of the DSIR is whether respondents perceive the organisation as bureaucratic and difficult to deal with. In total 15 respondents have this perception. Of the respondents that felt the DSIR has been bureaucratic and difficult to deal with, most described project delays and a lack of professionalism as the major problems. The following quotes summarise their reasoning,

- "I guess it is not their (the scientists) fault. It is acceptable."
- "Initially it took a while to get what we wanted, but we persisted."
- "They take too long to finish projects."
- "No problem with AIDD, but Wellington is another matter."
- "Head office is far too bureaucratic, although they are getting better."

The respondents were then asked how this level of bureaucracy affects the business relationship. Their responses included:

- "We get angry."
- "The people are good, it's the organisation that is difficult to deal with. So we will persist."
- "We won't deal with Wellington (DSIR)."
- "Very high costs due to high overheads may cause us to look elsewhere."
- "They find it difficult at times to get into joint ventures, due to their inability to allocate capital from their bureaucratic base."

Almost all respondents accepted these problems as part of dealing with the DSIR and similar scientific and industrial research organisations. Although, with the restructuring of the DSIR, MAF etc., the respondents are expecting an improvement in the level of professionalism.

All of the changes that respondents discussed are to do with the professionalism of the DSIR. The respondents perceive that the DSIR does not view their (the respondents) needs as the most important aspect of the business - client relationship. This is illustrated below by the respondents' suggestions as to how the DSIR should change:

- "User pays, user says."
- "If they make a mistake they have to correct it at their own cost, which they are not used to."
- "Be more practical. Develop a sense of urgency for project completion."

- "People need to be accountable."
- "Don't become too commercially oriented where the dollar is driving actions."
- "There is not enough information on what they do... how are we supposed to know what they do?"
- "They need a change in culture."

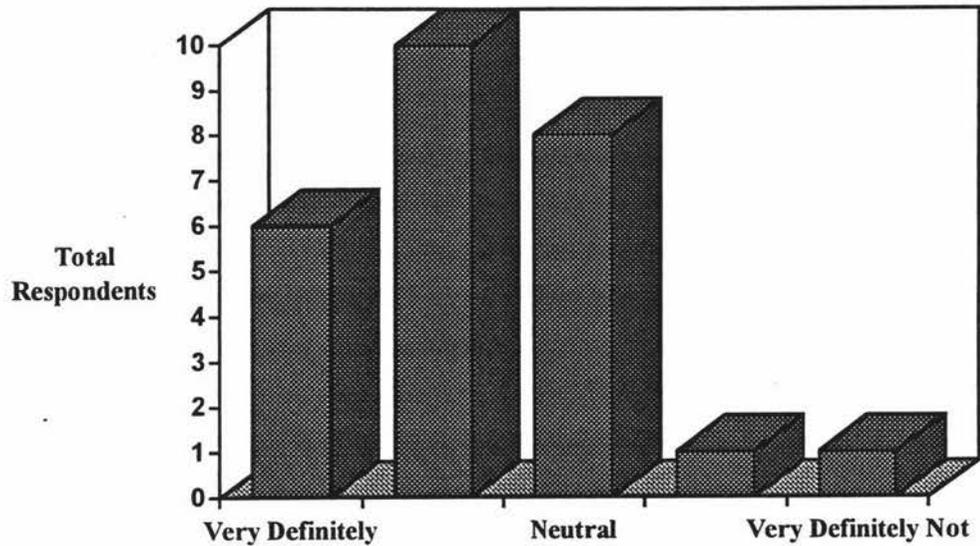
One respondent summed up the feeling that a professional, coordinated effort is needed in the DSIR by describing the development of a business division for the science teams. This respondent states,

- "I personally believe they (DSIR scientists) need a cooperative venture with a business division... To coordinate the funding side through to the project management side through to the client relations side...They have no coordination."

5.5.3 Market Expectations of IRL

Figure 5.10 shows that over half of the respondents are sure that the DSIR will be able to change for the better when becoming Crown Research Institutes. Although several respondents, while feeling an urgency for the DSIR to become more client based, do not want the organisation to forget that it is firstly, a scientific research institute and secondly, a commercial organisation. That it cannot "...forget its applied historical background and lose the 'ground - level' scientific work that progresses knowledge," as one respondent stated.

Figure 5.10 Level of Agreement by Respondents that the DSIR can Change



5.5.4 Factors Constituting an *Ideal* DSIR

The respondents were then asked to compare their previous description of the DSIR to the composition of an *ideal* scientific and industrial research organisation. The following comments outline the respondents views:

- "Need to be a lot more proactive."
- "We still look on them as experts. I wouldn't like to see some of that specialisation lost."
- "I think they could learn a lot about team work."
- "Every research organisation has got a certain amount of research going on that doesn't have an immediate use, but they (DSIR) certainly have got to become a lot more service oriented."
- "Don't pay for it."

Respondents reiterated that the quality of scientific work from the DSIR is second to none, however, the client contact skills need addressing. One respondent further stated that, "They (DSIR) badly need a market coordinator, who can coordinate between the scientists and the client. This would save the scientists time and, more importantly, save our time." This attitude of respondents demonstrates that the functions of the present marketing responsible employees of the DSIR, the Business

Development Managers, do not include client - scientist liaison. This result however, could also be explained by the scientists dislike of customer service and relations activities, and therefore refusal to cooperate with the plans of the Business Development Managers.

Despite the list of complaints and suggested changes, the respondents generally accept that the DSIR cannot be ideal in all aspects of their service requirements. Therefore, it seems that the respondents feel and accept the view that the DSIR is unable to satisfy their needs as fully as possible and still continue doing effective pure research. They did not think it was possible to have both.

It was important to complement the direct probing of the respondents' perceptions of the DSIR by asking if any organisation in the industrial scientific market fully satisfied their needs. All respondents stated that they did not expect any one industrial scientific organisation to fully meet their needs. They stated that due to the nature of such organisations it was unrealistic to demand too much from them as the set up costs, to cover all aspects of research, would be prohibitive.

5.6 Market Requirements of Scientific and Industrial Research

5.6.1 Introduction

This section of the study investigates the DSIR sections that were to join and become the new Crown Research Institute - Industrial Research Limited (IRL). The respondents were supplied a set of 20 cue-cards, each containing a service offered by IRL and a brief description of that service. The management of the DSIR had expressed concern for the high cost of assets in the DSIR, therefore, it was important to investigate the market demand for each service that would be supplied by IRL. This was to determine the services that would be more likely to generate revenue.

5.6.2 Services Demanded by the Market

Figures 5.11 and 5.12, show the services that respondents deemed applicable to their organisation.

Figure 5.11 The Services that Respondents Indicated as Applicable to their Organisation - Part A

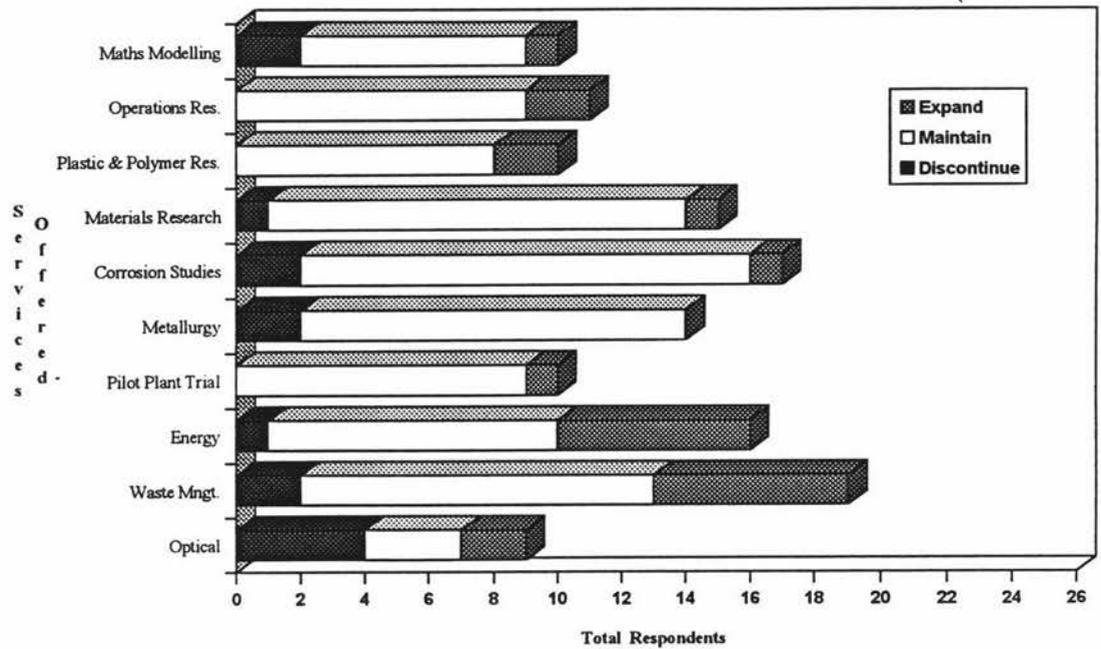
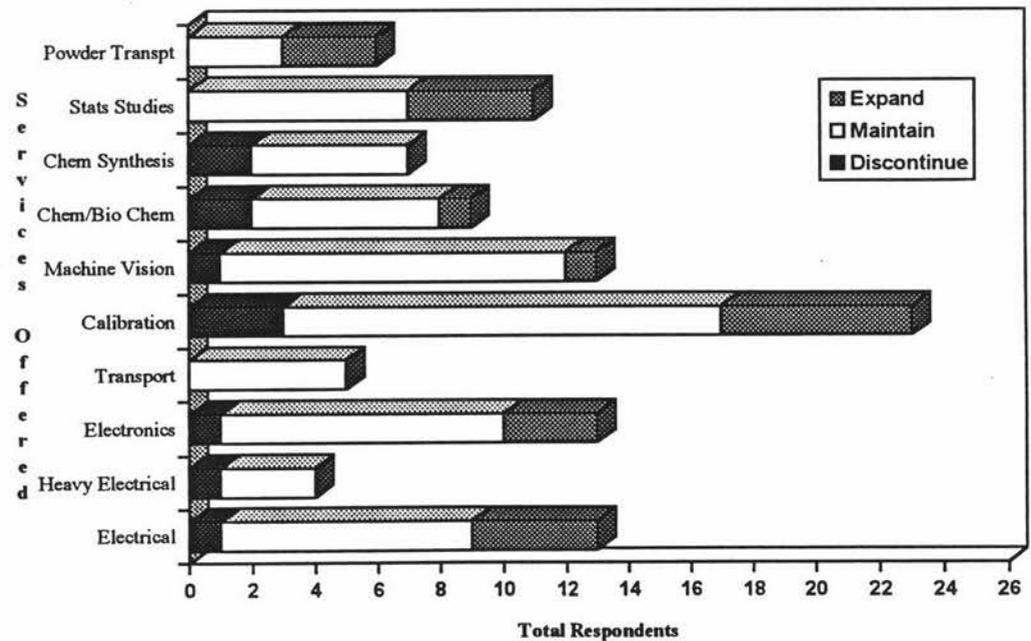


Figure 5.12 The Services that Respondents Indicated as Applicable to their Organisation - Part B



The results showed that the calibration of equipment is undertaken by almost all of

the respondents. Indeed, several respondents commission the DSIR to only do the calibration of equipment, despite the fact that many services that are offered are applicable to their organisations.

