

The Institutionalisation of Environmental Management at Hewlett-Packard Ltd.

Engineering Doctorate Thesis by Portfolio

Volume I

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¹ Hewlett-Packard Ltd

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⁶ Particularly my young nephew Lewis.

Institutionalisation of Environmental Management

Abstract

Abstract

This portfolio presents the results of a project that examined the development of environmental management in a large multi-national corporation over a four year period. The aim of the project was to "institutionalise"⁷ environmental management, in other words to ensure that environmental management was considered part of normal business practice and not a well intentioned afterthought. This was achieved through an in-depth case study using action research methods to facilitate and record organisational change simultaneously.

The research demonstrated that previous accounts of environmental management in industry have failed to provide an adequate analysis of the changes required to institutionalise environmental management. This is shown to be partly attributable to the dominance of the quantitative, outsider-based research methods.

The research makes three principal contributions to knowledge:

- ♦ Identifying and describing four different levels of change required for the institutionalisation of environmental management in a comprehensive study
- ♦ Identifying factors affecting the institutionalisation of environmental management in an industrial setting
- ♦ Demonstrating the usefulness and validity of insider-based methodologies for environmental management research

In this Portfolio it is argued that the institutionalisation of environmental management requires change at multiple levels and that the observation and further clarification of these levels can be achieved through insider-based research methods. At a practitioner level, it is recommended that industrial managers reconsider their strategies for achieving the institutionalisation of environmental management. In particular, company-wide employee awareness programmes and/or policy driven management systems only go part way towards achieving an institutionalised approach. An approach, in line with existing organisational roles, culture and objectives is recommended. Further, as environmental management becomes considered as part of normal business practice, it is recommended that researchers identify the boundaries between environmental and other management research to reflect industrial practice.

⁷ The definition and practical meaning of this term are explored in more detail in Chapter Three.

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Executive Summary

Executive Summary

i) Introduction

In this Executive Summary the reader is provided with a route-map for the Portfolio that follows. Significant project milestones and attributes are sign posted and the research findings summarised. Firstly, brief details of the project location and participants are provided to familiarise the reader with the research settings. Following this, the research is positioned within the wider context of environmental management research and practice. The project's key findings, recommendations and contributions are then outlined with reference to previous literatures⁸. The final section of this Executive Summary is a detailed route-map of the Portfolio structure and presentation style.

ii) Project Background

This portfolio describes a research project aimed at improving environmental management in an industrial setting. The research was a case study of a single organisation, namely Hewlett-Packard Ltd (HP). The project began in October 1994 and ran continuously until September 1998. During this time the researcher was based at Hewlett-Packard's premises in Bracknell, Berkshire.

In the UK, HP had identified the need for increased attention to environmental management, particularly in their sales and marketing locations. After a selection process, the researcher was invited to assist HP's UK sales company with their environmental management programmes. Shortly after the project commenced the research objectives were established in line with HP's objectives at the time. The practical objective of the project was to "institutionalise" environmental management by direct participation with company employees. The parallel research objective was to reflect on the project's success during (not after) its implementation and continually incorporate any insights back into the programme. Before summarising the key recommendations and contributions of this research, it is necessary to set the scene and describe the background of environmental management more generally.

iii) Environmental Management Research and Practice

In 1994 HP was typical of many organisations that were coming under increasing pressure to demonstrate their environmental performance. Some managers in industry, including those at HP, had begun to realise that environmental issues required more systematic management than had previously been achieved.

⁸ References are used sparingly in this executive summary. Full references and detailed arguments can be found in Chapters Three and Four.

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Executive Summary

At this time firms began attempting to align their business and environmental objectives to satisfy the wide ranging and varied demands of their stakeholders. Part one of this portfolio will show that this trend in environmental management has been represented in a number of ways. However, the common objective of these approaches towards environmental management is a desire to ensure that environmental management is considered to be part of normal business practice. So far, for the most part, the integration of environmental management into normal business practice is yet to happen. Additionally, there has been no detailed analysis of the efficacy or implications of this "integrated" approach within environmental management literatures. This portfolio will show that many of these insights have not previously been gained because researchers have rarely been able to access different organisational levels. It will be shown that outsider-based research methodologies instead have dominated this field. In particular, it has been relatively common to interview senior executives within a firm, or review published company documentation. Likewise, there are studies of "employees' environmental awareness" in general, either through survey or interview techniques. Neither of these approaches examines the real implication of an integrated or institutionalised environmental management function because they do not normally allow the researcher to gain access to the appropriate parts of the organisation, namely the inside, where most organisational decisions are made.

The "Research Methodology" section in Part One will demonstrate an increasing need for organisational and environmental management researchers alike to adopt insider methodologies instead and thereby gain more detailed insights into the processes of successful environmental management. In this context, this research makes a direct contribution to knowledge by analysing the institutionalisation of environmental management at Hewlett-Packard. Notably, the use of an action-oriented insider-based methodology allowed for the implications of this to be examined from an informed but relatively independent perspective.

iv) A Framework for the Institutionalisation of Environmental Management

In this portfolio, four levels of organisational change required for the institutionalisation of environmental management are proposed. These are represented in Table A which depicts the recommendations and findings of the project at HP. This is the framework for the Institutionalisation of Environmental Management. This Table will feature throughout the portfolio and is developed in detail in Part Three.

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Institutionalisation of Environmental Management

Executive Summary

Table A Framework for the Institutionalisation of Environmental Management

Framework for the Institutionalisation of Environmental Management			
Overall Findings	Levels	Findings at each level	Practical Recommendations
<p>1) <i>The institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred.</i></p> <p>2) <i>Environmental management is not a distinct organisational issue and should be analysed alongside other business practices.</i></p>	Individual Values	A broad-brush approach which expects every employee to value environmental protection is not particularly useful or realistic for managers wishing to improve environmental management	<ul style="list-style-type: none"> - Link environmental programmes to personal concerns for environmental protection - Demonstrate and provide "sinks" to capture employee environmental concerns
	Individual Action	A large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.	<ul style="list-style-type: none"> - Organise individual training and awareness according to employee roles and responsibilities - Involve appropriate level of employee according to objectives - Minimise effort put into generic company-wide programmes / Maximise effort put into specific improvement programmes
	Business Activity	Action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.	<ul style="list-style-type: none"> - Identify business group competencies and recommend environmental management programmes accordingly - Focus on "middle" managers and supervisors in addition to top management
	Company Values	Considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.	<ul style="list-style-type: none"> - Identify and demonstrate existing company objectives and strategies which are related to environmental management - Demonstrate linkages between environmental management and both "hard" and "soft" objectives - Reinforce company values with both communications and action

Institutionalisation of Environmental Management

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The first finding suggests that the institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred. The second main finding of this research is that environmental management is not a distinct organisational issue and should be analysed alongside other business practices. Both of these will be demonstrated as the Portfolio develops and are discussed in more detail in Part Three. The four levels that were articulated by the researcher for the institutionalisation of environmental management were Individual Values, Individual Actions, Business Activity, and Company Values.

In terms of individual values, it is popularly perceived that all employees need to be involved with environmental management, or perhaps that every individual should have personal values associated with environmental protection. However, this research shows this "broad-brush" approach is not particularly useful or realistic for managers wishing to improve environmental management. The research also suggested that employees' values *and* actions are important determinants in achieving environmental management change. In particular, during this research, a model was devised depicting the range of employee responsibilities possible for environmental management issues (discussed in Parts Two and Three).

The researcher also considered the business (in contrast to the individual) activity required to institutionalise environmental management. Previous environmental management researchers have tended to ignore the role of middle management in the achievement of change suggesting that a focus on either top management or general employee awareness is a more appropriate strategies for achieving change. The concept of targeting middle management complements existing strategy for achieving change and is argued here to represent a more effective way of approaching environmental management change. Additionally, this research proposes that change at a work-group⁹ level depends on that group's specific objectives and the discretion of employees within the group to effect change. It will be shown that previous descriptions of environmental management in organisations have not discussed existing organisational frameworks or employee responsibilities, in effect, isolating environmental management from normal business practice. Finally this research recommends that firms use existing aspects of company culture and objectives to frame environmental management. It will be shown that there was considerable value in using existing corporate objectives and core values as legitimising tools during the project at HP. This confirms previous literature that suggests the efficacy of this approach. In addition, the research at HP also provides specific examples of its application. The chapters in Part Two of the Portfolio will discuss the development of these findings over four years in significantly greater detail.

⁹ Discussed in more detail in Chapters Three and Eleven.

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Executive Summary

v) Presentation of the Portfolio

To guide the reader through the portfolio, the contents are summarised here. Firstly, the portfolio is divided into two volumes. The second is a collection of reports written by the researcher at six monthly intervals during the project, and *if necessary* the reader can refer to these as a processual guide to the development of the project. However the full picture of the research is represented in a more structured and logical way in Volume One.

Volume One is divided into three parts. These parts were chosen to present the research in a logical order for the reader, however it should be noted that the structure does not represent the sequential order of research activities. Although these parts can be considered separately, a more complete picture of the project can better be obtained by considering each as part of a whole. Across the three parts, chapters are labelled consecutively to avoid duplicate chapter referencing. Part One is entitled "Research Context" and is designed to provide the reader with the necessary background to the research project before moving on to the detail of the project itself. In Part Two - "Action Research" - details of the four year project are presented using a series of five "story boards". Finally, in Part Three - "Evaluation" - the findings of the project are presented and analysed, and the project's contribution to knowledge outlined. Each of the parts is now described in greater detail.

vii) Part One

The two main chapters in Part One are "Literature Review" and "Research Methodology". The literature review discusses trends in environmental management towards an approach that is integrated with normal business practice. In this chapter the recommendations for such an approach are explored in terms of different organisational levels. Experience is also drawn from other management disciplines that have followed a similar integrated approach. The development of the first research hypothesis was based largely on this literature review and practical experience at the company.

Also in Part One a chapter on research methodology (Chapter 4) describes methodologies associated with the study of organisations. Both organisational and environmental management research are examined from a methodological perspective. In this chapter, the reader will also learn about the specific research design and methodologies used by the researcher to achieve and record organisational change at Hewlett-Packard. In particular it will be shown that electronic mail messages were identified as a significant and unusual source of research data.

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viii) Part Two

Part Two (Action Research) describes the research project in greater detail. This part is presented differently from the other two. Drawing from recommendations from the MIT Centre for Organisational Learning (Roth and Kleiner, 1995; Roth, 1996) on how to depict complex organisational change processes, the researcher chose a "two-column" layout. In this type of layout, an account of the events is presented on the left hand side of the page written from the researcher's perspective. The right hand column is exclusively for primary data, including narrative from people involved in the change effort.

In all, five "story boards" are presented in this style, each taking a different perspective on the four years of research. Data used here were selectively sampled; the sampling strategy is discussed in Chapter 5. This sample of data enables a balanced representation of research, action, results and problems and does not merely represent vignettes of success. Significantly, one story board is provided on the development of the research process from a methodological perspective. Together, the five story boards present the process of research that led to the framework for the institutionalisation of environmental management. Further rationale as to the content and presentation styles of these story boards is also provided in Chapter 5 - Analysing and Presenting the data.

The Story Boards are labelled as follows.

- 1.) An Account Of The Action Research Process
- 2.) Business Planning for Environmental Management
- 3.) The Changing Environmental Management Organisation
- 4.) Getting the Message Across - Environmental Management Communication
- 5.) Single Issue Focus - Improving Waste Management Policy and Practice

The research findings presented in Table A are introduced in these story boards by way of themes seen in the research data. The story boards do not correlate to the findings exactly, although each story board introduces at least one. Chapter 5 describes where the findings appear in the story boards

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Executive Summary

In the first story board an account of the research process is presented. Here the reader will learn how the framework for institutionalising environmental developed over time and depended on the constant interaction between researcher and organisation. Story Board One also charts the development of research methodologies over time. The main objective of Story Board Two is to establish important context for the remainder of the story boards. Hewlett-Packard's approach to environmental management and the researcher's position in the organisation are described here. Also, Hewlett-Packard's process of Quality Management is discussed since this was a method identified to achieve environmental management change. Story Boards Three to Five portray themes seen in the research data which eventually formed the research findings represented in Table 1. The final story board is not related to any of the findings specifically but includes examples that contribute to all five. Focusing on one aspect of environmental management, the objective of this story board is to highlight examples of where organisational change and environmental performance were achieved in the four years. Additionally, Story Board Five relies heavily on electronic mail messages as evidence and is therefore used to highlight the characteristics of using this tool as a type of research methodology.

ix) Part Three

In the final part of the portfolio, the framework for institutionalising environmental management is derived and discussed in detail. The discussion is substantiated with references to material contained in the story boards and other relevant research data. In this section the wider implications of the research will be considered both in terms of the framework for institutionalisation and the research method used. This section will reinforce the three principal contributions to knowledge, as presented on Page 1. Additionally a number of secondary findings are discussed including: the difficulties of researching environmental management as a discrete issue, the validity of electronic mail data, and the challenges of measuring organisational change from an insider's perspective. It will be argued in this section that despite these challenges, insider-based methodologies are highly appropriate for studying areas of the business which are recommended to be integrated with organisational practice, such as environmental management. Surveys and other outsider-based methods cannot capture the richness of organisational life, which is now crucial to understanding the future role of environmental management in industry.

Part One
Research Context

Part One - Research Context

Introduction

Part One - Research Context

Introduction

The first part of the portfolio (to follow) describes the context of the research project. The research context has been divided into four distinct areas;

- The Players,
- The Project Background,
- The Literature Review, and
- The Research Methodology.

In essence this part of the portfolio describes the Who, What, Why, and How of the project. In other words: who were the players in the research, what was the research about, why is the research valuable and how was the research carried out. To familiarise the reader with the "players" of the research, in Chapter One a description of the research participants is provided. This provides an introduction to the researcher, the sponsoring company Hewlett-Packard Ltd (HP), and the Engineering Doctorate (Environmental Technology) Programme. The second chapter describes the project background, outlining the research objectives and their origin. A brief history of Hewlett-Packard Ltd's environmental management programmes is also presented as background to the project work. Chapter Three, the literature review, moves away from the project detail and describes some general and specific trends in academic research disciplines relevant to the project objectives. Besides literatures specific to environmental management, this section also explores subjects such as Quality Management, Human Resource Management and general organisational change literatures. The final chapter in Part One summarises the research context, setting the scene for Part Two where the main research activities are described. By the end of Part One the reader will understand the research context and will be suitably prepared for the project detail provided in Part Two.

Part One - Research Context

Chapter One - The Players

Chapter One

The Players

1.1) Introduction

In October 1994, a four-year collaborative research programme between Hewlett-Packard Ltd (HP) and Brunel University commenced at Hewlett-Packard's premises in Bracknell, Berkshire. A Research Engineer, from the Brunel University/University of Surrey Engineering Doctorate programme, started a four year placement with the company in their Environment, Health and Safety (EHS) department. The research engineer had been seconded to assist in the development of environmental management¹ systems for Hewlett-Packard Ltd whilst simultaneously researching for an Engineering Doctorate qualification in Environmental Technology. To familiarise the reader with the players (or participants) in this research, a brief description is provided of (1) the Brunel/Surrey Engineering Doctorate programme, (2) the sponsoring company - Hewlett-Packard Ltd and (3) the research engineer. Certainly the participants developed and adapted over time, frequently as a direct result of the research, but this chapter describes the participants at the outset of the project.

1.2) The Brunel/Surrey Engineering Doctorate Programme

The Engineering Doctorate in Environmental Technology at Brunel/Surrey Universities was established in 1993. The programme was developed in response to a report from the (then) Science and Engineering Research Council (SERC). Dr John Parnaby (President of the Institute of Electronic Engineers) chaired a working party to consider the increasing inadequacies of the traditional PhD qualification as a preparation for industrial work. The "Parnaby" report stated, "the major conclusion of the working party is that there is a need for a major new scheme providing engineering doctorate programmes in the processes and practice of engineering required by industry. Such an engineering doctorate would be distinct from, and complementary to, the traditional existing PhD, which has been criticised for lack of industrial relevance" (Brunel University/University of Surrey, 1996/97). The SERC initially set up three EngD programmes at Warwick, UMIST and Swansea/Cardiff in 1992. In 1993 a further two centres were established including one at Brunel/Surrey.

¹ The company's definition of this term is discussed in Part Two of the portfolio. Other definitions, including the researchers, are discussed in the Project Background and Literature Review to follow.

Part One - Research Context

Chapter One - The Players

The Brunel/Surrey programme is unique in that it has the specific theme of "Environmental Technology". The aim of the programme is to provide engineering doctors with the necessary skills to balance environmental risk along with all the traditional business or engineering objectives. To complete this doctorate successfully research engineers must carry out a doctoral standard project relating to environmental technology in conjunction with an industrial sponsor over a four year period. To acquire the necessary skills to complete the doctorate, research engineers must spend nearly all of their time with the company rather than at the university. They must also attend a series of taught masters-level modules on a range of subjects. The modules are highly interdisciplinary and cover such areas as Life Cycle Analysis, Risk Management, Environmental Sociology and Clean Technology. Typically, each module is organised to have a taught and a course-work component². The research engineer must complete both components of each module as a pre-requisite for passing the degree. The breadth of subject areas taught is designed to improve the research engineers' academic knowledge and industrial competencies. Hewlett-Packard Ltd was one of fifteen companies agreeing to sponsor a research engineer on this programme in 1994.

1.3) Hewlett-Packard Ltd

Before moving on to the project detail it is necessary to provide the reader with some general information on Hewlett-Packard Ltd as the second player in this research. This section is divided into two parts. The first is a general introduction to the company as a whole and does not necessarily represent the researcher's opinion of the company. Excerpts (shown in italics) are taken from official HP publications and documents. The information presented in this section is not a complete history of Hewlett-Packard³. Instead excerpts have been chosen that will have particular relevance later in the portfolio.

The second section is a list of the dramatis personae that featured in the project. This list is provided to help the reader later in the portfolio and is presented here to introduce the participants of the research briefly.

1.3.1 HP in Brief

The Hewlett-Packard Company designs, manufactures and services electronic products and systems for measurement, computing and communication used by people in industry, business, engineering, science, medicine and education. HP's basic business purpose is to accelerate the advancement of knowledge and improve the effectiveness of people and organizations.

² All items of coursework for these modules are available in the research portfolio.

³ For further information on the Hewlett-Packard company, *The HP-Way* by Dave Packard is recommended as further reading.

Part One - Research Context

Chapter One - The Players

The company's more than 25,000 products include computers and peripheral products, electronic test and measurement instruments and systems, networking products, medical electronic equipment, instruments and systems for chemical analysis, hand-held calculators and electronic components. Headquartered in Palo Alto, California, the company employs approximately 113,000 people, of whom 63,500 work in the United States. HP manufacturing plants are located in 28 U.S. cities, mostly in California, Colorado, the Northeast and the Pacific Northwest. The company also has research and manufacturing facilities in Europe, Asia Pacific, Latin America and Canada. HP sells its products and services through about 600 sales and support offices and distributorships in more than 120 countries and through retail dealers.

1.3.2) Company Culture

HP is a company recognised for its strong company culture. As corporate cultures go, theirs is revered as one of the finest in the world (Thomas, 1993). Kotter and Heskett (1992) rate HP's culture as scoring 1.9 on a 1 = high to 5 = low scale. This culture has survived large scale changes over time, moving from an instrumentation company to a household name in desk top printing. Kotter (1997) argues that HP's culture facilitated these changes. The following sections provide some background to this culture, with excerpts from official HP documentation. Within the company, HP's culture is called the HP-Way. The following section describes the development of this culture from the early days of Hewlett-Packard.

The evolution of the HP Way began in the early years of HP. Bill Hewlett and Dave Packard, two Stanford engineers, combined their product ideas and unique management style, and formed a working partnership. After many successful products and amidst a rapidly expanding organization, they met in 1957 with their key managers to formalize a set of corporate objectives. These objectives, along with underlying corporate values that shape how objectives would be met, remain as the foundation for something special -- the HP way of doing business.

The company's entrepreneurial flexibility is fostered by a decentralized organization that gives business units considerable decision-making authority. Collaboration with other companies and technology alliances allow HP to extend leading computing and instrument solutions to many industries. HP's openness and informality contribute to a non-authoritarian atmosphere. Employees share in HP's success -- which their efforts make possible -- through regular cash profit-sharing and stock-purchase programs. From the beginning, the company has adhered to a "pay-as-you-go" philosophy, financing its growth primarily from profits.

Part One - Research Context

Chapter One - The Players

HP's management practices are based on a belief that people are committed to doing a good job and are capable of making sound decisions. Seven corporate objectives provide a framework for group and individual goal-setting in which all employees participate.

For this research, the most interesting and relevant corporate objective is referred to as the "citizenship" objective. This objective calls for HP to be a good citizen in each community in which it operates. On a day to day basis, as will be shown later, the citizenship objective is quoted in reference to environmental management programmes.

1.3.3) Quality Management

To help the reader understand data presented later, one further aspect of Hewlett-Packard's approach to management is worth mentioning in this section. Total Quality Management is an important subject to Hewlett-Packard. The following excerpt, taken from a statement from the company's Chief Executive Officer, Lew Platt, shows this in more detail.

"Quality has a long tradition at Hewlett-Packard. From the earliest days, our founders wanted an extra measure of quality in every box we shipped. As Bill Hewlett put it, "...one of our basic objectives was to develop a reputation for quality, both in engineering and in the equipment we produced." Our customers came to know us as a supplier of high technology devices that were robust and reliable, and we took pride in the many stories of instruments that were dropped from a truck, or spattered with mud, or frozen at some cold northern outpost – and kept on working. In those days, our primary strategy for quality was 'test-fix-test': a demanding cycle of product engineering that weeded out the latent weaknesses that might cause trouble for customers.

In the 1970s and early 1980s, we learned from the Japanese about a better way to design and produce quality products. Our Japanese joint venture, YHP, won the Deming prize in 1982 for its systematic application of Total Quality Control (TQC). TQC was better because it focused on problem prevention through statistical process management, rather than depending on inspection and testing. We were deeply impressed by YHP's achievement, and embarked on a campaign to apply the TQC approach throughout our operations. We engaged teams of people in breakthrough improvement projects that revolutionized the way we work with suppliers and with customers. Our use of TQC resulted in, among other things, a tenfold reduction in the rate of product failures experienced by our customers.

Part One - Research Context

Chapter One - The Players

Today, our company is evolving as we add information appliances with plug-and-play simplicity to our portfolio of instrument and computer products. This means that we will need to satisfy new kinds of customers – customers who want products that are far easier to buy and use than products of the past. To meet these new customer needs, TQC at Hewlett-Packard is evolving. TQC has become Total Quality Management (TQM), a system that engages and aligns entire organizations in the delivery of superior value.

On a practical level, "Quality" is implemented by a Quality Maturity System. Later, in Chapter Six, it will be shown that this Quality Maturity System is particularly relevant to this research. A brief description of this system is therefore provided here. Subsequent discussions in Part Two of this portfolio analyse the QMS system in relation to environmental management. Once again, material presented is taken from Hewlett-Packard company literature and does not necessarily represent the views of the researcher.

HP believes that stronger, more competitive organizations are built through dedication to customers, to the application of sound process management, and to the principles of continuous improvement. This in turn leads to sustained business success. Quality Maturity is a reflection of this view. The ideal entity delivers the right set of quality products and services in a timely, cost-effective manner. Everything it does reflects a thorough understanding of markets and competitors, and results in value delivered to its customers. The vital processes that make up an entity are pro-actively managed and improved as a system. Discipline and rigor in planning and process management help an entity to optimize resources, learn from the past, and stay alert to changing conditions. The Quality Maturity System (QMS) helps an entity sharpen its abilities in these areas. QMS consists of training, consulting, and tools for building skills, as well as a review for assessing an entity's progress in its efforts to apply these skills.

The objective of the Quality Maturity System is to help build stronger and more competitive organizations through dedication to customers, continuous improvement, and the application of sound process management practices. The centerpiece of the Quality Maturity System is the QMS Review. The review is both an effective assessment tool and a powerful consulting intervention. It provides an entity with an objective benchmark of its progress toward applying quality principles to achieving business objectives and the opportunity to discover new ways to improve its progress. A QMS Review helps an entity view its business operation from a unique perspective. It does not evaluate decisions or assess results; rather it provides insight into the system of processes, methods, and tools that drive decisions and determine business results.

Part One - Research Context

Chapter One - The Players

The Standard QMS Review provides an entity with an assessment and guidance along a broad range of topics. The review can be effective for entities at all stages of quality maturity. The Standard Review is a tightly structured two-day event conducted by a certified Lead Reviewer and co-reviewer. Reviewers use a well-defined question set (see QMS Standard Review Questions) to guide them during the meeting. While the questions help the reviewers assess an entity's quality maturity, they are also valuable stimuli for discussion and consultation. The Standard QMS Review explores five key areas of activity within an entity. These include: strategic focus, business planning, process management, improvement projects and leadership and participation. The reviewers consider three elements. First, they evaluate the extent to which the activity yields valuable results. Next, they consider the approach applied to achieve the results. They evaluate the methods, techniques and tools. They determine if the approach is repeatable or ad hoc; if it is preventive or reactive. Finally, they evaluate how well the approach has been deployed. They assess the consistency with which the entity has applied the approach over time, and the extent to which it has been leveraged to other appropriate areas of the business. Each scoring element receives a single score based on a scale of zero to five. The score reflects the reviewers' assessment of results, approach, and deployment.

During the project at HP, the deployment of environmental management objectives within the QMS system became an indication of the institutionalisation of environmental management. This is discussed in more detail in Chapter Six.

1.3.4) Summary

Having presented Hewlett-Packard's main areas of business, approach to management, and culture, the reader should now be more knowledgeable about the organisation under study.

Three particular areas should be noted. These are that:

- ♦ HP is recognised for having a particularly strong company culture capable of surviving major organisational change,
- ♦ The company's long standing citizenship objective is often perceived to be the cornerstone of environmental management, and
- ♦ HP has embraced the concepts of Total Quality Management, using a proprietary QMS system to measure the organisational effectiveness of an entity.

All three of these areas are important to bear in mind for reading the remainder of the Portfolio, especially Part Two where the research data is presented.

Part One - Research Context

Chapter One - The Players

1.3.5) Dramatis Personae

Many individuals took part in the research project at HP. Table B contains a list of the main employees involved with achieving the research objectives. These are described by an identifier and the role(s) which they perform in the organisation. Additionally the location of this role within HP's organisation is also provided. This list is provided here only as an introduction to the range of employees involved in the project.

Table B Dramatis Personae

Identifier	Function(s)	HP Organisation
AW	EHS Industrial Trainee	UK Regulations
BK	Support Training Manager	Computer Organisation Support
BKn	Ireland Country General Manager	Ireland
BS	Site Facilities Manager (Satellite Offices) until Nov 97 EHS Manager (UK Sales Region) from Nov 97	Facilities
CL	Site Facilities Manager (CSC)	Facilities
CLC	EHS Administrator (from Nov 97)	UKSR EHS
CE	Marketing Assistant	Local Products Organisation
DB	Site Facilities Manager (Amen Corner) (until Nov 96)	Facilities
DG	UK Quality Manager	Quality
HR	Site Facilities Co-ordinator (Amen Corner) until June 97	Facilities
HS	Occupational Health Nurse	UKSR EHS
IR	Director of Central Communications	Central Communications
JB	Site Facilities Co-ordinator (Pinewood) (until Feb 98) UKSR Support Services Consultant (after Feb 98)	Facilities / Support Services
JBr	EHS Administrator (from June 97)	UKSR EHS
HR	Facilities Manager	South Queensferry Site Facilities
JG	UK Managing Director	United Kingdom
KM	Researcher / EHS Engineer (2)	UKSR EHS
LB	Site Facilities Co-ordinator (CSC) (until Nov 96) Site Facilities Manager (Amen Corner) (from Nov 96)	Facilities
LB	UK Regulatory Manager (until October 97)	UK Regulations
LS	UK Integration Manager	Business Development
NG	UKSR Business Solutions Manager	Business Development
PB	EHS Administrator (from March 95 to October 97)	UKSR EHS
PT	Amen Corner Site Facilities Manager	Facilities
PV	UK Finance and Administration Director	Finance and Administration
SM	CPO Marcoms manager	Computer Products Organisation
SP	Occupational Health Administrator	UKSR EHS
TR	EHS Manager	South Queensferry Site Facilities
TD	Director of Environmental Affairs	UKSR EHS
TM	UK Regulatory Administrator	UK Regulations
ZJ	Researcher / EHS Engineer	UKSR EHS

Part One - Research Context

Chapter One - The Players

1.4) The Researcher

The final player in this project was the researcher. At the beginning of the project, the researcher had just graduated with a degree in Environmental Engineering from the University of Nottingham. She had no previous industrial experience relating to Environmental Engineering or Management and had only been exposed to research methods relating to the physical and applied sciences. She applied to the Brunel/Surrey Engineering Doctorate in Environmental Technology programme to further her environmental qualifications and gain relevant work experience in a high profile company. In October 1994, the researcher was appointed by HP.

1.5) Summary

The objective of this first chapter was to describe the players involved in this research project. A number of significant points can be noted. Firstly, although knowledgeable about environmental issues and engineering, the researcher's background had, until this project, been dominated by research models of the physical and applied sciences. Later it will be shown that, over time, her knowledge of qualitative and organisational research processes improved as the project developed. Secondly, from an organisational research perspective, Hewlett-Packard looked to be a worthy subject. In particular, the company's citizenship objective and history of quality management suggested they might be an interesting subject of environmental management research. Finally, the approach taken by the Engineering Doctorate in Environmental Technology represented a pioneering approach to industry-based research. The unique combination of players resulted in an interesting and highly relevant piece of research that is described in the remainder of the portfolio. In the next section the specific project background is described in more detail.

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Chapter Two - Project Background

Chapter Two
Project Background

2.1) Introduction

The previous chapter introduced briefly the players involved in this research project. In essence this described "who" was involved in the project. Complementary to this, the following chapter examines "what" the research was about, in particular the background to the research project and how it was first described to the researcher. This section will enable the reader to understand the origin of the research objectives.

2.2) Environmental Management in the Electronics Sector.

In the nineteen eighties, the electronics industry, in particular computing, joined the firing line of firms expected to perform to high environmental standards. An extract from a report by McKinsey & Company consultants in 1992 describes this trend (McKinsey & Company, 1992); "Over the course of the next few years, the changing environmental paradigm will have far reaching implications for the electronics industry: current product design practices will have to be adapted, environmental costs and revenues will be generated in serving the demands of environmentally sensitised markets, major new infrastructures will have to be established for the collection and recycling of packaging and electronic waste; in short many current environmental management practices will have to be overhauled. As distribution channels consolidate and begin to aggressively enforce consumer demands "backwards" through the industry chain, equipment producers will bear the major burden of responding to the environmental demands of consumers and regulators alike; neither distributors nor suppliers are likely to seize the initiative". Similarly, a report by the "Electronics and Computer Industry", sponsored by The United States Department of Energy, expressed the problem as; "The electronics and computer industry, including computers, communications semi-conductors and consumer electronics, is the largest manufacturing employer in the U.S. The building blocks of this industry are usually viewed as relatively "clean". However, manufacturing by products of the electronic industry and the disposition of electronic products are raising important technical, financial and environmental issues" (United States Department of Energy, 1993).

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2.3) Hewlett-Packard and Environmental Management

Along with other companies, Hewlett-Packard had been following these trends in environmental management world-wide. Within HP, two particular areas of environmental management emerged. Firstly, an Environment, Health and Safety (EHS) management and audit system, devised in the late nineteen-eighties, provided a world-wide assessment tool for operational EHS improvements. Secondly, several years later, a Product Stewardship⁴ network emerged focusing on the environmental impacts of HP products throughout their life cycle. These processes continued to develop separately⁵, but were both predominantly aimed at design and manufacturing locations.

According to company documentation Hewlett-Packard's Environmental Management Policy is expressed as follows:

HP is committed to conducting its business in an ethical and socially responsible manner. An aggressive approach to environmental management, which includes occupational health, industrial hygiene, safety management and ecological protection, is consistent with the spirit and intent of our established corporate objectives and cultural values. We recognize that our company, together with other business organizations, has a major responsibility for protecting the ecology, and the health and safety of our employees, our customers and the communities in which we operate worldwide.

The Hewlett-Packard environmental management objective is:

To provide products and services that are environmentally sound throughout their life cycle and to conduct our operations worldwide in an environmentally responsible manner. The following principles guide us in achieving this objective:

- ♦ *Recognize that excellence in environmental performance is consistent with our corporate objectives and essential to our continued business success.*
- ♦ *Ensure that environmental policies, programs and performance standards are an integral part of our planning and decision-making process.*
- ♦ *Regard sound environmental management as an integral part of our total quality commitment and apply the principles and practice of continuous improvement accordingly.*
- ♦ *Be open and responsive to the environmental expectations and concerns of our employees, customers, government agencies and the public by providing clear and candid information about the environmental impact of our products, services and operations.*

⁴ Hewlett-Packard defines product stewardship as the philosophy and practice of designing products and their associated accessories and processes to prevent and/or minimize adverse environmental, health and safety impacts throughout the product life cycle related to: design, manufacture, distribution, use, take back, disassembly, reuse, recycling and ultimate disposition of the constituent parts and materials.

⁵ This had specific implications for this project, discussed in more detail in Story Boards One and Three

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- ♦ *Comply with applicable environmental legislation and regulation.*
- ♦ *Design and construct our facilities to minimize waste generation and promote energy efficiency and ecosystem protection.*
- ♦ *Design our products and services and their associated manufacturing and distribution processes to be safe in their operation; minimize use of hazardous materials; make efficient use of energy and other resources; and to enable recycling and reuse.*
- ♦ *Pursue a strategy of pollution prevention in order to substantially reduce or eliminate the generation of chemical and solid waste.*
- ♦ *Proactively address environmental contamination resulting from any HP operation.*
- ♦ *Foster environmental responsibility among our employees and encourage their initiative and involvement.*
- ♦ *Contribute constructively to the shaping of public policy based on sound business and scientific principles.*
- ♦ *Ensure our suppliers support our Environmental Management Policy and encourage them to adopt similar principles.*

In 1992 Hewlett-Packard's UK manufacturing sites had been exposed to the above programmes and policy but the large⁶ sales company had not seen any organised environmental management at all. Around that time, and due to a combination of market pressure and legislative developments, the managing director of Hewlett-Packard's UK offices recognised the need for a senior-level manager to co-ordinate environmental management programmes across the UK, with particular focus on the sales organisation. As a result, in 1993, an Executive was appointed to the position of Director of Environmental Affairs for Hewlett-Packard Ltd. This Executive had a large amount of experience in HP, previously holding such positions as Personnel Manager and Country Manager for HP Ireland. He had no prior experience of managing environmental management. This Executive believed that pressure from stakeholders relating to environmental issues would eventually impact business results, and that only a significant attitudinal change might prevent these business impacts from occurring. His vision was that, as a result of this change in attitude, environmental management would be *institutionalised*⁷, i.e. part of normal business practice, within a 5 year time frame. This vision was the driving force behind the research project and in time contributed to the title of the Portfolio.

⁶ Around 2500 employees

⁷ This is the main topic of the research and so will be analysed and defined in more detail in next chapter.

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With his experience and knowledge of HP business methodology the Director of Environmental Affairs decided to implement a four year environmental management programme to achieve his objective. After reviewing environmental management functions at Hewlett-Packard in other countries, and at a corporate level, he developed the first 3-5 year "UK Environmental Management Ten-Step Plan" (herein referred to as the Ten-Step Plan⁸) for the financial year 1995⁹. This was the first time that HP's Ten-Step Planning methodology had been applied to environmental management at the company¹⁰.

2.4) The Research Project

In October 1994 the Director of Environmental Affairs agreed to sponsor a researcher from the Engineering Doctorate in Environmental Technology programme¹¹. It was thought that, through participating in the development of the company's environmental management plan, the researcher would learn first hand the issues and factors which affect the institutionalisation of environmental management over a four year time frame. This objective concurred with the intentions of the Engineering Doctorate Programme, Hewlett-Packard's environmental management programmes and to some extent the knowledge base of the researcher. Thus the initial scope of the project was agreed. At the start of the programme, it was evident that HP had identified a need for greater environmental management, but did not want to create additional overheads in order to achieve it. Indeed, one of the reasons that HP had agreed to sponsor the researcher was because they did not represent an employee (in head-count terms) but, nevertheless, could assist Hewlett-Packard in the implementation of their environmental management programmes over four years. At the start of research the new "EHS department" consisted of:

- 1.) The Director of Environmental Affairs,
- 2.) An existing Occupational Health unit, and
- 3.) The researcher (employed as an environmental research engineer).

Staff in the occupational health unit were provided by an established Occupational Health services contractor and the research engineer was contracted to Brunel University. Only the Director of Environmental Affairs was a full time Hewlett-Packard employee.

⁸ Ten-Step planning is one of HP's Quality Management tools aimed at mid-range (3-5 year) planning and strategy development

⁹ Hewlett-Packard's financial year runs from November to October

¹⁰ Discussed in Chapter Five in more detail

¹¹ Described in Chapter One

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2.5) Summary

This section has provided a brief history of Hewlett-Packard's environmental management programmes prior to the start of the research project. Historically, HP had developed environmental management programmes in their manufacturing locations but the appointment of a UK Director of Environmental Affairs based within the sales company was a step forward. Unusually, this Director was asked to achieve his objectives without many additional human or financial resources. Instead his plan was to *institutionalise* environmental management within the business in a 3-5 year time frame. Since the focus of this research is to provide both industrial and theoretical perspectives, the next chapter describes the academic context of the project, in particular the literatures which relate to this initial project scope.

Part One - Research Context

Chapter Three - Literature Review

Chapter Three

Literature Review (Environmental Management)

3.1) Introduction

Having introduced the research participants and briefly outlined the project objectives, it is now appropriate to position this research amongst more general organisational research and practice. This chapter moves away from the project detail and investigates some key trends in environmental management research and industrial practice. The objective of this chapter is to provide the reader with part of the academic context of the project. Significantly, in this chapter, only literatures relating to environmental management and related organisational practices are described. Further literatures that relate to the methodological aspects of this project are referred to in the next chapter, including a review of organisational research history. For the remainder of this chapter, the subject of the research will be considered separately from its methodology¹².

In reviewing the environmental management literature for this research many similar terms were considered to be relevant. These terms included "ecological impacts", "eco-management", "Total Quality Environmental Management", "environmental policy" and "environmental strategy". In addition, over the course of the research the concept of Sustainable Development progressed further as a significant organisational (and political) issue. The objectives of this research did not include an analysis of Hewlett-Packard in the context of sustainable development. However, since literatures on environmental management and sustainability often include similar objectives and use similar terminology, a separation of the two areas was difficult. As a result, relevant literatures on sustainability and sustainable development were also reviewed.

In the first section, a history of industrial environmental management is provided as context for the remainder of the research documentation. Following this, the literature review will demonstrate trends towards an integrated approach to environmental management and examine recommendations for achieving this goal. This section includes a review of the term "institutionalisation" and similar terms in the literature from a number of perspectives. The chapter then moves on to analyse these recommendations in more detail. Specifically three types of change are considered. Firstly, the role of individual employees in environmental management, secondly the role of business strategy and thirdly the role of company culture.

¹² Although it will be shown later that one could not be considered without the other.

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Chapter Three - Literature Review

The literature review will show that despite widespread support for objectives similar to the institutionalisation of environmental management, there is little understanding of what this means in practice, nor why such an objective is desirable. Additionally, it will show that further understanding of organisational change, in particular environmental management change, would benefit from insider-based research methodologies.

3.1) A History of Environmental Management

First and foremost, this research was about environmental management in an industrial setting. By way of an introduction, and to help the reader understand the context of the research, this section explores briefly the history of industrial environmental management. The role of industry in protecting the natural environment has been subject to much debate over recent decades. It is not the intention of this portfolio to describe this in any detail. However a brief introduction is presented here.

Early ideas about managing environmental impact were centred around two supporting beliefs (Jackson, 1996: 43). The first belief was that it is possible to concentrate and contain environmental contamination, removing it from exposure to humans or the natural environment. The second was that it is possible to "dilute and disperse" pollution such that it no longer becomes a threat. Both of these were shown to be ineffective long term strategies as knowledge about the mechanisms of environmental impact were gained. Specific large scale incidents like the Union Carbide chemical release in Bhopal, India or the nuclear accident at Chernobyl, Russia, also raised the profile of industrial environmental management and caused firms to manage their operations more tightly in order to prevent similar disasters. A comment from the Head of the Environment at British Airways suggests the effect which these incidents had. "It's very difficult for top management to understand all the environmental issues and to understand their exposure. I suspect that one of the things that motivates companies is that they see what happens in Bhopal or an Exxon Valdez and they decide they need to bring a focus on it" (Brown, M 1995: 73-74, 78). As well as environmental damage on a disastrous scale, concerns about air quality, shortage of landfill space and the destruction of natural habitats caused firms to assess their more on-going environmental impacts.

The logic of the "dilute and disperse" philosophy was replaced with end-of-pipe technology. Firms attempted to reduce their impacts on the natural environment by adding an extra piece of technology to capture any un-wanted emissions prior to their release. A popular example was sulphur dioxide scrubbers on stacks from coal fired power stations designed to minimise a significant cause of acid rain. These types of technology later became known as "clean-up" technologies, as opposed to their "clean" successors.

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Chapter Three - Literature Review

As these technologies were developed firms began to feel the costs of clean-up operations and began to consider pollution prevention programmes and other cleaner technologies. One of the most famous example of this is perhaps 3M's "Pollution Prevention Pays" programme which, they claim, between 1975 and 1990, reduced their total pollution by over 530,000 tonnes (a 50% reduction in overall emissions) and, according to company sources, saved over \$500 million through lower raw material, compliance, disposal and liability costs (Hart & Ahuja, 1996: 30, Walley and Whitehead, 1994: 46). As these programmes developed, firms began to hit an inevitable obstacle. Low (or no) cost improvement programmes had all been exhausted and managers began to realise that significant environmental improvements would require additional effort and, probably, a new way of working. Coupled with this, consumer and customer awareness of environmental issues required that firms address not only the environmental impact of their plants' operations but also that of their goods and services.

These types of environmental issue posed a different problem for industry. Environmental management had so far focused on operational controls at a site level, but modifications to products and services required attention to environmental issues much earlier in the product development process. A senior manager in Hewlett-Packard described this trend in more detail. "The goal now is to reduce or eliminate environmental impacts that may occur over the entire life-cycle of a product, not just the effects of local manufacturing processes. In Europe especially, this philosophy of life-cycle management or product stewardship, is proving to be a major driving force behind a host of legislative initiatives that are leveraging market forces to evoke more environmentally responsible behaviour by industry" (Bast et al, 1995: 1). For many large multi-national firms this meant cross-functional and cross geographical programmes. Consequently, today, the term environmental management has come to include many concepts broadly associated with improving the environmental impacts of a company, whether they be focused on operational or product related impacts. By way of an example, one detailed summary of the common programme areas in environmental management is provided by Devereaux-Jennings and Zanderbergen (1995). Their original summary is presented in Table C as four groups, concerning products, employees, technical operations and management infrastructure. These groups were chosen as being appropriate categorisations of the original list and are a suitable simplification for the purposes of this discussion. Inevitably, such categorisation is imperfect, notably since some programmes fall under at least two groups, nevertheless it highlights that there are at least four different aspects of industrial environmental management.

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Products	Employees	Technical Operations	Management Infrastructure
Life Cycle Analysis	Environmental Officer	Total Quality Environmental Management	Total Quality Environmental Management
Product Stewardship	Environmental Ethic or Philosophy	Life Cycle Analysis	Environmental Risk and Liability Management
Eco-efficiency	Environmental Codes of Conduct	Eco-efficiency	Environmental Banking and Investment
Environmental Labelling	Principles for Sustainability	Pollution Prevention and Waste Management Strategy	Environmental Accounting
Environmental PR and Marketing	Environmental Awards	Environmental Impact Assessment	Environmental and Social Reporting
Principles for Sustainability		Environmental Audit	Environmental Sponsoring
		Responsible care	Environmental PR and Marketing
		Principles for Sustainability	Principles for Sustainability
		Green Industrial Architecture	Environmental Awards

Table C Common programme areas in environmental management, modified from Devereaux-Jennings and Zanderbergen (1995)

In Table C programmes which have been grouped under the "Product" category have the common aim of addressing the environmental impact of a firm's products and services. Conversely, programme areas grouped in the category of "Technical Operations" stem from efforts to minimise the local (and global) environmental impacts of a firm's operations. This might include site waste management, emissions monitoring or pollution prevention. Programmes grouped under the heading of "Employees" are aimed at maintaining an environmentally responsible work-force and finally those grouped as "Management Infrastructure" include initiatives aimed at developing the appropriate management systems and infrastructure to manage the previous three.

All of the programmes presented here have the same mission, that is to, directly or indirectly, reduce the environmental impact of business activities. This is the accepted understanding of environmental management to date as exemplified by the definition in Croner's Environmental Management and Case Law (1998). "Environmental management is aimed at reducing the impact of human activity to such a level that environmental harm and nuisance is minimised and that legal liability is also minimised. It is probably best considered as taking environmental factors into account in all management decisions, from product design to ultimate waste disposal, through and including product life cycle" (Croner Publications Ltd, 1998).

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Of particular interest to this research, one of the programme areas depicted in Table C is Total Quality Environmental Management. An association between Total Quality and Environmental Management is often made (Mitchell and Brown, 1994; Walley and Whitehead, 1994; Welford, 1992; Lamming and Hampson, 1996). It is necessary to describe the history of this association a little further since, as mentioned in Chapter One, Hewlett-Packard is considered to be a strong proponent of Total Quality Management.

The history of quality management started with production line inspections, ensuring that defective goods did not reach the customer. It then moved on to more pro-active manufacturing technology which aimed to eliminate defects or waste at source, thus reducing the pressure on the end of line inspections. Eventually Total Quality Management became a way of managing business processes, improving customer relations and loyalty, and maintaining brand image. This is similar to the process of development from end-of-pipe solutions to clean technology described earlier. Indeed, just as TQM deals with quality at every stage of the production process, both internal and externally, so environmental quality is dependent on everyone in the organisation 'owning' some product or service responsibility (Lamming and Hampson, 1996: S50). The logical extension of this is that environmental management becomes a way of integrally managing the business rather than a well intentioned afterthought, arguably by addressing the most cost effective stage of the business process to tackle such "greening". According to the "Total Quality Environmental Management" orientation, organisations should attempt to develop an overall environmental management system (EMS) which brings together all environmental activities. The development of the International Standards for Environmental Management (ISO 14000 range) and the European Commissions's Eco-Management and Auditing scheme (EMAS) is a sign that consensus on the content of such environmental management systems is being reached. These management systems and standards are a direct descendant from quality management and as such represent a "quality" oriented approach to environmental management. Newton and Harte (1997: 76) find that this approach is largely technicist in orientation, promoting the notion that successful organisational eco-change largely results from adopting the appropriate environmental technology and management system. Although this technicist approach has been questioned (Welford, 1993; Newton and Harte, 1997) it remains a popular recommendation in the literature and amongst managers in industry.

In parallel to the development of environmental management in industry, academics were also struggling to define the relationship between industry and the environment. New publications were devoted specifically to the subject of environmental management and higher education establishments created courses in environmental science, engineering and management.

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Within these publications, product-related environmental issues tend to remain in dedicated design or marketing literature with operational topics receiving more dedicated attention from journals such as *Environmental Quality Management* and *Greener Management International*. Additionally, management theory publications (generally special editions) are also now featuring "the environment" as a specific topic. The October 1995 volume of the *Academy of Management Review* is a good example.

More broadly, there are sources of literature available on subjects relating to the firm and its relationship with the natural environment. Paul Sabatier writes on the development of public policy and the roles of different actors in successful policy development. Sethi (1995) and others (Raiborn and Payne, 1996; Gottlieb and Sanzgiri, 1996 for example) write on the development of business ethics over time. Both of these and other disciplines such as Human Resource Management, Quality Management and Corporate Communications help to understand the role of industry in the natural environment.

Specific research into industrial environmental management also exists and varies according to the number of organisations studied, the degree of empirical evidence collected and the research method used. Some authors choose to describe environmental management practice generically, synthesising ideas from other technical and management disciplines. Of these, Starik et al (1996) focus on the area of an environmental business strategy, Hartman and Stafford (1997) on building green alliances and Welford (1992 and 1993) on the role of "Quality" and management systems in relation to the environment. In addition, some research has been carried out with a more empirical basis; Chadwick et al (1996) describe a study on the integration of environmental issues into the business strategy of Swedish firms using survey and documentary evidence from the firms in question, Cyswecki and Howell (1996) provide insight into the implementation of an environmental management system at 3M from first hand experience, Klinkers and Nelisson (1995) shows the benefits of promoting employee participation in environmental policies, and Halme (1996) provides perhaps the most satisfactory empirical based study in her work examining the "shifting environmental management paradigms" in two Finnish paper firms.

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Newton and Harte (1997) provide an up-to-date analysis of, what they call, the "green business" literature. From the literature they identify two predominant solutions to what they term "organisational eco-change". The first is the technical solution whereby success can be achieved through advances in environmental technology or by the introduction of an Environmental Management System (described earlier). The second is a cultural solution where the company's culture is assumed to be "wrong" and therefore should become greener. These two types of approach to organisational eco-change generally tend to feature in different literatures and will be explored in more detail in Section 3.4 of this chapter.

Despite these two, quite different, approaches to addressing environmental management issues, environmental management research and practice has focused solely on the processes which a firm can adopt in order to prevent negative environmental impacts. More recently Cramer (1998) finds this approach unsatisfactory. She defines environmental management as "the discipline which studies the development and shaping of environmental policy in business" (Cramer, 1998: 163). For her, this would then include the study of *unintentional* reductions in environmental impact as well as intentional programmes designed to produce the same. This definition represents a departure from traditional perceptions of environmental management. Previous descriptions, such as the example presented from Devereaux-Jennings and Zanderbergen (1995), have not recognised the complete picture of environmental performance improvement. Specifically, Cramer's definition would also include initiatives outside of a specific environmental management function, which nevertheless assist with environmental performance objectives.

Cramer's definition also allows for another perspective that was considered valid for the research at Hewlett-Packard. An alternative view of environmental management could be the management of business results that are impacted by stakeholders' environmental concerns. In other words, environmental management could include within its definition the impact of the business on the natural environment *and* the indirect impact of the natural environment on the business. The former would include traditional measures such as waste reduction and pollution prevention, but the latter would include effective negotiations with stakeholders regarding their environmental concerns. It will be shown later that this dual perspective is more useful for those wishing to incorporate environmental concerns into normal business practice. The definition used for this research is based on this dual approach¹³.

¹³

This was the approach taken by the sponsoring company. For further details see *Story Board One - Business Planning for Environmental Management*.

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For this research, environmental management is defined as "the management of real or perceived environmental impacts and their subsequent business impact". An environmental *impact* is defined as "any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services"¹⁴ and a business impact may include changes in employee satisfaction, profit, growth, market share and other traditional business objectives. This definition is slightly different to those offered by environmental management texts previously and is significant for the project described in this portfolio.

This definition does not take a unidimensional view of environmental management. Instead of considering the impact of a firm on the natural environment, which although essential may not in itself engender change, this definition allows for a firm to consider the subsequent or parallel impact on the business. This distinction should be considered as the research picture unfolds.

Having provided a brief *history* of environmental management in industry and described some previous and emerging interpretations as to its meaning, it is now appropriate to consider the *current* status of environmental management in industry and any significant research areas and trends.

3.2) Current Status of Environmental Management

After several decades of piecemeal attempts to address environmental problems, industrial managers have realised that the environment requires more systematic management. A trend is seen in firms attempting to better align their business and environmental objectives, which has been represented in a number of ways. In their article, *It's Not Easy Being Green*, Walley and Whitehead (1994: 50) report that; "The common rallying cry of many environmental thinkers is that the environment must be integrated into everyday business decisions". Klinkers and Nelisson (1995) take this view also, suggesting that it is imperative for management to include environmental considerations in its strategy, to involve environmental protection in all decision making processes and to make it an internalised business goal.

¹⁴ As defined in ISO 14001 (Croners, 1998)

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The integration of environmental management is seen as a popular next step for leading companies. Indeed, Stikker (1992: 1) argues that an approach which does not integrate environmental management into operational management responsibility is reactive and outmoded. Within the literatures, this integration is either expressed as a need for changes at a strategic level, with environmental issues featuring in decision making and business planning (e.g. Rothenberg et al, 1992), or through large scale cultural change where employee involvement and understanding are the key success factors (e.g. Hartman and Stafford, 1997: 188). These approaches appear to be based on the same fundamental objective, although stated somewhat differently. The objective is to ensure that environmental management is considered to be part of normal business practice. There are a number of related reasons for this direction. Firstly, as just mentioned, environmental management has frequently been compared to quality management where "integration" into the company was also seen as a key success factor (For example: Shiba et al, 1993: 29). Indeed the recent development of International Standards for Environmental Management (the ISO 14000 range) call for an EMS (Environmental Management System) to be an *integrated* part of the business processes (Watson, 1996: 52).

Secondly, environmental management practitioners in industry have resolved the quick fixes within their organisations and to move forward, in the vein of continuous improvement, need to address more fundamental organisational issues. Also, as environmental management develops into broader arguments of "sustainability", employee participation with company decisions is seen as desirable.

It is evident from the environmental management literatures that, in the most part, the integration of environmental management into normal business practice is yet to happen. Some obstacles to achieving such integration have been suggested (McCloskey and Smith in Fischer and Black, 1995). These include i) the interaction of technical and scientific expertise, ii) the continuing ethos of short-term profit rather than long term (business) sustainability, and iii) the nature of competition which currently favours survival of the fittest and not 'survival of the species'. In addition, whilst this approach is widely recommended, Walley and Whitehead (*op cit.*) suggest that most companies (and academic studies) do not really acknowledge the practical implications of an "integrated" approach to environmental management, or the effect that this can have on business processes. One reason for this, which a small number of authors (Cramer, 1998; Welford, 1998; Newton and Harte; 1997) have recently recognised, is the research method used by environmental management researchers. In particular it is suggested that environmental management researchers need to employ techniques which are based inside organisations in order to understand the practical implications of the approach that they recommend.

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This subject is discussed in more detail in Chapter 4 where organisational research methods are reviewed both generally and specifically to environmental management research. In summary, it appears that only a few authors within the green business or environmental management literatures have attempted to describe the issues associated with an "integrated" approach to environmental management. In themselves they do not represent a satisfactory analysis of what this approach would require. In particular these descriptions are based on somewhat superficial experience of environmental management in industry and therefore can not report the detailed implications of an integrated approach to environmental management.

As a result of weak environmental management literature, the researcher also paid attention to wider management theory in her analysis of what "institutionalisation" might mean. The following sections attempt to identify the critical elements of an integrated approach to environmental management and discusses them in light of this wider literature base. Insights are presented not only from the "green business" literature but also from general management theory , organisational studies and quality management.

3.4) Integrating Environmental Management Into Business.

Before examining the critical factors affecting the integration of environmental management, it is worth returning to the research objectives, as outlined by Hewlett-Packard. The objective of the project at HP was framed using the term "Institutionalisation" as opposed to "Integration". In fact environmental management writers have often expressed seemingly similar objectives using different terminology to represent the same types of phenomena; most, it seems, beginning with the prefix "in". For instance terms such as "integrate" (Walley & Whitehead, 1994: 50; Chadwick et al, 1996: 61-70), "inculcate", "instil", "internalise" (Klinkers and Nelisson, 1995) and "institutionalise" (Gladwin, 1993; Bansal, 1998) are used somewhat interchangeably among environmental managers and green business writers.

Many of these terms continue to be used in environmental management texts but are rarely defined or explained in any detail. In order to add some clarity, a brief commentary offering some different perspectives on these terms is provided here. All definitions are taken from the Eighth Edition of the Concise Oxford Dictionary of Current English.

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The verb "to integrate" means to combine (parts) into a whole. From an environmental management perspective this could imply that the environment needs to be combined with other elements of business into an overall "whole" approach to management. The verb "to inculcate" however means to urge or impress a fact or habit persistently. This appears to imply a much more forceful and "top down" approach than the former notion of integration. "To instil" is to "introduce a feeling or idea into someone's mind". This implies an approach whereby feelings or concerns for the natural environment are introduced into the mind of employees. The term "internalise" can be used to mean "making something the inner nature of a thing". Thus environmental management would be a part of the "inner nature" of an organisation.

Although only one interpretation, the definitions provided here highlight a number of possible explanations for what may appear to be the same phenomenon, which, put simply, is to establish Environmental Management as part of "the way things get done around here". Since they are often used interchangeably, these terms were taken as being synonymous for literature review purposes. The term "institutionalise" is now examined in more detail, since this was the term introduced by the organisation under study. There are several definitions of the word "institutionalisation" in the dictionary. The first is to "place in an institution". The second is "to subject someone (or something) to institutional life, often causing apathy and dependence on routine". Although this definition features strongly in common language usage, it is ignored for the remainder of this discussion because it is not consistent with the intent of Hewlett-Packard's senior staff who helped frame the objectives of this research. The third definition provided, which is more appropriate for this research, is to "make or become an institution". The word institution is defined in many ways, in particular it is described as an established custom, law or principle. Institutionalisation is also defined in the context of institutional theory. Institutional theorists are interested in a "rule-like, social fact quality of an organised pattern of action" and "an embedding in formal structure" or, in other words, the process by which items become institutionalised and the role of institutions in society (Scott, 1987; in Devereaux-Jennings and Zanderbergen, 1995), Organisationally, institutionalisation can therefore be described as a process whereby an item becomes embedded into formal structure or accepted practice.

Gladwin (1993) (as cited in Roberts, 1995) uses the term "institutionalisation" specifically in relation to environmental management. Gladwin characterises six responses to environmental management, and in particular the "greening" process. The first is described as "greening as institutionalisation".

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Here the business organisation is reformed in order to allow it to conform with the standards expected by the institutional environment. Gladwin's use of the term institutionalisation differs slightly from the one taken by this research. Gladwin's terminology suggests that firms can become more environmentally responsible as a consequence of the pressures placed on it by the business environment.

Most of the perspectives presented here define institutionalisation in broadly the same way. In general terms, institutionalisation is a process whereby items become embedded or established in formal routines and social behaviour. For the purposes of this research, the "Institutionalisation of Environmental Management is defined as "A process whereby the management of environmental impacts (and their subsequent business impact) becomes embedded into Hewlett-Packard Ltd's formal routines and organisational behaviour". The latter portion of this definition is derived from the definition of environmental management provided on Page 34.

For the remainder of the literature review, the term "integration" will be used to describe the intention that environmental management becomes part of normal business practice. This term has been chosen as the most popular term seen in the literature. Conversely, in remaining sections of the portfolio, when discussing the project at Hewlett-Packard, the phrase "institutionalisation" will be used. This was the terminology used to frame the research objectives. In Part Three the two terms are discussed in light of the research findings and any differences in their meaning explored.

Having discussed institutionalisation and some related concepts briefly, it is necessary examine the practical implications and requirements which would be necessary in order to achieve such an objective. Some authors have attempted to define organisational characteristics which would exist if environmental management were "integrated". In particular, Hutchinson (1996: 19) describes a list of factors which demonstrate "integration of environment policy and business strategy".

Although the list provides some useful advice, it does not describe "integration" adequately. For example, some items on this list call for radical changes and represent a change in business philosophy.

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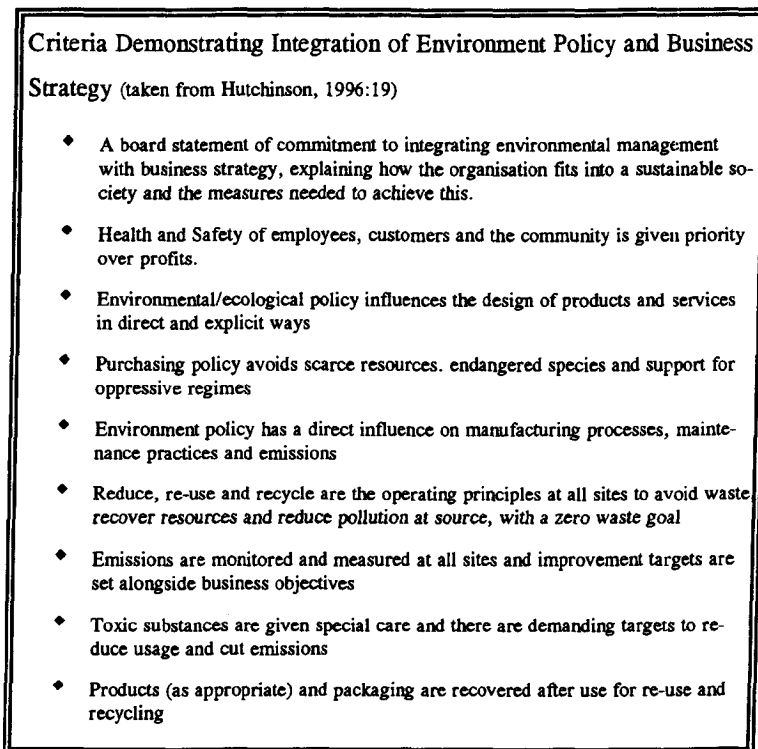


Fig. 1 Criteria Demonstrating Integration of Environment Policy and Business Strategy

An example would be; "Health and Safety of employees, customers and the community is given priority over profits", although a worthwhile goal in itself, such practice is not necessarily and indicator that environmental management has been successfully integrated into business strategy. In contrast to this somewhat philosophical goal, other items on the list are much more specific and tangible. For instance; "Emissions are monitored and measured at all sites and improvement targets set along side business objectives". Once again, this objective seems sensible for improving environmental performance but it may not be possible to identify specific events or processes where business objectives are established. Many large companies operate in multiple countries and in multiple markets with an increasing tendency towards more decentralised decision making. In this instance, is it appropriate for environmental performance targets to be discussed every time a business objective is established? It is not necessarily the case that business objectives are established on one occasion, making this goal more complex than it would first seem. Hutchinson's list also describes quite specific programmes that do not appear to relate to the degree of integration that has occurred. For instance, it would be equally possible to achieve improvements in (say) waste management without "integrating environmental management". These criteria describe requirements for many different approaches to environmental management which need not be integrated at all.

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Despite the apparent inadequacy of these criteria for articulating an integrated approach to environmental management, Hutchinson also argues that some companies have already achieved a level of environmental management integration and suggests some reasons as to why. These examples include where environmental management was "a logical extension of an early statement of vision and values" and/or "an integral part of the company's core ideology". From this it appears that companies are more likely to achieve an "integrated" approach to environmental management when their existing values are similar to, or supportive of, issues associated with environmental management. In addition, it is also suggested that a top executive is required to champion the issues. Without this championing it is suggested that a programme to integrate environmental management will fail. From this analysis it appears that a top management champion and organisational culture are important determinants of integrating environmental management.

Other writers in the green business literature attempt to identify further aspects of an integrated approach. Chadwick et al (1996) examine the Swedish experience of "Integrating Environmental Issues into Business Strategy". Ultimately, they recommend that the fundamental change required is for organisations to integrate environmental issues into a total management framework, whereby they become a core feature of the managerial decision-making framework. Starik et al (1996: 14) suggest a means of "growing" an environmental strategy which is integrated with the business planning processes. In the above recommendations, several concepts stand out. These authors suggest that environmental management needs to be integrated with business strategy with concepts such as decision making and business planning featuring strongly.

In addition to recommendations of changing business strategy, like Hutchinson (ibid.), other writers recommend a more "cultural" approach to improving environmental responsibility. Indeed, as mentioned earlier, Newton and Harte (1997) report that one of the predominant prescriptions for organisational change towards environmentalism is that of "culture change". This has been expressed as the level of personal commitment required from everyone in the organisation or as the need for shared organisational values which emphasise the importance of environmental responsibility (examples in Starik & Rands, 1995: 914, 919-920). In spite of the seeming immensity of this goal, green business writers often appear to assume that culture change is relatively unproblematic (Newton and Harte, 1997). In summary it appears that within the green business literature, some authors have used corporate strategy literatures as the basis for greening the organisation, whereas others have adopted an approach based on changing company culture.

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It is argued here that each of these is unsatisfactory for different reasons. Prescriptions of environmental culture change are seen to be relatively unproblematic, despite organisational change literatures which have stated quite the opposite (Ogbonna, 1992 for example).

Corporate environmental strategies are similarly based on assumptions of strategic management which are no longer universally accepted. Both of these prescriptions assume that change will *just happen* because it has to, or because an environmental strategy has been devised (Newton and Harte, 1997). One of the most important contributions of this research is the recognition that neither of these approaches are satisfactory on their own, and even in combination may not yield significant change. This research suggests that consideration needs to be given to both types of change and that all levels of an organisation both structurally and culturally need to be addressed in order that environmental management can be integrated.

In summary, previous literatures have suggested some of the organisational elements of an integrated approach to environmental management. However, no one has provided a thorough analysis of i) the levels of organisational change required or ii) how they interact.

Environmental management is not the first management topic which managers have attempted to integrate into normal business practice though. In the literature review, lessons were also sought from a wider management field. Two examples are particularly relevant.

Earlier, the parallel was drawn between environmental and quality management. Thiagarajan and Zairi (1997a, b and c) provide a very thorough analysis of the literatures on implementing TQM. This analysis refers to ninety eight examples of best practice in implementing TQM and aims to identify some of the critical success factors. Their factors are presented here as further possible factors affecting the integration of environmental management. Their analysis includes a long list of factors including:

- ♦ Leadership and the role of top management commitment,
- ♦ Employee involvement,
- ♦ The role of middle management,
- ♦ Rewards and recognition,
- ♦ Teamwork,
- ♦ Communication,
- ♦ Managing Suppliers,
- ♦ Accredited quality management systems,
- ♦ Benchmarking,
- ♦ Customer satisfaction, and

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- ◆ National Culture.

Many of these factors are seen as being important for *integrating* environmental management into the business but to date have not been explicitly listed or explored in any detail.

Secondly, in the field of Human Resource Management (HRM) it is also possible to find reference to recommendations for the "integration" of HRM policy. It is argued here that the integration of a human resource management policy is adequately similar to the integration of an environmental management policy to warrant further discussion.

Kirkpatrick et al. (1992: 132) describe four levels of "integration" in the organisation, as devised by Guest (1987). Firstly, the authors suggest that human resource policy should be integrated with strategic planning. The next level is an integration of internal processes, in order to ensure internal consistency. Thirdly, they suggest integrating human resource policies with the management process which is described as perhaps the most important level to achieve. Finally, it is recommended that there needs to be a congruency between employee values and business goals.

From the limited set of available literature on this topic, four subjects seemed to require further investigation from a wider literature base. The first is the level of organisational involvement required in the integration of environmental management. Some authors refer to the involvement of individuals (Starik & Rands, 1995; Klinkers and Nelisson, 1995), others the commitment of top management (Hutchinson, 1996; Watson, 1995), and further still the challenges of middle management in achieving change (Halme, 1996). Section 3.4 will explore the concept of levels within organisations and the extent to which environmental management could feature at those levels.

The second subject worthy of further discussion is the notion of culture change. There are numerous references to this type of "greening", many of which have been contested as unreasonable. Section 3.4 will also explore this subject in more detail. The third subject worthy of further analysis is the relationship between existing departments or groups within a company and environmental management. Reference has been made to specific departments in achieving environmental performance improvements but to date there have been no specific recommendations in this area. Finally, and cutting across these three it is necessary to examine the kind of change required to achieve the integration of environmental management. Some authors refer to changing company culture and others to business strategy. The section to follow will explore the integration of environmental management in terms of these different organisational levels.

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3.4) Organisational Levels And The Integration Of Environmental Management

It is not unusual to perceive or describe an organisation in terms of a number of "levels". Writers on organisational change (e.g. Van de Ven and Poole, 1995) have often divided their studies into organisational levels. As March (1981: 571) describes, "although it is an heroic simplification, out of which theoretical mischief can come, it is possible to see organization as the intermeshing of three systems: the individual, the organization and the collection of organizations that can be called the environment".

Indeed Beer and Walton (1987: 356) argue that change must occur at all three of these levels for it to be institutionalised. Likewise, Sethi (1998: 86) argues that any significant change in business behaviour requiring ethical choices must concern itself with a dual set of variables i) those relating to an organisations culture and ii) those relating to externally driven market constraints. Although an important area of inquiry, the project at Hewlett-Packard does not include analysis of the external environment in which the firm operates, but instead focuses on the interplay between the individual and organisational levels within the company's culture. Part Three in this Portfolio discusses briefly the broader implications of a firm attempting to "Institutionalise Environmental Management" in isolation from industry stakeholders. For the remainder of this section however, discussions are limited to internal organisational levels.

The parallel between quality and environmental management was described earlier. Writers on the implementation of Total Quality Management have recognised the interplay between different levels of organisation. Shiba et al. (1993: 29) see the practice of TQM occurring at four levels: individual, work group, organisation and regional or industry levels. Beyond describing specific functions which need to address Environmental Management (see Hutchinson, 1996: 19 for example), the "work group" level is one which writers on Environmental Management seem to omit.

Writers on organisational culture have also described organisations in terms of a number of "levels". Some models of culture include i) "the iceberg" -- smaller visible characteristics supported by a much larger, deeper set of assumptions (Atkinson, 1993: 22), ii) "the onion" -- with core beliefs surrounded by more layers of assumptions and rituals (Pauchant et al, 1990). These models say more or less the same thing - that there are very "deep" or "core" beliefs within an organisation's culture in addition to more visible "surface" manifestations. Smith (1993: 7) finds that the relationship between business and the (natural) environment can also be considered in terms of the 'onion model'. In this model corporate responsibility and business ethics lie at the core, followed by political and technical expertise, the functional areas of the business, and the corporate response to environmentalism.

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There are two types of "levels" under discussion here. Firstly, it is recognised that a firm operates at multiple levels, from the individual to the market place, with environmental management featuring at each. In addition, it is recognised that, within the organisation, there are different levels of culture exhibited - which may also need to feature environmental responsibility. In a sense, the first categorisation of levels is based on numbers of people, the second on the varying manifestations of values and beliefs. It is recognised that organisational change programmes, environmental or otherwise, need to address the different levels in an organisation. Some authors express this in terms of structural or hierarchical levels, and others in terms of the different levels of culture. To some extent, Smith's (ibid.) model embraces both types, with "corporate responsibility and business ethics" at the heart of the problem but with specific functional actions also necessary.

Generally environmental management writers have not really explored in any depth, the types or levels of organisational change required to institutionalise environmental management. Exceptionally, Starik & Rands (1995) do recognise that ecological sustainability must be analysed on multilevel and multisystemic bases. Like others, they suggest considering the Individual, Organizational and then other (external) levels. However, the recommendations from these authors are weak in terms of exploring the levels in any detail. In response to this, the following sections take three levels and discusses them in more detail. These are the individual, the work group and the organisational levels. The first section considers the role of *individual* employees in the integration of environmental management. Within this section both individual values and behaviour are considered in relation to environmental management. The second section considers the *work-group* level as described in the Total Quality literature and discusses the role of organisational sub-groups in achieving the integration of environmental management. Finally, the third section discusses environmental management change at the *organisational* level, discussing the role of company strategy and culture as environmental management becomes part of normal business practice.

3.4.1) The role of individuals in the integration of environmental management

Many authors (Starik, 1995; Klinkers & Nelisson, 1995; Ballantyne & Gerber, 1994; Hoffman, 1993; Welford, 1995) refer to the role of individuals in an environmental change programme. Individuals affiliated with organisations as owners, managers, employees, members and volunteers bring critical ideas and energy to the "greening" of organizations (Starik & Rands, 1995: 917). Starik argues that this innovative potential will be applied not to only popular areas, but also to all impacts of the organisations' products and services. There are two aspects worth considering at this level, individual values for the environment and individual behaviour.

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3.4.1 a) Individual Values

The role of individual values in the greening process is expressed in two ways. Firstly, it is recommended that firms embrace the "environmental worldview" of their employees as a way to influence behaviour within the organisation. Individual's fundamental values and assumptions about the natural environment - their environmental worldviews (Dunlop and Van Liere, 1978) - play a fundamental role in influencing environmental attitudes and, subsequently, behaviours (Starik & Rands, 1995). Secondly, a degree of "congruence" is recommended between the values of the organisation and the values of the individual.

This is recommended as a method of improving overall job satisfaction and efficiency. Individuals develop values which shape, and are shaped by, societal and organisational norms. "As organisations develop these norms in the form of culture, the fit between each individual member's value system and that of the group's is a major determinant in job satisfaction and ultimate success. Without a congruent fit, a dysfunctional employee / employer relationship develops which may threaten to undermine organisational efficiency" (Hoffman, 1993: 10).

A definition of "value" is provided by Rokeach (1973) as an "enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence" (in Bansal, Jackson & McIntyre, 1998). There are alternative perspectives of "value" provided by other writers on social behaviour but by and large they all encompass roughly the same notion of "preferable conditions for well being". Individuals have a wide ranging set of values including those relating to social, political and religious preferences. Rokeach breaks these down into either terminal (or ends) values and instrumental (or means) values. The former refers to beliefs about desirable states of existence that are worth striving for (such as happiness or wisdom); the latter, attainment of desirable end states (such as behaving honestly or responsibly).

Values towards the natural environment have been expressed as being related to twelve of Rokeach's eighteen "terminal" values (Hoffman, 1993). It has therefore been argued that the environment is a growing value among individual members of society. A consequence of this is that these values may transfer to the workplace. Although this transfer of values has been acknowledged, there has not been any detailed analysis as to the importance, or otherwise, of these latent green values contained within the organisation, how to capitalise on their existence or whether these values are desirable in *all* employees.

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3.4.1 b) Individual Action

It is argued here that without the ability to take action, values for environmental protection may lead to frustration or superficial (short lived) compliance. Similarly, Larkin & Larkin (1996) suggest that organisational change will not be successful unless managers stop communicating about values and start taking *action*. "The only effective way to communicate a value is to act in accordance with it and give others the incentive to do the same" (Larkin & Larkin, 1996: 96). This raises the question of the temporal relationship between values and action.

The order in which environmental values and behaviours arise is discussed by Halme (1996: 102) and also briefly by Welford (1996: 121). Halme argues that, although commonly assumed to start with values, her research found that change can start at either level first and lead to the other. Further evidence is seen on the need to involve individuals in taking action: "environmental problems can only successfully be resolved if all employees understand the causes and consequences of such problems, and if they are provided with the opportunity to take action in order to redress existing problems and to prevent the occurrence of environmental problems in the future" Roberts (1995: 95). An important point to note about this quote taken from Roberts (1995) is that he refers to "all employees". This is not uncommon amongst environmental management writers. In particular, Welford (1995: 118) also calls for "every individual to be involved". It is difficult to say, categorically, whether these authors really mean that "all" employees need to be involved. However, to make such generalisations may well be confusing to practitioners hoping to develop their systems for environmental management. It is also common to see the vision of "all employees involved" in discussions surrounding Sustainability. In particular, writers (Welford, 1995; Roberts, 1995) suggest that, at the very least, people should be encouraged to participate in decision making with regard to Sustainability. However, Neumann (1989: in Dunphy and Stace, 1993) points out that even participative approaches may not be as participative as they seem because, according to empirical data, approximately two thirds of a work force typically choose not to participate in change programmes even if they are given the opportunity.

Later this portfolio will show that employees' values *and* activities were important determinants in achieving environmental management change. In contrast to the assumption that all employees should be involved a model is presented depicting a range of employee responsibilities possible for environmental management issues.

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3.4.2) The work-group level

The second level which will be reviewed here is the work-group. This term work-group is used here to encompass a number of sub-organisational arrangements such as departments, project teams or business units. Together these sub-organisations make up the structure of the organisation but on their own act somewhat independently of the whole organisation. Despite the goal of wanting to integrate environmental management into normal business practice, and therefore into these sub-groups, previous environmental management literature has not really focused on their influence or importance.

Hutchinson (ibid.) and others mention several business functions which may be integrated into environmental management (or arguably vice versa). Specifically, in Hutchinson's criteria for integrating environmental policy with business strategy; Purchasing, Manufacturing, Design, Training and Accounting are mentioned. This list of functional areas is by no means complete. Other departments such as Personnel, Quality, Marketing or Operations Management have not been mentioned. To date, no one has adequately described the necessary role of groups within an organisation in integrating environmental management, or how they relate to other levels of change, such as the role of the individual. Later it will be shown that change at a work-group level depends on that group's specific objectives and the discretion of its employees to effect change.