Despite respondents stressing that the DSIR must not forget the need for long term scientific and industrial research projects that add to knowledge, they feel that it is the job of the government to fund such projects. This attitude towards funding is demonstrated by half of the respondents reference to the cost of project work with the DSIR. These respondents whom are not Producer Boards, may have in-house research facilities, and indicated in section 5.7.4 (Perceived Expense of Commissioning the DSIR) that they perceived the DSIR to be an expensive research organisation. The respondents had two reasons for this view: perception that the DSIR is a Government funded Department, and the DSIR generally only discuss costs not potential outcomes of commissioned research.

Respondents perceived the DSIR to be, or thought it should be, a public good, not a fee charging private enterprise. Therefore, these respondents who believe the DSIR's services are expensive, do not understand that Government policy changes have prompted the DSIR to charge fees for commercial work.

The respondents stated that the style of the DSIR employees is to mainly discuss costs of projects with clients. This suggests that the possible outcome of research is not explained to clients, rather the DSIR Scientists are viewed by the respondents as pessimistic to project work. One respondent stated that, "They (the Scientists) always seem so negative about what we will achieve in doing research. But we actually return fairly good results most of the time."

The understanding by respondents that the DSIR is government owned and therefore should not charge for research projects, and the services are discussed by Scientists only in cost terms, suggests the need for an education programme to the market. This programme should explain the cost of Scientific and Industrial research projects, including examples of packaged service offerings, demonstrations, and case histories of possible outcomes from each type of research. This information will aim to assist clients in the usefulness of possible research projects in the DSIR's service offering.

The DSIR could also consider, as part of an internal marketing programme, educating Scientists about different styles and techniques of negotiation and sales. This programme may assist in client relations, by coaching the Scientists as to best

describe the benefits of the services they offer to clients. However, due to the apprehension of Scientists to undertake marketing tasks, as discussed in Chapter Four, the education programme will need to be a long term project and supported by Management in the business planning of the DSIR.

Many of the services provided by the new CRI, Industrial Research Limited (IRL), are applicable to most of the respondent organisations. Although, when asked if they would commission many of the services, respondents commented that they just don't have the funds. They would rather obtain recent innovations in science and technology information at a secondary level. One respondent summed up this view by commenting that, "Power reduction would be wonderful. When someone has worked out a method to achieve this, let us know."

Figures 5.11 and 5.12 illustrate that the DSIR services combining to form IRL vary in the levels of demand. Discussion with the respondents suggested that the wide selection of skills to be offered by IRL, could be categorised into three types of services demanded: "Core Services"; "Peripheral Services"; and "Niche Core Services".

The "Core Services" of IRL, such as Waste Management, Calibration, and Energy, are services that are highly demanded by the market, including requests for their expansion. These services elicit responses that suggest they should be the centre of IRLs service offering:

- "Expand it. This (Waste Management) is why we go all the way to the DSIR in Wellington."
- "Needs to be pushed. Its a popular and much needed area that they (the DSIR) offer."
- "Expand it. As we need a lot of Calibration work."
- "Calibration has always been an important part of our industry, but with all the standards that are being introduced we need even more work done."

The results suggest that the "Core Services" could be positioned towards gaining commercial revenue, as these services are in great demand by industry. Moreover, these services should be focused on gaining commercial funding because they include short term project style services, such as Calibration, that are not eligible for the Government's Foundation for Research, Science, and Technology (FORST) funding.

The "Peripheral Services" include business functions, such as administration and communication with clients that complement the service offering, and the less demanded services offered. These less demanded services, such as Optical research and Heavy Electrical research, could be discontinued or contracted-out to reduce the investment in equipment at the DSIR. However, it could be suggested that the sections responsible for this type of research, that may not be core to the service offering, could focus on gaining FORST funds. The results of the FORST funded research may be able to be 'packaged' into more practical shorter term project work to offer to industry. This process could reduce the likelihood of failure from commercial research projects, a major concern by respondents, as they will have been pre-tested using FORST funds. Research into Optics, a service that respondents believe is expensive and unnecessary, could be gained through FORST funds. Then the results of this Government funded Optical research could be used towards commercial projects on Machine Vision, a service illustrated in Figure 5.12 as demanded by 13 of the respondents.

The services offered by the DSIR are specialised and will commonly have only a small market in which to compete. The smallest, but highly demanded services by respondents, are "Niche Core Services", that need particular consideration for their specialised needs. Figures 5.11 and 5.12 show that services such as Transport, Powder Transport, Pilot Plant Trials, and Plastic and Polymer Research are "Niche Core Services". The ten or less respondents who indicate these services were applicable to their organisation want almost all of these services to be expanded. Respondents that commission Transport studies however, are fully satisfied with the present service offering and do not perceive a need for the service to be modified.

Before planning a marketing effort aimed at these "Niche Core Services", it could be suggested that DSIR Management determine the financial viability of servicing these clients. If the projected return is worthwhile, then the results in 5.3.2, regarding how respondents gather information and choose a Scientific and Industrial Research Organisation, suggest the need for Key Account Managers. These Managers may be specialised Scientists, and will be the individuals that can keep "Niche Core Service" clients informed regarding future research possibilities. This style of relationship will satisfy respondents that discussed the general, non specific literature and promotional material they received from the DSIR as unhelpful. Respondents prefer to gain information on their needs only, so they can plan for project work, rather than having to determine what will be appropriate for their needs.

The Respondents' 'image' of the DSIR satisfying their needs therefore, seem to be through mainly short term projects, routine maintenance work and technology transfer (technology transfer is when an industry will adapt technological developments from another industry or process for their own use).

5.6.3 Technology Transfer

The demand for short term, non-pure research projects is substantiated by 19 of the respondents specifying that they would commission the DSIR for technology transfer. These respondents that will approach the DSIR to source and supply knowledge of recent developments in Scientific and Industrial research included all sizes of organisations from various industries.

Technology transfer is a type of commissioned work from the DSIR that is removed from the historical aim of the organisation: to undertake scientific and industrial research for the benefit of New Zealand business. There is a concern by DSIR employees that technology transfer will not challenge or motivate the DSIR Scientists to remain satisfied or competent in their positions. This will result in a reduction in the quality output of the DSIR and an increase in the attrition rate of Scientists from the DSIR. The effect of these concerns would be that the DSIR would not benefit New Zealand through significant advances in scientific and industrial research, instead the DSIR would adapt and diffuse overseas knowledge for small, specific needs of commercial clients.

5.6.4 Foundation for Science and Research Funding

One topic the respondents did not generally discuss is the funding support that is available from the Foundation for Science and Research. This government funding body will undertake joint ventures with organisations if it is satisfied the project results will benefit all of New Zealand. This means the cost of commissioned work from the DSIR is effectively half of the commercial rate.

Only three respondents mentioned the 'Foundation' for assistance in funding of research from the DSIR. With two of these respondents being Producer Boards who are familiar with the process involved in gaining funding from the 'Foundation,' as they undertake such ventures with several research organisations. It is apparent that

many clients do not know of this scheme or feel it is not available for their use.

5.7 The Market Perception of the "Client-Company" Relationship with the DSIR

5.7.1 Introduction

The perception respondents have of the style of business relationship they conduct with the DSIR will be covered in this section. The respondents discuss the present style of relationship they have with the DSIR, how conducive this style is for the development of a long term relationship, including any potential barriers to the relationship.

One potential barrier to long term relationships between the DSIR and their clients is the "user-pays" philosophy that the DSIR now implements with commercial clients. This philosophy towards becoming a private good is in contrast to the DSIR's scientific services historically being supplied without charge by the government. It is not universally accepted by industry. The opinions by respondents of whether the DSIR represents value for money, and the frequency of personal contact by DSIR employees with clients is discussed in the later part of this section.