3.4.3) Organisational Level

The third type of change recommended for integrating environmental management is at a company-wide or organisational level. In the section which follows two aspects of the organisation as a whole will be considered in relation to the integration of environmental management. Firstly, the role of senior and then middle management is discussed and secondly the role of company culture.

3.4.3 a) Company Management

It is common for environmental management writers to assume that top or senior management commitment is an important factor for the integration of environmental management. As Watson (1995) argues; "One fundamental element of an environmental management system is top management commitment. A second is integration of consideration of environmental issues at every stage of the business process. The principle is simple. Get the right people involved and raise the appropriate questions" (Watson, 1995:58). Few authors suggest that "top management commitment" is the only aspect of organisational life which must embrace the concepts of environmental management, but most argue that this must be present, if only at a superficial level.

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A distinction should be made between change programmes where there is top management commitment and those which are driven from "the top". "Top down" change programmes have often been abandoned because they invoke resistance (Gould, 1996: 29). Similarly, Thiagarajan and Zairi (1997) convincingly argue that the literature is unanimous in reinforcing that top management commitment is an important factor for the successful implementation of TQM.

In addition to top management, the role of "middle management" has also been discussed in relation to successful quality improvement processes (Roth, 1998). They have been found to have significant resistance to organisational change and yet represent a vital aspect of its success. Halme (1996: 102) also found that middle management could have a considerable impact on the success of environmental management changes. She also argues that even where change can be initiated at this level, top management support, however superficial, is essential to providing legitimacy for proposed changes. The importance of sub-organisational levels in achieving organisational change more generally is recognised. If the change program is to be successful, there must also be a predominance of consultative practices at the business unit level in order to win commitment at that level to the implementation of change (Dunphy and Stace, 1993: 917) .

Since they generally operate at a company level, it is worth considering the role of recognised Environmental Management Systems (EMSs) in the integration of environmental management in this section. It is argued here that EMSs (which require management in themselves) actually conflict with the desire to integrate environmental management because they will keep environmental management as a separate consideration. By attaching a label to environmental management it may have a tendency to become more distinct and therefore not integrated. Increasingly, emphasis is seen on integrating Environmental, Health & Safety and Quality Management systems. These developments may in time help achieve the desired level of integration more than specific systems for Environmental Management.

3.4.3 b) Company Values

In addition to considering the company management systems and structure, it is also considered important to influence organisational values when integrating environmental management. An interview with Robert Haas (Chief Executive Officer) from the Levi Strauss company, provides a practical perspective on the importance of values within an organisation. "A company's values -- what it stands for, what its people believe in -- are crucial to its critical success. Indeed values drive the business" (Haas, in Howard, 1990: 134).

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Haas makes the point that strategy and structure are not enough to ensure organisational success. "Values provide a common language for aligning a company's leadership and its people."

Organizational values are defined as "socially shared cognitive representations of institutional goals and demands" (Rokeach, 1979: 50). Organizational values provide a set of rules by which to interpret the complex and numerous signals within an organizational environment. These rules are not necessarily explicit, but they can shape and be reflected in organizational culture, structure, and decision processes (Bansal et al., 1998). Discussions of organisational values are most often embedded within discussions of organisational culture, on which there is a wide and varied debate, described very briefly here.

Culture, from an organisational perspective, has been defined in many different ways. This is partly attributable to the many definitions of "culture" that have been used in the sociological literatures over time. Ogbonna (1992) suggests that there are as many definitions of organisational culture as there are experts on the subject. Brown (1995) lists some of the best known and widely promulgated definitions in his book on the subject and recognises two distinct approaches to the conceptualisation of organisational culture. These are: culture as something an organisation *is* (Brown's "Metaphor") and something which an organisation *has* (Brown's "Objective Entity"). These two quite different interpretations have governed the direction of research into the management or otherwise of organisational culture. Most commentators have chosen the latter view, that culture is an objective entity which "shapes behaviour, gives organisational members a sense of identity and establishes recognised and accepted premises for decision making" (Ogbonna, 1992). Nevertheless there remain proponents of the view that "organisation is culture and culture is organisation" and therefore the two cannot be separated for the purposes of change. Since the objectives of this research was to create change (possibly cultural), the "culture as objective entity" view point was taken for the literature review and therefore for the remaining discussions in this section.

One of the most widely cited authors on the subject of organisational culture (subscribing to this viewpoint) is Edgar Schein. Schein (1985) identifies and describes three levels of cultural phenomena in organisations as follows:

- 1.) On the surface there are overt behaviours and other physical manifestations (artefacts and creations);
- 2.) Below this level is a sense of what ought to be (values);
- 3.) At the deepest level are those things that are taken for granted as 'correct' ways of coping with the (business) environment (basic assumptions).

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It is the pattern of basic assumptions (which are taken for granted) that Schein describes as culture (Ogbonna, 1992). The first two levels are manifestations of the embedded culture that are more visible within an organisational setting. Similar models of organisational culture have been proposed which all contain distinctions between the deeper and more superficial levels of organisational culture.

As described earlier, Hewlett-Packard is recognised by some as having a particularly strong culture. Tushman and O'Reilly (1996) discuss the paradox of strong cultures. It appears that the more institutionalised or ingrained organisational norms and values are, the more difficult they are to change. Thus, it could be argued that if a company's culture does not support principles of environmental management it may be very difficult to shift the perceptions of managers to support environmental responsibility. Gottlieb and Sanzgiri (1996: 1276, 1278) also discuss the role of prevailing cultures in changes towards more ethical business behaviour, stating that the tension between profit and ethics will either be eased or confounded further depending on that culture.

If an organisation does not already have a culture which fosters ethical or environmental management, the recommendation from the literature to date is for that culture to be changed. Indeed, one of the main recommendations for achieving "Total Quality Management" (and by association environmental management) was to develop a "quality culture" or, in other words, "quality must be endemic throughout the company" (Massey, 1995). Reger et al (1994) describe that, traditionally, TQM experts have suggested that successful implementation of TQM requires "metamorphosis; total change", "radical change.... a change in the basic philosophy of everyone in the company", or a "paradigm shift" similar to the re-framing that occurs during scientific revolutions.

The hypothesis represented by these views is that "only when viewed as part of these larger organisational transformations will TQM be sustained over time and avoid being another passing fad" (Kochan et al, 1995). As has been shown, these recommendations are mirrored in the literatures on environmental management. In these literatures, the need for attention to environmental management requires a process of significant organisational change. These culture change prescriptions are seen throughout the literature. As Smith (1993: 9) argues: A failure to incorporate a new set of environmental values at the heart of corporate culture will result in a process of simply bolting on a false consciousness in the form of a green tinge. The obvious drawback with this type of approach is the sheer magnitude of organisational change required to change the culture.

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Indeed, Rothenberg et al. (1992) argue that cultures are notoriously difficult to change and that it may well be more appropriate to match environmental management programmes with a company's existing culture. Throughout all these discussions it is evident that the integration of environmental management requires organisational change of some nature. How this change is to be achieved is not well described. The following section reviews other more general organisational change literatures to identify any recommendations applicable to the integration of environmental management

3.4.4) How to achieve change

Although organisational change is often seen as being necessary for integrating environmental management there is much debate on whether change can be planned *a priori* at all. Hope and Hendry (1994: 63) report that, throughout the 1980s, the emphasis in the prescriptive organisational change literature has been on programmatic (or planned) change implemented in a top-down fashion throughout the organisation. Increasingly though, authors (Beer and Walton, 1987; Beer et al, 1990; Hope and Hendry, 1994) are beginning to doubt whether change can be planned or pre-programmed. Beer et al (1990) describe the fallacy of programmatic change. In their study of organisational change at six large corporations they discovered that programmed change had little positive impact on organisations: "The most significant changes were initiated at the periphery of a corporation, led by general managers as opposed to the CEO or other director level manager".

This appears to contradict popular advice given by writers on organisational change, and indeed environmental management, on the importance of "top management commitment" which was summarised earlier. Beer et al (1990: 165) recognise this, stating "of course having a CEO or other senior manager who is committed to change does make a difference - and when it comes to changing an entire organization, such support is essential".

However, they also recognise that this creates something of a paradox. How can a non-directive change programme be directed? The managers involved in successful change programmes in their study created a climate for change or specified a general direction that the company should move in without insisting on specific solutions. Hope and Hendry describe a similar, more emergent, approach. Beer et al. (1990) discuss this emergent change, stating that it is slower to emerge but more effective and long lasting than programmes imposed from the top. It is slow to emerge because the change process has to rely on initiatives that have not been enforced. It is more effective and long lasting because the change is volunteered by managers who see the need to change rather than the imposition.

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Later, this portfolio will show that the researcher relied on change strategies which were emergent rather than directive using existing corporate objectives and core values as legitimising tools during the project. The emergent approach to change was consistent with Hewlett-Packard's culture, which is not based on command and control methods to achieve objectives¹⁵.

3.7) Literature Review Conclusions

The previous sections have discussed a varied collection of literatures which help contextualise the project at Hewlett-Packard. It is evident that HP's objective - to institutionalise environmental management - is similar to other objectives described in the literatures on environmental management. Although widespread acceptance exists for the integration of environmental management, the implications of this approach are not fully understood. Descriptions of what this type of approach might mean for a firm, in practical terms, have not been provided in the literature suggesting that the efficacy of the approach may not be well thought out. Those authors who attempt to list or describe elements of what "integration" may look like, do not describe how it may be possible to achieve those goals nor how time consuming or difficult it might (or might not) be.

Different levels have been considered in the organisation. Notably, writers refer to top management, company culture and the role of individual employees in their recommendations for integrating environmental management. Despite this no single framework exists for managers hoping to pursue an integrated strategy for environmental management. In more general terms, this project is also about facilitating organisational change. Previous research on organisational change questions whether change can be planned at all. Through the type of detailed insider-based researcher called for here, organisational change researchers have uncovered more appropriate mechanisms for change which are more emergent in nature. Further testing of this more subtle type of change is required.

Chapter Four

Research Methodology

4.1 Introduction

Previous chapters have described the research participants, the background to the research, and its relative positioning among organisational (and other) literatures. The objective of this chapter is to describe both the overall research design and the specific methodologies used to facilitate, observe and record the institutionalisation of environmental management. Before moving on to the specific methodologies used in this project a history of organisational research methods is provided, both in general and for the study of industrial environmental management. Bryman (1987) suggests that research *design* is distinct from research *methodology*. The research design is the overall structure and orientation of the project, whereas the methodologies described are the techniques used for data collection. After an introduction to research methods in general, the research design for this project will be described first, followed by the methodologies employed within that design. The author's own experience of using these methodologies is recorded in a separate section of the portfolio.¹⁶

4.2) History of Organisational Research Methods

Perhaps the most significant early work aimed at understanding organisational life, as it relates to industry, was the work of F.W. Taylor and his colleagues. Unlike previous researchers these "scientific managers" focused on putting ideas into practice. They focused on increasing organisational efficiency and measuring the jobs of workers. The influence of this scientific management has been a lasting one. Taylor succeeded in his aim of improving efficiency by various "scientific" measures and, with refinements, these are still used today (Pugh and Hickson, 1993). These essentially scientific studies soon met with opposition from the school of human relations, of which Elton Mayo is perhaps the most well known proponent. Opposition was based on the apparent dehumanisation of participants in these experiments. Studies in the field called human relations instead suggested the importance of examining groups of workers in their natural, hierarchical structural working conditions. Field researchers in human relations went into the industrial plants as participant observers, or to gain a close but detached view of work life, through intensive interviewing and observation. These observations gave apparently realistic descriptions of factory life for the first time in academic literatures.

¹⁶ Part 2: Story Board One - "An Account of the Action Research Process".

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In the field of sociology Dr Elliot Jaques, in his work *The Changing Culture of a Factory* (1951), provided the first, and indeed at the time the only, significant documented experience of social science in a continuing relationship inside an organization (Klein, 1976: 4). Jaques and his collaborators in the Glacier Investigations used the technique of "action research", defined here by Pugh and Hickson (1983): "Working in collaboration with members of the firm, they (action researchers) have several aims: to study psychological and social forces affecting group behaviour, to develop more effective ways of resolving social stress and to facilitate agreed and desired social change". A more detailed description of Action Research is provided later in this section, since this was the chosen method used in the project at Hewlett-Packard. Before getting to this level of detail, it is necessary to describe the various types of research method used in the study of organisations.

The methods used to study organisations generally fall in to one of two forms. So called "quantitative" research was typically exemplified by social survey and experimental investigations whilst "qualitative" research was (and still is) associated with devices such as participant observation and in depth interviewing. On the surface, the difference between these types of research appears purely in their methodology but their application has more recently raised philosophical issues associated with the fundamental nature of research itself. Foote-Whyte (1991: 96) describes the two forms in terms of "mainstream" and "alternative" research.

"Mainstream" researchers concerned themselves with macro-organisational theory and the processes by which environmental factors affect the organisation. They tend to employ questionnaire or survey research methods rather than intense observation and, broadly, separate research theory from practical application. The "alternative" stream, on the other hand, rejects the notion that theory and practice can be separated and, as a group, tends to focus on internal organisational change. Here it can be seen again that the type of research methodology applied is often linked to the content of the research, some methods yielding information on general organisational trends and others on more specific internal processes.

Evered and Reis Louis (1981: 7) take a slightly different approach and describe the essential difference in approaches to understanding organisations as two paradigms. Whether the two positions fulfil all of the criteria of "paradigms" is discussed by Bryman (1988). However, for the purposes of this review, the terminology is accepted. The two paradigms they describe are "inquiry from the outside" and "inquiry from the inside".

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"Inquiry from the outside may be characterised by the researcher's detachment from the organisational setting under study. In contrast, inquiry from the inside carries with it the assumption that the researcher can best come to know the reality of an organization by *being there* - by becoming immersed in the stream of events and activities, by becoming part of the phenomena of study" (Evered and Reis Louis, 1981: 11). The authors do make the point that a spectrum of research styles fall between these polar extremes but that the majority of researchers do fall into one paradigm or the other. Once again, the difference between these two paradigms is based not only on the technical differences in their application but on more philosophical grounds. Particularly, "inquiry from the outside" takes as its primary assumption that the subject under study is separated from, unrelated to, independent of and unaffected by the researcher (Evered and Reis Louis, *Ibid.*).

"Inquiry from the outside" is also (typically) based around a pre-selected set of categories that will guide the enquiry (Evered and Reis Louis, *Ibid.*). This approach limits the researcher's perception of the research in that they may only find what they are looking for. Worse still they may construct relationships and patterns in the data to suit the objectives of the research. In contrast to this model, "Inquiry from the inside" carries with it the assumption that the researcher can best come to know the reality of an organisation by being there. In this situation the researcher must become an actor in real situations and the research methodology must reflect this.

It has become common practice to associate "Quantitative" (mainstream) research with "Inquiry from the outside" and to assign this a positivist¹⁷ label. Similarly it has become common to associate "qualitative (alternative) research with "Inquiry from the inside". Guba and Lincoln (1982) refer to quantitative and qualitative research as resting on two divergent paradigms, and hence assumptions about the proper study of social life (Bryman, 1988). The differences between qualitative and quantitative research are both philosophical and stylistic. The following section describes the advantages and disadvantages of each of these methodological stand points in more detail, discussing any overlaps between them. In providing this analysis, this section adopts Evered and Reis Louis's (1981) classification of "inquiry from the outside" versus "inquiry from the inside".

¹⁷ Recognising only positive facts and observable phenomena.

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4.2.1) Inquiry from the Outside

Typically "quantitative" researchers have adopted the posture of an outsider looking in on the social world. An example of this type of study is Hirschi's study of the causes of delinquency (see Bryman, 1988). Hirschi expresses his preference for quantitative research; "because quantitative data can be analysed statistically, it is possible to examine complicated theoretical problems such as the relative importance of many causes of delinquency, far more powerfully than with verbal analysis of qualitative data" (Hirschi and Selvin, [1967] 1973 in Bryman, 1988). Surveys and experiments are the main vehicles of quantitative analysis, although other methods such as review of official statistics, structured observation and the content analysis of documentation demonstrate many of the characteristics of quantitative research. Quantitative research is underpinned by a natural-science model where researchers typically refer to variables, measurement and experiments. Other characteristics of this type of research are that i) these studies tend to confirm rather than develop theory, ii) they are structured to elicit hard, reliable data and iii) they perceive reality to be static and external to the researcher. "Outside research is designed to be detached from, and independent of, a specific situation under study in a particular organization. The researcher determines the frequency of, and associations among, events with respect to a set of hypothesised categories and relationships. Meaning is assigned to events on the basis of a priori analytical categories and explicit researcher-free procedures" (Evered and Reis-Louis, 1991: 13).

4.2.2) Inquiry from the Inside

Inquiry from the inside is dominated by the qualitative research tradition. Van Maanen et al. (1982) describe five fundamental characteristics of qualitative research. In addition to being based inside the organisation under study, qualitative research has a tendency to be inductive, where theory is developed (iteratively) from the data. Secondly, research tends to focus on a notion of "normal behaviour", minimising any interruptions to this state where possible. Qualitative researchers also assume that there is no *one* social order against which deviation can be defined and as such do not impose structure. Finally, work of this nature involves contextual description where the aim is primarily to describe or reveal a social situation as opposed to explain or predict one. Whilst qualitative researchers do not always employ methods associated with "inquiry from the inside", often researchers inside organisations do apply qualitative research methods.

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Within the broad category of "inquiry from the inside" researchers have adopted different strategies to achieve their objectives. Early work of sociologists in industry used a "medical" or "consultant" model where the researcher was perceived to give help and advice to the "sick" patient. This model implies "ill health" on behalf of the organisation which may not be appropriate to the given situation. Foote-Whyte (1991: 272) refers to three types of applied social research which vary according to the relations of the researcher to the subjects of the research:

- 1.) The professional expert model, in which the researcher makes a study and recommends a course of action to decision makers in the organisation studied (similar to the medical model described earlier);
- 2.) Action research, controlled by the researcher, in which the researcher aims to be a principal change agent as well as controlling the research process; and
- 3.) Participatory action research in which the researcher seeks to involve some members of the organisation studied as active participants in all stages of the research/action process.

This project was most similar to number two - action research- therefore, details of this type of methodology are described here in more detail.

4.2.3) Action Research

Amongst others, Susman and Evered (1978: 586) suggest that the term "action research" was introduced by Kurt Lewin in 1946 to denote "a pioneering approach toward social research which combined the generation of theory with changing the social system through the researcher acting in or on the social system". However, there are conflicting opinions on the origins of this type of inquiry (See Masters, 1995: 1 for more detail) which include the Science in Education Movement of the nineteenth century, the Group dynamics movement in social psychology and the Post-war Reconstructionist Curriculum Development Activity.

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Despite these conflicts, it is generally accepted that Kurt Lewin first constructed the theory and process of action research. The arguments advanced by Lewin for the merits of action research were Gestaltist¹⁸ in origin. He stressed the limitations of studying complex, real social events in a laboratory, the artificiality of splitting out single behavioural elements from an integrated system, and the advantages of understanding the dynamic nature of change, by studying it under controlled conditions as it takes place (Foster, 1972: 530). There are many definitions of action research (McCutcheon and Jung, 1990:1481; Kemmis and McTaggart 1990:5; Rappoport, 1970:449 as cited in Masters, 1995) but within all of these definitions there are four basic themes: empowerment of participants; collaboration through participation; acquisition of knowledge; and social change (Masters, 1995: 2).

The advantages of action research (expressed as opposed to positivist science) according to Susman and Evered (1978: 589) are that action research:

- is future oriented - dealing with the concerns of actual people;
- is collaborative - meeting the needs of both the researcher and the client organisation;
- Implies some system development or competency building as opposed to a one off solution;
- generates theory which is grounded in action;
- is agnostic in that it recognises that theories are based on previous actions and will require continual reformulation; and
- is situational i.e. does not ignore the context of the phenomena.

Most of these advantages relate more generally to "inquiry from the inside" methods, some of which need not involve any *action* on behalf the researcher. Advantages which are specific to action research relate to the collaborative nature of this type of work. Researchers are not seen as outside consultants, more often as permanent or semi-permanent members of the organisation. Despite these apparent advantages the work of action researchers has been criticised. Pam Swepson (1998) has expressed concern that practitioners of action research have become "trapped" by their ideals of value free science in their studies. "It seems to me that this has happened in some of the literature on action research when theorists have rightly attempted to establish the ideals of participation and emancipation, in reaction to the untenable ideal of the philosophy of a value free science" (Swepson, 1998: 1). To overcome this Swepson (ibid.) recommends that practitioners of action research maintain the strong ideals of action research as a *vision* (which can never be attained), but remain liberated to deal with local conditions when it comes to specific methodologies.

¹⁸ Gestaltist refers to when an organised whole is perceived as more than the sum of its parts.

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It has been shown here that research in organisations has a long and somewhat turbulent history and a divergence of ideals has emerged between "quantitative" and "qualitative" researchers. The next section describes how these methodologies have been utilised to understand the organisational phenomena associated with environmental management generally.

4.2.4) Research Methods in Environmental Management

To date environmental management researchers have either gained limited access to an organisation and conducted a series of interviews or documentary analyses, or they have studied the organisation from the "outside". Studies of multiple organisations have tended to be empirical in nature, once again with only "outsider" research strategies being employed. This is not surprising as multiple organisation studies are time consuming and difficult to achieve with an "inside" approach. A review of environmental management literatures suggests that relatively little empirical research has been carried out in this area. In addition, the majority of environmental management researchers have adopted research methods more akin to "inquiry from the outside". There is great opportunity for organisational and environmental management researchers alike to adopt "insider" methodologies and gain more detailed insights into the processes of successful Environmental Management. A handful of authors (Cramer, 1998; Welford, 1998; Newton and Harte; 1997) have recently recognised this opportunity. Understanding the complex interactions between the various actors inside and outside the company requires an insider's view, relying upon psychological, sociological and/or anthropological data and confidential strategic information (Cramer, 1998:170).

4.2.5) Summary

To summarise, after several decades, it seems writers in a diverse range of fields have recently called for a return to types of insider-based research. Evered and Reis-Louis (1991: 18) argue that organisational inquiry is currently characterised by two broad approaches. One is methodologically precise, but often irrelevant to the reality of organisations; the other is crucially relevant, but often too vague to be communicated or believed by others. They argue that ways are needed to improve the relevancy of one and to improve the precision of the other". Similarly, writing on the need to understand organisational change, Orpen (1994: 64) recommends that researchers adopt a style of research that (a) accepts that the investigator will affect what he or she is studying - that he or she is part of the 'field' under investigation, (b) involves the investigator in the changes that he or she recommends - to learn first hand what is involved, and (c) tries to be as systematic as possible in theorising and examining the effects of intervention, but without trying (vainly) to follow the research models of the physical sciences.

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In the area of Strategic Management, Snow and Thomas (1994) analyse the current nature of related field research. They also describe an overemphasis in explanatory research that uses surveys and other secondary data sources, as opposed to measures such as interviews and observation. It was shown that Beer and Walton (1987) also called for a return to the action research traditions of Organisational Development and a re-focus on describing the context of organisational change. Further, March (1981) suggests that it may be a mistake to focus research efforts on "dramatic" explanations of change. Consistent with arguments presented in the literature review section, he argues that most change in organizations results neither from extraordinary organizational processes or focuses, nor from uncommon imagination, persistence or skill, but from relatively stable routine processes that relate organizations to their environment (March 1981: 564). This type of change is arguably more easy to record from the inside of an organisation.

At this time it is also evident that environmental management research falls mainly into Foote-Whyte's mainstream category and has not yet benefited from the insights of prolonged inquiry from the inside. Most researchers in environmental management investigating companies' behaviour are "outsiders" (Cramer, 1998: 170). Their research is often based on interviews with key persons and formal written documents. Subsequent chapters show that the research project at Hewlett-Packard aims to provide the balance between rigour and relevance now called for, contributing to the understanding of social science application in an industrial setting. This also responds to the call for an increase in studying the processes of environmental management from an "insider's" perspective. In doing this, the research makes a significant contribution to the discipline of environmental management.

Having presented a summary of current trends in research methodology, both generally and in the area of environmental management, it is now appropriate to describe the methodology chosen for this research. In the sections which follow, details of the specific research method and methodologies used at Hewlett-Packard are provided.

4.3) Research Design

Before moving on to the eventual research design, it is worth considering the development of the researcher's understanding of research methods. As mentioned in section 1.4, prior to the start of this project the researcher had no industrial experience relating to environmental engineering or management and had been exposed only to research methods relating to the physical and applied sciences. This scientific background influenced the researcher's early perceptions of the research method.

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The first six month report of this portfolio¹⁹ states

"Although "The Institutionalisation of Environmental Management" could be described as an organisational issue, the project can still be treated as any other engineering investigation" (Jackson, 1995a).

By the second six month report, the researcher was talking in terms similar to those used in the natural sciences;

"Institutionalisation of environmental management cannot be measured directly. Thus, a number of inferential indicators will be used to assess the degree to which institutionalisation has occurred" (Jackson, 1995b: 2).

but she was beginning to recognise more qualitative techniques as being appropriate.

"Over the last year, I have found a number of formal research methodologies which could be used in this type of project. I intend to evaluate a number of these in the next six months to provide an academic grounding for the research activities. Briefly as an introduction to that evaluation I will be considering (amongst others) Organisation Learning Histories, Active Research in Organisational Change and Longitudinal Research Methodologies" (Jackson, 1995b: 9).

By the half way point of the project, the researcher was describing the research methodology in much more qualitative terms.

" This research is a four year individual case study from which it is hoped that broader and general conclusions will evolve. Case study research is appropriate for this project as it allows for a 'processual, contextual and generally longitudinal analysis of the various actions and meanings which take place in organisations' " (Jackson, 1996b: 18)

These excerpts show how the researcher's understanding of methodological issues changed over time. This was as a result of both experience and literature analysis. The following section now describes the research method, written from a newly informed position about the type of research project which this research resembles.

As discussed earlier, research into organisations, whether focusing on organisational behaviour, organisational change or strategic management (amongst others), has been split into one of two principal types, namely mainstream and alternative. The Engineering Doctorate programme²⁰ (associated with this research project) advises research engineers to spend as much time as possible at their industrial sponsor's premises to conduct their research. In this particular project, Hewlett-Packard was also keen for the researcher to be involved in the organisation's activities and assist in the implementation of their environmental management objectives. Given the prospect of prolonged access, combined with the opportunity to influence change at the company, the researcher decided to employ a research design which was more "alternative" in nature.

¹⁹ All of the Six month reports are presented in chronological order in Part Four of the Portfolio

²⁰ See Part One: Chapter One - The Players.

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Schein, 1996 summarises one advantage of this type of approach: "Particularly in relation to culture, when I see my colleagues inventing questionnaires to "measure" culture, I feel they are simply not seeing what is there, and this is particularly dangerous when one is dealing with a social force that is invisible yet very powerful". The remainder of this section describes this design in more detail.

4.3.1) A Case Study Of Hewlett-Packard

The focus of this research is specific to Hewlett-Packard Ltd. Such detailed organisational inquiry falls under the description of case study research. Case study research consists of a detailed investigation, often with data collected over a period of time, of one or more organisations, with a view to providing an analysis of the context and processes involved in the phenomena under study (Hartley, 1994: 208-209).

This statement by Hartley (*ibid.*) can be broken down for discussion. The first point to note is that case study research consists of a detailed investigation, often with data collected over time. This research is a detailed investigation at Hewlett-Packard Ltd with data collected over a four year period. The second aspect of Hartley's description is that it can be of one or more organisations. It is the intention of this research to focus solely on the internal aspects of Hewlett-Packard's environmental management programmes and as such will not look to other organisations (in any detail) for comparisons or similarities. In choosing to focus solely on one organisation, this research is open to criticisms of non-representativeness and non-generality. This research does not intend to represent a "sample" of organisational life. There may be lessons which can be applied (with due caution) to other organisational situations (these are discussed in Part 3 of this thesis) but this is only a secondary objective. Consistent with the recommendations of Wainright (1997: 7), the primary concern for this project was the validity of data collected, that is, whether or not the data expresses the considered and authentic views of the informant, as opposed to any attempt at generality. The final aspect of Hartley's definition is that case study research provides an analysis of the context and processes involved in the phenomena under study. This research provides an analysis of the context and processes involved in the institutionalisation of environmental management. Hartley (*ibid.*) also suggests that case study research is suited to probing areas of original and emergent areas of theory. As discussed in the literature review, a thorough description of industrial environmental management has not yet been provided. Through applying the case study approach, the research at HP makes a direct contribution to this field. However, the concept of the "case study" is not without its problems.

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As with other qualitative research, case studies have been accused of lacking in rigour and reliability, hence not addressing the issue of generalisability so fundamental to scientific research. This quite fundamental conflict affecting qualitative research is an important point to note and it will be revisited in Chapter 12 in the light of the research conclusions.

4.3.2) An Inquiry From The Inside

In addition to being a case study, this research is also an "inquiry from the inside" (See Evered and Reis Louis, 1981). This is partly due to the opportunity for "inside" research offered by the organisation under study and partly due to the lack of such research in organisational inquiry as a whole. The researcher was situated in the Environment, Health and Safety department at Hewlett-Packard's UK Headquarters in Bracknell. Chapter 2 described the background to the project and the function of this department in more detail, this chapter instead focuses on the research strategies employed by the researcher for her inquiry.

Insider research methods have both advantages and disadvantages. They are accused of being tainted by the "fallacy of subjectivism" (Russell, 1945 in Evered and Reis Louis, 1981) in that the findings can be distorted and contaminated by the values and the purposes of the researcher. Russell is suggesting that it may not be possible to be completely subjective in any project where the researcher is closely involved with the subject of the research. Such studies may appear to be so fuzzy that the findings often have dubious precision, rigour or credibility (Evered and Reis Louis, 1981). It is arguable whether any type of scientific research can be completely objective. Indeed it has been argued that the values of the researcher and the context (political, economic etc.) in which the research is carried out may influence the results of even quantitative research. However, this does not reduce the importance of avoiding close association with the subject of inquiry in insider based research. In this project several strategies were employed in an effort to increase the objectivity of the research:

- 1.) The researcher spent time removed from the organisation in order to step back from the research and analyse the emerging data.
- 2.) Regular supervision from external supervisors was provided to ensure that the researcher had not "gone native".
- 3.) Third party researchers (external to the organisation) were used to corroborate some data.²¹

²¹ Details of the corroborating activities are described in the Six Month reports.

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These strategies helped build awareness for the problems associated with "inquiry from the inside" and helped to reduce their prevalence. The advantage of conducting research from an "insider's" perspective is that a rich appreciation of organisational context can be achieved, where meaning is developed from the point of the view of organisational participant. The researcher was able to learn first hand, the factors associated with the institutionalisation of environmental management from several perspectives. These are described in more detail in the next section.

4.3.3) An Action (and) Research Approach.

Also described earlier, research conducted from the inside of an organisation uses a number of techniques to elicit information on the organisation's activities; surveys, focus groups, interviews all being common examples. Observing a system from within, however, undoubtedly causes some degree of influence over the system under observation, hence qualitative research techniques have dominated this type of inquiry. "Action research" is the most popular term used for research, conducted inside organisations, which is based on the researcher's active participation with the organisation. Jones (1987: 24) describes her experiences of action research as "intensive, longitudinal involvement with particular individuals and groups within particular organisations, with the intention of understanding how these people experience, give meaning to, act and interact with respect to particular situations."

The important concept in this statement is involvement. In this type of project researchers are active in the organisational processes under study. This can be seen as an extension of participant observation, where the research may passively participate and observe as opposed to intentionally acting as change agent. Action research brings to the forefront the key issue of the link between theory and practice, and the need to ground and test ideas for practice within that most exacting of testing grounds - organisational life as it is actually experienced and enacted by its members. Action research is particularly suited to studies of organisational change. Lewin's (ibid.) original formulation emphasises the process of understanding through initiating change (Jones, 1987: 30).

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As Sue Jones (1987) describes - "the action researcher is concerned with understanding the impact of interventions intended to affect the way in which change occurs". Several authors (Clark, 1972; Carr and Kemmis, 1983; described in Swepson, 1998) have proposed models for conducting action research. Some of these recommend specific models or processes to be applied irrespective of the organisational conditions, whilst others suggest a more tailored approach, taking local conditions into account. Several authors (in Masters, 1995) discuss the modes of action research as falling under three categories. It is not in the methodologies that the three modes of action research differ, but rather in the underlying assumptions and world views of the participants that cause variations in the application of the methodology (Grundy, 1982: 363; cited in Masters, 1995). The following table, taken from Masters (1995) outlines the three typical classifications.

Table D Classifications of Action Research

Philosophical Base	Technical Action	Mutual-Collaboration	Participatory Action
	Research	Action Research	Research
	Natural Sciences	Historical-Hermeneutic	Critical Sciences
The nature of reality	Single, measurable, fragmentable	Multiple, constructed, holistic	Social, economic. Exists with problems of equity and hegemony.
Problem	Defined in advance	Defined in situation	Defined in situation based on values clarification
Relationship between the Knower and Known	Separate	Interrelated, dialogic	Interrelated, embedded in society
Focus on collaboration theory	Technical validation, refinement, deduction	Mutual understanding, new theory, inductive	Mutual emancipation, validation, refinement, new theory, inductive, deductive
Type of knowledge produced	Predictive	Descriptive	Predictive, Descriptive
Change Duration	Short Lived	Longer lasting, dependent on individuals	Social change, emancipation
The nature of understanding	Events are explained in terms of real causes and simultaneous effects	Events are understood through active mental work, interactions with external context, transactions between ones mental work and external context.	Events are understood in terms of social and economic hindrances to true equity
The role of value in research	Value free	Value bounded	Related to values of equity
Purpose of research	Discovery of laws underlying reality	Understand what occurs and the meaning people make of phenomena	Uncover and understand what constrains equity and supports hegemony to free oneself of false consciousness and change practice to more equity.

The research at Hewlett-Packard did not fit nicely into one of these classifications, although it was more closely aligned to the second "Action Research" classification. The research problem was defined in-situ, the researcher was integrated fully with the organisation and was hence not value-free, the purpose of the research was to understand developments in environmental management and how employees understood the phenomenon, and the change was designed to be longer lasting than interventionist driven change.

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However, rather than limit the scope of this study to one type or mode of action research, in this portfolio the research methodology will be described as it happened. This will form the basis of one chapter in Part Two of the portfolio. The methodologies described in the next section may fit, in parts, with the cyclical (or other) models described in action research literature, but they are also driven somewhat by the situational elements of the research and the practices of the sponsoring organisation.

The objective of the following section is therefore to describe the type of action which the researcher was able to influence during the research, how learnings from those actions were fed back to the organisation and how this entire process was recorded and analysed. The research methodology for this project can be divided into two parts; namely the methodologies for action and for research. Although this is not an entirely appropriate division, (all action is research in this project) it is the most suitable for presentation. Action methodologies describe how the researcher facilitated change towards the "Institutionalisation of Environmental Management" and research methodologies, how resulting data was recorded.

4.3) Methodologies for Action

There were two elements to the actions taken at Hewlett-Packard during this research. These can be described as i) the relationship between the researcher and the informants within the organisation, ii) the objective of the actions taken. These are described below.

4.3.1) Relationship with informants

In action research projects (and in fact other qualitative research) researchers may adopt a number of different roles in order to make sense of their work at the company. The roles which were assumed for the project at HP were;

- ♦ *Participant Observer*:- In this role the researcher was participating in the organisation, but was not instigating any planned change. This was a passive role.
- ♦ *Change Agent*: - In this role the researcher was actively introducing change to the company, making note of any results. This was an active role.
- ♦ *Hewlett-Packard Functionary*: - The researcher quite often behaved as a "normal member of staff" in the Environment, Health and Safety department.

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The roles presented here highlight, once more, an issue central to qualitative research, that is, the issue of detachment. The necessity of establishing a rapport in order to gain access to what might be sensitive or closely guarded information means that the degree of detachment associated with quantitative research (described earlier) may not be viable or desirable (Wainright, 1997: 7). In this case, detachment from the organisation was both desirable and yet undesirable. It was desirable because, at HP, external perspectives are often given more credibility in change programmes (hence the frequent use of consultants in this area), but it was undesirable in that detachment from the situation may not have yielded such rich contextual data. Most, if not all, employees at the company were aware of the research but accepted the somewhat (at least) "dual" role which the researcher played.

Qualitative researchers have frequently suggested that research design, data collection and analysis are simultaneous processes (Burgess 1984a, 1984b; Habenstein, 1970) (Bryman and Burgess, 1994). This was true for the project at Hewlett-Packard. In adopting the above roles, the researcher was continuously mindful of the research objectives throughout the project. Preliminary hypotheses would form and guide subsequent action at the company. In order to portray the ongoing development of research ideas, a chronology is provided on the process of action research. This is Story Board One - An Account of the Action Research process.

4.3.2) The objective of actions taken.

The second aspect of the "methodologies for action" worth considering is the methods used by the researcher to assist HP in achieving the "Institutionalisation of Environmental Management". They are presented here together as an overview, the action research story boards in Part Two of the portfolio describe each of these activities in more detail. Three types of action dominated this project, which were each aimed at achieving specific but different results. The methodologies were based loosely on elements of Hewlett-Packard's Quality Maturity system²², in particular, Process Management. HP describes its business activities in terms of Six Key Processes. These are, Customer Voice, Business Planning and Control, Product Generation, Order Generation, Order Fulfilment and People Development & Organisational Learning.

²² See Part 1: The Players

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These are shown in Fig. 2

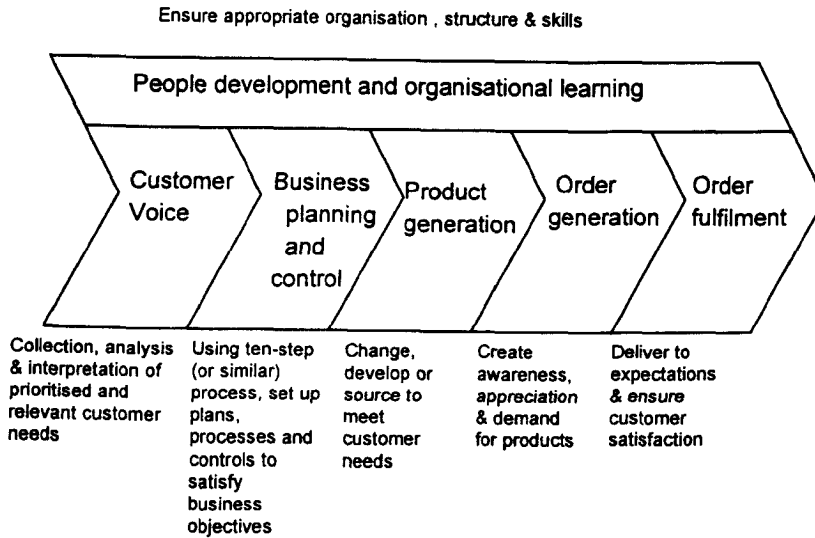


Fig. 2 Hewlett-Packard's Six Key Processes.

Applying these processes, the researcher could see that in order to "sell" Environmental Management within the organisation, there were a number of important areas of attention, adapted from Fig. 2 Some areas, represented in italics, will be discussed in more detail since they represented the main areas of activity.

- ♦ Identification of internal and external customer Environmental Management needs,
- ♦ *Environmental Management business plans to specify and control objectives,*
- ♦ Development of Environmental Management products and services to meet customer needs,
- ♦ *Creating awareness and demand for Environmental Management products and services,*
- ♦ Delivering Environmental Management solutions to fulfil customer expectations, and
- ♦ *Building and monitoring an Environmental Management organisation to achieve specific objectives.*

During the project, the researcher was involved in all of these areas although, as mentioned, three types of action research dominated.

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The first type of action consisted of determining Environmental Management business plans to specify and control objectives. The researcher perceived this as an indication of how to achieve and measure the "Institutionalisation of Environmental Management". On a day to day level this took the form of influencing the EHS department's plans and targets, discussing research progress with the Director of Environmental Affairs and assisting with the department's quality performance self assessment. Each of these is evident in Story Board Two - Business Planning for Environmental Management.

The second type of action involved more interaction with other members of the organisation (not just the EHS department). The aim of these activities was to achieve specific environmental management improvements in line with the overall objective of institutionalisation. Specific programmes included office waste management, packaging recycling and recovery, evaluating transportation impacts and product stewardship. Part Two of the portfolio describes the actions involved in establishing teams to tackle these issues and the progress of one specific area (waste management) throughout the project.

The third type of action was aimed at raising the general awareness of environmental issues amongst the whole organisation (Creating awareness and demand for Environmental Management products and service). This included co-ordinating newsletters, notice-boards, events and presentations.

Each of these action areas were present in all four years, but the specific programmes and level of involvement changed over time. This variation in methodology is demonstrated in Table E. Evidence supporting the information contained within this table can be found in Part Two of the Portfolio. Table E shows that, in the first year, planning activities were merely administrative, the researcher would up-date the EHS business plan with little influence over its content. Other activities were also "low-level" and fairly limited in their application. The main issue area progressed in the first year was waste management, chosen by many Environmental Management practitioners as a first step because short term objectives can easily be achieved. In the second year the researcher was responsible for co-ordinating EHS planning and building on the foundations established previously. She became an active member of EHS teams and processes. Other areas of environmental management started to feature in the change work but waste management continued to dominate.

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Table E Variation in the areas of "Action" over four years

Type	Year 1	Year 2	Year 3	Year 4	Comments
Planning	Administrative ownership of EHS plan.	Specific programme owner for plan. EHS Plan co-ordinator	Overall focus point for EHS planning activities	Facilitates implementation and review of EHS plan	This allowed for a natural "career" progression of the researcher whilst giving her constant access to EHS plans
Communication	Site / functionally focused." Low level" internal environmental communications	Pilot large-scale awareness and information projects. External presentation as required	Consistent and regular internal environmental communications. Some proactive external presentation	Deployed communication objectives, more external representation	This allowed for a build up of awareness rather than early overkill. Also allows the organisation to become familiar with the researcher as environmental person gradually
Involvement	Member of EHS teams / committees. Pilot "green" only teams	Active member of EHS teams, some facilitation of objectives. Further "green" teams as required.	Some team leadership, facilitation where required. Start reducing any dependency, Activity outside UK as well.	Reduced involvement with teams, support as appropriate, leadership if necessary. European and International involvement.	This allowed for a range of types of activity in the research. Allows for access to several levels of organisation in change process.
Issue Focus	Waste Management	Product Stewardship	Green Purchasing	Transport	Different areas allowed for different types of issue to be considered. Had to be subject to organisational conditions though. These were set in advance but were not strictly followed

By the third year the researcher was leading change in a number of areas. She was the overall focal point for developing the EHS business plan and was recognised as a valuable contributor to EHS management. In this year, the researcher also started to reduce dependency on her support in line with the objectives of "institutionalising" environmental management. The final year of the project saw a continued increase of activity in all the action areas, but this also had to give way to the objectives of analysing and interpreting the collected data. In order to help this, a student in the department was allowed to help the researcher achieve her "action" objectives whilst she was concentrating on the final stages of the research. To a large extent these methodologies developed, and many lessons were learned, as the research progressed. In addition to the methodologies for action, there were also specific research methodologies used to capture data during the change programme. These are described in detail in the next section.

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Chapter Four - Research Methodology

4.4) Research Methodologies

There are many research methods associated with organisational research. Many case study researchers, in their pursuit of the delicate and intricate interactions and processes occurring within organisations, will use a combination of methods, partly because the complex phenomena may be best approached through several methods, and partly deliberately to triangulate (and therefore improve validity). Bryman (1989) lists seven distinct types. Only two of Bryman's types were not used in this project. Structured observation is normally carried out by a researcher who does not participate in the day to day activities of the organisation. In this project it is part of the design that the researcher plays an active part in day to day activities so structured observation would be difficult to achieve. Similarly for Simulation, there is no need to simulate real life situations because the researcher is involved so involved in the organisation. **Table F** outlines the main examples of the methodologies used in this research according to Bryman's categorisation. They are presented here as a brief introduction. Each of them is mentioned throughout Part Two of the Portfolio, where the project detail is described.

Each methodology is now discussed in more detail in generic terms.

4.4.1) Self Administered Questionnaires.

Self administered questionnaires are normally a set of questions which the respondent completes on their own. The questionnaire is designed such that the responses can be assumed comparable. Filling in surveys or questionnaires at work is time consuming, especially if the subject matter appears irrelevant or of little value to the company. Internally at Hewlett-Packard, people hesitate to use surveys as a primary source of data for that reason. However, there are advantages to carrying out surveys, if a good response can be generated. In order to obtain a yardstick for the level of awareness in a company, a broad survey could be an appropriate mechanism. In this project the researcher used existing surveys, that were considered "normal" at the company and hence generated a good response.

For example, in 1995 the researcher was able to adapt one internal survey at Hewlett-Packard to include environmental questions on a permanent basis. Occasionally separate surveys were carried out for the specific purposes of this research. For example in March 1996 a survey of recycling behaviour was carried out by the researcher and other members of a waste management project team²³.

²³ See Story Board Four - Single Issue Focus: Improving Waste Policy and Practice

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Table F Research Methodologies

	Company Objectives	Research Objectives	No. of Participants	Dates Conducted
Self Administered Questionnaires	To assess the effectiveness of "Platform" functions in delivering services to HP businesses	To assess employee awareness of the EHS department and their specific programmes	500 random	March 1995
			500 semi-targeted	March 1996
	To measure HP employee satisfaction	To measure employee satisfaction with HP's environmental performance	2,000	May 1996 May 1998
	To assess employee awareness of recycling facilities in the office	To assess employee awareness of recycling facilities in the office	60	March 1997
Structured Interviews	Incidental	To determine the perception of Environmental Management at HP amongst HP managers and employees	15	June 1996
Participant Observation	Independant observer's perspective	To participate in and observe the implementation of Environmental Management	up to 2500 (approx. 100 regular contact)	Constant
Unstructured Interviewing	Numerous	To find out specific managers / employees perceptions regarding specific topics	not recorded	Opportunistic
Archival Information		Information used to discover the following:		
(Official Documentation)	Record Retention and Filing	HP position statements on Environmental Management issues	unknown	June 1992 (approx.) to September 1998
(E-mail)	Communication between employees	Employee reflections and statements on Environmental Management topics	several thousand messages recorded	December 1994 to September 1998
(Memos etc.)	Communication between employees	Employee reflections and statements on Environmental Management topics	unknown	December 1994 to September 1998
(Newsletters etc.)	Communication from EHS department to employees	Tools used to communicate about Environmental Management to employees	approx. 30	December 1994 to September 1998
Other data				
QMS	To measure the Quality Maturity of the EHS function	To measure the Quality Maturity of the EHS function		
Audit	To measure the UKSR's performance against corporate EHS objectives	To provide a snapshot of EHS performance in the UKSR	approx. 50 people involved but audit of whole UKSR	September 1995 June 1997 July 1998
Green Day	To raise awareness for recycling in Thames Valley sites.	To gauge the take-up of environmental programmes in the UKSR	approx. 100 people	April 1997

Part One - Research Context

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4.4.2) Structured Interviewing

Structured interviewing concerns face to face, precise and formulated questioning. In other words, having the same pre-determined interview schedule for many people. This is an area which was used in this research for specific purposes as opposed to general data capture. For instance, in a study of the perceptions of environmental issues in the workplace a range of employees were interviewed according to a set of pre-determined questions. The results of these interviews are only used to support other more "on-going" sources of data collected throughout the research process. In addition, these interviews were used as a calibration tool during the project. Initial themes which were emerging from the data were tested during interviews conducted at approximately the half-way stage of the research.

4.4.3) Participant Observation

Participant observation comprises the fairly prolonged immersion of the researcher in the context that it is to be studied with the purpose of gaining first-hand knowledge of that context, primarily through observation of individuals as they go about their normal work activities (Bryman, 1995). Bryman (amongst others) distinguishes between three types of participant observer role: covert, full or indirect.

Full participant observation was employed in this project, that is, the research engineer had a work role within the organisation but was known as a researcher among most of the employees at the company. The different roles which the researcher adopted in this project were described in the previous section. The benefit of full participation in this project was the virtually unlimited access to employees and documentation within HP. This access extends to networks beyond HP UK. Senior EHS managers across the company world-wide were aware of and supported the research. Although the participation overall may be considered to be full, the degree of participation with individuals varied according to circumstance. In some situations the researcher would lead a project or meeting, in others she would merely take part (not in a leadership position). Other situations in the company are just observed and the researcher has little influence over their execution. Participant observers rely a great deal on recording as many of their observations as quickly as possible, by writing notes which record events or remarks of importance (Bryman, 1995). In this research, field notes were recorded regularly in a log book. This enabled subsequent analysis of the data for relevant trends. The log book was backed up on a regular basis.

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4.4.4) Unstructured Interviewing

With unstructured interviewing, the researcher may not have a set of pre-defined questions. This type of interviewing is designed to allow a more open ended approach to questioning, allowing the informant to discuss the issue rather than answer a question. Unstructured interviews often form part of participant observation research as they can be conducted relatively spontaneously. In this research, unstructured interviewing did occur occasionally with notes taken in the research log book or subsequently confirmed by electronic mail.

4.4.5) Documentary Analysis

The analysis of documents is generally used to supplement other research methods. This was also the case in this project. Access to a wide range of documentation was possible. The researcher archived all electronic mail (e-mail) coming in and out of the EHS department as an historical account of day to day events. This source of information was particularly insightful and warrants further discussion.

The rapid growth of information technology systems has affected the way in which employees communicate at work. Many companies (including Hewlett-Packard) now use electronic messaging software to allow communication between employees and business partners. Often these systems are used instead of the telephone since a message can be put together coherently in advance of the person receiving it. Electronic mail is the most widely used communication tool at HP. Indeed, every employee in HP around the world has an e-mail address.

The use of electronic mail data as a research tool was first identified by Sproull (1986). His particular emphasis was on the use of e-mail as a more effective survey technique. The advantage of using electronic mail messages for this project was that they represented a potentially permanent record of semi-natural conversational information. The term "potentially permanent" is used here because there is still a responsibility on the behalf of the researcher to retain this information before it is destroyed as part of normal electronic house-keeping procedures. The value of the information gained from this data source occurred to the researcher only a couple of months into the project. Since then electronic mail messages sent to and from the researcher (and other staff in the EHS department) have been stored. Staff within the EHS department have on occasion volunteered information to the researcher, which she may not have "picked up" automatically, by forwarding interesting messages or developments from their own activities. This also shows the acceptance of the researcher in the office environment discussed in more detail in Section Three of the Portfolio.

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Access to presentation material was also possible, along with minutes, reports and all other "hard copy" evidence. These documents were mostly used to triangulate data obtained from other sources.

4.5) Keeping "on track"

With a project of this nature, where the researcher was immersed in the organisation for prolonged periods, it was important to incorporate a research "progress check". This was to ensure that the overall objectives of the project were on track, in particular those relating to the development of the contribution to knowledge and other academic goals. In order to keep the research process "on track", quarterly²⁴ meetings were held between the researcher and her supervisors. During these meetings the researcher would present a summary of research progress to date and introduce central concepts or advances in methodology. The supervisors would then raise questions or concerns with the project as necessary.

The purpose of these meetings provided an opportunity for the researcher to "remove herself" from the sponsoring company (mentally, if not physically) and ensure critical reflection on the processes occurring at the organisation. This was important to prevent the researcher from "going native" in an anthropological sense. The progress was measured according to a number of specific objectives set during the research and according to project planning devised by the researcher. In addition to academic progress meetings, the researcher was also measured according to academic criteria by the sponsoring company. Similar to an employee performance evaluation in nature, these company performance reviews also provided personal and career guidance to the researcher as she developed within the company.

In line with the Engineering Doctorate requirements, the researcher produced a progress report every six months. In all, eight of these reports were produced, six taking more or less the same format, one forming the mid-way dissertation, and the eighth taking the form of a more detailed account of the research (Parts One, Two and Three of the Portfolio). The remaining seven progress reports are contained in reverse chronological order in Part Four. Documenting the research process in this way also provided useful check points for progress, in particular the mid-way dissertation stage encouraged a critical review of the project. The effectiveness of these measures and other advantages / disadvantages of the research methodology are discussed in Part Three of the portfolio after the research data has been presented.

²⁴ Used here to mean every three months

Part One - Research Context

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4.6) Summary of Research Methods

To summarise, this research was a case study of a single organisation namely Hewlett-Packard Ltd. The researcher was based at the company's premises for the duration of the research and as a result employed tools associated with "insider" research. The methods used to create change include influencing strategic plans, environmental awareness programmes and team based project work to improve environmental performance. In addition, the researcher used specific tools to encourage the institutionalisation of environmental management. The methodologies used to collect research data were varied and relied somewhat on existing processes at the company. Consistent with the findings of other qualitative researchers, data analysis was intrinsically linked to research methodology and enabled continuous refinement of research hypotheses. In combination, these research methods provide a more complete picture of environmental management events occurring at Hewlett-Packard over four years.

Part One - Research Context

Summary

Summary - Who? What? Why? How?

Having described the research methodology and other elements of the research context, it is now appropriate to move on to a presentation of the research data. Before continuing, the following brief summary reminds the reader of the contents of Part One of the portfolio.

The first part of this portfolio described in some detail the context of the research project carried out at Hewlett-Packard. The first chapter described the "players" involved in the project. This chapter provided background information on the researcher, the Engineering Doctorate programme and in more detail, the sponsoring company. This enabled the reader to understand the "**Who**" of this project.

In the second chapter, the events leading up to the development of the project were described, including a more detailed discussion of the company's existing approach and structure for environmental management prior to the start of the research. This chapter also described the research objectives, outlined by members of Hewlett-Packard Ltd in conjunction with the researcher and her supervisors. This chapter therefore describes the "**What**" of the project.

The third chapter then took a step back from the detail of the project and described features of the literatures relating to the institutionalisation of environmental management. This included an analysis of not only the "Green Business" literature, but also those relating to Quality Management, organisational change and organisational research methods. Several areas were identified as being relevant to the project at Hewlett-Packard and opportunities for contribution outlined.

In the final chapter, the research methodology was outlined. The chapter described both methodologies for "Action" and for "Research". It was shown that this research was based "inside" Hewlett-Packard with the researcher being afforded a high degree of involvement in implementing change at the company. A range of complementary research methodologies were described which were used to collect data over the four years. This chapter therefore describes "**How**" this research was carried out.

Part One - Research Context

Summary

From the literature it was evident that the project at Hewlett-Packard makes a contribution to knowledge. By aiming to institutionalise environmental management, this project provided a significant opportunity to test whether this type of approach is achievable, desirable or even suitable as the next "step" in environmental management. The research also provides evidence on what the fundamental aspects of an "institutionalised" approach to environmental management are and whether, and how, they can be achieved. Additionally, the project represented a unique opportunity for a longitudinal, insider-based research project about environmental management. This contributes to the discipline of environmental management and extends the types of research method employed in this area. As a result, the project also contributes more generally to the understanding of research conducted within organisations providing further evidence to the insider/outsider debate. As an aside, since this project was being driven by Quality Management methods, it also provided a useful opportunity to contribute to the literature which assumes a connection between these two elements of business management. By taking an approach which stimulates, instead of forcing, change, a contribution can be made to the knowledge on how to change organisational practice and culture. These areas of contribution will be discussed again specifically, in light of the research data, in Part Three of the Portfolio. However, they also feature indirectly throughout Part Two where the details of the project are described.

Part Two of the Portfolio represents one account of the research project at Hewlett-Packard. By means of an introduction, and an extension to the chapter on research methodology just presented, the first chapter in Part Two describes the processes used to analyse the data collected over four years. This chapter also explains the choice of presentation style used to portray the research data and how the themes presented were derived. This is the largest part of the portfolio, and the most detailed. It describes four years of research in a series of five "Story Boards". For readers who are not concerned with the project detail, it is possible to jump straight to Part Three of the Portfolio where the results are discussed and analysed in relation to previous research. For readers interested in specific aspects of the research, it is wise to read the story board introduction first and then determine which story boards are most relevant. A detailed picture of the entire research can only be obtained by reading all of the story boards in turn.

End of Part One.

Part Two
Action Research

Part Two - Action Research

Introduction

Part Two - Action Research

Introduction

Part One of this portfolio described the background of the research project at Hewlett-Packard. In Part Two details of the project itself are provided; the "Action Research" which occurred between October 1994 and September 1998 is described. It is a presentation of the qualitative research data collected during the project. Five "story boards" are used to present the data. Each individual "story board" portrays a particular element of the research, but as a collection they also unravel a more complete picture of the research process and conclusions. An introductory chapter describes the rationale behind the story boards' content and layout. The five story boards then follow, each depicting a different aspect of the research at HP and each highlighting different themes found in the data. In this part of the portfolio, the reader will learn about the project at HP, as depicted by the researcher. The framework for the institutionalisation of environmental management is derived, setting the scene for the Part Three which discusses the findings of the research in relation to previous literatures and the main areas of contribution to knowledge.

Part Two - Action Research

Analysing and Presenting the Data

Part Two - Action Research

Analysing and Presenting the Data

5.0) Introduction

This introductory chapter to Part Two describes the data analysis techniques used to derive the main themes in the research data and therefore the framework for the "Institutionalisation of Environmental Management" described in the Executive Summary. There were two phases to the data analysis in this project. The first, described as "In the field analysis", was the process used to analyse data during involvement with the organisation. The second, described as "Post-fieldwork analysis" was the process used to re-examine the entire data set towards the end of the project. These are both described in this section, the second including a description of the process used to "code" the data into a set of themes. The next section describes the process of how a distinct set of data was chosen for presentation in the story boards. This explains both the rationale behind each story board and its contents. Finally, this introductory chapter provides guidance on how to read the "split screen" format used for the story boards.

5.1) Analysing the Data

"There comes a time when a researcher has to face the truth, gathering research data is a lot more fun than analyzing and reporting it" (Cole, 1994: 1).

As with other qualitative longitudinal research of this type, there is a large amount of available data. Miles (1979: 590) refers to qualitative data as being an "attractive nuisance"; attractive in the sense that the data are "rich, full, earthy, holistic" and a nuisance in that collecting and analysing the data is often problematic. Presenting such data in a coherent format which is both interesting and informative has always presented some difficulty for qualitative researchers (see Ely et al (1991) or Feldman, M. S. (1995) for further information). For this project the presentation of data needed to reflect the many and rich sources of data, the varying participation of the researcher and the development of action and research over time. With these conditions in mind, the researcher identified an appropriate selection of data for presentation in five story boards. The analytical process of reducing the large volumes of data to a manageable collection of stories is outlined below. As an introduction, the first section describes elements of the research methodology which influenced the analysis process.

Part Two - Action Research

Analysing and Presenting the Data

5.2) Sources of Data

Before moving on to describe the analysis of research data, it is worth revisiting the varied sources of data and their characteristics as sources of evidence. As mentioned elsewhere in the portfolio¹ there are many sources of data for this project; documentary evidence, e-mail messages, surveys, interviews, literature and diagrams to name a few. Each of these data types represents information from a different perspective. It is the combination of these perspectives which adds an element of totality to the research. Nevertheless, in order that the reader understand the source and biases of any data presented, it is important to describe each of these perspectives in turn.

5.2.1) Log Book Notes

Notes taken from the research log books are the researcher's recollection and interpretation of events over time. They are subject to the values and previous experiences of the researcher but represent one perspective on the data to be considered. The use of field notes as a source of data is well documented in the literature. As Ely et al. (1991:69) describe, the log is the place where each qualitative researcher faces the self as instrument through a personal dialogue about moments of victory and disenheartenment, hunches, feelings, insights, assumptions, biases, and ongoing ideas about method. The review of these log books, and in fact the sheer act of writing them, form part of the (often subconscious) ongoing analysis of data throughout the field research.

5.2.2) Electronic Mail messages.

A large quantity of electronic mail messages were stored by the researcher (amounting to several thousand individual messages). Roughly a quarter of these messages were written by the researcher to HP employees in relation to Environmental Management programmes. The remainder are i) their responses, ii) messages forwarded to the researcher for interest or iii) messages sought out by the researcher from key organisational informants such as the Director of Environmental Affairs. The researcher did not ask any employees (apart from those in the EHS department) to produce e-mail messages additional to those produced as part of their normal working practice. This approach was deemed to be too intrusive. The e-mail messages can be taken to be from the perspective of *their* author, the researcher did not directly influence their construction in any way. However, the researcher did make the most of this tool, encouraging her colleagues to document their discussions with other organisational members (with this tool). This did not affect the content of any discussions, but improved the quantity and quality of data available.

¹ See Chapter 4

Part Two - Action Research

Analysing and Presenting the Data

As described earlier, the use of electronic mail data as a research tool was first identified by Sproull (1986). His particular emphasis was on the use of e-mail as a more effective survey technique, but the advantages he suggests from using this tool hold for this project. Sproull (ibid: 160) identified four characteristics of electronic mail; its speed, asynchrony, lack of intermediaries and ephemerality of messages. If used with participant based methods, the researcher has also found e-mail data to be permanent, opportunistic, and easy to search and attribute. In addition, as will be shown in this research, sequences of "conversations" can also be recorded with several authors' perspectives. The use of e-mail messages as a source of qualitative data is not widely discussed in the literature. Part Three of this portfolio examines the advantages and disadvantages of this tool in more detail. As with log book data, preliminary analysis of data occurred as e-mails were received and stored.

5.2.3) Documentary Evidence

For this project the documentation available to the researcher was limited only by the researcher's awareness of its existence. There were several types of documentary evidence in this research which required different treatment from an analytical point of view. Firstly there were official records relating to Environmental Management programmes, such as minutes or reports. These represent their authors' interpretation of the events under discussion, whether as note taker or programme owner. Secondly there were documents which portray a company position, often compiled after several iterations involving several different authors. These documents are "public domain" and can include electronic documents available on the internet. The third type of documentation included specific communications, often one way, with the intention of achieving a desired result. This would include internal memos and letters with limited distribution. All of these types of documentation were used as data for this research. In each case, the author(s), content and audience(s) are considered. These, and other sources, provided the bulk of research data analysed for this project. The following sections now describe the analysis process in some detail.

5.3) "In the field" analysis

As with most qualitative research, data categories were not decided a priori. Okely (in Bryman and Burgess, 1994) describes the "funnel approach" used by anthropologists. From the outset of the fieldwork, the anthropologist adopts an open ended approach to the full range of information and all manner of people (Okely, 1994: 20). However, this type of open-ended approach has implications for data analysis. Indeed data analysis cannot be separated from other research activities as is often assumed with quantitative research techniques.

Part Two - Action Research

Analysing and Presenting the Data

The fieldworker cannot separate the act of gathering material from that of its continuing interpretation. Ideas and hunches emerge during the encounter and are explored or eventually discarded as fieldwork progresses (Okely, 1994: 21). Okely's description is consistent with the experience of the researcher in this project. In order to portray the process of data analysis simply, this section describes the entire process as though it were a distinct phase. It is important to note that this was not the case, and a more detailed chronology of the research process is provided in Story Board One - An Account of the Action Research process. Consistent with approaches discussed in Ely et al. (1991: 145), initially broad categories were identified to help store the data in a logical and easily retrievable manner. Documentary and electronic mail data were classified according to one of several categories. First the data was classified as either "content" or "context". The notion of "context" is widely referred to in qualitative research. "Social science in application involves a continuous interplay between the content of the work being done and its context" (Klein, 1976:9). Klein takes context to mean "those aspects of the client system which are not part of the immediate problem". For this research, context also refers to aspects of the client system which *are* part of the immediate problem (i.e. environmental management), but are not limited to one specific concern. Content categories therefore included data about specific projects or environmental issues at the company. Context categories included data about the on-going management and organisation of Environment, Health and Safety at the company as well as more general company information. The initial categories are presented in Table G. One of the context categories shown in this table is slightly different to the others. Labelled as "My influence at HP", this category was used to store evidence relating to the role of the researcher at the company.

Category (Content)	Description	Category (Context)	Description
Waste Management	Messages and documentation relating to the management and disposal of office waste	My influence at HP	Evidence relating to the role of the researcher during the action research process
Resource Conservation	Messages and documentation relating to the use of natural resources such as fuel, water and materials.	Company Profile	Details of company wide information such as financial performance and organisational restructuring.
Product Stewardship	Messages and documentation relating to the management of HP's products' environmental life cycle	International EHS Management	Details of the corporate approach toward EHS management and its relation to the UK company.
Pollution Control	Messages and documentation relating to the prevention and control of emissions to land air and water.	European EHS Management	Details of European EHS programmes and organisation in relation to the UK.
		UK EHS Management	Details of UK EHS teams and activities.

Table G Initial categories used to store research data.

Part Two - Action Research

Analysing and Presenting the Data

As can be seen, "content" categories were based on the company's Environmental Management programme areas. These are referred to throughout the remainder of the story board as "issue areas". For the purposes of this research an "issue area" is defined as a broad environmental topic under which many individual "issues" can be categorised. An "issue" is a specific topic of interest to the company. By way of an example, the *issue area* "Waste Management" might include *issues* such as office recycling, waste disposal and waste reduction. At the start of the project, the researcher anticipated that all research data over the four years could be filed in one of the four issue areas. Evidence which was not specific to these issue areas, for instance, the production of an environmental management newsletter was recorded in one of the "context" categories.

The researcher proceeded to collect and store data relating to the management of Environment, Health & Safety at the company, filing evidence in the categories described above. In order to remain as open-ended as possible, very little detailed analysis of documentary evidence was carried out until roughly half way through the research. In addition to this filing system, chronological notes were taken by the researcher in a series of log books. The first story board (described shortly) provides details of the *ongoing* process of research during this project. In addition, the next section describes the main data analysis process carried out toward the end of the research.

5.4) Post-Fieldwork Analysis

After over three years of data collection, the researcher was faced with the task of analysing the data obtained from various sources.

"After fieldwork, the material found in notebooks, in transcripts and even in contemporary written sources is only a guide and trigger. The anthropologist writer draws also on the totality of experience, parts of which may not, cannot be cerebrally written down at the time. It is recorded in memory, body and all the senses " (Okely in Bryman and Burgess, 1994: 21).

Despite Okely's comments, the researcher felt the need to examine the more tangible data in a structured way. The process of analysis used in this research is now presented as a series of steps as a guide to researchers wishing to conduct similar research. Briefly the steps were:

- ♦ Refamiliarisation
- ♦ Organising the Data
- ♦ Coding
- ♦ Distilling Key Findings

Part Two - Action Research

Analysing and Presenting the Data

5.4.1) Refamiliarisation

Before carrying out a detailed analysis, the researcher needed to refamiliarise herself with the entire data set. Rather than examine all sources, the seven research log-books² were used as a source of trigger information at this stage. The researcher studied each log book, highlighting notable events, comments and ideas. For each log book an index was produced listing three types of information³.

- 1.) Issues - The environmental management "issues" mentioned in the log book were listed. For instance, office recycling, packaging or energy management. The researcher could then see, at a glance, whether there was any information pertaining to a specific issue within a specific log book
- 2.) Context - The background events occurring in the company which affected the development of specific issues were drawn out and listed in note format.
- 3.) Research Ideas - Any ideas or comments relating to the research design and methodology were also listed in abbreviated note format. This enabled the researcher to identify the point where research ideas began and also to identify those ideas which did not develop over time.

Since the dominant methodology in this project was Action Research, uncovering information about HP's approach to institutionalisation required a review of the methodologies for action. The researcher wanted to organise the data to be consistent with the methodology used for "Institutionalising Environmental Management". The researcher chose six categories of Environment, Health and Safety management that she had been involved in, to a greater or lesser extent, over the four year period. These were based on the "Six Key Processes" described in the Research Methodology section earlier.

♦ Business Planning

"Business Planning" activities were associated with Hewlett-Packard's business planning cycle. Action in this area typically included the development of strategic and tactical plans for the EHS organisation. The researcher was extensively involved in the maintenance and development of EHS planning activities allowing good data access.

² See Research Methodology in Part One of the Portfolio

³ Examples of the "Log Book Indices" are included in Appendix C

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Analysing and Presenting the Data

- ♦ **Organisational Development**

Action in the area of "Organisational Development" related to changes in the organisational structure responsible for Environmental Management; from the establishment of teams and committees to the observation of key individuals in the change process.

- ♦ **Customer Enquiries**

Responding to "Customer Enquiries" formed part of the researcher's role as EHS Engineer. Action in this area related to monitoring the type of concern expressed by Hewlett-Packard customers and the subsequent action taken by the company.

- ♦ **Internal Communication**

Action relating to "Internal Communication" was related to the use of specific communications tools to promote Environmental Management concepts within the company. Typical examples could include EHS newsletters, intra-net⁴ development and awareness raising events.

- ♦ **Audit / Measurement**

Action associated with "Auditing and Measurement" related to measuring Environmental Management performance. Typical action included the use of internal surveys and audits and the measurement of environmental aspects⁵.

- ♦ **Influence and Networking**

Other types of action fell under the category of "Influence and Networking". This was action affecting the company's "environmental" relationship with external stakeholders such as membership of industry associations and negotiations with the press.

5.4.2) Organising the Data

Having refamiliarised herself with the research data, the researcher organised the data into a series of Action Research Matrices. The researcher devised an Action Research Matrix for each log book (representing roughly six months). Each row represented an Environmental Management programme area, each column an action research category. This is shown in Table H. Full versions of the Action Research Matrices are provided in Appendix C.

⁴ A term used to describe the "internal" internet sites at Hewlett-Packard

⁵ As used by ISO 14001

Part Two - Action Research

Analysing and Presenting the Data

Action Research Category / Environmental Management Programme Area	Business Planning	Organisation Development	Customer Enquiries	Internal Communication	Audit / Measurement	Influence and Networking
Environmental Management Context						
Waste Management		Waste team established				
Product Stewardship						
Resource Conservation						
Pollution Control						

Table H Layout of the Action Research Matrices.

Each of the notes listed in the log-book indices were inserted into the matrix at the appropriate location. For example a reference to the establishment of "waste team" would be placed in the waste management row and the organisational development column as shown. This exercise resulted in seven tables (one for each log book), representing the entire research period in a two dimensional index. These tables are presented as a collection in Appendix C. The wording used in these tables does not provide a full description of the activities, rather it represents "shorthand" used by the researcher to trigger memories. The Action Research matrices represented a route-map into the data to help the researcher easily locate information relating to (say) a specific issue or a specific type of activity.

5.4.3) Coding

Although the researcher had identified a route-map for all of the research data, the task of coding all of this data was too large. Over time, the researcher had already formed preliminary conclusions about the "Institutionalisation of Environmental Management". These preliminary ideas were associated with specific occasions, or pieces of evidence which the researcher could readily recall. They had effectively been "book marked" as significant in the researcher's mind. The researcher retrieved evidence associated with these significant events and reviewed them in more detail in a coding exercise.

In reviewing the data, the researcher aimed to identify three things:

- ♦ HP's definition and understanding of the "Institutionalisation of Environmental Management";
- ♦ The types or levels of organisational change recommended and/or achieved during the process of "Institutionalisation"; and
- ♦ The initiatives within HP that were recommended, or successful, in achieving change at these levels.

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Analysing and Presenting the Data

Within these areas, many themes emerged from this data set, some which the researcher had anticipated and others which she had not. These themes are shown for interest in Table I; all of the themes are demonstrated in the story boards to follow.

Table I Themes observed in the data

Category	Themes	Description
Level of Change	Individuals	This was data which showed where Hewlett-Packard's Environmental Management activities were aimed at the individual within the organisation.
	Management	This was data which showed where Hewlett-Packard's Environmental Management activities were aimed at senior or functional management within the organisation.
How to Change	Partnerships	This was data which showed the importance of "partnerships" both internally and externally to Hewlett-Packard's environmental management programmes.
	Personalised	This was data which showed where members of the company had personalised environmental management messages in order to elicit action.
	HP Positioning	This data showed where change agents had used HP's relative market positioning to create awareness or motivate change.
	Empowerment	This data showed where employees within the company were encouraged to feel a sense of empowerment for resolving environmental issues.
	Business Case	This data showed where the "business case" was used as a motivator for creating change.
	HP Way	This data showed where the company's existing culture "The HP Way" was used as a motivator for creating change.
	Quality	This data showed where "Quality Management" was referenced in conjunction with environmental management activities and the general acceptance of quality management at the company.
	Leadership	This data showed where references to organisational leaders or champions were made to influence change.
	UK Influence	This data showed instances where members of the UK EHS organisation had influenced change at a European or World-Wide level in order to promote change locally.
	Obstacles	This data indicated the obstacles to environmental management change that were encountered.
Concepts	Push Vs Pull	This data showed how members of the EHS organisation perceived the benefits of a Pull versus a Push strategy.
	Integration / Institutionalisation	This data showed how members of Hewlett-Packard used concepts like "integration" or "institutionalisation" in their descriptions of environmental management.
	Commitment	This data shows the usage of the term "commitment" in connection with environmental management practice .
	Ownership	This data shows the usage of the term "ownership" in connection with environmental management practice and generally throughout HP. .
Results	Internal Awareness / Action	This data shows where environmental management issues were successfully deployed internally.
	Company Projection	This data shows where environmental management featured in the company's external communications and projection.

Part Two - Action Research

Analysing and Presenting the Data

5.4.4) Distilling Key Findings

From the themes identified in the coding process the researcher was able to derive specific findings relating to the institutionalisation of environmental management. In the coding process the researcher had focused on three question areas to make sense of the data.

- ♦ HP's definition and understanding of the "Institutionalisation of Environmental Management";
- ♦ The types or levels of organisational change recommended and/or achieved during the process of "Institutionalisation"; and
- ♦ The initiatives within HP that were recommended, or successful, in achieving change at these levels.

In terms of defining institutionalisation, the data suggested that

- ♦ Individual Values,
- ♦ Individual Actions,
- ♦ Business Activity, and
- ♦ Company Values

should be considered in the change process. The data also indicated the mechanisms used to achieve successful organisational change at these levels. Of notable importance the following themes were particularly strong:

- ♦ The role of existing company culture;
- ♦ The use of a business case for environmental management;
- ♦ Framing environmental management in personal terms;
- ♦ Using a leader or senior manager to influence change.

The findings resulting from the data analysis stage are presented in Table A in summarised form and as an introduction only. These findings are demonstrated throughout the story boards and are used as a structure for discussion in Part Three of the Portfolio. The reader is reminded of all of the findings as the story boards develop.

Analysing and Presenting the Data

Table A Framework for the Institutionalisation of Environmental Management

Framework for the Institutionalisation of Environmental Management		
Overall Findings	Levels	Practical Recommendations
<p>1) <i>The institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred.</i></p> <p>2) <i>Environmental management is not a distinct organisational issue and should be analysed along side other business practices.</i></p>	<p>Individual Values</p> <p>A broad-brush approach which expects every employee to value environmental protection is not particularly useful or realistic for managers wishing to improve environmental management</p>	<p>- Link environmental programmes to personal concerns for environmental protection</p> <p>- Demonstrate and provide "sinks" to capture employee environmental concerns</p>
	<p>Individual Action</p> <p>A large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.</p>	<p>- Organise individual training and awareness according to employee roles and responsibilities</p> <p>- Involve appropriate level of employee according to objectives</p> <p>- Minimise effort put into generic company-wide programmes / Maximise effort put into specific improvement programmes</p>
	<p>Business Activity</p> <p>Action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.</p>	<p>- Identify business group competencies and recommend environmental management programmes accordingly</p> <p>- Focus on "middle" managers and supervisors in addition to top management</p>
	<p>Company Values</p> <p>Considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.</p>	<p>- Identify and demonstrate existing company objectives and strategies which are related to environmental management</p> <p>- Demonstrate linkages between environmental management and both "hard" and "soft" objectives</p> <p>- Reinforce company values with both communications and action</p>

Part Two - Action Research

Analysing and Presenting the Data

5.5) Choosing what to present

Having identified a route into all of the data and the resulting findings, the researcher needed to determine which of this data to present and why. The researcher had two objectives in choosing the data for presentation. The first was that the data should reflect the findings of the research and the second that the data should reflect a balanced selection of research activities. Having constructed the Action Research matrices and established the themes within the data, it was appropriate to select a sample of data to be used to represent the research at Hewlett-Packard from these matrices. It would have been impossible to present the changes and insights obtained from the entire project and so a sampling strategy was required. It was also necessary to determine an appropriate style of presentation for this data so that its richness was presented without unnecessary complexity.