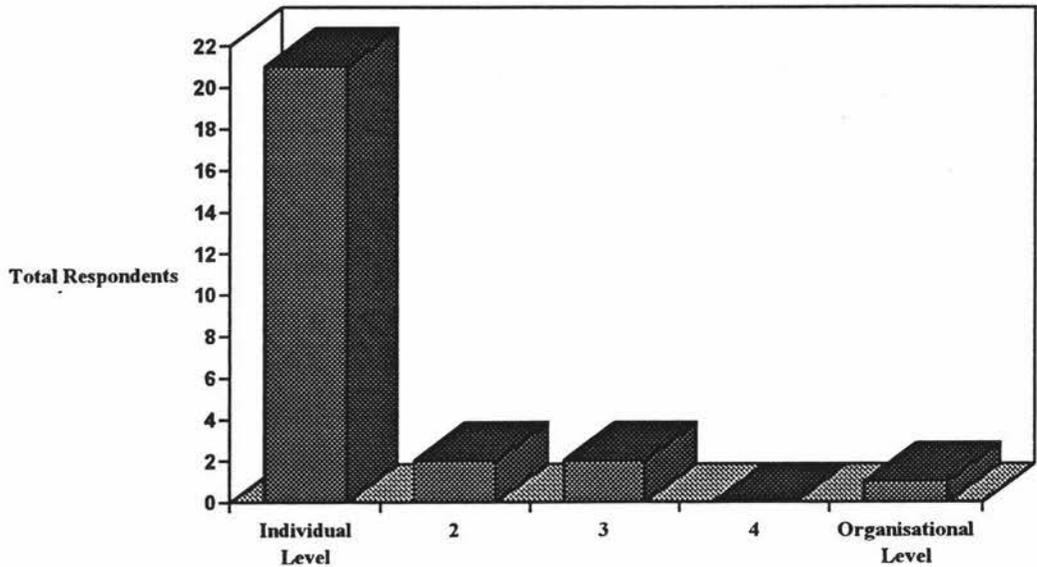
5.7.2 Style of Business Relationship

The respondents indicated on a five-point scale whether when undertaking work with the DSIR they interact with a specific specialist within their science or industry area. Figure 5.13 demonstrates this style of relationship with 21 respondents indicating that they always deal with a specific individual when commissioning projects from the DSIR. This response is in keeping with the type of industrial business the DSIR is in, where the service provider must develop an intimate knowledge of each client's business needs.

When the respondents who indicated that an individual style relationship was most appropriate with the DSIR began to explain why, 14 expressed a need for control in the relationship. They explained that this individual style relationship was the most effective method of gaining satisfaction from project work as there is a high level of

detail involved, and the scientists must be briefed fully on the scope of the project.

Figure 5.13 Respondents' Perception of the Style of Business Relationship they have with the DSIR



However, due to the continual restructuring of the DSIR over the past decade, the respondents felt it has not been easy to maintain these desired individual relationships. The respondents commented that,

- "All dealings with the DSIR have been project specific. We find out exactly who to speak to."
- "Personal contact is the only way to do business with them (the DSIR). You have to know who to talk to, so that you can personally monitor the progression of a commissioned project. "
- "With all the transition it has been hard to maintain a long term relationship with a specific scientist or group (within the DSIR)."

Three respondent organisations ranked three or higher towards an organisational level relationship style on the scale illustrated in Figure 5.13. These organisations are smaller operations of less than 50 employees that stated they have not developed long term relations with specific DSIR employees yet. One of these respondents also commented on the essence of professionals, their uniqueness, by explaining that,

- "It is the overall concept we are interested in, that's why we haven't

limited ourselves to deal with only one scientist. That would be foolish as they are all so different and we can benefit from meeting as many as possible."

The respondents who did not feel strongly about the development of a relationship with specific individuals in the DSIR, also felt they did not know enough about the DSIR to contact "the right person". These respondents have generally had less contact with the DSIR and are conscious of a lack of information concerning 'who to approach in the DSIR for project work.'

Of the total respondents, 18 appreciate the magazines and bulletins they receive from the DSIR, however, some respondents commented that they lack in-depth information for each specific client industry. They stated that being kept up-to-date with recent information on relevant scientific and industrial research, would make dealing with the DSIR more convenient. Furthermore, several respondents indicated that if they were aware of all relevant research opportunities with the DSIR, they would be more likely to undertake research on a frequent basis.

5.7.3 Opportunity for the Development of Long Term Business Relationship

Determining what style of business relationship respondents maintain alone is only partially useful. The likelihood of these relationships being maintained over the long term, and what factors are necessary to achieve this, are important to both industrial and scientific professionals and their clients.

All but one respondent agreed that the DSIR is dependable and stable enough to facilitate the development of a long term relationship. When they described why, respondents began explaining that maintaining a relationship with the DSIR was no better or worse than any other industrial scientific professional, and that a concerted effort is required to achieve an effective relationship. This response suggests that clients in this market expect a business relationship may never fully satisfy their requirements. The following quotes, summarise the respondents opinions,

- "No worse (the DSIR) than any other similar organisation."
- "I think it requires effort from both sides."

After determining that respondents are equally agreeable to the possibility of

developing long term relationships with the DSIR as with other professionals in the industry, it was pertinent to investigate if they would actually develop these relationships.

Again, all but one of the respondent felt that it was desirable to develop a long term relationship with the DSIR. Although, the following respondents' comments, explaining their initial response, illustrate that they may never develop these relationships,

- "Yes (it is desirable), but there are morale problems in the DSIR."
- "As long as they offer what we want."
- "Yes, but it takes time."
- "Yes, but we have little to do with them."

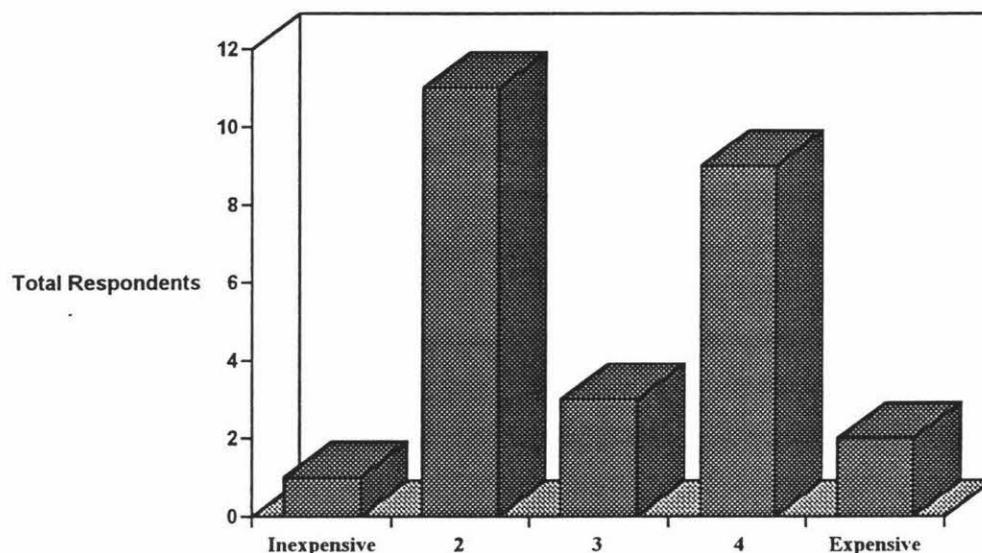
Of these respondents, a total of 16, when questioned if it was likely that they would make the DSIR their organisation's 'research arm', said that they did not commission enough scientific and industrial work to make this worthwhile.

These underlying feelings and behaviour of respondents, resulting in the improbability of continual project work with the DSIR, could be explained by the historical function of the DSIR. There has been general confusion by respondents as to the precise role the DSIR will now play in New Zealand's economy, as historically it has been a public good funded solely by government revenue. This background could be the cause of the apprehension by respondents to pay for project work in a long term relationship with the DSIR.

5.7.4 Perceived Expense of Commissioning the DSIR

It is appropriate to develop an understanding of whether the respondents believe the DSIR to be value for money. Figure 5.14, shows that the respondents were almost evenly divided as to whether they thought undertaking work with the DSIR was value for money or not.

Figure 5.14 Level of Agreement by the Respondents that the DSIR Represents Value for Money



The major cause of respondents perceiving the DSIR costs to be high, was they could not see a logical 'breakdown' of total project costs. For example, one respondent remarked,

- "One thing we are going to insist on is that they (the DSIR) should break down the invoices to show exactly where costs have gone."

Following, is a combination of explanations from respondents that believe the DSIR is value for money in this industry and respondents who do not believe the DSIR is value for money:

- "Yes, because you are buying experience."
- "They should break down the invoices to show exactly where the costs have gone."
- "They sometimes don't know how to sort out the scope of a project, then costs rise."
- "Charges are excessive."
- "Think twice about using the DSIR with 'User pays'."
- "We have a tendency to stick with the people we know (the DSIR),"

rather than going out to someone else, who is maybe five percent cheaper."

- "Would like to pay less, but accept the cost."

5.7.5 The Level of Personal Contact between the DSIR and the Market

The final area to consider when investigating the present and future style of relationship the DSIR has with clients, is the present frequency of contact between the two groups.

Overall the respondents feel that the present level of contact with the DSIR is satisfactory. Respondents are visited by, and have visited, the DSIR facilities around New Zealand. Comments were made by respondents, referring to the individual style of business relationship they have with DSIR Scientists. However, respondents expressed that although they deal with specific DSIR Scientists, it has taken a long time to develop these relationships. Respondents stated that sometimes the DSIR Scientists can be difficult to contact and slow to respond to respondent requests. These opinions are illustrated by the following comments from respondents:

- "We have a guy (in the DSIR) we have been dealing with for sometime now. But unless we persist, he has a habit of not returning our calls. It is only because they (the DSIR) are the best that we persist."
- "We don't have enough time to sit and talk with them (the DSIR). I would prefer they sent some meaningful news letter or flyer, then contacted us by phone to see if any of the recent research interested us."

These findings suggest that the respondents are generally satisfied with the "Core Service" offering of the DSIR. The "Core Service" offering constituting the scientific services, such as Calibration and Waste Management. However, the findings indicate a need for the DSIR to concentrate on the improvement of some "Peripheral Service" factors, such as administration and communication with clients. These "Peripheral Service" factors complement and support the "Core Service" offering. The results suggest that these complementary services are perceived by respondents as major factors in the determination of satisfaction levels in developing a relationship with the DSIR. This is demonstrated by the lack of ease of contact with DSIR Scientists being a major cause for dissatisfaction by respondents ("Peripheral Service"), while the DSIR's research ability ("Core Service") is

perceived by respondents as more than satisfactory.

Although there is an overall feeling from respondents that the DSIR should improve contact and communication levels with clients, seven respondents believed the present style of relationship, while not perfect, was adequate and all they expected from a scientific and industrial research organisation:

- "I enjoy the contact with our personal friend in the DSIR. He's not a bad specialist to deal with, compared to the majority (Scientists), who can often be quite eccentric."

This result strengthens the suggestion that an improvement to the "Peripheral Services", specifically the style of relationship, would create an opportunity to increase the satisfaction levels of the respondents.

5.8 Chapter Summary

Respondents believe undertaking scientific and industrial research is important for New Zealand business. The majority of respondent organisations allocate a budget for Research and Development and/or have in-house research facilities. Despite this apparent dedication to research activities, the respondents generally prefer to commission less pure scientific research from organisations such as the DSIR. Stating that their organisations do not have enough funds to undertake pure scientific and industrial research, and anyway, it is the responsibility of the government to fund such projects. This view of the role of government in scientific and industrial research is due to the DSIR's historical role as a public good.

Respondents' behaviour when purchasing scientific and industrial research use a high involvement, cognitive approach. A style of purchasing behaviour that is common for industrial goods and services. The majority of respondents source information from word-of-mouth and personal contacts, when evaluating which scientific and industrial research organisation to commission. Presently, the DSIR and other research organisations employ non-specific sales calls and non-direct advertising for the majority of their marketing communication activities. These techniques are not favoured by the respondents, as they are not directed at the specific research needs of their organisations. Therefore, the respondents do not use the information given in

these techniques to evaluate possible research organisations to commission.

The purchase of scientific and industrial research is considered by half of the respondents only after they have searched in-house and/or back to their equipment suppliers for assistance. Although all respondents agreed that gaining outside specialised advice was important for many scientific and industrial research problems, and that the DSIR was a state-of-the-art research house along with the majority of other research organisations. This suggests that research organisations have reached a minimum standard in the scientific and industrial research profession in the clients' minds, and must consider other factors than technical expertise to position on.

Only a quarter of the respondents are fully aware of the changes that the DSIR will go through to become CRIs. Despite this low level of awareness, almost three quarters of the respondents feel positively about the changes. The two major reasons stated by respondents are: (1) that the change will be good if it is the last change; and (2) the style of service offered from the DSIR can only improve. Although, respondents believe no scientific and industrial research organisation can fully satisfy their needs. These results correspond to the respondents perceived image of the DSIR as bureaucratic and difficult to do business with. Suggesting that the DSIR could concentrate on the improvement of administration and other "Peripheral Services" to gain an advantage in the market, as respondents do not expect research organisations to give satisfaction in several areas of their service offering.

However, respondents stressed the need for the DSIR not to lose its pure scientific ability, the focus on long term scientific and industrial research projects that add to knowledge. The respondents believe it is the responsibility of the Government to fund such projects.

The above view of public investment in pure research was illustrated in the services the respondents indicated they would commission from the new IRL. Although many services were applicable to the respondent organisations, respondents commented that they did not have the funds or perceive a priority in commissioning the majority of DSIR services. This is in contrast to the respondents earlier stating they were dedicated to research, with the majority of respondent organisations allocating research budgets.

The interviews established three types of services that comprise the total service offering to the respondents from the DSIR, and other research organisations: "Core

Services", that are highly demanded services by the market; "Peripheral Services", such as administration that is presently unsatisfactory to respondents, and less market demanded services such as pure research; and "Niche Core Services", that have small but loyal clients who could develop long term relationships with DSIR Key Account Managers.

Almost all respondents indicated that Technology Transfer is one service they would employ the DSIR to undertake on their behalf. This result compounds the concern DSIR Scientists have to their organisation moving away from its historical aim of benefiting New Zealand business through research, as Scientists may no longer be motivated or challenged by undertaking a greater amount of Technology Transfer.

The respondents do not feel that they are informed of all the possible research projects that they could commission the DSIR to undertake. This suggests that need for a continual communication programme with clients on their specific need in research, including visiting clients and having them visit the facilities of the DSIR. This planning would assist in developing long term relationships with clients, complementing an internal marketing programme for the DSIR. The aim of the internal marketing programme could be to improve "Peripheral Services" of the DSIR service offering and to maintain satisfaction in the "Core Services".

These suggestions from the findings may aid in the development of long term relationships that the respondents feel are possible with the DSIR, although in the past, it has been less than satisfactory to do business with the DSIR. This unsatisfactory result in the past is a major concern as the DSIR has undertaken research projects with almost all respondent organisations for more than ten years. This period of time would appear to be sufficient to develop a mutually beneficial business relationship. The respondents are still not satisfied, however, they continue to return to the DSIR for research projects. This suggests that an improvement of the "Peripheral Services", indicated by the respondents as presently unsatisfactory, would strengthen the present relationship with clients.

Chapter Six

Conclusions

6.1 Introduction

The concluding chapter of this study discusses possible limitations of the investigation. The next three sections bring together the findings of the internal and external interviews by discussing how the results address the objectives of the study. These sections conclude on factors effecting a successful transition of the DSIR to a private enterprise. Next a framework to summarise the topics highlighted in the first two thesis objectives is presented. The findings highlight several areas for possible future research which are discussed after the concluding comments of the present study.

6.2 Limitations of the Study

The size of the samples may be viewed as a limitation of the study. Internally, the number of employees who participated in the study was small. The ability to extrapolate their opinions and perceptions across the total DSIR organisation however, was deemed valid and reliable due to the post study review by the employees of the DSIR.

Externally, the sample was almost a census of the total organisations that commission scientific and industrial research, for the relatively small size of the industry. The composition of the sample may have been enhanced by the inclusion of industry clients from overseas. This is because the DSIR and other research organisations undertake projects outside of New Zealand, albeit only comprising a small percentage of their total commercial work.

6.3 To Investigate Factors that Both Enhance and Inhibit the Transition From a Public Organisation into a Private Enterprise.

The Market and Employees of the DSIR are optimistic of the future changes, especially if they are the last major changes for several years. Therefore, there are

few changes required of the "Core Services" of the DSIR, rather a concerted effort is needed to achieve client satisfaction through improvement of the "Peripheral Services" and structure.

Due to the DSIR's almost constant structural changes over the past decade, the market shows apprehension to the possibility of developing stable long term relationships with the DSIR. This suggests that there is no relationship marketing present in the client-business interaction with the DSIR, as the organisation only concentrates on one way communication and does not allow input and suggestions from clients. The result is a situation where clients feel alienated and distant from the DSIR, with a concerted effort required by clients to develop any communication with the professional service. This is in contrast with the generally accepted business communications approach, which is initiated by the provider, to the client, and is then maintained by the provider.

Despite the Government deciding to implement the changes to the DSIR, the general perception by the market, is that the DSIR is a public organisation and therefore should be publicly funded not privately funded. Although it is the pure science function of the DSIR that is emphasised by the market as a necessary public good, this attitude includes all services offered from the DSIR.

Even though the DSIR is going to be repositioned, due to Government policy, the market still perceive the organisation to be the same as before the proposed restructuring. This not so favourable perception includes the DSIR's style, customer relations, service offering, and ability to be competitive. Although, the DSIR is still held in high regard by the market, its scientific resources, both human and physical, are perceived as high quality by clients and the services it offers are competitive. This substantiates the need for the DSIR to concentrate on the improvement of peripheral aspects to the "Core Services", to meet client expectations. Therefore, it is not just an internal change that is expected to occur, but a full restructuring where like services are put with like services, and the market is educated to the benefits of this restructuring.

However, the Scientists of the DSIR generally perceive that a change in the type of research activities they undertake, towards a commercial orientation, will be detrimental to their profession. They are concerned that New Zealand business does not view scientific research as important. These beliefs by DSIR employees will need addressing in an internal marketing programme, as the external factor of Government

Policy change has brought about the necessity for the DSIR to gain a greater level of commercial funding.

An internal marketing programme will also need to educate DSIR employees on *how* to gain more commercial funds, as they state they neither know how, nor want to focus on commercial revenue generation. Despite the DSIR employees' apprehension, they are resigned to the shift towards commercially funded projects and are keen to be successful in this new direction.

6.4 Determine the Key Factors to Success of the Professional Service.

It is important that the Industrial Scientific Professionals concentrate efforts on services that are demanded and provided successfully. These services are the "Core Services" of the particular professional. Although, the employees view their service offering as not totally up-to-date, the commercial market only requires facilities that will supply answers to their practical and applied commercial problems. Therefore, the DSIR employees strive for technologically advanced facilities. While their commercial clients levels of satisfaction are not determined on the level of technological advancement, as they perceive the majority of research organisations in the profession to be technologically equal. Instead, the commercial clients satisfaction is determined on the "Peripheral Services" offered, such as Administration and personal contact.

All the services that fall outside the "Core Services" must be rationalised. This includes tendering out services, discontinuing services, and modifying services that have the possibility of becoming core to the service offering of the profession. This rationalising of non-core services will also aid in the relationship function of their professional organisation as only services that are demanded and satisfying to clients should be retained. That is a tautology.

The research also suggests that it is not the "Core Services" of the DSIR that are causing dissatisfaction in the business relationship for the clients. The peripheral factors of the "Core Service" offering, such as Administration, Payment Procedures, and Project Deadlines are creating the most dissatisfaction for clients. While the majority of DSIR employee respondents perceive that the "Peripheral Service" area of Administration is over funded, compared to "Core Services" of research in their organisation. This problem is compounded by the market perceiving administrative

services as below standard in the industry, and a major source of frustration and dissatisfaction for clients. These factors are specific, internal to the DSIR, and although perceived as major problems to the clients, they are not major parts of the "Core Service" offering to improve. However, an attempt to modify these peripheral areas of dissatisfaction at present, would encounter resistance from within the DSIR.

After successfully marketing the benefits of change internally to the DSIR, acceptance and a positive working relationship between employees in the organisation will almost fully rectify the peripheral areas of dissatisfaction to the "Core Services" perceived by the clients. Although, due to the resistance to change within the DSIR, the process of optimising the complete service offering of the organisation will be slow and problematic. This opposition should not however, deter the change. Even though these areas of concern are not the major service offering of the DSIR, they do have a major influence on whether clients wish to develop a long term relationship with the DSIR.

The results also suggest that the DSIR's gaining of commercial revenue is complimentary to gaining Foundation for Research Science and Technology (FORST) funding. Educating Scientists at the DSIR on how to 'package' their research service offering to both government and commercial avenues of funding, and which offering is most appropriate for each funding source, could be achieved through an internal marketing programme.