On the basis of the Action Research matrices described earlier, the researcher devised a data sampling strategy. Table J shows the areas of data that were selected with circle symbols. These were chosen for any combination of three reasons: (i) the richness of data within that area, (ii) relevance to the tendencies seen in the data and (iii) the extent of the researcher's involvement. As an alternative, it would have been possible to select the areas for presentation randomly from this table. However, since the activity areas were categorised towards the end of the research there are some "blanks" in the table which saw very little (or no) action research during the four years.

Table J Data Sampling Strategy

	Business Planning	Organisation Development	Customer Enquiries	Internal Communication	Audit / Measurement	Influence and Networking
General "Environmental Management"	②	③		④		
Waste Management	⑤	⑤/③	⑤	⑤	⑤	⑤
Product Stewardship		③				④
Resource Conservation		③			⑦	
Pollution Control		③				

Part Two - Action Research

Analysing and Presenting the Data

Each number on the table corresponds to a "Story Board" that will be presented in the portfolio⁶. Originally, six areas were identified within this matrix, but over time two were rejected⁷ because they did not add sufficient additional information to the series to warrant separate attention. To compensate, additional data sources which did not fit within the four areas, but were worthy of presentation, are used to support arguments in the story board discussions. This sample of data enabled a balanced representation of research, action, results and problems over the four years. Consequently, the story boards do not merely represent "vignettes" of success. An additional story board is also provided on the development of the research process. It has been argued (see Waddington, 1994: 7) that social scientists too infrequently report on how their research was *actually* done, most providing a more idealised conceptualisation of how it *ought* to have been done. This story board is an attempt to present the process of research in this case as honestly and systematically as possible. This is presented as the first Story Board in order to frame the remaining ones among the bigger research picture. The Story Boards were labelled as follows.

- 1.) An Account Of The Action Research Process
- 2.) Business Planning for Environmental Management
- 3.) The Changing Environmental Management Organisation
- 4.) Getting the Message Across - Internal Environmental Management Communication
- 5.) Single Issue Focus - Improving Waste Management Policy and Practice

Having identified the broad subject areas to be covered by the storyboards, the researcher set up a manual filing system for each one. All of the research data were revisited using the seven Action Research Matrices⁸ as a route map. A note in the appropriate box of a matrix would start a search for related information on that subject. Inevitably useful data were found that had not been mentioned in the log books. As data for one story board were examined, further evidence would come to light for other story boards, highlighting the strong interdependency of events and issues at the company. Data retrieved for the purposes of one storyboard were not removed from their original sources, just copied. In this way all of the data were reviewed for each story board, allowing for duplicate data uses. Once a complete file was produced, the researcher read the file as a single story, enabling the researcher to identify quotes and other evidence suitable for presentation and, more importantly, the theme of the story board.

⁶ Number 1 is missing from this table because the first story board - An Account of the Action Research Process - had already been identified.

⁷ Shown with crossed out lines through them on Table J

⁸ Discussed in Section 5.4.2 earlier

Part Two - Action Research

Analysing and Presenting the Data

Table K Story Board Contents Summary

Story Board Title	Objectives	Data Sources	Findings
<p>Story Board One</p> <p>An Account of the Action Research Process</p>	<p>Describes the development of theory and methodology over time.</p> <p>Topics discussed within each year include</p> <ol style="list-style-type: none"> 1) Defining "Institutionalisation" 2) Research Methodology 3) How to achieve change 	<p>To include data mainly from Log Book, e-mail messages and minutes of progress meetings.</p>	<p>The institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred.</p> <p>Environmental management is not a distinct organisational issue and should be analysed along side other business practices.</p>
<p>Story Board Two</p> <p>Business Planning for Environmental Management</p>	<p>This story board provides a general overview of HP's strategy for Institutionalising Environmental Management. Developments in three topics are tracked over time:</p> <ol style="list-style-type: none"> 1) HP's understanding of Environmental Management 2) Using Quality Management to measure "Institutionalisation" 3) The changing role of the researcher. 	<p>Includes mainly data from HP's business plans and Quality Maturity documentation. Also some log book notes.</p>	<p>Environmental management is not a distinct organisational issue and should be analysed along side other business practices.</p> <p>Considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.</p>
<p>Story Board Three</p> <p>The Changing Environmental Management Organisation</p>	<p>This story board describes changes in the "EHS organisation" over time. It is organised around three themes -</p> <ol style="list-style-type: none"> 1) The role of the EHS department 2) Getting the <i>right</i> people in the EHS organisation 3) EHS as <i>part of the job</i> 	<p>Includes data from HP organisation charts, log book notes and e-mail sources.</p>	<p>A large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.</p> <p>Action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.</p>
<p>Story Board Four</p> <p>Getting the Message Across- Environmental Management Communication</p>	<p>This story board describes the communications used within the company to position Environmental Management. It is organised according to four themes</p> <ol style="list-style-type: none"> 1) The Business case 2) Using the Culture to change the culture 3) Leadership 4) A Personalised approach 	<p>Includes data from communication's documents, surveys and articles etc. Looks at content, author and audience of communications.</p>	<p>A broad-brush approach which expects every employee to value environmental protection is not particularly useful or realistic for managers wishing to improve environmental management.</p> <p>Considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.</p>
<p>Single Issue Focus - Improving Waste Management Policy and Practice</p>	<p>This story board describes the development of one environmental management issue area over time, namely office waste management.</p> <p>This story board is chronological and structured according to each year of the project</p>	<p>To include data from all sources, but mainly electronic communications.</p>	<p>A large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.</p> <p>Action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.</p>

Part Two - Action Research

Analysing and Presenting the Data

5.6) Choosing the Layout of the Story boards

Having decided the themes of the story boards, it was necessary to identify an appropriate layout for their presentation. Presenting the data from qualitative research is recognised to be a challenging step. "Reality is not palpable. It is impossible for language to be adequate to the phenomena. We can only scan it and attempt to convey its vitality. What we have is the facsimile of expression or a representation of reality. Something is lost and gained in every representation. The phenomenon itself escapes us". These statements from Muriel Singer (1995: 2) represent the frustrating fact that no matter how un-biased or value free the account, documentation of events represent only that, they are not the event. The reader (as well as the writer) will interpret the account according to their preconceptions and values. The most a writer can achieve, it seems, is to recognise this limitation in representation and make attempts to portray events in a logical, understandable way.

The MIT Centre for Organisational Learning devised a method of portraying complex organisational change data to promote organisational learning. Their "Learning Histories" (see Roth and Kleiner, 1995 and Roth, 1996) use a two-column format. The following paragraph is taken directly from Roth (1996: 12) because it is a detailed description of the two-column format which requires no further adaptation.

"In this format a new type of text location is introduced -- the left hand column --and other text format locations take on different functions. Full column text is used for context setting, exposition, and "setting up the telling of a story" that follows in a two-column form. At the end of the two-column formatted section, full column text provides analysis, summary or implications of the stories. A left hand and right hand column format is used to keep authors' commentary separate from participants' narratives. The right hand column is exclusively for primary data -- narrative from people involved in the change effort. Other text in the right hand column includes written comments by people, sections of memos or meeting transcripts, speech excerpts, or other forms of primary data. The left hand column is used by the authors to comment on the right hand column narrative. The left hand column comments include questions which people were asked, the assumptions, interpretations, attributions and generalizations researchers have for what is said, comments on how representative comments are, remarks which provide context or summary for what is said, and implications of particular statements".

The researcher decided to adopt this two-column format as a suitable way to represent the many and varied sources of data, the role of the researcher and the complexity of the research project. This type of layout enables the reader to follow an account of the issue / activity selected in a logical way.

Part Two - Action Research

Analysing and Presenting the Data

An account of the events, based on the story board files described earlier, is presented on the left hand side of the page. This is written from the researcher's perspective and is as objective an account as one from a participant observer can be. Carl Rhodes (1996) raises concerns with this type of approach: "The monological format of representation of organisational studies suppresses the empowerment of diverse and indigenous voices and does not allow for ambiguity, heterogeneity, and discord". In his own representation, Rhodes uses the concept of a "Ghost Writer" whereby "the research can be represented in the form of text (stories) told by the organisational storytellers, where the initial role of the researcher is merely to textualise the story". Although this type of narrative is extremely appealing, it was not possible to provide such an account in this instance. The data collected in this project were not intended to provide such varied perspectives. That said, the numerous sources of data presented in the story boards will show the reader the plural nature of this research, even though it is represented, in the main part, from the researcher's perspective.

On the right hand side of the two column format, evidence is presented which relates to the text provided on the left. There are several sources of evidence for this project, each described in some detail in the previous section. Different data sources have different types of (general) bias. This is a technical bias, that is, it is a consequence of the research technique or methodology used. Each type of data presented in the story boards is slightly different to the other in order to differentiate between them. This is to help remind the reader of the "technical" bias encountered with each different type of data source. In addition to this technological bias, data also have specific bias which arises in the individual's use and understanding of terms. It cannot be assumed that the researcher's understanding of "environmental management" is the same as an informant's. It is not the intention of this research to provide a detailed analysis of these perspectives, but it is important to point out to the reader that these biases exist. Where relevant, or where it makes a significant contribution, specific bias is discussed in the flow of text on the left hand side.

In describing the company's activities over a four year period, it is necessary to refer to and use some terminology particular to the company. Where possible, and without disrupting the flow of the story, this terminology is explained. Explanations for specific terms are presented from the researcher's perspective. Since she has been immersed in the organisational culture for nearly four years, yet been encouraged to adopt an independent stance, this perspective is both informed and yet objective. Where possible, terminology has been confirmed by interviewing employees at the company as to their interpretation. In the most part explanations are provided in footnotes. Examples of the types of data used in the story boards and a guidance on how to read between the left and right columns is provided on the next page. This shows the two-column format in practice.

Part Two - Action Research

Analysing and Presenting the Data

5.7) Reading the Story Board Format.

On the left hand side of each page, an account of events is presented from the researcher's perspective. The story refers continuously to events, comments or ideas which occurred during the research programme. As often as possible, these events are supported by evidence in the right hand column. There are several types of evidence used. Diagrams or other evidence, which can be found on presentation material at the company, are presented in a frame like the one shown in Fig. a, with a shadow and rounded corners. This particular example shows HP's Environmental Management Strategy and will be seen in Story Board Two. Larger versions of the diagrams that are important or difficult to read in the smaller format are provided in the Appendices. Notes from the research log book are represented in single line boxes with no shadow or rounded corners. The example shown in Log. a is taken from Story Board Four and refers to a waste management meeting. Comments from internal e-mail messages are represented by a grey box with rounded corners. The message shown in e-mail (a) describes some events in the early stages of the research. Extracts from company documentation are represented by a double line box with no shadow or rounded corners. The extract shown in Doc. a is taken from some meeting minutes and is found in Story Board One. Images are also used, particularly in Story Board Three. These are simply inserted with no frames. These images are either copies of graphical printed information or scanned images from the research log book. It is recommended that the reader review this supporting material, although in the most part the story can be uncovered by reading the left-hand column alone.

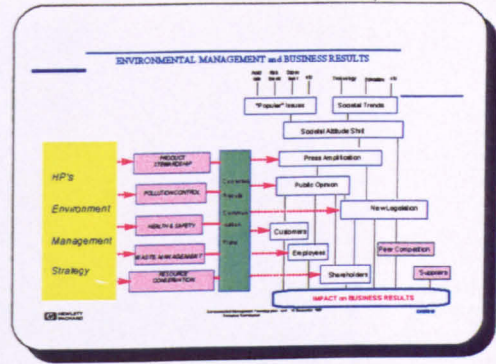


Fig. a

17/08/97 Log Book entry (Excerpts)

For the first time I feel like we have the right people in the room talking about waste.

The dependency has almost gone - but not quite, still early days. They are actually telling me as opposed to asking.

E-Mail (a)

Pinewood Site: EHS Team Member. *Message - Stress Busting and Environment. 02/02/95*

When she comes to talk to us, ZJ will cover herself, her job, vision etc., HP commitment and tie in.

ZJ will run a short brainstorming session for us correcting any factually wrong ideas as we go along!

Advice is that we start small and on topics that are measurable and achievable in the short-med term.

Doc. a

UK Sales Region: Research Engineer: "Process Management Meeting" December 1994.

A review of the current status of process management revealed that, contrary to former belief, very few processes documented in HP have any avenues which could be considered "environmental". Instead it was decided that from now on concentration will be placed on developing new processes.

Model environment

Health Queenslanders have received 25 7700 certificates for environmental management - cost of the L.A. and 2000 operations to create this certification when the official launch on 10. March 2000. HP has been working with the British National Institution since 1991 to help develop the environmental management systems, and was one of those British companies that applied in the past programme.

The Environmental Manager, Trevor Rae is delighted that HP is one of the first recipients of the ISO 14001 certification. "This is the result of the ISO 14001 standard is a tremendous achievement. For HP this is an independent undertaking the way we run our business - taking environmental Quality Management ISO 14001 as a demanding standard, but now we achieve because environmental protection is a critical issue for which we must be prepared to take responsibility."

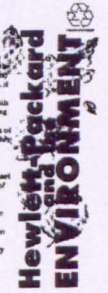
The Health Queenslanders site can be

viewed here: www.healthqueensland.gov.au

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The Health Queenslanders site can be



Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Part Two - Action Research

Story Board 1

An Account Of The Action Research Process

6.0) Introduction

The research methodologies used in this project were not determined in advance, they developed and were refined over time. The contributions to knowledge did not occur in a single flash of inspiration, rather they formed gradually from continuous interaction with the organisation. The role of the researcher did not remain static. As the programme developed so did the researcher's awareness and familiarity with the objectives of the research.

In order to portray these complexities to the reader, the first story board recounts the research process. Developments in both the methodology and theoretical basis of the research are described over each of the four years. This story board demonstrates the complex formation and refining of research ideas over time in a form of "confessional account" (see Hughes in Bryman and Burgess, 1994). This type of "confessional" is reminiscent of travel writing, the author embarking on an unknown journey with only his pen to make sense of his experiences. The journey of this research, as described by the traveller is presented in this story board.

Each section within this story board describes advances in three areas, although they are not explicitly labelled. These are;

- 1.) Development of the researcher's definition of the "institutionalisation of environmental management",
- 2.) Refinement of the research method and methodologies, and
- 3.) Insights obtained from stimulating organisational change.

The story board shows how the conclusions of the project emerged from ideas which originated very early in the programme. It also shows how some ideas did not stay the course, but were necessary as part of the overall development process. Subsequent story boards also feature the development of these conclusions in more detail, where this is the case a reference to the appropriate story board is provided.

As with all of the subsequent story boards, several types of data will be referred to in the account which follows. In particular, material from the research "progress meetings" is used in this one. These progress meetings proved to be a very useful tracking mechanism for the project and, in hindsight, provided an invaluable history of the research process.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

6.1) Orientation and the First Year (FY95)

On 10th October 1994, the author started a research project at Hewlett-Packard Ltd's premises in Bracknell, Berkshire. Despite having no detailed research objectives at this stage, it was clear that the researcher's first task would be to become familiar with the organisation she would be studying over the next four years. As a result, the first few weeks of the placement involved a series of orientation interviews with a range of Hewlett-Packard employees. These employees were asked to describe specific elements of HP's culture in addition to their role at the company. During this time, the researcher "shadowed" the Director of Environmental Affairs in order to become more exposed to the daily operations associated with Environmental Management at the company. This included mainly observing and taking part in internal and external meetings.

In early November, the first supervisors' meeting¹ of the project took place. Subsequent meetings would be held on a quarterly basis. At this first meeting the researcher presented the Ten-Step plan for Environmental Management (see Story Board Two) as the vehicle for her project. Also at this meeting, the project title was agreed to be "Institutionalisation of Environmental Management into a Distributed Non-Manufacturing Organisation"². A few weeks later, the researcher had another progress meeting with her industrial supervisor.

¹ The supervisors' meetings were attended by both types of project supervisor -- academic and industrial -- in addition to the researcher.

² The "Distributed Non-Manufacturing Organisation" was HP's UK Sales Region. This region contained roughly twenty sites of varying size throughout the United Kingdom, all engaged in sales, marketing and support activities.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Minutes of this meeting show the areas of research focus at that time. Excerpts from these minutes are shown opposite. These minutes suggest that the researcher had completed her period of "orientation" and was ready to start assisting the organisation with their Environmental Management plans. In particular, the researcher was given "ownership"³ of the Ten-Step⁴ plan for Environmental Management. The progress of the Ten-Step plan, and the researcher's involvement in it, are discussed in Story Board Two.

At this stage, the researcher was somewhat puzzled as to the company's motivation for improving Environmental Management. She consulted the Director of Environmental Affairs who suggested that there were two reasons for the company's environmental policy. These were expressed as a combination of "business results" and "citizenship"⁵ objectives". The researcher converted this concept into a diagram called "HP's Green Formula". This diagram is shown in Fig. 1 opposite. Within the diagram, the shade of "green" depends on the "mix" of objectives. This dual objective behind Environmental Management at HP runs throughout the story boards and is discussed in more detail in Part Three. This was one of the earliest contributions to one of the key findings of the research which suggests that it is necessary to position environmental management in terms of the existing company culture and objectives.

Research Engineer / Industrial Supervisor Progress Review Meeting / 9th December 1994

Orientation

ZJ's period of "orientation" is now complete, she feels that she is settling in to the company and is becoming increasingly aware of the way HP works. After two months of being at the company, TD felt that ZJ is now suitable to carry out specific projects towards the implementation of Environmental Management (example suggested - formulate a solid waste management policy for HP UKSR).

The Ten-Step Plan

It was decided that ZJ should be the owner of the Ten-Step plan for Environmental Management. It will therefore be her responsibility to update the plan at all times and to develop an internal and external version.

HP's Green Formula

A model was developed which explains the reasoning behind Environmental Management. It is a combination of the citizenship of HP employees and survival in the competitive market place.

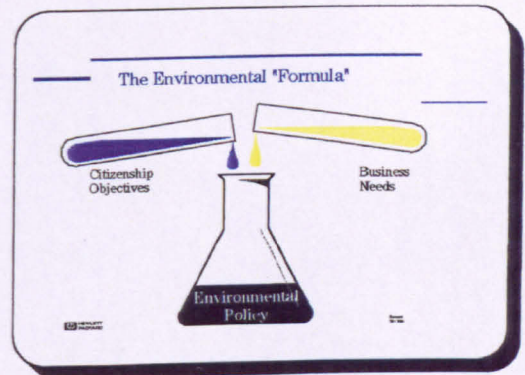


Fig. 1 HP's Environmental Formula

³ The term "ownership" is used frequently and quite specifically within HP to describe the designated person who controls a project or issue. The term is not formally defined anywhere in HP's literature but is widely used. From her experience, the author believes that the term is used constructively to encourage individuals to feel personally responsible for the progress and resolution of issues.

⁴ For a detailed description of Ten-Step planning see Part One - The Players

⁵ Hewlett-Packard has a long standing "Citizenship" objective described in Part One - The Players

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

By February 1995 the researcher started to get more involved with the organisation. As a pilot awareness raising project, she facilitated a "brainstorming" session at the Pinewood site's EHS Team meeting (see Story Board Two for more details). Rationale for choosing this site as a pilot can be found in the research log book, relevant excerpts from which are shown opposite. Mainly, this site was chosen because, within HP, its employees were perceived as being more environmentally aware than employees at other sites. This was attributed to the location of the site in a quiet woodland area. The researcher felt that it would be easier to achieve change at this smaller site, and that she would be able to use the exercise as a pilot for subsequent programmes.

In order to help understand HP further, during this "brainstorming" session, the researcher asked the Pinewood employees to comment on the obstacles to achieving Environmental Management objectives. Their recommendations are shown opposite in Doc. 2. Firstly, employees recommended that "ownership"⁶ for environmental problems should be clear, perhaps with some performance measurement. In addition there should be incentives to act and more communication of key results. Of particular note was their suggestion of a TQC (Total Quality Control) methodology to tackling environmental issues and a more "business like" approach. The recommendations made by these employees were based on their experiences of working at HP. It was clear, even at this early stage, that some employees believed Environmental Management could only be improved by taking a "business like" approach, consistent with other non-environmental programmes at the company.

Log Book 22nd February 1995

For a number of reasons the Pinewood site will be included in my system boundary.

Acceptance of environmental issues is already quite strong.

Although only some of PWD is directly associated with the SR it will be a good starting point to consider the whole site.it will be comparatively easy and trouble free to get the "buy in" environmentally.

Doc. 2

HP UK Sales Region: EHS Engineer: *Environmental Impacts of Pinewood site. Brainstorming session results. February, 1995*

The following topics were deemed to be environmental issues for Pinewood.

The landscape (Positive and Negative), Litter, Traffic/Transport, Recycling (many items mentioned), Water Usage, Energy, Kitchen waste,

Factors that were considered fundamental to successful implementation of environmental initiatives.

Ownership of problems, recognising that everyone has some element of environmental responsibility. Perhaps should be measured on their environmental performance.

Measurable Targets

TQC project methodology required, a more business like approach to environment is needed

Communication of results and of HP environmental literature in general

Incentives to attract people to take part.

⁶ Note the use of the phrase ownership. This was defined earlier and will feature throughout the story boards.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

As a result of this session and other involvement with the organisation, the researcher noted the particular importance of Quality Management both to HP generally and to the objective of "Institutionalisation of Environmental Management. As a result, the researcher gave a presentation on this subject at the second supervisor's meeting in February 1995. This presentation shows some of the researcher's early thinking on how to resolve the problems posed by Environmental Management. More specifically the researcher felt that, at that time, Environmental Management programmes were not considered part of the company's core business. The researcher believed that this would eventually cause problems and resentment of environmental considerations.

The solution, it seemed, was to incorporate Environmental Management into Total Quality Management such that "the environment is considered at all stages of the business". The researcher made an assumption that Total Quality Management was suitably well received within the organisation (at all stages of the business) and that Environmental Management could be "incorporated" into it easily. This was not an unreasonable assumption since there was widespread external evidence⁷ that HP had adopted the principles of Total Quality Management and, so far, the experiences of the researcher confirmed this. In addition, the UK company had recently been awarded the President's Award for Quality⁸ in recognition of the strong focus on Quality Management in the company.

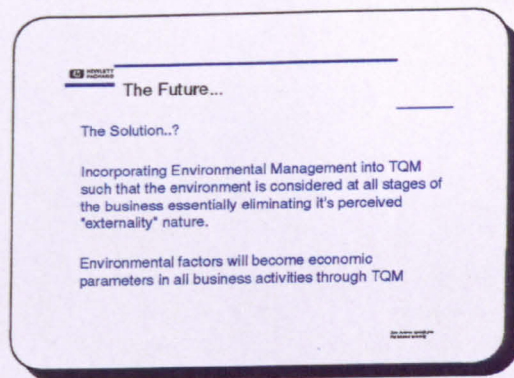
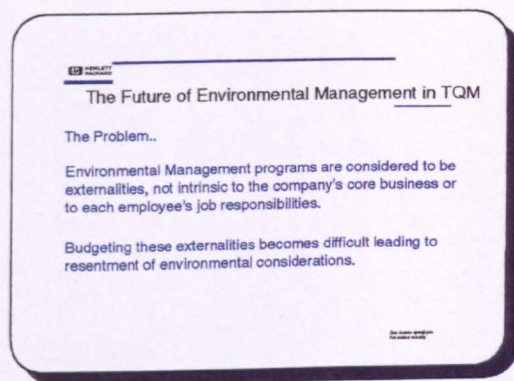


Fig. 2 Excerpts from a progress meeting presentation February 1995

⁷ See Thiagarajan and Zairi (1997) for example

⁸ An award given to HP entities demonstrating the best "Quality Management" around the world.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

The researcher did not expect (nor intend) to achieve this goal (incorporate Environmental Management into Total Quality Management) but she felt that this was an appropriate approach for HP to take in the future. In the meantime, the researcher recognised that Quality Management could be used in other ways to aid the "Institutionalise Environmental Management". This influenced the choice of method used to assist HP in the "Institutionalisation of Environmental Management" as described in the Research Methodology section earlier.

Although the term "institutionalisation" had not been specifically defined at this time, the researcher believed that measurement of environmental awareness would provide useful data for determining the success of the project. In order to measure whether environmental awareness was increasing, the researcher knew that she would need to measure a baseline environmental awareness in the first year of her research. There were a number of possible ways of achieving this, some of which were discussed in more detail in Chapter Four (Research Methodology). One method chosen was to adapt an existing employee survey on the effectiveness of "platform"⁹ services within the Sales Region. Working along side the quality department, the researcher devised a set of ten areas that were representative of the programme areas at the time. As part of a larger survey, employees were asked to comment on the *awareness, importance and satisfaction* of these Environmental Management issues at the company.

Platform Services Survey 1995.

During May 1995, the Platform Services Satisfaction Survey was carried out to assess the levels of satisfaction from internal customers. The Platform Groups that took part were; Quality, Information Technology, Personnel, Financial Services Centre, Regional Accounting, Environmental, Support Services, Financial Planning, Logistics Services Organisation, Legal & Tax Treasury. The Survey was sent to 1000 employees in the UK Sales Region, and 226 employees responded to the Survey, 77 of which responded to the Environmental Section.

⁹ Platform services include non-business unit organisations such as Personnel, Information Technology, Quality and Financial Planning

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

This survey helped the researcher understand the awareness of environmental management topics at the company and establish a baseline for subsequent measurements¹⁰.

At this stage the researcher had not determined the research methodologies in full, although collection of documentary evidence and log book entries had begun. In addition, the researcher had identified a useful source of data that appeared to be suitably unobtrusive. The researcher started saving her own (and others') messages from the internal e-mail system. These messages were filed electronically and in hard copy for review at a later date. Later, during the data analysis, the researcher was surprised to understand "old" messages in a different way from when they were written or filed. This methodology continued throughout the project and, in fact, was one of the most useful sources of data. Consequently, the characteristics of e-mail as a research tool are discussed in Part Three of the Portfolio. A further measurement tool chosen by the researcher to provide some indication of the Institutionalisation of Environmental Management was HP's corporate EHS Audit. During the project, there were three UK Sales Region Audits. These are referred to throughout the story boards but are mentioned significantly in Story Board Five where the audits were used to motivate improvements in the waste management programme.

By March 1995, the researcher was nearly half way through the first year of the project. The first "Six Month Report" contained in Part 4 of this portfolio describes the research programme in that period in more detail.

¹⁰ In Part Three (Discussion I) results of this and other measures are discussed in relation to the objective of "Institutionalisation".

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Of particular note in this report is section 1.4 - The Scope of the Research. This section describes the scope of the project as the "environmental performance of HP's products, operations and culture". Some months later, an EHS department logo was developed which referred to the Environmental stewardship of People, Operations and Products (described in more detail in Story Board Three). The similarity between these approaches should be noted. The "Products, Operations, People" theme pervaded the research programme and will be seen throughout the story boards.

This example demonstrates a process whereby ideas generated by the researcher, relating to her own research, seeped into the Environmental Management programmes at HP. In fact, as will be shown, the high degree of consistency between the research and HP's Environmental Management objectives helped prevent conflict between the academic and practical goals of the Engineering Doctorate programme.

By June 1995, the researcher had started to develop preliminary ideas about the "Institutionalisation of Environmental Management" and what such an objective might mean. A copy of a "brain map" (Buzan and Keene, 1994: 61) drawn in the research log book is shown in Fig. 3 (a larger version in the Appendix). The brain map identified several aspects of "institutionalisation". In particular the diagram refers to adapting and changing people, culture and "the norm". Performance measurement was also strongly indicated in this diagram suggesting the importance of being able to measure change.

"The First Six Months" progress report - excerpt
1.4) Scope of the Research - The Research will focus on
i) The Environmental Performance of HP Products,
ii) The Environmental Performance of HP operations and
iii) The Cultural Acceptance of Environmental Management
incorporating all principles of Environmental Management

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Shortly afterwards, notes in the research log book posed a question which (it will be shown later) has particular relevance to the "Institutionalisation of Environmental Management". The question asked whether institutionalisation meant "middle management commitment". The researcher had been observing a European EHS meeting when she made these notes. During this meeting it seemed, from a participant's comments, that middle management was a particular barrier to change at the company.

This example highlights a relevant detail about the "insider" research method being used. Many questions, such as this, were raised in the research log books. They were written as they occurred, often in seemingly unrelated contexts. As a result of constant identification with the research objectives, the researcher would make notes during meetings, or after conversations, which seemed to be unrelated to the subject under discussion. It appeared that just "being there" helped form ideas in a more *continuous* way which would not have been possible with more structured research methodologies.

Such insights, the author believes, would not have occurred without a balanced exposure to theory and practice. This balance is explored in more detail in Chapter Twelve - Doing Action Research.

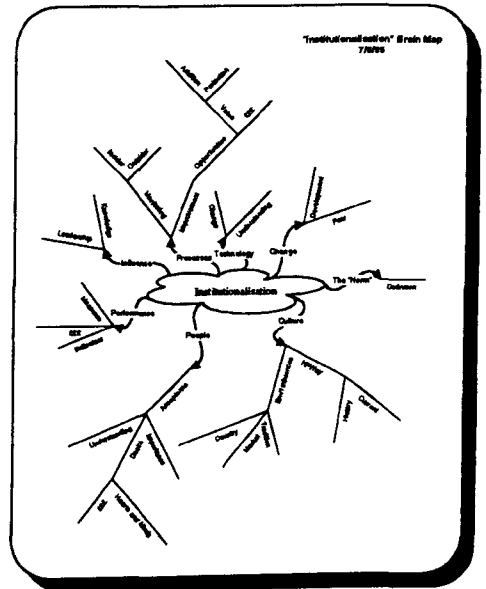


Fig. 3 Institutionalisation Brain map
June 1995.

Log Book 29th June 1995

Does institutionalisation mean middle management acceptance?

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

In order to ascertain what HP believed "institutionalisation" to mean, the researcher devised a small survey for a selection of managers within the company. Extracts from some of their responses are shown opposite. Of particular note within their responses was that EHS¹¹ issues should be considered an integral component of business activities, "totally incorporated into the main stream business process". These managers also suggested the need for senior management attention to EHS in order for institutionalisation to occur. These and other ideas on defining institutionalisation were presented and discussed at the third supervisor progress meeting in August 1995. See the log book entry (opposite) for details.

Worthy of note in this log book entry, is the suggested focus on "action". It was evident even at this early stage that in order for institutionalisation to occur, organisational action, and not just concern, was required. This was one of the earliest contributions to one of the key findings of the research which proposes that the institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change.

These notes also suggest the need for competencies to be built in Environmental Management. Put simply the researcher felt there was a danger that environmental management could improve whilst she was resident at the firm, but might not continue afterwards without a designated focal point. In order to prevent this, a process of employee learning was required in order that they became competent in environmental management, without the need for the researcher.

Researcher:- "What does institutionalisation of environmental management mean?"

"Institutionalisation means: "Environmental, Health and Safety (EHS) activities and criteria are considered integral components of business activities and are critical to the business success of an organisation".

"It means that the EHS function has been totally incorporated into the main stream business processes where EHS issues are part of the business discussion regarding day to day decision making processes."

Researcher:- "What would institutionalisation of environmental management require?"

A decision at the highest level that the organisation needs to incorporate environmental, health and safety into operational requirements.

"I believe that EHS institutionalisation will only occur if there is top level HP management support and push for it.....Education of existing managers, engineers, employees so they are aware of this commitment"

"...Institutionalisation will require even more "active buy-in" by senior and then middle management".

Log Book 24th August 1995

Key concepts

Institutionalisation is an evolutionary, not revolutionary concept - time is important...persistent communication. Balance between everyone having some degree of responsibility and having individuals who are empowered to make decisions fearlessly. Decisions supported by all levels of management.

Too much "consensus building" can lead to unresolved issues. **ACTION** is the key.

Building self esteem by providing intelligible information - new skills, support and encouragement, empathy (and see things as others are seeing it).

Institutionalisation of EHS will only be sustained if we can learn from the experience.

¹¹ Note the interchangeable use of terms Environmental Management with EHS.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Also at this supervisor's meeting the question was raised whether HP's QMS system¹² was a suitable method of measuring the "institutionalisation of environmental management". It was generally agreed that this approach was a suitable idea but that further justification would be required. A discussion on the appropriateness of the QMS system as a tool for implementing and measuring environmental management is referred to in Story Board Two in particular.

During the first year of research at Hewlett-Packard, the project objectives were outlined and the principle methodology for achieving those objectives set. Early ideas about the role of environmental management in the company were formed and the researcher began to identify the factors affecting its institutionalisation. At the time, It seemed from their planning documentation (see Story Board Two) that HP's environmental management objectives were based on three concepts.

- ◆ Improving the Quality Maturity of the EHS function
- ◆ Improving EHS without additional (human) resources
- ◆ Demonstrating the business impact of EHS issues in order to achieve results.

The company's Quality Maturity System was accepted as a suitable approach for managing and measuring the research process. In this respect, the researcher was using the tools available at the company to describe "Institutionalisation" in their own language. At the end of FY95 a second academic supervisor was approached to join the project. The second supervisor was chosen for his expertise in the social sciences, particularly in relation to organisations and environmental management.

¹² Described in Part One of the Portfolio.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

6.2) Building on Action and Research (FY96)

At the beginning of the second year, the researcher started to expand the objective of the research into a series of specific research questions. Notes from the research log book in October 1995 are shown opposite as an example. In the excerpt opposite a progression of ideas can be seen where the researcher constantly re-evaluates the main question of the research. The notes show the early tensions seen by the researcher because she was involved in both action and research.

The start of FY96 also saw the researcher becoming more involved with implementing environmental management programmes. The first supervisor's progress meeting in FY96 (November 1995) was also the first meeting attended by the new second supervisor. During this meeting the researcher presented details of the project areas she was involved with (see Fig. 4, also provided in the supporting documentation). The activities associated with Ten-Step planning and QMS reviews are described in Story Board Two, the "Pinewood E-team" in Story Boards Three and Four and the "Thames Valley Waste Management" in Story Board Five.

At this meeting, the researcher also presented a diagram of where the research project was positioned in relation to other fields of research and practice. At this stage this was perceived to be at the intersection between Environmental Management, Quality Management and Change Management. The researcher believed that there were literatures which described the combination of any two of these areas (as shown in the diagram opposite), but that the research at HP would make a contribution at the intersection of all three. This positioning focused the literature review into these areas.

Log Book 12th October 1995

Research questions relating to Institutionalisation (Excerpts)

Aim "To implement an environmental management strategy into HP's UKSR over a four year period to observe the way in which the organisation responds to environmental issues

BUT

I am not implementing simply to observe

I am not interested in the way the organisation changes regarding environmental issues.

I am both implementing and observing the implementation -- Can I do that?

I want to know -- How can an organisation "consider the environment" -- Can organisations adopt / internalise environmental management

"Is it possible for HP to institutionalise environmental management in four years?"

"Will a TQ approach institutionalise environmental management?"

Aim: "To observe / monitor / facilitate the development of an environmental management strategy and to observe the organisational changes which occur throughout its implementation".

Am I combining Action and Research??? Action is professional intervention in ongoing processes, Research is generation of new knowledge.

I could use signals to demonstrate which role I am playing at any one time.

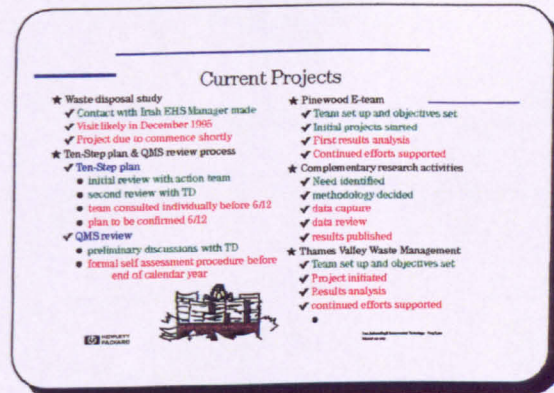
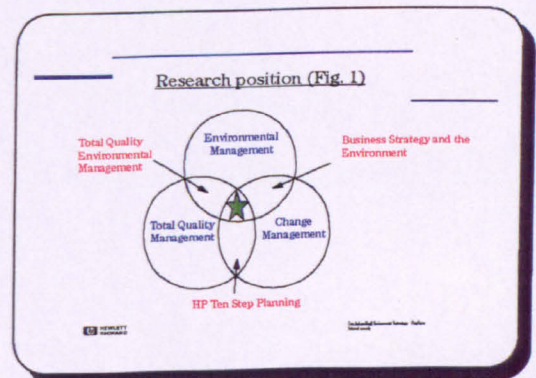


Fig. 4 Above and Below, Progress meeting slides (November 1995).



Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

At the company level, the researcher believed that if business groups were encouraged to adopt Environmental Management practices without the support of their staff, and backing of corporate objectives, they would have difficulty maintaining results. On the other hand, a strong mandate or position statement expressing the company's commitment to the environment would effectively be "greenwash" without practical programmes behind it. It seemed that Environmental Management needed to filter into all levels of the organisation and in different ways.

By the mid-way stage the definition of institutionalisation had changed only slightly, the researcher expressing the external projection element as "business values". This was changed because the researcher did not feel comfortable including the company's external environmental management face within the concept of institutionalisation. "Business values" refers instead to *stated* elements of HP's value system or culture.

The next few months were spent expanding this concept of institutionalisation and, in particular, preparing for the mid-way dissertation required by the EngD programme. The researcher examined the four aspects of "Institutionalisation" and devised "sub categories" which would be analysed for change. The researcher wanted to monitor change in all of HP's environmental management programme areas¹³ but in devising this analytical framework the researcher uncovered, what would eventually lead to, a contribution of the research. The framework devised at the time is included in section 4.2 of the Dissertation (see Part 4 of the Portfolio) and is represented by Fig. 6.

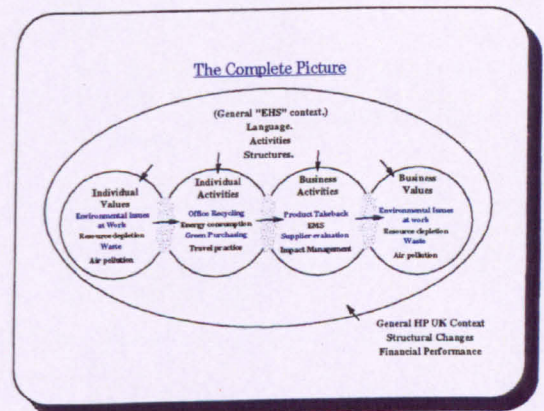


Fig. 6 Research Framework (July 1996).

¹³ See Story Board Two for more information

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

The contribution identified at this stage relates to the discretion of individuals in the organisation and the areas of environmental management that they can feasibly influence. For instance, although some "waste management" can be tackled by employees in the organisation, more significant results will be seen by focusing on particular groups within the organisation. This shows that environmental management issues will present themselves differently at different levels of organisation. For example, office paper recycling represents an area of individual action, whereas the subsequent arrangements for the collection and measurement of that recycling, is an area of group or business action. This concept was a significant milestone in the development of another key finding of the research which suggests that it is necessary to consider employees' roles and responsibilities within the organisation when implementing environmental management programmes.

6.2.1) Developing Methodology

During FY96, different research methodologies were being tested. As mentioned earlier, the researcher wanted to raise the environmental awareness amongst employees at the company. One method chosen to achieve this was to produce an "EHS Newsletter". The first EHS newsletter spurred an employee to respond and comment on some of the issues raised. A series of interesting (electronic) discussions regarding the most appropriate media for environmental publications ensued. The first e-mail is shown opposite (E-mail 1).

E-Mail 1

HP UK Sales Region : Employee: Message - EHS Newsletter 16/10/96

"Our team in the Response Centre has just received 20 copies of the EHS newsletter (for a team of 11). It was interesting to see that the number one issue was Solid Waste Reduction.

We believe that the following should be noted: There are other ways of publishing this information that allow a wide distribution without the senseless slaughter of trees. An example of this is the recently advertised ~/infranet page on the WWW which does mention Health & Safety and Recycling on the page:

<http://www.uksr.hp.com:80/~infranet/support/news/sitenews.htm>

We believe that the paper that was printed on cannot be recycled. If this is untrue, why is there no recycle symbol on the sheet. If it is not possible to put this information on the web, then we would like to see a notice board for this type of information. We would appreciate your comments.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

There are a couple of points to note about this e-mail. Firstly, the newsletter had achieved its first objective of creating more awareness; this employee now knew where to voice his environmental concerns. It also suggests that the employee cared about the environment and in particular the "senseless slaughter of trees". The researcher decided to use this message as an opportunity to obtain some additional research data. She responded to this message by asking colleagues at HP to comment on the employee's concerns. Several employees responded, some providing quite detailed responses to all of the questions raised, others choosing to answer only some. The purpose of asking these questions was twofold. Firstly, the researcher genuinely wanted to get a feel for the most appropriate communication mechanism for environmental issues within the company and, secondly, she wanted to "survey" a small population of employees on environmental issues.

This example shows clearly how the researcher was opportunistic in her use of methodology. The researcher was able to capitalise on these opportunities as a result of continuous identification with the objectives of the research and the need to capture data unobtrusively.

E-Mail 2

HP UK Sales Region : Research Engineer: Message - EHS Newsletter 17/10/96

This exciting response highlights a number of issues.

1) Employees are reading the EHS newsletter. 2) When faced with environmental issues, employees do care and expect to see the best environmental option being used. 3) The distribution method that we used for the newsletter may not be the best environmental option.

Questions I would like you all to consider are:

If we publish information on the web or electronically will enough people read it? Is it possible to print colour copies on to recycled paper in the Print room? Is the "desk drop" process wasteful? Do people read notice boards?? Maybe the environmental impact of the paper used is justified because of the high level of awareness it creates in the workplace!! Please send me any comments or questions on the above.

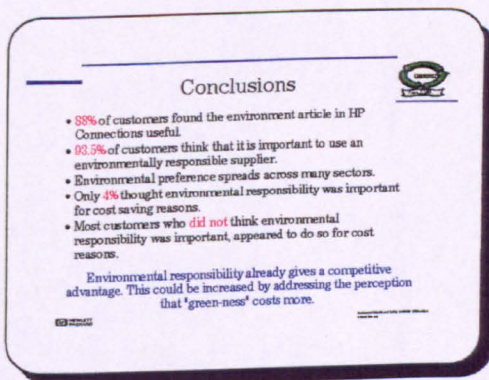
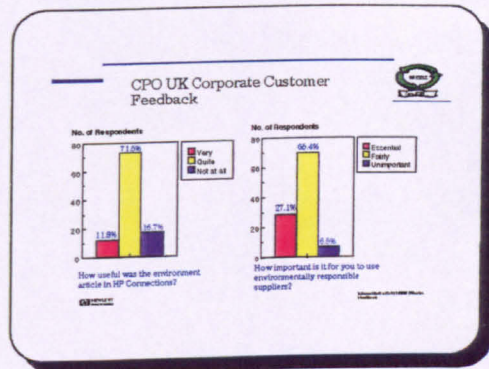
Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

A second example of the opportunistic approach to gaining research data was seen in June 1996. In this month the researcher had an opportunity to include environmental information in an external brochure sent to a large number of HP's customers. The log book entry opposite shows some early notes on this initiative in January. As shown an environmental article was to be included in a marketing newsletter sent to HP's corporate customers. The researcher made sure feedback, that indicated the level of interest in the article, would be obtained to help further improve communications activities. Feedback was seen as important because people in HP are often quick to respond to information directly from customers. Once again, the researcher had felt it important to use an existing communications channel to provide environmental information rather than establish a new one. This was for two reasons. Firstly, in encouraging the business unit to own the communication it was assumed that their awareness of the issues would increase. Secondly, it was thought that customers would be more likely to read their standard HP newsletter than an additional "environmental" one. Feedback from the article was duly analysed and was used to communicate the value of environmental management to business managers. Some of the material used is shown opposite as an example.

Log Book 30/01/96

SM from CPO Marcom called and confirmed that we were the right side of the deadline for getting env1 information into their newsletter. Should be a really good initiative. I have initiated that we get included on the feedback questions - 10,000 corp accounts!



Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

During FY95 the researcher had used the Platform Services survey (described earlier) to indicate the level of environmental awareness at the company. This exercise was repeated in FY96. A summary of results is provided in E-mail 2.

In 1996, the researcher was also beginning to identify research methodologies relevant to the project at HP. Early ideas which included techniques associated with Action Research and Organisational Learning are shown in Fig. 7. Rather than adopt specific methodologies, the researcher was keen to utilise a number of methodologies to cope with the specific local conditions of the project. It was at this stage that the researcher first noted the split screen approach used by people constructing organisational learning histories. This led to the layout used in these story boards (as described in the Story Board Introduction).

6.2.2) Summary of Year Two

By the end of the researcher's second year at HP, she had started to identify the academic context of the research and early ideas about its contribution to knowledge were forming. By this point, a more specific definition of "institutionalisation" had formed, embracing the perceived need for action at different levels of the organisation. This eventually formed the first overall finding of the research which says that the institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change.

In addition, the researcher was more familiar with the wide range of research methodologies which could be employed within the project.

E-Mail 2

UK Sales Region: Director of Environmental Affairs:
Message - 1996 Platform Services Survey - EHS
23/07/96

The results from the PSS show that awareness of the EHS function has increased since last year. This is hopeful news in view of this year's "Leadership & Participation" goal. The top three issues (to be addressed) are also encouraging. Top of the list, "Safety at Work", followed by "Energy initiatives in the workplace", and then "Internal information about HP & environmental issues". We will obviously address these, and other issues in our annual Q4 revisions of the 10-step plan; also our continued awareness campaign will be stepped up. If you would like further details, please contact Zoe (61382) or myself.

Research Methodology

- Action Research!
 - A process can be studied by introducing changes and observing the effects on it.
 - must be participatory and collaborative
 - Cycles of Planning, action and evaluation. (PDCA?)
 - My research questions if the change is necessary at all.
- Organisational Learning? (a figure?)
 - Ethnography
 - primarily participant observation
 - Journalism
 - getting the "story" and presenting in a way that draws people in
 - Action research
 - capacity to reflect and assess results
 - Oral history
 - data collection for describing complex events
 - using the voices of a narrator
 - Still the need for the change is not addressed.

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Fig. 7 Progress meeting slides (July 1996).

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

6.3) Refining ideas (FY97)

By early 1997 the researcher was involved with facilitating more organisational activities. This included ensuring compliance to European Environmental Regulations, assisting in the development of an EHS web page and the company environmental report.¹⁴ As described in the research methodology earlier, the principle objective of this year was to increase the environmental programme activities and to start reducing the dependency on the researcher. This can be seen in the remainder of the story boards which describe the specific programme activities in more detail.

As a result of spending more time on environmental management projects the researcher began to identify where successful change had occurred and where it had been frustrated. The experience gained from these activities led to the development of two specific concepts in this year.

Firstly, while the researcher was facilitating change in these areas, she realised that it was necessary to use different approaches to achieving change depending on the project and the part of the organisation which it affected. These ideas contributed to one of the key findings of the project which suggests that action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.

¹⁴ For more details of the changing role of the researcher over time see Part One - Research Methodology

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Specific to this realisation, in January 1997 the researcher drew a diagram (shown opposite and also in the supporting documentation) to represent a vision of how environmental management would work without an EHS department. The diagram shows different types of environmental management activity. In the centre of the diagram, company Business Units are represented. The researcher believed that their contribution to environmental management was to ensure that they produced and marketed products which, at least, followed the company's environmental policy. In support of this, infrastructure services such as Human Resources and Information Technology would provide appropriate services which would compliment their existing role in the organisation. For instance, Human Resources would - "Promote and maintain an environmentally responsible work-force" and Purchasing would - "Select and approve environmentally responsible suppliers". This model was presented to an audience of senior managers by the then European EHS Manager as a vision of the future.

Secondly, around the same time, the researcher articulated some ideas about the importance of personal environmental values as a "Golden Bridge" theory. The development of the diagram shown in Fig. 9 was the culmination of several earlier thoughts about the relevance of personal values. These ideas contributed significantly to two practical recommendations seen in the framework for institutionalising environmental management. The first advising managers to link environmental programmes to personal concerns for environmental protection and the second for the company to demonstrate and provide "sinks" to capture employee environmental concerns.

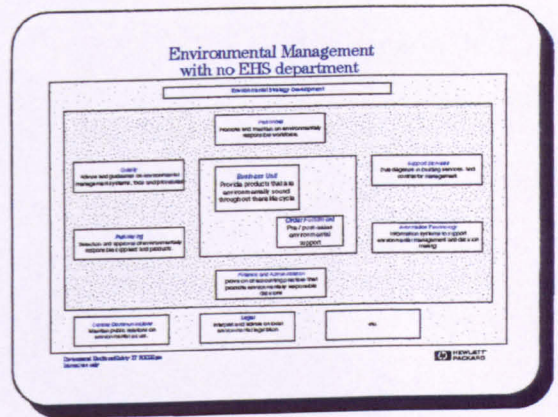


Fig. 8 Environmental Management with no EHS department (January 1997).

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

The diagram opposite shows two problem scenarios which arise as a result of an inconsistency between individual and organisational values. The first occurred when individuals were frustrated that the company did not share their personal commitment to the environment, the second when the individual did not know where to address his environmental concerns within the organisation. The diagram suggests that by building a "Golden Bridge" between individual and organisational values, these frustrations would not occur. The researcher believed that this could be achieved by (i) highlighting organisational values associated with environmental issues and (ii) providing a suitable "sink" for the concerns of individuals.

An example of this "sink" phenomenon was the continuous and regular e-mail communications sent to the researcher expressing concern for environmental issues in the workplace, simply because she was a recognised point of contact. An example of this was seen earlier, when an employee responded to the researcher as a result of the first EHS newsletter.

A couple of months later the researcher developed further models to describe aspects of the institutionalisation process. The thoughts at this time were not about the functional areas involved in Environmental Management, rather the role of individual employees in achieving change. The researcher had noticed that, for the majority of Health and Safety programmes, change was required at an individual level; people having discretion for their own health and safety. A large number of people were affected by essentially the same Health and Safety issues, requiring the same information and programme assistance from the EHS department. With environmental issues, things appeared to be different.

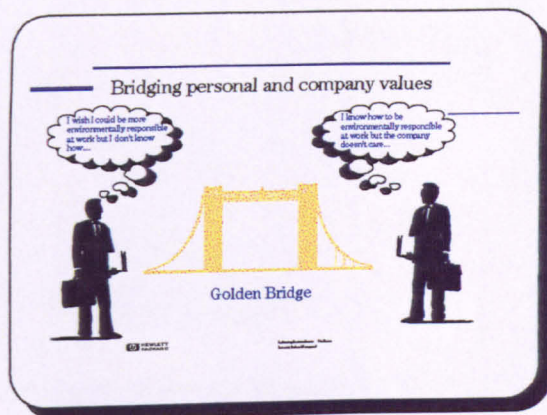


Fig. 9 Bridging personal and company values
(January 1997).

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

At an individual level, it appeared that an employee could contribute to environmental management only where practically feasible. For example employees could recycle their paper or turn their computer off at night. When it came to other aspects of environmental management such as compliance or environmental performance measurement, there were only a small number of critical employees which needed to be involved. The researcher identified four levels of individual "ownership" (shown in Fig. 10). The first was a "general" level of ownership whereby an individual would address environmental issues associated with being at work - irrespective of their specific function. This was seen particularly in Story Board 5 where specific employees were prepared to take limited environmental action, irrespective of their role. The next level described ownership of environmental management issues as "Occasional"; occurring when employees *occasionally* required access to environmental information as part of their job. The third level featured when environmental issues were recognised as part of a "process"; individuals would own environmental issues in as much as they were measured as part of a specific task. The example used to illustrate this was a Purchasing Manager who would consider the environmental impact of purchasing decisions as part of a larger purchasing process. The final level identified was where employees had "functional" responsibility for specific aspects of Environmental Management. A good example of this being a Facilities Manager with specific responsibility for waste disposal.

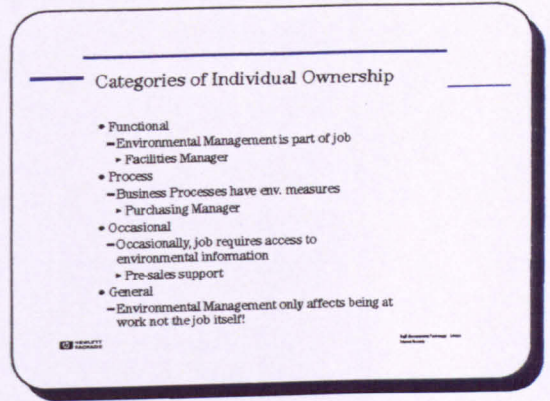
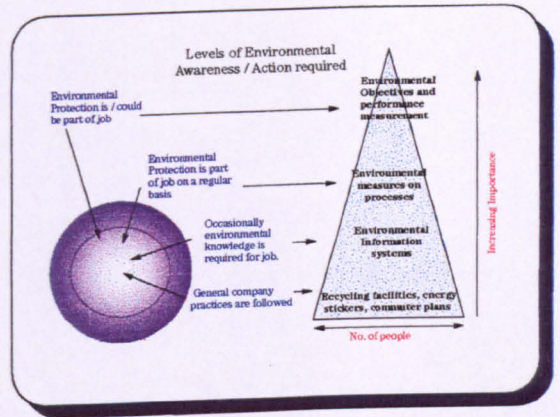


Fig. 10 (Above and below) Categories of Individual Environmental Management Ownership



Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Neither of the last three levels preclude or guarantee these individuals taking ownership for environmental issues at a personal (general) level. Consistent with the "EHS with no EHS department" model, this approach relies on existing organisational roles.

The concepts introduced here on the levels of individual responsibility for environmental management form a large section in Part Three (Chapter 11) where the framework for the "Institutionalisation of Environmental Management" is discussed.

FY97 also saw some further clarification of the research methodology. As this stage the researcher identified two distinct aspects to the methodology, eventually termed the *Action Methodology* and the *Research Methodology*. In other words, the methodologies used to stimulate change in the organisation and the methodologies used to record resultant evidence or data. These were eventually used to structure the research methodology section, as seen in Part One.

FY95 and FY96 had seen efforts from the EHS group (and the researcher) to measure the awareness of environmental issues at the company in the form of a Platform Services Survey and the Employee Satisfaction Survey. Neither of these were carried out in FY97. The platform services survey was replaced by a new process in this year and the employee satisfaction survey was only carried out on a bi-annual basis. The company's changes in this case are a good example of where the opportunistic research strategy employed by the researcher was occasionally subject to the changing needs of the client organisation. This is discussed in more detail in Part Three (Chapter 12).

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

To summarise, in the third year, specific ideas about the contribution to knowledge of the project were forming. The essence of the research findings had been formed, although they had not been specifically articulated at this point. The necessary structure and processes for institutionalisation were identified and the researcher had begun to question assumptions (seen in the literature)¹⁵ about environmental management change. Specifically in this year, concepts developed which explain the "Individual Action" element of institutionalisation. The researcher had noted that individual action was dependent on the position and discretion of the employee within the organisation. She believed that not every one had the same capacity to take "action" and some had greater overall impact than others. In addition, the researcher had also clarified the importance of individual values to the change process.

¹⁵ A return to the literature is described in Part Three of the Portfolio.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

6.4) The Final Year (FY98)

The final year of the project saw the researcher's involvement in the organisation lessen in order to devote attention to interpreting and analysing data. Minimal contact with the organisation was maintained through the Industrial Trainee (described in Story Board Three). In addition preliminary ideas from previous years developed into three distinct areas of contribution. To embrace this, in December 1997 the researcher pulled together a final set of three "Core Research Concepts" which embraced the findings identified over the preceding years and aspects of the research methodology.

Firstly, having reviewed relevant literatures, the researcher believed that there was a need to bridge the gap between theory and practice in organisational research. She maintained that complementary insights could be gained through insider based research to the results obtained by other research methods.

Secondly, the researcher believed that there was a tendency for environmental management to be viewed as either a strategic or cultural problem. She believed that these perspectives were both incomplete, and that significant improvements in environmental management could only be achieved by tackling the "middle ground" between business strategy and personal or organisational values. The researcher believed that this middle ground involved changing the daily activities of smaller, or functional, groups within the organisation as opposed to prescribing company-wide change programmes.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

Finally, the researcher believed that in order to institutionalise environmental management, change would have to be driven or stimulated from within. In other words a top down imposition would be an ineffective mechanism in the long term. The researcher believed that this would require Environmental Management to be positioned in relation to existing personal or organisational values. These areas are discussed in more detail at the end of the story boards in Part Three of the Portfolio. The three areas are shown in Fig. 11.

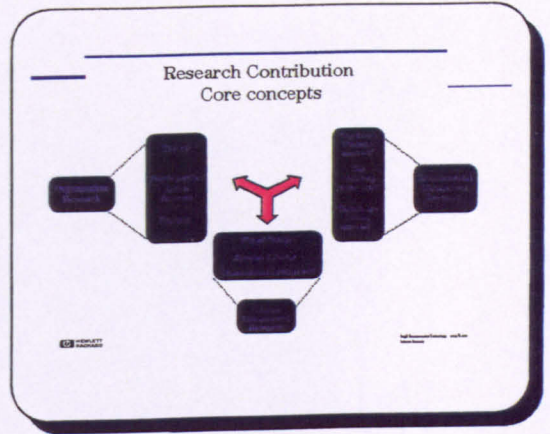


Fig. 11 Research Contribution - Core Concepts

Having identified, in general terms, the areas of contribution of the project, the researcher returned to the data collected over four years for further analysis. The process and themes of data analysis were described in the Story Board introduction section. The process is shown graphically in Fig. 12 opposite.

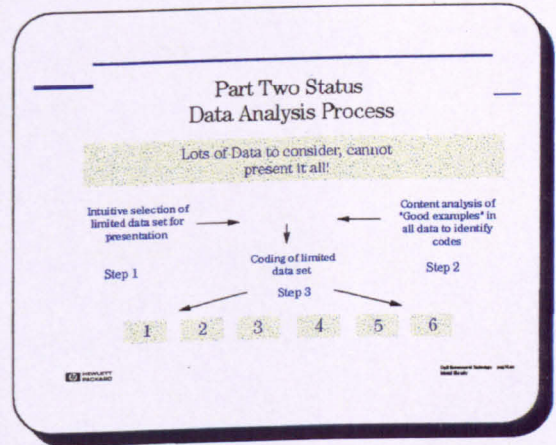


Fig. 12 Data Analysis Process

During the final year the researcher was, to a limited extent, involved in the organisation's environmental management programmes. This enabled continuous data gathering right up to the end of the project. However, the final year did not see any "new" ideas about the research, all models and concepts having emerged over the research period during periods of high involvement with the organisation. The majority of this particular year was spent analysing data, refining ideas and positioning the research contribution. The process of "post fieldwork" data analysis and documentation confirmed early ideas about the process of "institutionalisation" and the initial findings were strengthened. By March of the final year, the researcher had identified three specific areas where this project makes a contribution to knowledge. These were described in the Executive Summary and are discussed in more detail in Part Three, after the remaining story boards.

Part Two - Action Research

Story Board 1 - An Account Of The Action Research Process

6.5) Story Board One - Summary and Conclusions.

This, the first, story board attempted to show that research is not a linear process, although in this case many early ideas developed over time. It was advantageous to approach the research with an open mind and allow skills in action and research to develop throughout the project. The collection of research data was thorough, systematic and consistent for four years but the use and interpretation of that data changed over time until the final conclusions were derived. In addition to the themes which emerged about the institutionalisation of environmental management, there were also a number of methodological themes which are shown in this story board. The remaining story boards discuss the former in more detail, but the latter are discussed here in this summary.

The first methodological theme which is evident from this story board is that, through a combination of (i) always being there and (ii) constant identification with the research objectives, the researcher was able to gain insights which would not have been gained through "outsider- based" research methods. The second is that the researcher used predominantly existing tools to achieve and measure change at the company. These methodological choices have advantages and disadvantages which are discussed in Chapter 12.

The second story board, presented next, describes aspects of HP's Environmental Management programmes, as they feature in the company's formal planning process. This story board evaluates the characteristics of HP's approach to environmental management critically but from an informed perspective. Four topics are discussed in relation to HP's environmental management plan. Firstly, since the plan is for "Environmental Management", HP's understanding of this term and related concepts is considered. Secondly, since the research is about the "institutionalisation" of environmental management, HP's understanding and interpretation of this concept (as seen in the plan) are also considered. The story board also describes how HP's approach to Environmental Management was based on principles of Total Quality Management, discussing the implications and acceptance of this popular approach. Finally, the story board also shows the development of the researcher, professionally, in relation to the development and implementation of the plan. This change in researcher-influence is an important concept to consider and will be revisited in more detail in Chapter 12 - Reflections on the Action Research Process.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

Part Two - Action Research

Story Board 2

Business Planning for Environmental Management

7.0) Introduction

As described in Chapter 4 (Research Methodology), the researcher was involved, to a varying degree, with the development of the EHS department's business plan. This business plan was the principal tool used in HP's attempt to institutionalise environmental management. This section of the portfolio, the second "story board", therefore describes the EHS "Business Planning" activities over the research period. The rationale behind this section is threefold. Firstly, in describing aspects of HP's planning activities over a four year period, it is possible to give the reader important context for the overall research programme. Specifically this section highlights the business focused, "quality" approach adopted by the EHS department to institutionalise environmental management. The second reason, related to the first, is that this story board introduces the company's environmental management programme areas and their understanding of environmental management in practice. Thirdly, by examining the entire research period in this general way, it is possible to get a longitudinal view of how the company's plans adapted as the research progressed and the researcher's influence increased.

In this story board, three topics are discussed in relation to HP's environmental management plan.

- 1.) Firstly, since the plan is for "environmental management", HP's understanding of this term and related concepts is considered.
- 2.) Secondly, since the research is about the "institutionalisation" of environmental management, HP's understanding and interpretation of this concept (as seen in the plan) are also considered.
- 3.) Finally, this story board describes the development of the researcher, professionally, in relation to the development and implementation of the plan.

Unlike the remainder, this story board does not introduce many of the research findings presented in Part One, rather it is a necessary introduction to environmental management at HP. Several types of data source are used to create this story board although company presentation slides predominate.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

7.1) At the beginning

Upon her arrival at Hewlett-Packard, the researcher was presented with an EHS business plan entitled: "A structured, Quality-oriented and business focused approach to Hewlett-Packard's Environmental Management Function". This was the FY95 "Ten-Step"¹ plan for environmental management. The basis of the UK plan was HP's proprietary Ten-Step Planning methodology². Comments from HP's internal EHS auditors³, shown opposite, show how this plan was seen to be a "best practice" within the company. This comment suggests that, at that time, a "best practice" approach to environmental management in HP was perceived to include a focus "on the value EHS brings to the business".

Expanding on this concept, the essence of HP's environmental management plan was to prevent the environmental concerns of stakeholders from negatively affecting business results. In order to achieve this, the EHS department was positioned as a business with the intention of selling its product to the rest of the organisation. Accordingly, customers were identified and prioritised, channels of delivery chosen and competition considered. The basis of the plan was a hypothesis that environmental issues (if not managed correctly) would negatively impact business results.

New approach to Environmental Management in HP - EHS Auditors' Remarks (June, 1995).

"A ten-step plan has been developed which we believe is an HP "best practice". It is realistic, thorough, and focuses on the value EHS brings to the businesses"

¹ Ten-Step planning is described in Part One of this portfolio - Research Context

² Ten-Step plans are normally based on a 3-5 year time frame, but are reviewed and modified on an annual basis. A complete version of the first (FY95) and final (FY98) plans are included in the Appendix as supporting documentation.

³ Hewlett-Packard uses a team of EHS auditors to assess EHS performance at HP sites throughout the world.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

This hypothesis was depicted in a diagram (Fig. 13) drawn at the time.⁴ The diagram suggested that, through a variety of stakeholders⁵, "popular" environmental issues would impact the business unless corrective results were achieved and communicated. This diagram was more than just a picture, the concepts behind it drove the Ten-Step plan, and consequently Environmental Management, for the entire research period. There are two things worthy of further discussion here. Firstly, this diagram shows the programme areas falling under the umbrella of Environmental Management at HP. Secondly, this diagram suggests that HP perceived Environmental Management as helping to prevent negative business impacts from occurring. These concepts are discussed in more detail in the following sections.

7.2) The Company's Understanding of Environmental Management

Fig. 1, shown here, suggests that (at the time) environmental management was considered to include five programme areas. These are (as shown) Product Stewardship, Pollution Control, Waste Management, Health and Safety, and Resource Conservation. The researcher was told that these areas mirrored corporate Environment, Health and Safety programme areas at the time. Definitions of these programme areas were not provided in the plan. The term "environmental management" has a number of possible interpretations, as shown in the Literature Review (Part 1, Chapter 3).

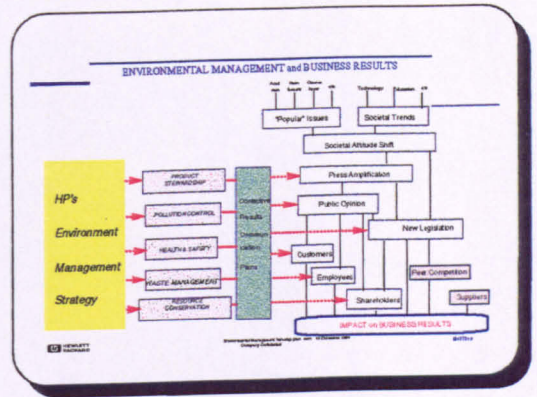


Fig. 13 Environmental Management and Business Results (October 1994)

⁴ A larger version of this diagram is also contained in the support documentation

⁵ The term "stakeholder" is used here to mean any individual or group of individuals who have a "stake" or interest in the company's development.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

From these programme areas, it is possible to assume that HP's understanding of the term "Environmental Management" included Health & Safety management. Indeed a definition of Environmental Management used throughout the company at the time confirms this and is shown opposite.

HP's Definition of Environmental Management
(*HP's Commitment to the Environment*,
Hewlett-Packard Company, 1994)

"Environmental Management at HP includes occupational health, industrial hygiene, safety management and ecological protection".

The researcher found evidence to the contrary. Hewlett-Packard's Environmental Management Policy⁶ refers only to "environmental" issues, indeed the company has a separate Health and Safety policy. Confusion of the terminology surrounding Environmental Management continued throughout the duration of the research, even to the extent that phrases were used interchangeably within the researcher's notes .

Initially, the term "Environmental Management" was used synonymously with "Environment, Health and Safety". To denote purely "environmental" activities the company would use the abbreviation "E", for example E-team or E-programme; the "E" being extracted from the abbreviation "EHS". For some employees however, the term environmental implied internal or working environment and was not associated with "green" issues. This could be due to employees' experience of Environmental Health Officers in their personal lives. Others included both the internal and external aspects of the word environment in their understanding, with indoor air quality, safety and recycling in the same set of issues.

Interview notes with TD (July 1996)

"There is a separate focus of the E, using the upcoming HS audit as an accelerator. ZJ is running a TQC project on the environment with some people who are experts in TQC methodology. By pulling out the E with a separate focus, we are protecting it from the HS flood.

Interview notes with IR (July 1996)

"You just come up to my office area, there was an environmental issue there, which has a real health and safety impact, so I'm looking for health and safety because we have things in place, like a big bucket that really shouldn't be there, packages that shouldn't be there 'cause people can fall over them, that's health and safety. But it's to do with the environment that we're working in."

⁶ Presented in Chapter 2 - Project Background

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

The researcher was keen to promote environmental (green) programmes within the company and distinguish them from concerns about the internal working environment. At the same time the EHS department needed to maintain a consistent and recognisable approach. In 1996, the researcher devised a departmental logo which aimed to provide a better balance between "environmental" and "health & safety" issues. The basis of the logo was a concept that EHS helped HP's Products, Operations and People. The researcher helped the department to turn this into a logo (shown opposite). The logo was used throughout the department's communications and was even used on a team baseball cap, distributed to members of the Field EHS Council (see Story Board Three).

Some notes from the researchers log-book in April 1996 comment on the effectiveness of the "Products, Operations and People" approach. In addition, an interview with one member of the Field EHS Council indicated that the baseball caps distributed were effective as an aid to reminding people about the "People, Operations and Products" concept. This concept pervaded the plan's documentation from then on. Fig. 14 (taken from the plan), drawn by the researcher in 1997, shows how all environmental management activities fall under those categories, or at the intersection between them. This diagram was devised by the researcher in an effort to integrate all the areas of environmental management into one framework.



Log Book 26/04/96

For the first time I felt that at FEHSCO we didn't just talk about H&S. We discussed manager health and safety, waste and energy management and product stewardship - at last!! until this meeting I did not believe it! The people, operations, products line is working!

Interview notes with BK July 1996

We also got little hats. I know because I lost mine. Somebody has taken my hat. I only hope that they are using it effectively. And that they know what the pop culture is. Can you explain to Tima what the pop culture is? Oh come on. It is products, operations and people.

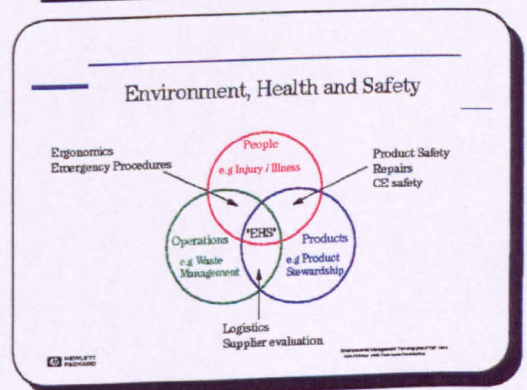


Fig. 14 FY97 Ten-Step Plan "Environment, Health and Safety"

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

As has been shown, certain individuals remembered this approach but towards the end of the research employees were still confused as to the relevance of the "Products, Operations, People" concept. This can be partly attributed to a reliance on the researcher to provide continuous promotion of this logo but who was unable to provide as much support in her final year.

In summary, HP's understanding of environmental management was somewhat confused. The first Ten-Step plan was defined as an environmental management plan, but included a strong health and safety content. The long term focus of the plan, especially in earlier versions, was clearly environmental. The new *Director of Environmental Affairs* assumed that health and safety management could be improved fairly quickly, leaving resources free for tackling more long term environmental issues. Efforts to integrate both environmental and health and safety issues into a common framework were initially successful but were not sustained. Four years on, health and safety management continued to represent the majority of activity within the EHS department. In part, this was related to the development of the environmental management organisation which is discussed in more detail in Story Board Three.

Story Board 2 - Business Planning for Environmental Management

7.3) Preventing Negative Business Impacts

A second aspect of the Ten-Step plan for environmental management was its focus on preventing negative business impacts. This approach is quite distinctive, focusing on protecting the business and not, as might be expected, the environment or health and safety. Additionally, it was assumed that there would be negative business impacts if an environmental management programme did not exist, rather than positive business impacts if it did. Over time, this rather negative approach did change. Later versions of the plan refer to enhancing, as well as protecting, value and of leadership as opposed to just regulatory compliance.

An example of this was seen in 1997 when the EHS department analysed the role of environmental management in the business' value chain.

Environmental Management was then described as having three sources of value. These were expressed as (i) protecting HP from adverse EHS risks (and vice versa⁷), (ii) Enabling effective management of key business processes, and (iii) Providing opportunities in new business areas. The first of these was consistent with the earlier perception that "negative" impacts could be prevented but the remaining two had a more positive outlook. Despite these changes, the approach seen in the planning documentation was still driven by predominantly business needs.

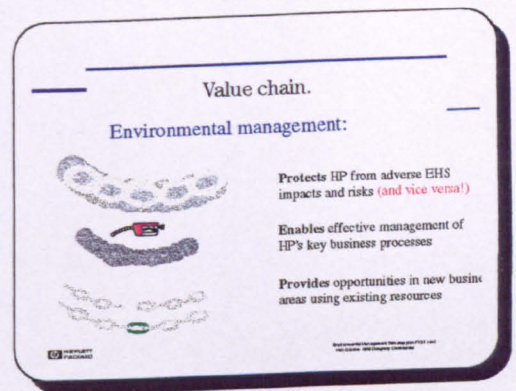


Fig. 15 FY97 Ten-Step Plan "Value

⁷ protecting the local and global environment from HP's activities.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

Story Board One showed that this business driven approach represented only half of the environmental management picture within HP, despite the content of the Ten-Step plan. In particular, environmental management had been expressed as both a business objective and a measure of good citizenship. The plan's documentation did not include any reference to the second of these areas, focusing only on the prevention of business impact. Yet Story Board One shows that a softer approach, appealing to people's values, would also work.

7.4) The Company's Definition and Understanding of "Institutionalisation"

Having reviewed the company's definition(s) of, and approach towards, environmental Management. It is also necessary to determine their perception of institutionalisation, as shown in the research data. The term institutionalisation does not feature in any of HP's environmental management Plans. However, it is possible to distil their approach from the plans and other evidence.

Two main areas stand out in HP's approach. Firstly, HP wanted to improve environmental management and achieve "additional business success largely through the use of existing resources", in other words without increasing the size of the existing EHS department. Secondly, HP's environmental management objectives were framed in terms of improving the quality of the EHS department. Each of these is now considered in more detail as they relate to the central issue of attempting to institutionalise environmental management.

Story Board 2 - Business Planning for Environmental Management

7.4.1) Additional business success largely through the use of existing resources

One aspect of HP's approach was their desire to improve environmental management without additional resources. This was explicitly expressed in the Value Proposition⁸ of the plan shown in Fig. 16.

This concept requires further explanation at this point since it is perhaps the most important premise of EHS activities in HP's UK Sales Region and more importantly provided the parameters for the research objectives. The important concept here is the use of existing resources. Hewlett-Packard Ltd did not want to create a separate function for environmental management. Rather it believed that environmental management would be sustained if it pervaded through the existing organisational structures. This aspect of the plan remained consistent over the four years. Information on the development of environmental management in the organisation, within the constraints of a "no additional resources" objective, deserve the attention of a story board in their own right. Story Board Three - The Changing Environmental Management Organisation - provides this necessary detail.

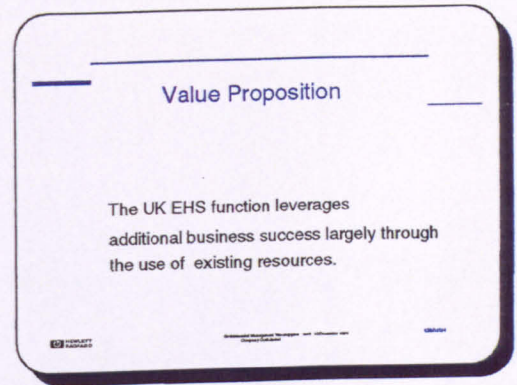


Fig. 16 Ten-Step Plan Value Proposition

⁸ A clear statement of who the target customers are and precisely what key benefits and price will be delivered to them (Hewlett-Packard, 1993).

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

7.4.2) Five Year Objectives set in Quality

Management terms

As mentioned, Quality Management tools were used to devise the strategic and tactical contents of the environmental management plan, track its progress, both quarterly and annually, and provide a means of measuring the effectiveness of the EHS organisation. This approach provided structure to an area of the company which had previously not been exposed to Quality methodology. Corporate EHS Auditors commended this approach (shown opposite).

Interviews carried out in FY96 also gave the researcher some feedback on the use of this methodology for environmental management. One senior manager indicated the wide-spread acceptance of Ten-Step planning within the company. He felt that it was simply a good business discipline to have a Ten-Step plan irrespective of whether the plan related to environmental or other issues. Another manager also commended this approach, recognising the plan as an important tool in achieving change.

The objectives of the Environment, Health and Safety plan were written in relation to Hewlett-Packard's Quality Maturity System (QMS)⁹. In their words, the department aimed "Towards 3.5' in Approach, Results and Deployment" for all of the QMS axes. In simple terms this meant that the department was attempting to improve its performance in a number of key areas thereby being capable of achieving a specific "Quality Maturity" score.

(EHS Auditors' remarks, June 1995)

"Bracknell's EHS program is characterised by strong senior management ownership, solid business planning, and alignment with the principles of total quality management."

Interview notes with PV (July 1996)

"Ten step planning methodology is routinely applied to most business situations so doing a ten step plan was not unique to environment that was just our normal method of tackling things the TSP process involves understand what the customer wants, what resources does the activity need, what the critical business issues are etc.. eventually down into key priorities for the year so it is a logical cascade in looking at an issue - from that we develop a plan and developing key strategies to achieve that. I see that as just a good business discipline."