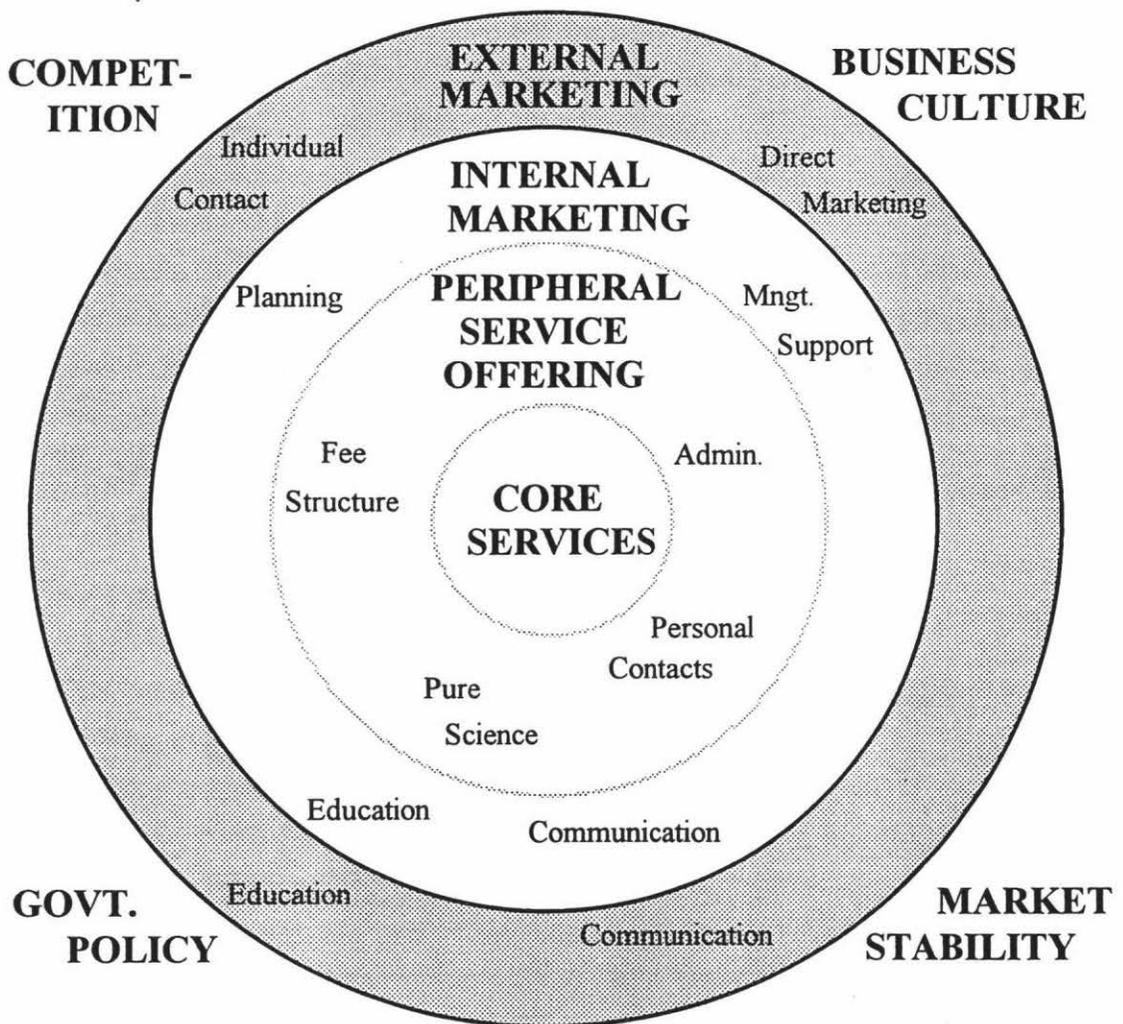
6.5 Develop a Framework that Will Aid in the Strategic Decision Making Process of Industrial Scientific Professionals.

The framework in Figure 6.1 serves as a summary of the topics highlighted in the conclusions and an illustration of their relationship. The most important part of the Scientific and Industrial Research Organisation is the "Core Services". These services are not only central to the service offering, but are also the most demanded services by the market. They include such services as Waste Management, Calibration, and "Niche Core Services" of Transport and Pilot Plant research. These services are commercially oriented, and less technically demanding on the Scientific Profession than the Pure Scientific "Peripheral Services".

"Peripheral Services" are comprised of Pure Scientific Research, along with complimentary elements of the services offering, such as the administration style and

fee structure of the Scientific and Industrial Research Organisation. These complimentary elements are the major determinants of customer satisfaction. While the core of the service offering is seen as fairly homogeneous across the industry by clients. Therefore, a strategy concentrating on the differentiation of "Peripheral Services", which primarily determine client satisfaction, appears to be a Key Factor to Success in the Scientific and Industrial Profession.

Figure 6.1: A Framework of Key Managerial Considerations for Marketing the Services of an Industrial Scientific Professional Organisation.



A major aspect in a successful framework for an Industrial Scientific Professional, is the concentration of effort on marketing internally to the profession. This is to develop strong relationships and collegiality of employees of the profession before it is possible to begin planning external marketing strategies. This internal focus must also be a "top-down" communications emphasis, that the management and employees

have input into and feel positively towards.

A Key Factor to Success of an internal marketing programme could be the implementation of a long term education programme to employees of a Scientific and Industrial Research Organisation. This would be beneficial as it aims to teach the benefits and techniques of gaining further commercial revenue.

Once the internal marketing programme has been seen to be effective by management, an external marketing programme can be implemented. Due to the style of business relations and buyer behaviour in this market, a Key Factor to Success is to provide personal contact with clients. This includes written and verbal information regarding the clients specific research needs, and an educational programme promoting the benefits of commissioning research.

Factors that impinge on the success of a marketing strategy in this industry include: Government Policy; the Stability of the Market; the Business Culture; and Competition. While these factors can be isolated, they are seen to be interrelated. For instance, Government Policy on investment in Research and Development will directly affect the stability of the scientific and industrial research market, due to the restructuring of major competitors, such as the Ministry of Agriculture and Fisheries and the DRI.

6.6 Suggestions for Future Research

The findings of the present study suggest four areas of interest for further investigation: (1) a follow up study to monitor the progress of the CRIs in the new market environment; (2) the specific details of successful educational programmes in the industry; (3) the style of relationship that multinational New Zealand subsidiaries have with their head office and how this impacts on their business activities in New Zealand; (4) and the testing of the proposed framework in Figure 6.1, for salience across other professions.

After the CRIs have gone through a 'settling-in' period, future study to monitor the effects of the changes within the CRIs and in the market would complement the present study. Internally, an investigation as to whether the employees' attitudes to commercial revenue generation have altered would be of interest. This future research could be expanded to include competitors of the CRIs, their attitudes to the

market environment, and how they have learnt from, and altered due to the changes in government policy.

The implementation of educational programmes for professionals and clients in the scientific and industrial research industry have been suggested from the findings of this study. A future investigation into the specific styles of education programmes that will be successful in this industry and other professions may further assist professionals in marketing planning.

New Zealand subsidiaries of multinational organisations were a noticeable group of the external sample in the present study. The results suggested that these subsidiaries develop a style of conducting business that is often directed from their overseas head office. Future research might study the effects these relationships and business styles have on the scientific and industrial research industry.

The framework proposed in Figure 6.1, which resulted from the findings of the present study, is a tool that may be tested for robustness, applicability, and modification within other professions. This may include professions, similar to the industry in the present study, that have been influenced by government policies calling for a commercial orientation of public goods within the profession.

6. References

- Aaker, D.A. & Day, G.S. Marketing Research. New York: John Wiley & Sons, 1990.
- Babcock, D.L. Managing Engineering and Technology: An Introduction to Management for Engineers. Englewood Cliffs: Prentice Hall, 1991.
- Bagozzi, R.P. Marketing as Exchange. Journal of Marketing, 1975, 39, 32-39.
- Bateson, J.E. Researching the Service Consumer. Paper Presented to the American Marketing Association Services Conference, 1986, 27-32.
- Benjamin, G.A. Profitable business development: recognizing the myths that block professionals from marketing success - part one. Journal of Professional Services Marketing, 1990, 6 (1), 149-166.
- Bennion, B.C. Professional Ethics. London: Charles Knight, 1989.
- Berkowitz, E.N. & Flexner, W.A. The marketing audit: A tool for health service organisations. Health Care Management Review, 1978, 3, 51-57.
- Berry, L.L. Services marketing is different. Business, 1980, May-June, 24-29.
- Berry, L.L. The employee as consumer. Journal of Bank Marketing, 1981, 3 (1), 33-40.
- Berry, L.L. Relationship marketing. In Berry, L.L., Shostack, G.L. & Upah, G.D. (Eds.), Emerging Perspectives on Services Marketing. Chicago: American Marketing Association, 1983.
- Berry, L., Conant, J., & Parasuraman, A. A framework for conducting a services marketing audit. Journal of the Academy of Marketing Science, 1991, 19 (3), 255-268.
- Best, D. Consumer Expectations of Services. Paper presented to the Australian Marketing Educators Conference, Perth, Western Australia, February 1990.

- Bharadwaj, S.G., Varadarajan, P.R. & Fahy, J. Sustainable competitive advantage in service industries: a conceptual model and research propositions. Journal of Marketing, 1993, 57, 83-99.
- Bitner, M.J., & Zeithaml, V.A. Fundamentals in Service Marketing. Paper presented at "Add Value to Your Service" the 6th Annual American Marketing Association Services Marketing Conference, 1989.
- Bitner, M.J., Booms, B.H. & Tetreault, M.S. The service encounter: diagnosing favourable and unfavourable incidents. Journal of Marketing, 1990, 54, 71-84.
- Blois, K.J. The marketing of services: An approach. European Journal of Marketing, 1974, 8, 137-145.
- Bloom, P.N. Effective marketing for professional services. Harvard Business Review, 1984, 62, 102-110.
- Bolton, R.N. & Drew, J.H. A longitudinal analysis of the impact of service changes on customer attitudes. Journal of Marketing, 1991, 55, 1-9.
- Bonoma, T.V. The Marketing Edge - Making Strategies Work. New York: Free Press, 1985.
- Bowen, D.E. Managing customers as human resources in service organisations. Human Resource Management, 1986, 25 (3), 371-383.
- Bowen, J. Services Marketing: A Contingency Approach to Organisational Culture. Paper presented to the Australian Marketing Educators Conference, Perth, Western Australia, February 1992.
- Brown, S.T. & Swartz, T.A. A gap analysis of professional service quality. Journal of Marketing, 1989, 53, 92-98.
- Burack, E.H. Changing the company culture - the role of human resource development. Long Range Planning, 1991, 24 (1), 85-95.

- Calonius, H. A market behaviour framework. In Moller K. & Patschik, E., (Eds.). Contemporary Research in Marketing. Helsinki: European Marketing Academy, 1986.
- Calonius, H. Market communications in service marketing. In Avlonitis, G.J., Papavasiliou, N.K. & Kouremenos, A.G. (Eds.), Marketing Thought and Practice in the 1990s. Athens: European Marketing Academy, 1989.
- Capella, L.M. & Sekely, W.S. The marketing audit: Methods, problems and perspectives. Akron Business and Economic Review, 1978, 9, 37-41.
- Chorn N.H. The 'alignment' theory: Creating strategic fit. Management Decision, 1991, 29 (1), 20-24.
- Christopher, M., Payne, A. & Ballantyne, D. Relationship Marketing. London: Heineman, 1991.
- Crane, F.G. Choice criteria and cue usage in selecting lawyers. Journal of Professional Services Marketing, 1989a, 5 (1), 113-121.
- Crane, F.G. A practical guide to professional services marketing. Journal of Professional Services Marketing, 1989b, 5 (1), 3-15.
- Crane, F.G. Professional services marketing in the future: challenges and solutions. Journal of Professional Services Marketing, 1993, 9 (1), 3-12.
- Cronin, J.J.Jr. & Taylor, S.A. Measuring service quality: a re-examination and extension. Journal of Marketing, 1992, 56, 55-68.
- Donnelly, J.H. & Berry, L.L. Bank marketing - past, present, future. In Donnelly, J.H. & George, W.R. (Eds.): Marketing of Services, Englewood Cliffs: Prentice-Hall, 1981.
- Drucker, P. The Practice of Management. New York: Harper & Row, 1954.

- Edvardsson, B. Edvinsson, L. & Nystrom, H. Internationalisation in knowledge - intensive service companies, - a frame of reference and some management observations. Paper presented at the 7th Annual Conference on Services Marketing, Arlington, October 1988.
- Eigler, P. & Langeard, E. Principles of political marketing for the service organisation. Paper presented to the Copenhagen School of Economics and Business Administration 5th Annual Conference, Copenhagen, 1976.
- Fay, M. & Bell, J. Competition and collegiality: The shifting patterns of the professions. Marketing Education Group Proceedings of the 1990 Annual Conference, 1990, 1, 445- 463.
- Fay, M. & Hoogsteden, C. Surveyors in a changing climate. New Zealand Surveyor, 1983, 30, 472-489.
- Fisk, R.P., Brown, S.W. & Bitner, M.J. Tracking the evolution of the services marketing literature. Journal of Retailing, 1993, 69 (1), 61-103.
- Gabriel, C. The validity of qualitative market research. Market Research Society Journal, 1991, 32 (4), 507-519.
- George, W.R. The retailing of services - a challenging future. Journal of Retailing, 1977, 53 (3), 85-98.
- George, W.R. Internal marketing for retailers: The junior executive employee. Developments in Marketing Science, 1984, 7, 322-325.
- George, W.R. Internal Communications Programs as a Mechanism for Doing Internal Marketing. Paper Presented to the 3rd Annual American Marketing Association Services Conference, 1986.
- George, W.R. & Compton, F. How to initiate a marketing perspective in a health service organisation. Journal of Health Care Marketing, 1985, 5 (1), 29-37.
- Goodwin, C. & Bradford, R. Models of service delivery: an integrative perspective. Paper presented to the 2nd International Research Seminar in Service Management, La-Londe-Les-Maures, France, 1992.

- Gronroos, C. Designing a long range marketing strategy for services. Long Range Planning, 1980, 13, 36-42.
- Gronroos, C. Internal marketing - an integral part of marketing theory. In Donnelly, J.H. & George, W.R. (Eds.), Marketing of Services. Chicago: American Marketing Association, 1981.
- Gronroos, C. A service-orientated approach to marketing of services. European Journal of Marketing, 1982, 12 (8), 588-601.
- Gronroos, C. Strategic Management and Marketing in the Service Sector. Cambridge: Marketing Science Institute, 1983.
- Gronroos, C. Internal Marketing - Theory and Practice. Paper presented to the 2nd Annual American Marketing Association Services Conference, 1985.
- Gronroos, C. Developing the service offering - a source of competitive advantage. In Suprenant, C. (Ed.) Add Value to Your Service. Chicago: American Marketing Association, 1987.
- Gronroos, C. Defining marketing: A market-orientated approach. European Journal of Marketing. 1989, 23 (1), 52-60.
- Gronroos, C. Service Management and Marketing - Managing the Moments of Truth in Service Competition. Lexington: Lexington Books, 1990.
- Gronroos, C. Scandanavian management and the Nordic school of services - contributions to service management and quality. International Journal of Service Industry Management, 1991, 2 (3), 17-25.
- Gronroos, C. & Gummesson, E. Service orientation in industrial marketing. In Venkatesan, M. (Ed.), Creativity in Services Marketing. What's New, What Works, What's Developing. Chicago: American Marketing Association, 1985.
- Gronroos, C. & Monthele, C. Services Management in the Public Sector. Stockholm: Liber, 1988.

- Gummesson, E. Towards a theory of professional service marketing. Industrial Marketing Management, 1978, 7, 89-95.
- Gummesson, E. The marketing of professional services - an organisational dilemma. European Journal of Marketing, 1979, 13 (5), 308-318.
- Gummesson, E. Beyond Services Marketing. Paper presented at the 3rd American Marketing Association Services Marketing Conference, Chicago, 1984.
- Gummesson, E. The new marketing - developing long-term interactive relationships. Long Range Planning, 1987, 4, 10-20.
- Hengleson, J.G., Brown, N.J. & Birrer, G.E. Marketing a law firm: It's more than advertising. Journal of Professional Services Marketing, 1990, 5 (2), 153-166.
- Hensel, P.J. Transferring product positioning strategy to the professional service market sector. Journal of Professional Services Marketing, 1988, 4 (1), 31-39.
- Heskett, J.L. Lessons in the service sector. Harvard Business Review, 1987, 65 (2), 118-126.
- Hodge, T.G., Brown, M.H. & Lumkin, J.R. The use of marketing plans and advertising among accounting firms: is this profession a viable candidate for marketing? Journal of Professional Services Marketing, 1990, 6 (1), 43-52.
- Howard, J.H. Leadership, management and change in the professional service firm. Business Quarterly, 1991, 2, 111-116.
- Johnson, E.M. Are Goods and Services Different? An Exercise in Marketing Theory. Washington D.C.: Washington University Press, 1969.
- Johnston, R. & Bryan, R. Products and services - a question of visibility. The Service Industries Journal, 1993, 13 (3), 125-136.

- Jozefowicz, B.M. Marketing/selling professional services: Are more "rainmakers" the answer? Journal of Professional Services Marketing, 1990, 5 (2), 61-76.
- Judd, R.C. The case for redefining services. Journal of Marketing, 1964, 28, 58-59.
- Kelly, S.C. Developing customer orientation among service employees. Journal of the Academy of Marketing Science, 1992, 20 (1), 27-36.
- Kotler, P. Marketing Management, New Jersey, Prentice-Hall, 1991.
- Kotler, P. & Bloom, P.N. Marketing Professional Services, New Jersey, Prentice-Hall, 1984.
- Kotler, P. & Connor, R.A. Marketing professional services. Journal of Marketing, 1977, 41, 67-75.
- Kotler, P., Gregor, W.T. & Rodgers, W.H. The marketing audit comes of age. Sloan Management Review, 1977, 18, 25-43.
- Levitt, T. After the sale is over. Harvard Business Review, 1983, Sept.-Oct., 36-45.
- Lovelock, C.H. Classifying services to gain strategic marketing insights. Journal of Marketing, 1983, 47, 9-20.
- Lovelock, C.H. Service Marketing, New Jersey, Prentice-Hall, 1984.
- Lovelock, C.H. (Ed.), Managing Services - Marketing, Operations, and Human Resources, London: Prentice-Hall International, 1988.
- Lovelock, C.H. Langeard, E. Bateson, J.E.G. & Eigler, P. Some organisational problems facing marketing in the service sector. In Donnelly, J.H. & George, W.R. (eds.), Marketing of Services, New York: American Marketing Association, 1981.
- McLean, F. Services marketing: the case of museums. The Service Industries Journal, 1994, 14 (2), 190-203.

- Ministerial Scientific Task Group Report. Crown Research Institutes: Research Companies for New Zealand. Wellington: Government Printing Press, 1992.
- Mitchell, V.W. Organizational homeostasis: A role for internal marketing. Management Decision, 1992, 30 (2), 3-7.
- Moeller, A, & Schneider, B. Climate for Services and the Bottom Line, Paper presented to the 2nd Annual American Marketing Association Services Conference, 1985.
- Mokwa, M.P. The strategic marketing audit: An adoption/utilization perspective. The Journal of Business Strategy, 1986, 6, 88-95.
- Morgan, N.A. Implementing marketing: Key issues for professional service firms. Journal of Professional Services Marketing, 1990a, 6 (1), 7-16.
- Morgan, N.A. Professional accounting firms and marketing. The Services Industries Journal (UK), 1990b, 10 (3), 599-613.
- Morgan, R.E. Marketing professional services: An empirical investigation into consulting engineering services. Marketing Education Group Proceedings of the 1990 Annual Conference, 1990c, 3, 973-994.
- Morgan, N.A. & Piercy, N.F. Barriers to marketing implementation in professional service firms. Marketing Education Group Proceedings of the 1990 Annual Conference, 1990, 2, 956-972.
- Morgan, N.A. & Piercy, N.F. Barriers to marketing implementation in U.K. professional service firms. Journal of Professional Services Marketing, 1991, 8 (1), 95-113.
- Morgan, R.E. & Chadha, S. Relationship marketing at the service encounter: The case of life insurance. The Service Industries Journal, 1993, 13 (1), 112-125.
- Naylor, J. & Wood, A. Practical Marketing Audits: A Guide to Increased Profitability. New York: John Wiley & Sons, 1978.