Interview notes with PV (July 1996)

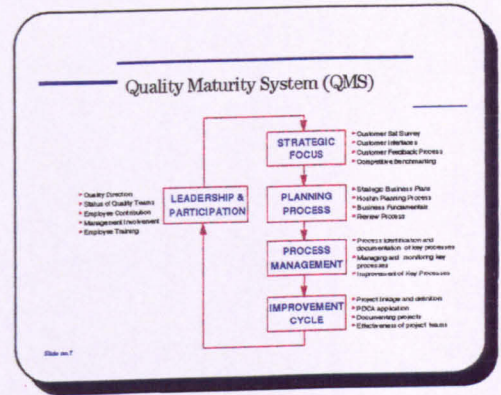
" TD has developed a Ten-Step plan for improving HP's approach to environmental issues - I think that the deployment of that plan and roll-out of it are the most important changes we have had"

⁹ Outlined in Part One - The Players (Hewlett-Packard Ltd)

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

HP's QMS system is based on five axes (described in detail in Chapter 1). These are shown opposite. For each axis, the QMS system measures a business' approach, results and deployment. "Approach" is measured according to their knowledge of their business area, use of data or tools, and whether the business operates predominantly in a proactive or reactive mode. "Results" are assessed according to whether the business' approach is achieving or driving the results they need. "Deployment" is measured in terms of the extent to which the business' objectives are integrated into the organisation. In particular, the "Deployment" aspect of the QMS system is closely linked to HP's desire to "Institutionalise environmental management.



Each axis is assessed according to "approach", "results" and "deployment" and assigned a score of between 1 and 5. A scoring guide is available to assessors, to ensure consistency of approach between reviewers. Before moving on to discuss the progress in this area it is worth dwelling on the notion that these elements can be measured and assigned a score. Assigning a score to these areas reduces their meaning to a single number, but within HP these numbers are very powerful. Many managers in HP recognise intuitively the meaning of a score they are given and will compensate accordingly. Despite this, it is obviously open to misinterpretation. HP's corporate Quality department spend considerable time explaining the QMS system to new users in an attempt to avoid interpretation problems.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

During the course of this project, the company actually changed to a new version of QMS, which moved away from the scoring approach. The researcher decided to maintain consistency of approach in her analysis of the organisation and therefore continued to use the system available at the start of the project.

The use of these "Quality" indicators to measure Environmental Management performance was an obvious choice for the Director of Environmental Affairs since he was an experienced HP Quality reviewer. He believed that the QMS approach would indicate the extent to which Environmental Management was institutionalised. The researcher also believed that the QMS system was an appropriate methodology for assessing and driving the Institutionalisation of Environmental Management. The rationale for this was shown in Story Board One. Consequently, from the first year, the researcher was involved in assessing the overall maturity of the EHS organisation using the company's Quality Maturity System¹⁰.

Since the objective of the plan was to reach a maturity score of "3.5" in four years, it was important to take intermediate measures with the same measurement criteria as each year of the programme progressed. In 1994, a colleague from the company's Quality department assessed the quality of the EHS organisation using this system. His analysis was based on some self assessment documentation provided by the Director of Environmental Affairs. He gave the EHS organisation a score of 2.1 (out of 5) suggesting that "Approach" was strong but "Results" were not evident as yet. His commentary was not surprising; it is shown opposite.

UK Sales Region: Quality Manager: *Memo regarding the QMS scoring of the EHS function.*

"My scoring assessment of your self review is attached. This was a strange process to go through as the group is in a formative stage. This combined with your in depth understanding of Business / Quality results in a document where you know what you should / could be doing in these areas and have plans in place. Words like will and would indicate these future plans. This shows in the scoring with approach being good and results still to come."

¹⁰ The QMS system is described in more detail in earlier sections.

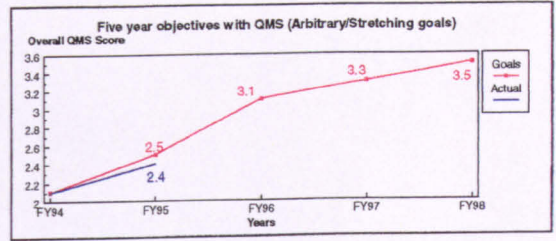
Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

At this stage the organisation has only just been formed and the first ten step plan developed. Ten-Step planning was seen as a good approach but no results had been achieved as yet. In 1996¹¹ a similar scoring exercise resulted in a new EHS maturity score of "2.4" an overall increase in maturity from the previous year. This is shown in Fig. 17. At this stage the EHS department was still very strong on its approach to environmental management, but deployment remained a problem.

The difficulties of deploying environmental management concepts to employees had been exacerbated by an ever growing environmental management organisation. As more people were getting involved it was increasingly difficult to maintain effectiveness as a single environmental management function. This problem was recognised as one which might develop in any organisations hoping to integrate environmental management.

After the QMS review carried out in FY96, the researcher and other members of the EHS department realised that the scoring criteria of the QMS system needed translating into EHS performance measures in order to be understandable to the wider EHS organisation. Only a small number of people, including the researcher, could intuitively understand what a score of "2.4" meant. Not all employees were familiar with the QMS and its specific scoring system.



UK Sales Region: Director of Environmental Affairs: UKSR
EHS Department QMS Review -- FY95

As in 1994, UKSR EHS function remains much stronger on "Approach" than in the other two areas. However, because of the intention to deploy EHS responsibilities into the greater HP organisation, the size of the "EHS organisation" has effectively increased, making deployment goals more stretching. Indeed in the FY96 Hoshin, Leadership & Participation has been selected as the breakthrough issue. One of the strongest messages from this review is the need to re-focus efforts in Process Management.

¹¹ It should be noted that, although carried out in FY96, this analysis was based on activities carried out in FY95.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

As a result, during FY97, the researcher set about trying to link the QMS scores to environmental management performance measures. After several iterations, this exercise resulted in a series of tables (shown opposite and again in Appendix A) which linked QMS scores with EHS maturity at an Individual, Business group and Company level¹². The objective of this was to assist members of the EHS department, such that they would have a clear understanding of what a QMS score of "3.5" for an environmental management function would look like.

These tables were presented in the "People, Operations and Products" format. As with other detailed slides, full versions are presented in the Portfolio Appendices. As a result of developing these tables the researcher (and hence the company) gained a better understanding of what institutionalisation of environmental management would entail. At this stage a specific QMS measurement was not carried out, although both the researcher and other members of the EHS department had a greater understanding about where the organisation needed to get to in terms of environmental maturity.

Fig. 17 (a, b and c) Environmental Management Maturity in QMS terms

EHS Maturity "People" (2)				
Score	1	2	3	4
Individual	Responsible industry body approval to EHS issues Award of company policy Self Certified for business contract	Evidence of individual action. Reporting of hazards and incidents Responsible adherence at workplace and promotional participation in EHS teams outcomes	80% of employees aware of EHS policies & procedures Employees are encouraged to report incidents on reporting activities. High EHS scores on EHS types	All employees accept EHS as part of the "value" proposition Separation of waste producers. Peer pressure on safety awareness
Business Group	Some evidence of EHS having EHS Content Participation in EHS awareness. A range of the uses of recycling and other "green" topics	Support for inspection Management visibility in Green events Some training provided, but not used Some attention to EHS reports. Cooperation with EHS on "topical" items	Nearly all Business have at least one EHS Business Fundamental EHS features in most business plans Business unit reports present at EHS training classes	No business meeting without EHS Content EHS participation in all business plans Integration with Quality at the level of the EHS performance
Company	EHS Policies available Compliance activities reviewed	Participation with EHS interest groups Encouraged, collected employee voice data on EHS matters. Occasional submission to EHS activities	EHS is a "regular" at EHS conferences. Press use of "green" signage on EHS sponsored part of business value safe activities	EHS reported on EHS dashboard & welcoming to guest applications Separate reports (quarterly) issued on EHS to employees and customers

EHS Maturity "Operations" (2)				
Score	1	2	3	4
Individual	Clear awareness of some of the environmental impacts. Small number of employees concerned Little peer support	Employees generally knowledgeable of key environmental impacts Evidence of some individual avoidance or corrective actions Limited support for company EHS schemes	Most employees fully knowledgeable about company EHS activities Personal EHS targets a motivator, widely available Employees actively use the card as a tool for company activities	Typical employee talks enthusiastically about "EHS" & EHS activities EHS activities listed and carried out Strong and effective EHS suggestion scheme
Business Group	Evidence of appropriate statements in some business plans. High risk areas show some form of prevention/prevention activity	Major impacts recognized and communicated Major preventive action Some analysis of EHS importance shown in some business plans Monthly "topical" activities	EHS impacts covered by Business Fundamentals Some improvement plans in place. Some pre active EHS planning in business development Monthly "topical" activities	EHS figures in business presentations as matter of course Specialized EHS metrics identified and tracked Citizenship issues highlighted on business plans
Company	Some attempts to demonstrate accepted compliance to EHS operators. Basic "regulatory" approach	Some environmental "targets". Compliance to accepted norms taken as company standard Defensive player statements in place	Cautious attempts at self publicity to EHS metrics Fully compliant EHS equipment audits Benchmarking undertaken Reporting plans in place	Environmental impact statements used plans as company reports Compliance maintained at most company presentation Environmental plans in "competitive analysis"

EHS Maturity "Products" (2)				
Score	1	2	3	4
Individual	Many employees aware to some extent of actual and perceived environmental reputation of company products	Employees generally aware of company products and regulation. Some can justify with listed examples	Most employees aware of the environmental impact of company products and their importance. Some awareness of general competitive position with regard to EHS	Most employees familiar with environmental features of company products, understand the competitive challenge in relation to and are aware of "value"
Business Group	Business aware of company environmental policies, and capable of justifying them as a "value"	Use of prepared statements and documents. Proactive presentation of Company. Proactive on "topical" issues "regards" for credibility	Capable of customer individual responses. Use of "regards" to address results Wide recognition that "environmental products" can be advantageous	Environmental Products image used regularly as competitive by various staff Individual presentations concerned based on specific customer needs
Company	Use of already available materials prepared "one centralised" for general "regulatory" exposure	Design for environment shows up in some product lines "user friendly" that expected for EHS regulatory	Wider public evidence of product stewardship. Proactive positive consequences of "green" features in products Company image	Separate environmental reporting. Company leaders regularly feature green news of products. Regular details for public relations. Environmental tasks given by non EHS specialists

¹² These levels were derived from the researcher's definition of Institutionalisation - See Story Board One for more details.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

In her final year, despite pressures of time, and to some extent priority, the researcher encouraged members of the EHS department to carry out another QMS measurement. This was carried out by the researcher, the new EHS Manager¹³ and the Director of Environmental Affairs. This assessment was conducted just prior to the FY98 planning process. A score of 3.1 was arrived at, compared to a score of 2.4 some two years earlier (see diagram). Comments from a report describing the third review are shown in Doc. 10. At this stage the objectives were somewhat on track, although significant effort would be required to attain the stretching goal, a score of 3.5, by the end of FY98.

Over the time frames of this project, it appeared, at least according to the QMS system, that HP's environmental management maturity improved over time. The QMS was crucial to these improvements. The assessments caused changes to the department's planning activities in a form of continuous improvement. In particular, an excerpt from the FY98 plan shows how results from the QMS assessment would filter through to the annual planning activities.

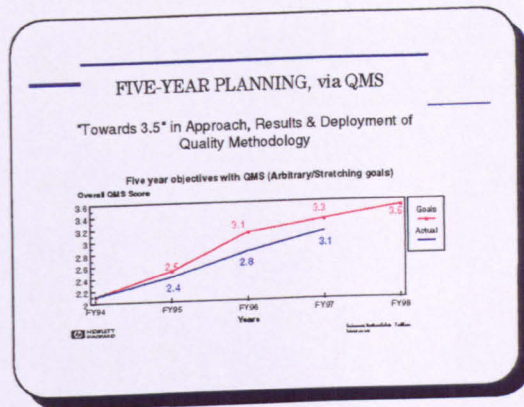


Fig. 18 QMS Scores (January 1998)

UK Sales Region: Environmental Research Engineer: *Report on QMS Measurement.*

"Summary"

"However, as in previous years, the UKSR EHS function remains much strongest on "Approach". "Results" are more evident than in previous years due to the growth of the virtual EHS organisation. However, since it is the intention to deploy EHS responsibilities into the greater HP organisation, the size of the "EHS organisation" effectively increases year on year, making Deployment scores ever more stretching. The FY98 Hoshin will thus be based on improving "Deployment" to the virtual EHS organisation."

UK Sales Region: FY98 Situation Statement

Over the last three years significant improvements have been made in all areas of Environment, Health and Safety management. The Process Management focus during FY97 enabled some understanding of the processes behind a growing EHS organisation, although organisational changes slowed progress in this area. Management ownership of EHS issues still requires a breakthrough effort. Deployment of the Environment, Health and Safety plan through the empowerment of the virtual organisation is the most significant challenge for FY98.

¹³ See Story Board Three - The Changing Environmental Management Organisation

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

Despite continual efforts to address the issue, deployment of environmental management to the wider organisation remains the biggest challenge. This was confirmed in December 1997 when members of the Field EHS Council (FEHSCO)¹⁴ were asked to brainstorm areas which they felt were in need of attention. Strongly evident in this analysis was the need for greater demonstration of value, and general deployment of environmental management to FEHSCO and beyond. Also, it is worth highlighting the perceived need for greater "E" (environmental) focus within the organisation at this time.

7.5) The Role of the Researcher

Over the course of the project, the researcher's involvement with the Ten-Step plan varied. At the outset, the researcher was new to the organisation and had little influence over this plan, but was involved in its implementation.

One year on, in September 1995, the researcher was asked to review the contents of the Ten-Step plan and to make improvement recommendations for the FY96 version (see e-mail). She consulted with members of the Field EHS Council in order to incorporate their various perspectives into the plan's contents.

By 1996, the role of the researcher in relation to the annual planning activities had increased again. At this time, members of the Field EHS Council were asking the researcher for help with their planning activities.

Doc 9

UK Sales Region Administrator: *Minutes of FEHSCO meeting 3rd Dec 1997. "Development areas"*

More "E"

Visibility of EHS **

EHS Leadership **

Q3 Audit

Demonstration of EHS Value **

Ergonomics/Safety Behaviour

Escalation

EHS Communication **

Danger of Delegation

Deployment & Engagement **

Senior MGMT Champions

More Individual Communication by FEHSCO **

Employee "Pull"

Funding for Essential Activities

Recycling UK

** = linked

E-Mail 04/09/95 Review.pre

Dear FEHSCO member,

As you know it is now time to review our ten-step and annual planning. At the last FEHSCO meeting it was decided that we would review the TSP on 23rd Sept during the scheduled progress meeting.

In order that the review day runs efficiently and effectively, it would be extremely constructive for all members to review the existing plan before that day.

This should be a relatively easy process of looking at the plan in the light of developments encountered in the last year of implementation.

Such developments could include, The recent EHS Audit, Changes in customer preferences?, Internal organisational changes, resource constraints etc. etc.

¹⁴ See Story Board Three - The Changing Environmental Management Organisation.

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

A note from one FEHSCO member and a comment in the research log book highlight this in more detail. The comment in the research log book also shows the researcher's increasing awareness of qualitative research methods which was described in more detail in Story Board One and Part Three of the Portfolio.

In 1997, several changes were made to the ten-step plan to better reflect the understanding and practice of environmental management in planning for FY97. On this occasion, the researcher had almost complete discretion over the plan's development. The plan was checked by the Director of Environmental Affairs and the rest of the FEHSCO organisation, but was predominantly based on the researcher's interpretations.

By the final year of the project the researcher was a respected consultant in the development of the Ten-Step plan for environmental management. As an example, in November 1997, the researcher, in conjunction with the new EHS Manager¹⁵, began looking at the Ten-Step plan again. They realised that over time, FEHSCO had somehow lost focus. A great deal of organisational change had occurred over the year. These organisational changes are presented in more detail in Story Board Three to follow. Once again, the researcher also consulted the members of the FEHSCO group to decide areas of development for the FY98 plan.

Although outside the scope of this project the researcher was also asked to prepare the FY99 plan. Notes shown opposite suggest that despite efforts by the researcher to reduce this, the organisation was still somewhat dependent on her for contributions.

E-Mail (22/01/96)

Zoe

Ever conscious of the next FEHSCO meeting is due 14 February and a deadline to develop strategies around the Hoshins by then. Whilst I have some thoughts of my own it would be very useful to discuss with yourself the key direction we should drive the waste and energy Hoshin.

Log Book 31/1/96 (Selected)

"XX came round and we spent quite a long time developing her strategy for FEHSCO. This interested me...

I am quite keen for FEHSCO to work well and develop my 10 step plan. So much so that I spend a fair amount of time chasing people's actions and helping them develop their own planning. Does this matter? I think I have to acknowledge this as I am definitely not observing normal behaviour! I am observing a 'champion' being really keen and motivating (me!?)".

EHS Administrator: Minutes of FEHSCO meeting
9th June 1998

Ten Step Planning - Zoe

The plan was reviewed at the last meeting, nothing specific to report. The Hoshin plan needs to be reviewed and to re-establish what EHS is trying to achieve. It will be put on hold until ZJ has finished her Doctorate

¹⁵ See Story Board Three - "The changing Environmental Management Organisation" .

Part Two - Action Research

Story Board 2 - Business Planning for Environmental Management

7.6) Summary

The objective of this story board was to describe three specific aspects of HP's environmental management planning activities in their attempt to institutionalise environmental management. In doing this, three aspects of HP's approach have been demonstrated, which although not specific to the business planning data feature strongly in them. These are:

- 1.) HP's definition of environmental management is varied, and widespread understanding of its meaning is not evident.
- 2.) The company's approach to institutionalising environmental management is based on a Total Quality framework with the limiting factor of "no additional resources"
- 3.) The role of the researcher changed over time causing some methodological concerns to be raised.

These three topics all feature indirectly in Chapters 11 and 12 in more detail.

Story Board Three, which follows, extends the analysis of the research data outwards from the EHS department to examine "The Changing Environmental Management Organisation" during the institutionalisation of environmental management. This includes an analysis of the role of the central EHS department and a virtual¹⁶ EHS organisation at the company. This story board also presents evidence for two of the key research findings included in Table A.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

Part Two - Action Research

Story Board 3

The Changing Environmental Management Organisation

8.0) Introduction

The second story board described, amongst other things, how senior managers at Hewlett-Packard wanted to improve environmental management using only *existing resources*. The implications of this, from a human resources perspective were that:

- 1.) the EHS group would not have the opportunity to hire new members of trained staff;
and
- 2.) employees within the organisation would have to participate in environmental management programmes without official reporting lines to the Director of Environmental Affairs.

This chapter of the portfolio, the third story board, describes these "organisational" elements of the project at HP. In other words, the departments, teams, councils, and individual champions, who became involved with the environmental management programme, are described.

Since the objective of the research was to learn about the institutionalisation of environmental management, this story board describes how HP attempted to make environmental management part of normal business practice and therefore part of employee responsibilities. In addition, this story board extends the analysis of the research outwards from the EHS department (and its planning activities) into the rest of the organisation.

Within the story board three aspects of the "changing environmental management organisation" are considered:

- 1.) the EHS department, where the researcher was based as a full-time employee;
- 2.) the wider environmental management organisation including ad hoc committees and teams involved with environmental programmes; and
- 3.) the individuals that were involved in specifically "environmental" improvements.

In order to analyse these, a content analysis was carried out on documentation relating to the environmental management organisation and its development. This was to help generate insights into the process of organisational change as the researcher attempted to institutionalise environmental management.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

It should be noted that the content analysis of "organisational" documents was carried out as part of a bigger analysis of research documentation (described earlier). Data relating to the development of the environmental management organisation were found in minutes of various team meetings, the environmental management plan, and in the researcher's e-mail message collection. Many themes emerged during the overall analysis; some of which were specific to the "organisational" data. The themes identified for this story board were labelled as:

- ◆ The role of the EHS department;
- ◆ Getting the right people in the environmental management organisation; and
- ◆ Environmental management as part of the job.

These three themes provide the structure of the story board. Discussion points which are presented in this story board consider the role of an EHS department if environmental management is institutionalised, whether environmental issues are really "everyone's responsibility" and whether environmental management should be considered part of existing job responsibilities or separated out for specific attention. Within this story board, two of the research findings feature.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

8.1) The EHS Department and its role in the Institutionalisation of Environmental Management.

The structure of the EHS department at the start of the project was described in Chapter 2. In summary, at this stage the EHS department consisted only of the newly appointed Director of Environmental Affairs, an out-sourced Occupational Health unit and the researcher. During FY95 the Director of Environmental Affairs was also assigned responsibility for the UK Regulatory department¹. At that time, despite many overlaps, the departments kept their individual identities. When the small EHS department merged with the, existing, UK Regulatory group, the department appeared bigger but actually no "new" resource had been allocated. This was partly to combine two smaller functions but also to address the increasing amount of environmental regulations touching both the regulatory and EHS staff.

Of particular concern, from a regulatory perspective was the issue of producer responsibility, specifically relating to packaging and electronic equipment recovery and recycling. In February 1996, whilst attending a conference on "End of Life Management² for Electrical and Electronic Equipment" (See e-mail opposite), the researcher realised that this issue would require an increasing amount of resource and attention in the future. As a result, the researcher proposed that Hewlett-Packard take on an additional Engineering Doctorate research engineer to carry out a project relating to Hewlett-Packard's "Product Take Back" strategy.

E-mail

Hewlett-Packard Company: European EHS Manager.
Message: EOL electronic products 23/01/96

Hello Zoe,

Let me take a few seconds to thank you for being able to attend the conference organised by the U.S Embassy in London on the above referenced subject. As you may know, the subject is of critical importance to our business and neither <TD> nor myself will be there that day, I'm very pleased that you will be able to attend the meeting.

¹ The purpose of this department was to ensure HP's compliance with UK product regulations, some of which related to Environment, Health and Safety.

² A term commonly used amongst companies addressing producer responsibility, see Story Board Four for more details.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

After discussion with appropriate University and company officials, the project was agreed and the selection process initiated. The second research engineer would also be situated within the EHS department.

Log Book - 9th February 1996

Put forward the idea to TD about doing an EngD (someone else!) in Product Take-Back. TD liked the idea and asked me to put it to the programme director.

The events just described are an example of how the researcher, through constant identification with the research objectives (in this case the restriction of *no additional resources*), could facilitate changes in line with institutionalisation of environmental management whilst based at the company. By this time, the department had also gained an additional part-time administrator to perform personal assistant duties for the Director of Environmental Affairs.

Log Book - 1st February 1996

TD is sounding more and more like he will hire an EHS manager for our site.

In February 1996, the Director of Environmental Affairs commented to the researcher on the possibility of hiring an EHS manager for the Amen Corner site. At the time, this appeared to conflict with the intention of having *no additional resources* devoted to the management of EHS. By the end of the same year, a manager from the Support Services department was given responsibility for ensuring compliance to the Corporate EHS Audit. With a Facilities background, this manager had had good exposure to the wide range of environmental management issues as they affected HP sites. The decision to "second" her, thus leaving official reporting lines within Support Services was a strategic one designed to forge greater linkages between the EHS department and the Support Services Organisation. In November 1997 the same manager was officially appointed as the new EHS manager for the UK Sales Region. In January 1998, the manager relocated (physically) to the EHS department although the job remained funded through the Support Services Organisation.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

This event, and others similar contributed to the formation of one of the research findings which suggests that action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.

In particular, this example shows that environmental management was seen as an appropriate extension of the existing Support Services department's responsibilities. The Support Services function had responsibility for (amongst other things) building maintenance, waste disposal, indoor air quality and the provision of office furniture. With the EHS manager located within this group she had significant influence over environmental management concerns, such as ergonomics, electrical safety and waste reduction.

At the beginning of June 1997 the UK Director of Environmental Affairs became jointly responsible for environmental management in Europe along with another senior colleague from Germany. This appointment meant that the director spent an increasing amount of time fulfilling his European role, with a consequent reduction of time spent on UK related plans. In an interview with him in August 1997, the researcher asked the Director of Environmental Affairs to comment on the advantages and disadvantages of him having taken the European role. Relevant notes taken from this interview are shown. The notes suggest that, overall, the move was a positive one, but it did leave the UK organisation slightly short of resources.

7th August 1997

TD's new role in Europe.

Positive

It suited the UK plans in terms of extending boundaries.

Opportunity to accelerate <BS>

Negative

...really this move was too soon for the UK organisation. Links to person dependency. The preparation had not really been done.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

As can be seen, during 1997 many organisational changes took place within the EHS/Regulatory department. The researcher noted that in the space of approximately one year there were only four staff (out of a maximum of fourteen) that remained constant (one of these four being the researcher). A comment from the research log book related to this is shown opposite. Changes were a combination of staff retirements and resignations, new hires and re-organisations. The researcher felt that these changes slowed the progress of the department and its plans down somewhat, although there was little specific evidence to confirm this.

Log Book - 2nd August 1997

Note... How did I suddenly become the "oldest" (in terms of experience) member of the team.
hmmmm.

At the beginning of FY98, the EHS department was still in a process of change. The boundaries between the EHS and Regulatory organisations were not clear and new staff members were just becoming familiar with the department's objectives and processes. In addition to this, the researcher was unable to devote as much time to her functional responsibilities than had previously been possible, due to final year research commitments. In order to address this, the department decided to hire a one year placement student from Bradford University. The objectives of this placement were twofold. Primarily, the student was hired to liberate the researcher from her departmental tasks and to provide some consistency in their execution. Secondly, the student would provide a bridge between the two departments (EHS and Regulatory) working partly for both.

In May 1998, Hewlett-Packard offered the researcher a full time position in the UK Regulatory department as an Environmental Regulatory Engineer. See e-mail (job offer one) The role will also include some work for the continuing "virtual" EHS organisation as an environmental consultant.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

In the early stages of this project, environmental management would not have existed without the organisation, co-ordination and leadership shown by the EHS department. In particular, the researcher and the Director of Environmental Affairs were vital in the first couple of years of the programme. The choice to "second" an EHS manager from the Support Services Organisation and to take on a second Engineering Doctorate researcher also suited the "no additional resources" approach. Despite this, the department did eventually have to grow and take on more administrative staff to ensure that environmental management continued to grow and improve.

In attempting to create awareness for environmental management issues, it was not surprising that particular individuals in the EHS department became recognised. This was enhanced by high visibility programmes such as the EHS newsletter and other communications programmes. However, there seemed to be a very fine line between employees recognising the contribution of the EHS department's staff and being over-dependent on them. The objective of the EHS department's plan was to institutionalise environmental management, which meant trying to establish EHS as part of "normal business; dependency on the EHS department for co-ordination and leadership seemed to contradict this. Some comments made to the researcher opposite provide further insight in this area. At that stage, this employee perceived that the EHS department would always co-ordinate environmental management but that individuals within other groups would have some EHS responsibilities.

Log Book - 29th February 1996

Spoke to <HR> on the way back from the meeting. Un-prompted she asked me how I thought EHS would progress. She said "There is a great deal more interest now in it, more and more companies are doing it". We discussed TD's vision of a distributed organisation and individual ownership of EHS issues. She took that to mean like the fire marshalls i.e. a rep in each department and a central function. This I would say is half institutionalised i.e. people accept that it should be represented in each dept but they want it to be a specific separate job instead of their own. I drew a diagram to represent this - Flowers.pre

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

These observations were probably based on the employee's experiences as a Fire Marshall, since that is how Fire Marshalls are organised within HP. This conversation, amongst others at the time, developed the researcher's ideas about the role of the EHS department and the extent to which all employees should be involved in environmental management. This was discussed in Story Board One and will be analysed in more detail in Chapter 11.

Further data also pointed to the organisation's dependency on the EHS department. This was shown in the Ten-Step planning documentation for FY98. A specific problem called "dependency on the core team" was highlighted (see opposite). On several occasions the researcher would suspect that employees believed that, since there was an EHS manager, it was the EHS manager's job to manage all environmental management issues. "That's their job" was a common perception amongst employees. A similar phenomenon was described in an e-mail (opposite) from a U.S. Environmental Manager in 1995.

Dependence on the EHS department was markedly seen in August 1997 when the researcher interviewed the Director of Environmental Affairs about his increasing involvement in the European Organisation and also more specifically in the waste management programme discussed in Story Board Five. The dependency on the department, and to some extent the researcher, was an unfortunate consequence of raising awareness of environmental management. This is explored in more detail in Chapter 12.

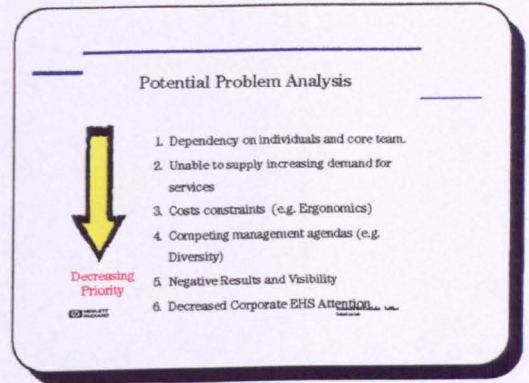


Fig. 19 Potential Problem Analysis (January 1998)

E-mail

"even with this (*top level*) support it seems that many HP managers still rely on their EHS department to "do what is needed" to meet acceptable levels of performance, rather than expecting their managers to develop the infrastructure in their businesses that assures that EHS processes are in place and managed in the business"

(PP, August 1995)

Interview notes with DG (July 1996)

"They probably think that Tom is looking after that, that is rather than personally being involved"

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

Throughout the data obtained from interviewing HP managers, significant attention was seen on the need for a senior environmental management champion and the need for organisational resources in general. In particular, in one set of interviews, managers were asked to comment on the most significant environmental programmes they had noted over the last six months. Nearly all of the managers recalled the appointment of the Director of Environmental Affairs as the most significant recent event, despite this having occurred some two years previously.

The previous account described one of the themes seen in the organisational data. Specifically, as awareness for environmental management increased, the EHS department was seen as the owner of environmental management, despite their objective of trying to achieve its institutionalisation. In some ways, the EHS department was a victim of its own success, having to hire additional staff to continue to meet objectives. This phenomena was also described in Story Board Two, when it was shown that the effectiveness of the environmental management organisation was hampered by its increasing size. These two factors suggest that the institutionalisation of environmental management may not be as easy as is expressed in the literatures

8.2) Getting the Right People

The second aspect of the changing environmental management organisation presented here represents further evidence towards the research findings. In particular that action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.

Interview notes with JG (July 1996)

"Again the real change came when we decided to dedicate a major resource and that is when TD was dedicated and that in turn created people like ZJ and whatever."

Interview notes with DG (July 1996)

"Everybody is so busy at HP with so many initiatives and so many choices that we want the involvement. So the management team would sponsor it. But you definitely need a dedicated team to drive it."

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

This was already seen in the previous section, where the EHS manager was seconded from the Support Services organisation which had existing responsibilities for EHS issues. Other examples are presented here.

Set up just prior to the arrival of the researcher, the first organisation associated with environmental management in the UK Sales region was the Field EHS Council. This council had been pulled together by the Director of Environmental Affairs as one way of achieving environmental management through existing resources. The council (then) included representatives from Facilities, Regulations, Support and Logistics departments.

In addition, two internal "consultants" (experienced EHS managers from HP's UK manufacturing sites) also attended the council meetings in an advisory capacity (see organisation chart opposite). The function of the Field EHS Council was to implement the Ten-Step plan, described in the first story board. By the time the second Ten-Step plan for environmental management had been developed, the concept of the "virtual EHS organisation" had been adopted by the EHS department. The "Virtual Organisation" referred to members of organisation who were involved with environmental management but who had no official reporting lines to the EHS department.

The virtual organisation was used to refer collectively to all the teams and committees involved in environmental management. Consistent with the findings of the research, the concept of the virtual EHS organisation relies very much on adapting existing roles within the organisation.

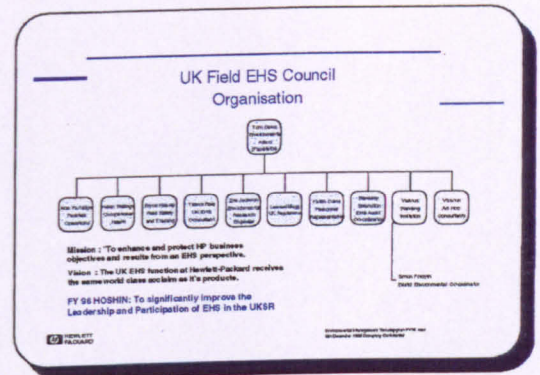


Fig. 20 Field EHS Council Organisation Chart FY96

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

By this time, the FEHSCO team had changed slightly to include a permanent member from the Personnel organisation and had lost its member from the Logistics team. An EHS Audit Co-ordinator was also invited to join the Team to assist with planning for HP's internal EHS auditing process. This co-ordinator would eventually become the EHS manager, as described in the previous story board

In the second year of the project, the researcher was also a permanent member of the Field EHS Council. This provided the researcher with opportunities for observing the activities of the team, whilst feeling the pressures of being an active member as well. The researcher was unable to attend a scheduled FEHSCO meeting in February 1996. Instead she decided to ask a number of council members how the meeting had gone.

One member said that the meeting went well with no major problems. Another reported that it was a good day spent mostly on defining metrics for business fundamentals³. An excerpt from the researcher's log book, shown opposite, describes the result of asking another member of the council. As shown, at this stage the researcher noted that there seemed to be some resistance from the "virtual" organisation.

Around this time there was a second indication of some tension within the virtual EHS organisation. Additional comments from the same FEHSCO member regarding the Health and Safety team⁴ highlight the problem of communicating strategic plans to a more tactical, hands-on team.

Log Book - 19th February 1996

Eventually I went to HS - she told me all the juicy bits!

{Detail removed for confidentiality}

- all in all not a very motivating meeting!

I wonder why? - there seems to be a little resistance from our "virtual organisation" - people who are not directly EHS are finding it a bit of a bind.

HS also told me that the H&S team at Amen Corner also went a bit strangely. She said the team were a bit quiet after TD presented the Hoshins. I think the team people want to be involved but associate planning with their normal jobs? - too serious perhaps from TD? - Who knows.

³ See Story Board One for definition

⁴ note the absence of the term "environment"

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

Despite any tensions within the virtual organisation, the Field EHS Council continued to grow. In 1997, the concept of the Business Unit EHS (BUEHS) consultant was born. The linkages to the existing FEHSCO structure is shown in the organisation chart on the right. These consultants were invited (see relevant documentation shown) from Business Units which had specific risks. For example, a consultant was invited from the Chemical Analysis Group for her expertise and concerns with chemical handling. Another joined from the Medical Products Group and others from Support and Logistics. These became known informally as "Vertical Risk Managers". The concept of "Vertical" and "Horizontal" Risk management is depicted in Fig. 22 drawn by the researcher around this time. Vertical risks, i.e. those specific to a particular business unit within the company, such as chemical handling or consumables recycling, were managed by employees specific to that business unit. These consultants were empowered to make EHS related decisions for their respective business units.

One example of the empowerment shown by these business unit EHS consultants is shown in the e-mail opposite. This manager was not a member of the EHS department. He had a full time position in the Medical Products Group but felt suitably empowered to write this note to his staff on EHS matters.

Throughout the project, the Field EHS Council was the cornerstone of the virtual EHS organisation. Members of the council were all managers whose functional areas all had connections with Environment, Health and Safety management but were not actually EHS department staff.

UK Sales Region: EHS Administrator: *Minutes of FEHSCO meeting August 1996.*

"FEHSCO membership"

"Decision to invite BUEHS Consultants to join FEHSCO agreed unanimously. ACTION: TD to confirm and invite.."

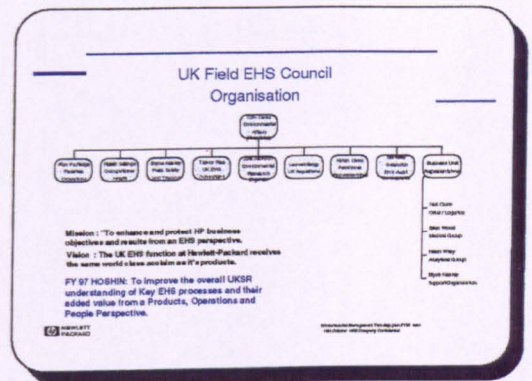


Fig. 21 Field EHS Council Organisation Chart FY97

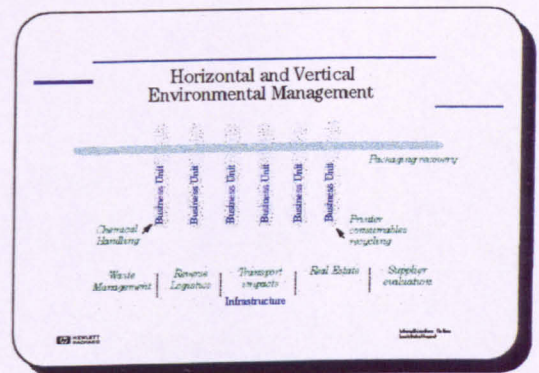


Fig. 22 Horizontal and Vertical Risk Management

E-Mail - Hewlett-Packard UK Sales Region: BU EHS Consultant. Message: *Environmental, Health and Safety (EHS) 04/10/96*

Ladies and Gentlemen,

I am extremely concerned with two instances that occurred today regarding contaminated medical products..... Please be aware that HP have a strict policy regarding contaminated products which is intended to protect HP employees.....If this causes any problems then please contact myself or HS in our EHS department immediately.

Best Regards BW (Healthcare EHS consultant)

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

For instance, in addition to members from the EHS department, FEHSCO included employees from logistics (in preparation for pending producer responsibility legislation⁵), facilities (who had responsibility for waste disposal, real estate, fleet management and utilities amongst others) and support (with responsibility for training customer engineers). Each of these representatives were managers with significant influence within their business unit. During the research evidence was seen that this structure was important.

Interviewer: "You think that FEHSCO will be important to the change process in the end?"

BK: "I don't think it will happen with out FEHSCO. So it is important"

When the concept of the Business Unit EHS Consultants was born this provided even more opportunity for appropriate people to be involved in environmental management. Each was responsible for the (vertical) risks associated with their business. As managers within their organisations, they had more influence over changes in practice, than someone from (say) the "EHS department".