- Normann, R. Service Management Strategy and Leadership in Service Businesses. Chichester: John Wiley & Sons, 1991.
- Normann, R. Services Management. New York: John Wiley & Sons, 1984.
- New Zealand Science Expenditure, New Zealand Science Review, 1990, 47 (3-4), 56.
- Ohmae, K. The Mind of the Strategist: Business Planning for Competitive Advantage (6th ed.). New York: Penguin Books, 1987.
- Parasuraman, A., Zeithaml, V.A. & Berry, L.L. A conceptual model of service quality and its implications for future research. Journal of Marketing, 1985, 49, 41-50.
- Parasuraman, A., Zeithaml, V.A. & Berry, L.L. Customer-Orientated Organizational Culture: A Key to Successful Services Marketing, Paper Presented to the American Marketing Association Conference, 1985.
- Parasuraman, A., Zeithaml, V.A. & Berry, L.L. SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. Journal of Retailing, 1988, 64, 12-40.
- Payne, A.F. Developing a marketing-oriented organization. Business Horizons, 1988, 31, 46-53.
- Piercy, N., & Morgan, N. Internal marketing - the missing half of the marketing programme. Long Range Planning, 1991, 24 (2), 82-93.
- Quinn, J.B., Dorley, T.L. & Paquette, P.C., Beyond products: services-based strategy. Harvard Business Review, 1991, 69, 58-67.
- Rathmell, J.R. What is meant by services? Journal of Marketing, 1966, 30, 32-36.
- Rathmell, J.R. Marketing in the Service Sector. Massachussets: Winthrop, 1974.
- REINZ. Monitoring Members' Levels of Satisfaction. Unpublished research report, Massey University, 1992.

- Regan, W.J. The service revolution. Journal of Marketing, 1963, 27, 57-62.
- Rooks, W.A. & Weinroth, J. An empirical confirmation of dual strategies used in marketing high-technology goods and services: the decision-supporting software example - part two: Research findings, conclusions and implications. Journal of Professional Services Marketing, 1993, 9 (2), 187-198.
- Rushton, A.M. & Carson, D.J. The marketing of services: Managing the intangibles. European Journal of Marketing, 1985, 19 (3), 19-40.
- Sasser, W.E. & Arbeit, S. Selling jobs in the service sector. Business Horizons, June 1976, 61-65.
- Schneider, B. Notes on Climate and Culture, Paper presented to the American Marketing Association Conference, 1988.
- Schneider, B. & Bowen, D.E. Employee and customer perceptions of service in banks: Replication and extension. Journal of Applied Psychology, 1985, 70, 78-94.
- Sherrard, M.J. The Role of Marketing in Consulting Engineering Practice. Unpublished postgraduate research report, Massey University, 1992.
- Shimpoek - Vieweg, K.J.D. The internal marketing of legal services: The law library. Journal of Professional Services Marketing, 1991, 8 (1), 129-142.
- Shostack, G.L. Breaking free from product marketing. Journal of Marketing, 1977, 41, 73-80.
- Shuchman, A. The marketing audit: Its nature, purpose, and problems. In Newgarden, A. & Bailey, E.R. (Eds.), Analyzing and Improving Marketing Performance: Marketing Audits in Theory and Practice. New York: American Management Association, 1959.
- Smith, A.M. & Turnbull, P.W. Service Characteristics and their Implications for Quality, Paper Presented to the Marketing Education Group Annual Conference, Oxford Polytechnic, 1990.

- Solomon, M.R. Suprenant, C., Czepiel, J.A. & Gutman, E.G. A role theory perspective on dyadic interactions: The service encounter. Journal of Marketing, 1985, 49, 99-111.
- Souter, G.N., & McNeil, M.M. Information Search for a Professional Service, Paper presented to the Australian Marketing Educators Conference, Perth, Western Australia, February 1992.
- Swartz, T.A., Bowen, D.E. & Brown, S.W. Fifteen years after breaking free: Service then, now and beyond. In Swartz, T.A., Bowen, D.E. & Brown, S.W. (Eds.), Advances in Services Marketing and Management: Research and Practice. Greenwich: JAI Press, 1992.
- Tansuhaj, P., Randall, D., & McCullough, J. Applying the internal marketing concept within large organizations: As applied to a credit union. Journal of Professional Services Marketing, 1991, 6 (2), 193-202.
- Teas, R.K, Dorsch, M.J., & Mc Alexander, J.H. Measuring commercial bank customers' attitudes towards the quality of the financial services marketing relationship. Journal of Professional Services Marketing, 1988, 4 (1), 75-94.
- Thomas, D.R.E. Strategy is different in service business. Harvard Business Review, 1978, 56, 158-165.
- Turnbull, P.W. & Valla, J-P., (Eds.). Strategies for International Marketing. London: Croom Helm, 1987.
- Turner, E.B. Marketing of professional services. Journal of Marketing, 1969, 33, 56-61.
- Unvula, C. & Donaldson, J. The service sector: Some unresolved issues. Service Industries Journal, 1988, 8 (4), 459-69.
- Webster, C. A note on cultural consistency within the service firm: The effects of employee position on attitudes toward marketing culture. Journal of the Academy of Marketing Science, 1991, 19 (4), 341-346.

- Webster, F.E. Management science in industrial marketing. Journal of Marketing, 1978, 42, 12-28.
- Wheatley, E.W. Marketing Professional Services. Englewood Cliffs: Prentice-Hall, 1983.
- Wittreich, W.J. How to buy/sell professional services. Harvard Business Review, 1966, 44, 127-138.
- Wilson, A. Marketing Audit Check Lists. New York: McGraw-Hill, 1982.
- Worcester, R. & Downham, J. (Eds.) Consumer Market Research Handbook (Third Edition). New York: Mc Graw-Hill, 1986.
- Wyckham, R.G., Fitzroy, P.T. & Mandry, G.D. Marketing of services - an evaluation of the theory. European Journal of Marketing, 1975, 9, 59-67.
- Zeithaml, V.A., Parasuraman, A. & Berry, L.L. Problems and strategies in services marketing. Journal of Marketing, 1985, 49, 33-46.
- Zemke, R. Scandinavian management - a look at our future? Management Review, 1988b, July, 16-28.

Appendices

	Page
Appendix A: External Respondents by Organisation	130
Appendix B: Letter of Introduction to External Sample	131
Appendix C: Internal Question Guide	132
Appendix D: External Questionnaire	135
Appendix E: DSIR/IRL Services Cue Cards' Contents for External Interviews	146
Appendix F: Response Letter to the Results from the DSIR	150

Appendix A : External Respondents by Organisation

Organisation	Respondent's Position
1. New Zealand Hardware Ltd	Quality Assurance Manager
2. Air New Zealand	Technical Manager - Engines
3. Bridon New Zealand Ltd	Plant Engineer
4. Alcan New Zealand Ltd	Mechanical Engineer
5. New Zealand Steel	Electrical Group Engineer (Rolling Mills)
6. Levenes New Zealand Ltd	Technical Representative
7. Bluebird Foods Limited	Group Technical and Development Manager
8. New Zealand Kiwifruit Marketing Board	Research and Development Manager
9. New Zealand Dairy Board	Corporate R&D Manager
10. Meat Research Development Council	Executive Director
11. UEB	Technical Officer
12. New Zealand Starch	Development Manager
13. Tui Milk Products	Technical Manager
14. Monsanto	Product R&D Manager
15. Transpower	Technical Contracts Manager
16. General Electrics Corporation	Laboratory Manager
17. New Zealand Wool Board	Research Co-ordinator
18. Telecom	Senior Product Manager
19. Power Corporation	Senior Technical Marketing Manager
20. Ompipak	National Factories Manager
21. ENZA 1	Corporate Research Director
22. Airways Corporation of New Zealand	Laboratory Manager
23. New Zealand Pharmaceuticals	Market Development Manager
24. ENZA 2	Technical Manager ENZA Processes
25. Hirstlens New Zealand Ltd	Technical Manager
26. Watties New Zealand Ltd	Laboratory Manager



**MASSEY
UNIVERSITY**

Private Bag
Palmerston North
New Zealand
Telephone 0-6-356 9099
Facsimile 0-6-350 5608

**FACULTY OF
BUSINESS STUDIES**

**DEPARTMENT OF
MARKETING**

Appendix B: Letter of Introduction to External Sample

Name?
Title?
Address?

Date?

Dear Ms/Mr...?

I am a Masterate student studying marketing at Massey University. My main topic of interest is the marketing of industrial professional services. This year my research towards a thesis is to investigate the 'fit' between the services provided by Scientific and Industrial Research Organisations and the needs and perceptions of their present and potential clients. Soon I will be interviewing both the staff of Scientific and Industrial Research Organisations from their customer base. You have been chosen for an interview as a person that will be able to give meaningful information to develop an overall picture of the perceptions of present and potential clients of these organisations.

The research will contribute to academic knowledge, more importantly, from a practitioner's point of view it will provide the industry with information on the specific services most required by clients and how best to deliver these services.

I will contact you by telephone in the next two days to discuss a possible time to come and talk to you.

Thank you, in anticipation of your valuable time.

Yours sincerely,

Michael Sherrard
Marketing Department

Appendix C: Internal Question Guide

CONFIDENTIAL

Department of Marketing

Massey University

Survey of Industrial Scientific Professional

Name: _____

Position: _____

Section: _____

Internal Interview Question Prompts

1. What do you perceive the change to a CRI will mean for your section of IRL? (Probe for: changes in the structure, funding, outlook, etc.)

2. Should your section of IRL be doing more industrial/commercial work? (Explore for feelings of reliance on the Foundation for revenue)

3. Will more industrial/commercial work create a negative image for IRL?

4. Do you feel that your work colleagues at IRL are hesitant to undertake more industrial/commercial work? Why?

5. What would be the ideal situation for IRL to operate under?
(Suggest: within its funding and revenue, organisational structure, and work ethic)

6. Do you think there is a place for marketers and business people to assist IRL in the future? (If YES - How?, If NO - Why?)

10. Is it possible for IRL to become the R&D arm of large organisations? Why?

11. How might IRL market itself better to gain these long-term client relationships? (Look especially for positioning and strategy responses)

12. (A) Are there any specific barriers that might have caused a lack of potential long-term relationships with industrial/commercial clients?

(B) If so, how could these barriers be eliminated?

13. (A) Do you think the resources in your organisation are used productively? (Probe to see if they think IRL is inherently a public good with vast resources that may never recoup costs)

14. Was the (*old*) DSIR a non-profit organisation?

15. Is the (*new*) IRL going to be a non-profit organisation?
(Determine their expectations of the structural change)

Is there anything else you would like to discuss?

THANK YOU

Appendix D: External Questionnaire

CONFIDENTIAL

Department of Marketing

Massey University

Survey of Industrial Professional Service Market

Name: _____

Company: _____

Address: _____

Demographics

Firstly, could I ask you some questions about your organisation?

1. What position do you hold in the company?

2. How many years have you been in this industry?

1. less than 1 year
2. 1 - 5 years
3. 6 - 10 years
4. more than 10 years

3. What is the total number of staff employed in this company?

1. less than 10
2. 10 - 29
3. 30 - 49
4. 50 - 99
5. 100 - 300
6. more than 300

4. What is the age of your company?

1. less than 5 years
2. 5 - 9 years
3. 10 - 14 years
4. 15 - 29 years
5. 30 years or more

5. What is your firm's approximate turnover (\$) per annum?

1. less than 500,000
2. 500,000 - 2 million
3. over 2 million - 5 million
4. over 5 million - 10 million
5. over 10 million - 20 million
6. over 20 million - 50 million
7. over 50 million - 100 million
8. over 100 million

6. Is the head office of your organisation in New Zealand?

1. YES
2. NO

7. Do you have in-house research?

1. YES
2. NO

If YES, is this in New Zealand or Overseas?

1. New Zealand
2. Overseas

Where? _____

Industry-wide Questions

8. Do you allocate a budget for scientific or industrial research on an annual basis?

(What I mean is, consulting, or calibration and testing?)

1. YES

2. NO

If YES, approximately how much?

If NO, do you allocate *any* funds for scientific or industrial research?

1. YES

2. NO

If YES, How do you allocate funds?

(ad hoc, project specific, etc.)

If NO, why do you not allocate any funds?

9. Who is your first choice when seeking scientific or industrial research assistance?

First choice: _____

Why? _____

Second choice: _____

Why? _____

Third choice: _____

Why? _____

10. Is it important to seek outside specialised advice on scientific and industrial matters?

(Please refer to the cards)

- Very Important
- Important
- Neither Important nor Unimportant
- Unimportant
- Very Unimportant

Why? _____

11. What sources of information and/or referral do you use when making a decision on a scientific and industrial organisation to contract?

Sources: _____

12. How up-to-date do you perceive the different scientific and industrial research organisations?

(Please refer to the cards)

	V.Modern	Modern	Neutral	Not Modern	Old
In-house	1	2	3	4	5
DSIR	1	2	3	4	5
Massey Uni.	1	2	3	4	5
Otago Uni.	1	2	3	4	5
MAFTech	1	2	3	4	5
DRI	1	2	3	4	5
Pvte. Consltns.	1	2	3	4	5
MOT	1	2	3	4	5
Aussie Co.s	1	2	3	4	5
Other	1	2	3	4	5

13. Which organisations would you consider when you need to either make changes in a technical process or optimise a technical process?

- In-house
 - DSIR
 - Massey University
 - Otago University
 - MAFTech
 - DRI
 - Private Consultants
 - MOT
 - Australian Companies
 - Other Organisations:
-

DSIR Specific Questions

Now I would like to ask you some questions more specifically about the DSIR.

14. On the 4th July the DSIR will become 10 Crown Research Institutes. The new Industrial Development CRI consists of :

DSIR Industrial Development (AIDD, IPD, SIDD)
Physical Sciences (PEL, AMD)
and Chemistry

Are you aware of what this may mean in terms of the services they provide?

- YES
- NO

If YES, What? _____

Do you think this will be a good change?

- YES
- NO

Why do you say that? _____

15. What type of organisation would you describe the DSIR as?
(Please refer to the cards)

Academic/Boffinish Pragmatic/Commercially
Oriented
1 ----- 2 ----- 3 ----- 4 ----- 5

What makes you say this? _____

16. How does this description differ from what you feel would be an *ideal* DSIR organisation for your needs?

17. Does any organisation meet your needs fully?

YES

NO

If YES, Who?

18. Here is a set of cards containing services provided by the DSIR. Could you firstly sort them into two piles: Applicable and not applicable to your organisational needs. Then with the applicable pile, please tell me if you feel the services should be discontinued (and why?), continued at their present level (and why), or expanded (and why?).

Applicability

Priority

- | | |
|--|--------------------------------------|
| <input type="checkbox"/> Electrical | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Heavy Electrical | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Electronics | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Transport | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Optical | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Machine Vision ('smart machines') | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Chemical Product Development | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Waste Mngmnt/Environmental Res | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Powder Transport | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Energy | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Pilot Plant Trials | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Metallurgy | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Corrosion Studies | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Materials Research | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Plastics and Polymers Research | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Operations Research | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Mathematical Modelling | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Statistical Studies | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Chemical Synthesis | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Calibration of Equipment | <input type="checkbox"/> D C E _____ |
| <input type="checkbox"/> Other Services: | <input type="checkbox"/> D C E _____ |

19. Does your organisation view the DSIR as a state of the art research house?

(Please refer to the cards)

- Very Definitely
- Definitely
- Neutral
- Definitely Not
- Very Definitely Not

Any particular reason for this? _____

22. Is the DSIR dependable and stable enough to facilitate the development of a long term relationship? (i.e. like a 'research arm' of your organisation)

YES

NO

If YES, then why? _____

If NO, then what reasons make you say this? _____

23. Is it desirable to develop a long term relationship with the DSIR?

YES

NO

If YES, then why? _____

If NO, then why? _____

24. How would you rate the level of confidentiality of the DSIR, compared to other similar institutions? (including your organisations requirements) (Please refer to the cards)

Very Confidential

Confidential

Neutral

Not Confidential

Not at all Confidential

Why do you say this? _____

Appendix E: DSIR/IRL Services Cue Card Contents for External Interviews (The size of each service card is A5)

Calibration of equipment

This covers all kinds of industrial and scientific measurement including alignment, flatness, roundness, length, weight. An example would be checking the alignment of large diameter cylinders used in paper making.

Operations Research

This includes process optimisation, discovering the "best way" to carry out some operation such as meat cutting or siting of (say) a fire station to optimally serve a community.

Mathematical Modelling

All kinds of modelling of processes including but not limited to financial, economic, geothermal, environmental, climatic and industrial generally. An example would be modelling the geothermal field at Wairakei to determine how long steam would be available at different draw off rates.

Statistical Studies

All statistical work but especially complex and difficult studies.

Chemical synthesis

Including pharmaceuticals, animal attractants, industrial compounds, natural and inorganic products.

Pilot plant trials

All chemical and material processing work done at the intermediate scale between bench studies and full scale.

Metallurgy

Testing, materials selection, non destructive testing, failure prediction and prevention.

Corrosion studies

Including marine, and examining possible prevention methods and materials selection to prevent or minimise corrosion.

Materials research

Plastics, polymers, steels, non ferrous alloys, wood, composites, etc.

Waste management / Environmental

Recommendations on process control to avoid waste, waste treatment, waste minimisation, reuse of material, scrap reduction.

Powder transport

All kinds of flowing powder transport and measurement including measurement of mass flow, density, moving powders hygienically (especially dairy industry).

Energy

Power use reduction, alternative fuels, energy saving and optimisation, motor vehicle tuning.

Electrical

Testing and development of all electrical components.

Heavy Electrical

High voltage (up to 800kv) and high current (up to 10,000 amps) work including development and testing and calibration.

Electronics

All new product development, testing and calibration.
Includes microwaves, antennae etc.

Transport

Most aspects of road or other transport including suspension testing, road damage, design and testing work.

Optical

Light measurement, testing and calibration. New and innovative lenses, cameras and vision aids.
Sunlight measurement.

Machine vision

Combining computing power with video equipment to automatically control, measure or test in environments where this operation would be fatiguing or impossible for humans. Includes fruit grading, optimal sail shape for KZ1, hostile environment viewing and decision making.

Chemical and biochemical product development

All kinds of chemical compounds and mixtures, natural product extraction, enzymes, fermentation, inorganics, minerals.

Plastics and Polymers Research

All types of research including structure, durability etc.

Appendix F: Response Letter to the Results from the DSIR

NEW ZEALAND INSTITUTE FOR INDUSTRIAL RESEARCH AND DEVELOPMENT



November 1992

Associate Professor Norman Marr
 Department of Marketing
 Faculty of Business Studies
 Massey University
 Private Bag 11222
 Palmerston North

Gracefield Research Centre
 Gracefield Road
 PO Box 31-310
 Lower Hutt
 New Zealand
 Phone +64-4-566 6919
 Fax +64-4-566 6004

Dear Norman

The Chief Executive of Industrial Research Limited, Dr Geoff Page, has asked me to convey to you our thanks for the excellent job done by your student Michael Sherrard on the marketing project which he did for us. In the course of his work Michael uncovered a number of areas which have been a significant contribution towards the Company's strategic planning.

We enjoyed working with Michael and hope that he found the experience of working with real life data contributing to major decisions a helpful and rewarding one. In addition, as a consequence of this positive experience we are actively looking for opportunities of using the Massey research skills in this area in the future.

Yours sincerely

Kevin Duckworth
 General Manager
 Measurement, Applied Mathematics & Analysis