There were other teams that formed part of the virtual organisation as well as the Field EHS Council. Story Board One described the researcher's involvement in a "green team" at the Pinewood site. One member of the green team at Pinewood (JB) was employed within the "Facilities" organisation. This meant that she had specific responsibility for managing the disposal of office waste at that site. After on going environmental discussions, this member proposed that a team be set up across the whole of the Thames Valley sites to examine the issue of waste management in more detail. This would involve similar people from all sites who had official responsibility for the disposal of office waste (See e-mail opposite). Some discussion resulted as to whether this waste management team should contain representatives from other departments as well as Facilities.

E-Mail

Hewlett-Packard UK Sales Region: EHS Engineer.
Message: Waste Management Project 17/10/95

Further to the pre SFM on Tuesday 10th October.

JB mentioned the prospect of carrying out a project to "manage our waste better". I am looking to set up a team with facilities (or a suitable volunteer in the satellites) representatives from A/C CSC, Pinewood and the Satellites, myself and possibly a couple of others to have a look at the way in which we manage our waste.

⁵ See Story Board Four

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Story Board 3 - The Changing Environmental Management Organisation

One member suggested that a "customer"⁶ opinion was needed to advise on the practicality of any solutions from an employees' perspective. Another suggested that employee's perceived waste management to be a Facilities job and hence no-one would volunteer. Once again, the material shown here suggests that individuals at HP were prepared to leave environmental management matters to the responsible part of the company. This was completely at odds with the objective of "institutionalisation" and to date remains one of the most difficult tasks to achieve.

Throughout FY96 the new Thames Valley Waste Management team continued to meet. Towards the end of FY96 and the beginning of FY97 the group realised that there was an obstacle to the team's future success. In identifying waste reduction opportunities, the team had realised that an improved relationship with their waste management contractor would be required. After some initial attempts to influence the management of this contractor, the researcher realised that efforts were slowing down because employees attending the waste management meetings, although enthusiastic, did not have enough discretion to implement the changes that they were suggesting.

The researcher sent out an e-mail to this effect (see opposite). The suggestions she made were supported by members of the team, one member's comments are shown in the e-mail opposite. The project team would now concentrate on the "awareness raising" elements of waste management and office recycling whereas the contractual side of waste management would be tackled on an on going basis by the researcher in conjunction with the Facilities organisation.

E-Mail

Hewlett-Packard UK Sales Region: EHS Engineer.
Message: Waste Management Team 07/11/95

Further to recent messages about establishing a HP-Thames Valley Waste Management Team I suggest that we have a "kick-off" meeting fairly soon in order to establish the purpose and objectives of the team etc.

All facilities representatives originally put forward should attend. At this meeting we will also discuss the future attendance of Non-facilities people either as guest speakers or permanent fixtures (so to speak). AN has also been invited to facilitate the project in light of her experience of TQC and other projects.

E-Mail Hewlett-Packard UK Sales Region: EHS Engineer. Message: Waste Project 02/10/96

Everyone,

After talking to some of you recently, I have the following suggestion for our waste management project.

The original team focuses on raising awareness in the workplace... launching a campaign etc. etc. At the same time.. I work with the Facilities Managers on getting new contracts organised.

I think this might be more practical as it would enable us to get the project more visible more quickly and get people used to the idea of recycling etc and would enable the contract owners more time to change etc etc. Also since some sites own skips etc.. we need to take that into consideration.

⁶ Meaning an internal customer of facilities' services

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Story Board 3 - The Changing Environmental Management Organisation

Although initially a problem, the researcher saw this change as an opportunity to ensure that environmental issues (specifically waste management) were dealt with by the appropriate level of staff in the appropriate parts of the organisation.

By 1998, the structure of the waste team as it had originally devised had changed. As mentioned, in 1997 a decision to split the group's activities meant that the original team had a very specific objective of raising awareness for recycling activities. Other on-going waste management issues were addressed by the researcher in conjunction with the Facilities Managers.

After a short while (and some associated organisational changes), the awareness raising team shrank to only three people and after the launch of a new recycling process⁷ the team did not meet at all. However issues relating to waste management continued to be dealt with by the facilities organisation with some guidance and leadership from the researcher. The more consultative role of the researcher can be seen in the e-mail shown opposite. This e-mail also shows the progress made by the team since the start of the project. This is discussed in more detail in story board five.

The events which led to the formation and reformation of the waste management team are presented here as an example of where having the right people⁸ involved was essential to the institutionalisation of environmental management. This is articulated in one of the research findings which suggests that a large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.

E-Mail

UK Sales Region: Waste Team Member.
Message: *Waste Project 02/10/96*

As discussed earlier, I also feel this is the best way forward. Some of the decisions with regard to contract renewal can only be taken by the SFM's involved and there will be a time lapse as contracts elapse. I don't think it will be feasible going out to tender as a group and we won't be able to do it across the sites simultaneously.

E-mail

Researcher to Waste Management team 2nd July 1998

If any of you would like to discuss any aspect of waste management in advance of the imminent EHS audit let me know...

Good points I think we can be proud of include:

- * Improved measurement of waste data - I have all the figures
- * Increased paper recycling - all offices
- * New cardboard recycling - all offices
- * Getting rid of Wheely Bins - CSC (a particularly nice story)
- * Regular meetings with BFI, Footprint and HP
- * Co-ordinated processes
- * Reduced number of waste contractors
- * Regular spot checks of waste contents * Recycling awareness day
- * Plans for acetate, disks etc.
- * Audited contractors - BFI, Footprint * Waste segregation at CSC

All in all I think we have come a long way.

See you all soon

ZJ

⁷ See Story Board Five

⁸ This concept is explored in Chapter 11 in more detail

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

In this case, the individuals in the original waste management team did not have adequate discretion to implement necessary changes within their role.

A second example of where the EHS department tried to establish a team with the right people was the team set up to manage issues associated with the End-of Life of electrical equipment. As mentioned earlier, FY97 saw the introduction of a second research engineer focusing on the issue of product take-back. As a result of this project, a wider team focusing on End-of-Life Management (for electronic equipment) in the UK was set up in the company.

This team was called EOLM (End of Life Management).

An excerpt from the minutes of their first meeting is shown. As can be seen, the group was set up to be a "tongue in cheek" virtual organisation. This is because the team set itself up as a pseudo-company, with Managing Director, Technical Director and other officially titled roles. The team continued to run in FY98. Government pressure in the area saw HP take a strong position on emerging "take-back" legislation. Members of the EOLM organisation were mainly from the Business Development team, the manager of which was a member of FEHSCO. This group was targeted because the team had experience of HP logistics processes. The second research engineer continued to provide research and practical input into that group, demonstrating more indirectly the benefits of insider-based research to HP.

UK Sales Region: EHS Engineer No. 2
EOLM Initial Meeting - Minutes 24th April 1997.

"Purpose"

To discuss the future role of EOLM as a "tongue in cheek" virtual organisation within LSO and HP Ltd, in relation to the End of Life Management of HP products within the UK and Eire.

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Story Board 3 - The Changing Environmental Management Organisation

Similarly to the Waste Management team, the End-of-Life management team was set up in an appropriate part of the organisation which had experiences of asset recycling and logistics. Getting these areas to adopt their respective areas of environmental management took time: the specific case of waste management is examined in story board five.

The examples described here have shown that getting the right people involved with environmental management can be rewarding. This was seen at two levels, the individual and the business group. With individuals, it was important that they were afforded adequate discretion to implement changes which would improve Environmental Management. At a business group level, it was important that aspects of environmental management were deployed in the appropriate (existing) areas of the business. Story Board One showed how these ideas formed into a concept called "Environmental Management with no EHS department" and subsequently into the related research findings.

8.3) Environmental management as part of the job

The third aspect to the changing environmental management organisation which will be discussed here is whether environmental management should be considered "part of a job", or separated out for specific attention. Story Board One showed how, at the start of the project, the researcher tried to establish green teams consisting of enthusiastic volunteers. Just prior to the establishment of the Pinewood Green Team, the researcher facilitated a "brainstorming" session at the Pinewood site EHS meeting. This was organised in an effort to encourage employees to identify the environmental effects⁹ of the Pinewood site.

⁹ The researcher understood this term to be equivalent to environmental aspects as defined by the international

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

The researcher asked the group to identify factors that they considered fundamental to the successful implementation of environmental initiatives; the response is also shown opposite. These responses helped the researcher in her understanding of the organisation. In particular she noted the strong focus on "measurement" indicated in these factors and the strength of quality management at the company.

One of the success factors identified mentioned that "everyone has some element of environmental responsibility - perhaps should be measured on their environmental performance". At the time the researcher agreed with this perception. In fact, in several EHS newsletters (see Story Board Four to follow) the researcher used the phrase "everyone's responsibility" in association with environmental management. Later the researcher developed a model depicting the role of individuals in environmental management¹⁰ which contradicted this perception. This model provides support for one of the findings of the research which suggests that a large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.

Doc :3.

HP UK Sales Region: EHS Engineer: *Environmental Impacts of Pinewood site. Brainstorming session results. February, 1995*

The following topics were deemed to be environmental issues for Pinewood.

The landscape (Positive and Negative), Litter, Traffic/Transport, Recycling (many items mentioned), Water Usage, Energy, Kitchen waste,

Factors that were considered fundamental to successful implementation of environmental initiatives.

Ownership of problems, recognising that everyone has some element of environmental responsibility. Perhaps should be measured on their environmental performance.

Measurable Targets

TQC project methodology required, a more business like approach to environment is needed

Communication of results and of HP environmental literature in general

Incentives to attract people to take part.

" I think this is one of the challenges that TD has. In getting this ownership of responsibility permeating through all levels of the employees"

(Notes with PT July 1996)

standard for environmental management.

¹⁰ Described briefly in Story Board One and discussed in more detail in Chapter 11.

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Story Board 3 - The Changing Environmental Management Organisation

As a result of the initial brainstorming session, a member of the Pinewood EHS team was asked to organise a "green" subcommittee of the EHS group (see opposite). A newsletter distributed around the Pinewood site at the time describes the development of this "green" subcommittee against the wider organisational context at the time. The separate "green team" met several times during FY95 investigating such issues as site energy consumption and waste management.

Despite regular meetings, by FY96 the activities of the "green-team" at the Pinewood site were virtually non-existent. Members of the team told the researcher that whilst they remained committed personally to improving the environment, and would continue to do so whilst at work, the additional work involved with the "green" team was taking up too much of their time.

A memo sent out by the researcher around that time describes this in more detail. These events helped form some of the researcher's early ideas about the role of "green teams". This was discussed in more detail in Story Board One¹¹. When the Pinewood "green team" failed, the reason provided was that the team meetings took up too much time (which their managers resented). Whilst this may have been an excuse, the reasoning caused the researcher to have further ideas about successful environmental management. It appeared that separating "the environment" out from the general duties of employees (even particularly committed ones) would eventually cause some resentment. The employees actually said that they would still continue to consider the environment where they could in their job but that they could not commit to extra team activities.

E-Mail

Pinewood Site: Facilities Co-ordinator: Message
How can Pinewood be Greener ? 10/07/95

The Environmental Health and Safety Committee has given me the task of running a sub-committee to make pinewood a greener, more environmentally friendly building.

It would be ideal if the sub-committee was representative of the different groups in the building, but it is more important that the members are enthusiastic.

HP UK Sales Region: EHS Engineer: *Memo to Pinewood EHS Team members. 19/01/96*

A review of "Green Team" activities at the end of 1995 revealed that although there was still interest in improving the environmental performance of the Pinewood site, time available to commit to meetings about such activities was becoming difficult to find.

At the same time the UK Field EHS organisation was developing its plans for FY96. It was decided that their main focus for this year would be to "improve leadership and participation with "prime partners" in the organisation". One of these prime partners being Facilities.

Thus, for FY96 we have decided that in terms of reporting "Green Progress" to the EHS team JB and I will form a "Partnership" of EHS and Facilities to promote greener activities.

Other "Green Team" members will now act as "ambassadors for our cause" within their department or area. It is likely that we will encourage more people to become these ambassadors and help us spread the message. These people will not attend regular meetings together relieving them of any formal time commitment.

JB will report our progress at the EHS team meetings as normal.

¹¹ Describes developments in research methodology and ideas.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

Another example of where HP tried to make environmental management part of a "job" and not a separate activity was in the development of the Office Responsible Manager¹² (ORM). Prior to the arrival of the researcher, the Director of Environmental Affairs had introduced environmental management as part of the ORMs' responsibilities. Excerpts from minutes of the relevant ORM meeting are shown opposite. The role of the ORM at that time was "to monitor the work environment to ensure people are working in a safe manner and to take the necessary action". Although several environmental issues were introduced as part of discussions relating to environmental management, the role of the ORM was predominantly associated with health and safety.

By FY96, the Director of Environmental Affairs had become the Office Responsible Manager for the Amen Corner Office and was influential in further developing the role of ORM. He developed a job description for the ORMs with associated performance metrics. This job description covered EHS related matters in a more encompassing but less identifiable way. The ORM Council continued to meet every six months, always covering EHS topics in their meetings. A note in the minutes of a meeting during this year point to a change of strategy in terms of internal awareness raising regarding EHS. The concept of "Pull" as opposed to "Push" marketing is discussed more in Story Board 1 and in Part Three of the Portfolio. It represented a change in thinking about the way to "sell" EHS products to the organisation. It was seen to be better to create "pull" for environmental management rather than "push" the issues on to people. This was later represented in a diagram shown here for interest.

Minutes of the ORM meeting held on 23rd February 1994.

Environmental Management

TD introduced the topic of environmental management and outlined the main areas as being:

Product Stewardship

Waste Management

Pollution Control

Environmental Health and Safety

Job Description: UK Sales Region ORM (Office Responsible Manager)

Function: To ensure effective implementation of HP's legal, corporate and communications requirements at a particular site.

Key areas:

Management of cross boundary issues

Assurance of "HP-Way" norms and values

Assurance of site compliance to legislation and policy

Assurance of local external relations and image

Interview notes (TD July 1996)

Office responsible managers (ORM) had little job description. They are responsible for making sure that HP Way is run in that office. I did a trade off with them so that I facilitated activities in which they benefited and they were given a budget, etc. In return, they would return with EHS concerns.

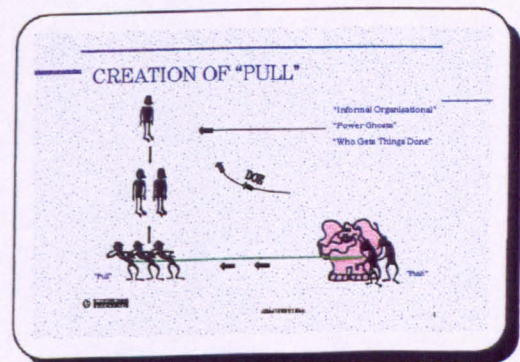


Fig. 23 Creation of "pull" for environmental management

¹² The manager responsible for a single office location as opposed to the various functions within that location.

Part Two - Action Research

Story Board 3 - The Changing Environmental Management Organisation

8.4) Summary

In Story Board Three, the organisational characteristics of HP's attempt to institutionalise environmental management have been described. Notably, this story board introduced three themes:

- ◆ The role of the EHS department
- ◆ Getting the *right* people in the EHS organisation
- ◆ EHS as *part of the job*

In particular, data and discussion presented in this story board considered the role of an EHS department if environmental management is "institutionalised" showing that at HP leadership from a central or senior management position was seen as important to *maintain momentum*. Also, this story board raised the question whether environmental management is really everyone's responsibility and whether it should be considered part of existing job responsibilities or separated out for specific attention. These questions are considered further in Chapter 11 where the framework for institutionalisation of environmental management is presented and discussed in full.

Story Board 4 (to follow) extends the analysis of research data outside of the environmental management organisation, in its broadest sense, and considers the communications tools used to raise awareness for environmental management amongst general HP employees. Also the reader will learn about four distinct approaches used to "sell" environmental management in HP.

Part Two - Action Research
Story Board 4 - Getting the Message Across

Part Two - Action Research
Story Board 4

Getting the Message Across - Environmental Management Communications

9.0) Introduction

The third story board described how the environmental management organisation adapted and grew over time as HP attempted to institutionalise environmental management. As a follow-on, this storyboard provides details of the communication tools used by the "virtual" and core EHS organisations during the same period. This should provide the reader with an introduction to the types of messages being communicated, their author(s) and intended audience(s).

One aspect of the action research methodology was aimed at raising the general awareness for environmental issues amongst the whole organisation. This included the researcher co-ordinating newsletters, notice-boards, events and presentations. This story board describes the use and content of these communications activities. The data are grouped according to the method being used to achieve change. Throughout the research many techniques were used to achieve change at the company and four of the most prominent are described here. It should be noted that these techniques were not determined in advance. They were evident only through the continuous analysis of communications data as the project progressed. The approaches taken by HP to achieve change are described here as four themes identified within the communications data. These themes helped to form some of the research findings depicted in Table A. Briefly, the themes were:

- 1.) Using a business argument to motivate change,
- 2.) Using the culture to change the culture,
- 3.) Using leadership to promote change, and
- 4.) Using a personalised approach to encourage change.

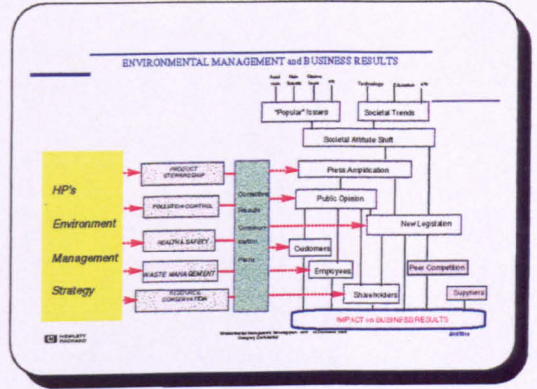
These themes were not time related, they were seen throughout the project both concurrently and independently. As such, this story board is not chronological. Instead, communications data relating to each theme will be presented in a logical order. Each of the story boards includes reference to a wide range of data sources, however, in this story board, articles from newsletters and magazines predominate.

Part Two - Action Research

Story Board 4 - Getting the Message Across

9.1) Communications Context

The diagram shown opposite, taken from the second story board, shows that "communication plans" are a vital element of Hewlett-Packard's environmental management strategy. The researcher was in a good position to influence and collect examples of environmental management communications that were used throughout the project. Most of these were written by members of the EHS department, although there were exceptions.



Shortly after her arrival, the researcher was encouraged to use internal communications tools to introduce herself to the organisation. This was achieved through an article in HP's internal magazine, "Read-Out". This article introduced the researcher and, to some extent, environmental management to the company. The article described the researcher as working at Hewlett-Packard under the Director of Environmental Affairs, whilst also carrying out research in the general domain of environmental management. This is a good example of how the dual role of the researcher was made transparent from the outset of the project.



After a period of orientation at the company, the researcher was asked to increase the number of "environmental" articles which featured in the Read-Out magazine. An opportunity for this arose in June 1995. The researcher had noticed a project with some environmental benefits that could be described in such an article. The researcher approached the project's managers along with the Read-Out editor and arranged the article, depicted on the right.



Hewlett-Packard ENVIRONMENT
What's edible, 100% natural and doesn't cost the earth?

The answer lies in a new type of packaging that is the opposite of what you'd expect. It's called the "Eco-Pack" and it's made from 100% recycled paper. It's the only packaging that can be recycled with the waste that it's made from. It's also the only packaging that can be recycled with the waste that it's made from. It's also the only packaging that can be recycled with the waste that it's made from.

Part Two - Action Research

Story Board 4 - Getting the Message Across

The article (in August 1995) described a new type of packaging that was being used by the local customer service centre. The project team, looking into the problems associated with expensive "foam-in-bag" packaging, identified a cheaper, environmentally responsible type of packaging that met their practical needs. The main purpose of the article was to communicate that environmental improvements need not be expensive, hence the title of the article. A relevant extract from the article is also shown opposite. This article was the first of many examples where environmental issues were positioned amongst business objectives. This was seen as a suitable approach throughout HP, as an example the extract opposite is taken from an interview with Hewlett-Packard's Chief Executive Officer.

9.2) Using the Business Case

The use of a "business case" for communicating environmental management was exhibited in a number of ways. On the one hand, environmental management was communicated as NOT costing more money. This approach was used to encourage employees to adopt environmental practices since there would be no financial impact from doing so, as seen in the article about biodegradable packaging just described. The second approach can be seen in an article called "HP Puts Cleaner Water On Tap". The article (shown opposite) described how HP's Chemical Analysis equipment was being used to improve the quality of drinking water. The article was actually written by a Sales manager within the chemical analysis group described as "HP's Environmental Account Specialist". In this article "the environment" was expressed as a business opportunity as opposed to a way of reducing costs.

*What's edible 100% natural and doesn't cost the earth"
- August 1995*

This goes to show that environmental initiatives do not necessarily have to cost the earth, and can be part of a successful business operation. "

Interview notes with LP (January 1997)

"HP managers do respond to the right thing to do for HP, and also to social considerations, but if EHS can show a cost improvement, a productivity gain, or other business case it would help".



"HP puts cleaner water on tap" - December 1996

This is a classic example of HP exploring a business opportunity which also benefits the community.

Part Two - Action Research

Story Board 4 - Getting the Message Across

The "business case" for environmental management was also used in internal EHS newsletters as shown in the excerpts opposite. Frequent reference to "cost saving" or "value added" services was seen.

This is an expected approach for a company to take. There is a wide range of literature which describes environmental management in terms of win-win situations or saving money through cost reduction. It makes financial sense for a company to promote the environment in this way and is the most accepted wisdom on getting buy-in from financially driven managers in firms.

Despite this, in Story Board One (and to a lesser extent in Story Board Two) it was shown that a combination of business results and citizenship objectives actually provided the motivation to be green, the shade of "green" depending on the mix of objectives¹. This suggested that in some instances, the business case was not, in itself, sufficient for achieving change. Other examples were seen where the company, and indeed the researcher, would promote the value of environmental management as part of good Citizenship as opposed to a business case. These two approaches are discussed in more detail in Chapter 11.

Chapter 1 - The Players - described Hewlett-Packard's long-standing culture, in particular the Citizenship Objective. References to this objective and other elements of HP's culture were also used to motivate organisational change.

"EHS Newsletter" - March 1997

There are three main benefits to this new service - the paper is collected for free from HP premises. - all paper collected goes to make recycled paper - For every tonne recycled £10 goes to charity.

In particular the following services have added real value to the management of our business, financially as well as in terms of employee welfare.

"EHS Newsletter" - May 1998

Switching recycled paper is an important first step in reducing the environmental burden of our paper consumption, reducing the amount of unnecessary paper used at work would also help, and save money at the same time.

There is also an increasing volume of customers, from major accounts to the household printer, that are requesting collection and scrapping of their out of date equipment.

¹ See Fig. 1 in Story Board One

Part Two - Action Research

Story Board 4 - Getting the Message Across

9.2) Using the culture to change the culture

The second theme seen particularly in the communications data was that HP was trying to use existing elements of their strong company culture to stimulate organisational change. Throughout the internal communications, environmental management was positioned in relation to existing elements of HP's culture. This became known internally as "using the culture to change the culture". An example from an EHS newsletter at the Bristol site which captures this nicely is shown opposite. HP did not have an environmental management programme per se in 1957, however early corporate objectives are used as a legitimiser in this example.

Hewlett-Packard's culture has many documented attributes, as described in Chapter 1. Additionally, the researcher observed additional practices which were not explicitly documented as company objectives and values but nevertheless seemed to be an assumed part of the HP-Way. The environmental management communications at HP reference some of these cultural elements. It is worth pointing out that of the data which refers to company culture, the majority were written by existing HP employees and not the researcher. As the research progressed, the researcher latched on to this technique and started using it actively to achieve change. As previously mentioned, communications activities were not organised according to these themes, but they were very evident upon analysis.

"Hewlett-Packard's commitment to the environment is deeply rooted in the cultural values on which this company was built. It stems from the corporate objectives we established in 1957 that call for us to be an asset to each community in which we operate."

(Bristol EHS Flyer - Date 1997)

"From a shareholder perspective HP's own corporate objectives include citizenship as a key corporate objective - so we have articulated as a company a clear commitment to good citizenship and all that that involves. I think that environmental issues are embedded in that" (*Interview notes with PV - July 1996*)

Links to corporate "Citizenship"

"Model Environment" - June 1995

"Hewlett-Packard is a model of good environmental citizenship. Their policy is one of honesty and partnership with Lothian Regional Council.

"*Environmental Management for business today*" - December 1997

From HP's point of view, environmental management is an obvious extension of our traditional corporate objectives, starting with "Citizenship".

In keeping with its history of responsiveness, HP is aware of emerging trends

"EHS Newsletter" - May 1998

By doing this, HP will be disposing of its equipment in a responsible manner whilst at the same time fulfilling its legal obligation and being a "good citizen"

Part Two - Action Research

Story Board 4 - Getting the Message Across

References to company culture were seen in a number of different and distinct ways. The first method seen was when a specific item, for example a business fundamental or a company objective, was used as a type of hook for the environmental issue in question. The hook was used to add legitimacy to the environmental issue since it was already well established in the organisation. This was seen most prominently in the use of the "citizenship" objective.

In addition to specific references to the "Citizenship" and other documented objectives, there were other, less explicit, references to aspects of HP's culture. In these instances no recognisable item was referred to, but a connection was made with the general *modus operandi* of the business. For example, see the quote taken from the magazine article "HP helps put cleaner water on tap". The author of this article seems to believe that HP has a reputation for exploring business opportunities with a community orientation.

Other messages about environmental management re-enforced previously stated, or assumed, aspects of HP's culture. For example, several articles mentioned that HP was "working in partnership with" someone (for examples see opposite), which is characteristic of the way in which HP conducts business. One particular example of this was seen in a Read-Out article, not written by the researcher, detailing HP's accreditation to the British Standard for Environmental Management (BS 7750) at their South Queensferry site. Other examples seen were articles which referred to HP as "being amongst the leaders" which, again, is an "unsaid" element of HP's culture (See quote opposite).

"HP puts cleaner water on tap" - December 1996

This is a classic example of HP exploring a business opportunity which also benefits the community.

HP working in Partnership with....

"Rubbish plan thrown in bin" - March 1995

HP's Real Estate Manager, CH joined forces with other major companies and Bracknell Forest District Council to oppose Berkshire's Waste Local Plan

"Model Environment" - June 1995

HP has been working with the British Standards Institution since 1991 to help develop the environmental management standard

Their policy is one of honesty and partnership with Lothian Regional Council.

"HP puts cleaner water on tap" - December 1996

HP's Chemical Analysis Group is working with a number of UK companies to improve the quality of our drinking water.

"EHS Newsletter" - August 1996

Shortly, the EHS department, in conjunction with Site Facilities, will be running a recycling awareness campaign so watch out for that too.

Model environment

South Queensferry has received BS 7750 certification for environmental management - one of the UK's first large operations to receive this certification since its official launch on 30 March 1996. HP has been working with the British Standards Institution since 1991 to help develop the world's first environmental management standard, and was one of three Scottish electronics firms involved in the pilot programme.

Site Environmental Manager, Trevor Dyer is delighted that HP is one of the first recipients of the BS 7750 certification. "One of the central themes of the BS 7750 standard is continual improvement. For HP this focus on improvement involves the way we run our business - making environmental management a natural extension of Total Quality Management. BS 7750 is a demanding standard but once we welcome because environmental protection is a critical issue for which industry must be prepared to take responsibility."

The South Queensferry site has also

received much recent environmental recognition. In 1995, it was one of HP's five operations to completely eliminate use of CFC's (Hazardous Depleting Chlorofluorocarbons) in its manufacturing process. There have also been several other initiatives and in replacing its refrigeration plant with a CFC-free system. Upgrading the building's cooling system will also result in a 50% reduction in water usage. Energy savings of 20% have been achieved since 1991, with a further 10% saving expected from the cooling system upgrade.

Lothian Regional Council's Deputy Director of Water and Drainage, Dr Malcolm Haug said, "Hewlett-Packard is a model of good environmental citizenship. Their policy is one of honesty and partnership with Lothian Regional Council. They have consistently achieved 100% compliance with discharge standards and have been willing to advise other companies in Lothian on good practice. We sincerely hope that other companies will follow HP's lead in striving for continual environmental improvement through BS 7750 certification."



(Interview notes with IR - July 1996)

"Hewlett-Packard would always want to be seen to be a leader, which is part of the HP-Way"

Part Two - Action Research

Story Board 4 - Getting the Message Across

As mentioned previously, the concept of "using the culture to change the culture" became a recognisable and distinct approach to achieving change at HP. The principle behind it is that (within HP at least) existing elements of the company's culture can be used to highlight areas which are closely linked to the culture but which are not being adopted. This approach questions whether members of the organisation *really* subscribe to the HP-Way. If they do, then they will be environmentally responsible as well. If not, then their legitimacy in the organisation is questionable. This might seem like quite a strong approach to take. However, these approaches are not enforced militarily, rather they are *suggested* indirectly in communications.

These approaches legitimise Environmental Management for those members of the organisation who are sceptical about environmental issues, but accept the contents of the HP Way. In this way Environmental Management was positioned as part of the "HP-Way" in an attempt to Institutionalise Environmental Management. The concept of "using the culture to change the culture" eventually formed one of the research findings which suggests that considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.

Part Two - Action Research

Story Board 4 - Getting the Message Across

9.3) Using leadership to promote change

The third theme seen in the communications data relates to the use of a leader, or figurehead, to add credibility to the message. This was done in one of two ways. Namely, a leadership figure was used to elicit authority or to further encourage and empower employees.

The use of a leader as an authority was first seen in a newsletter for the Pinewood site in 1995. In an article about Environment, Health and Safety, the reporting lines from a recycling committee to the managing director were clearly delineated. This was probably to show the importance of the issue to senior managers at HP. Comments from an interview in July 1996 show that the presence of a leadership figure was appreciated for his ability to exert influence.

Throughout the research, several EHS Newsletters used the presence of a leadership figure to motivate individuals. August 1996 saw the production of the first EHS newsletter distributed to sales-region employees. The newsletter used the "Products, Operations and People" logo described in Story Board Two. This newsletter was primarily an awareness-raising tool for the imminent Corporate EHS Audit. It described the EHS audit process and how employees could provide help. The most prominent topics mentioned were "Manager's responsibility toward Health and Safety" and "Office Recycling". Several references were made to leadership figures, including the involvement of the Chief Executive Officer of HP in reviewing the Audit results.

Interview notes with PT (July 1996)

"We have appointed a director of environment and we have given him resources to make sure that HP's pursuing the environmental agenda and he has an organisational position and credibility within the team structure that enables him to exert influence"

Extracts from the EHS Newsletter (August 1996)

Bracknell's EHS programme is characterised by **strong senior management ownership**, solid business planning and alignment with the principles of Total Quality Management

Next year our audit results **will go all the way to (the CEO)** so that he can monitor us against what he considers to be a very important business fundamental.

Part Two - Action Research

Story Board 4 - Getting the Message Across

Late in October 1996 the second EHS newsletter was distributed. Once again the main contents of this newsletter related to the EHS Audit that had been conducted one month previously. The newsletter used a picture of the UK Managing Director to attract attention. There was some evidence that this approach worked. A relevant e-mail comment from one of the researcher's colleagues is shown opposite.

Although a great deal of communications used a "leadership" figure to encourage or enforce change, other data (presented in Story Board Three), suggested that this level of organisational commitment was not enough to motivate change in its own right. The influence of other levels of the organisational hierarchy was also required. Nevertheless, the use of a figurehead to at least visibly support change programmes was important. The levels at which change needs to occur within the organisation feature in one of the practical recommendations of the research, specifically that managers should focus on "middle" managers and supervisors in addition to top management. The role of leadership and senior management commitment is discussed in more detail in Chapter 11.

E-mail RC (October 1996)

I have not really been 'aware' in the past BUT I did take the time to read the newsletter... partly because 'it was pretty' and (The Managing Director) caught my eye !"



Story Board 4 - Getting the Message Across

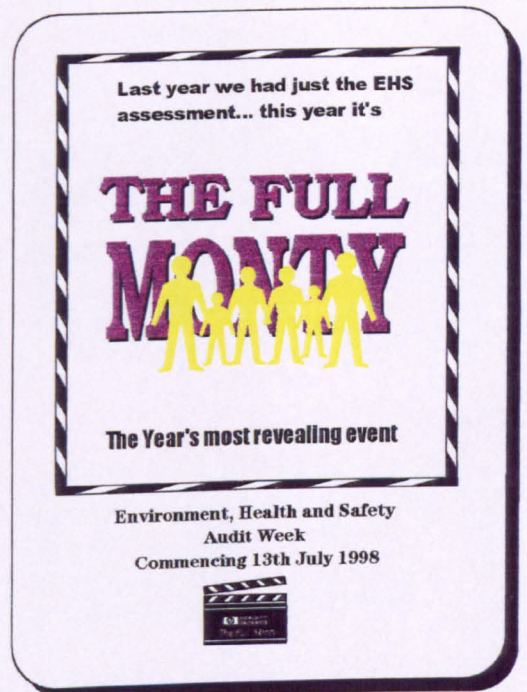
9.4) Using a personalised approach to encourage change

The fourth theme, seen specifically in the communications data, shows how HP tried to personalise information in order to get a message across. This was apparent in several of the communications data and was exhibited in a number of ways.

Earlier it was described how, in the first year of the project, the researcher co-ordinated an article called "What's edible, 100% natural and doesn't cost the earth?". In this article, new biodegradable wheat packaging was described in relation to a familiar wheat snack. The fact that the packaging was edible also helped this association. This approach was intended to attract the reader's attention.

Much later in the project the researcher devised a "movie" theme for an Audit awareness campaign, which was once again aimed at raising EHS awareness through something familiar to employees in the company. An example of a poster used in the movie theme awareness campaign is shown opposite. These examples need not have been specific to environmental management. They could be used to raise awareness and "grab attention" for other organisational issues. Arguably, these approaches could be more effective at attracting attention to an environmental management issue because they are not using stereotypical environmental images.

The second type of approach within this theme was to appeal to people *en masse* for assistance in environmental management programmes. Examples of this type can be seen particularly in the EHS Newsletter articles which referred to environmental management as "everyone's responsibility".



Story Board 4 - Getting the Message Across

As an example, in April 1997 the researcher helped organise a "Green Day" at the Amen Corner site. This was part of waste management programmes at the time and so the background to the day is described in slightly more detail in Story Board Five. The e-mail message opposite shows the communication which was used to invite members of the existing "virtual" EHS organisation to the event. This message was sent to several groups in the organisation. The communication focuses on a more individual style, highlighting fun things to do. It was also designed to make the volunteers feel important and part of the larger environmental management network.

In December 1997, the Director of Environmental Affairs wrote an article for the "Read-Out" magazine describing, in some detail, HP's view of environmental Management. This was perhaps the most detailed article about environmental management to feature in Read-Out during the project. Many of the themes seen in other communications also feature in this article. The main message of the article described the increasing importance of environmental management to HP's sustained business and the approach taken by the company. The article recognises the contributions which individuals in the organisation have made so far in terms of environmental management. This is shown in the excerpt opposite.

As discussed in Story Board Three, the perception that environmental management was "everyone's responsibility" altered during the project, nevertheless, some of the communications tools used throughout the project relied on this kind of message. This is discussed in more detail in Chapter 11.

E-Mail

UK Sales Region: Research Engineer: Message - EHS Team invitation 03/04/97

As a member of our Field EHS Council I thought you might like to know about a "Conservation Lunch" at Amen Corner on Friday 11th April. Come and find out about Hewlett-Packard's commitment to the Environment. There will be information, freebies and a competition and the restaurant will also be serving "green" food. There will be an opportunity to sign up for involvement in future green projects and to become a "conserver at work"

Book the date in your diary now... watch out for more information! Please forward to members of your organisation that might like to attend.

point Environment Management for Business Today



The main message of the article described the increasing importance of environmental management to HP's sustained business and the approach taken by the company. The article recognises the contributions which individuals in the organisation have made so far in terms of environmental management. This is shown in the excerpt opposite.

This recognition is thanks to countless individuals across the world who personally consider the environment to be an important part of our business practice.

Environmental Management for Business Today - December 1997

Part Two - Action Research

Story Board 4 - Getting the Message Across

9.5) Summary

The data presented in Story Board Four described how HP used a number of techniques to sell the benefits of environmental management to employees. These four methods were not the only methods seen, although they were the most prominent. Tables 1 and 2 in Appendix B show excerpts from the communications data according to all of the themes.

None of these methods were distinct to environmental management communications. In other words, they featured equally in communications about other issues at the company. It is not really surprising that managers used similar techniques to motivate change whatever the issue, however the tools used in this case study are still relevant for further discussion. In particular they are presented as an example of where language and techniques used were consistent with prevailing company practices.

Having presented three perspectives on HP's approach to achieving institutionalisation of environmental management, the next story board examines the achievements in one specific area of environmental management as an indication of the project's success. Story Board Five describes changes to the management of office waste at the company over a four year period.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

Part Two - Action Research

Story Board 5

Single Issue Focus - Improving Waste Management Policy and Practice

10.0) Introduction

The first four story boards have taken distinct aspects of HPs efforts to institutionalise environmental management and examined them over time and according to the main tendencies exhibited by the data. This storyboard is slightly different in that it follows the progress of a single environmental management programme area over time, namely waste management. It cuts across the previous three story boards (with reference to all three in places) focusing on just one programme area. The objective of this story board is to portray some results achieved during the institutionalisation of environmental management. This should provide the reader with an idea of the practical aspects of the research at HP, highlighting, again, the changing role of the researcher over time.

The contents of this story board show aspects of all of the themes seen in the data. Unlike previous story boards, this one is presented as a chronology divided into yearly sub-sections. This story board (as with others) includes reference to a wide range of data sources, however in this particular story board electronic mail messages form the main body of evidence. A secondary objective of this story board is to demonstrate the value of electronic mail as an organisational research tool.

Story Board 5 - Improving Waste Management Policy and Practice

10.1) Waste Management FY95

In FY95 the researcher started to look at improving environmental programmes in the UK Sales Region. After some initial work trying to raise environmental awareness at the Pinewood site (see Story Board Three) the researcher was directed towards improving office waste management. The researcher obtained some guidance in this area from the Corporate Solid Waste Management Programme. The notes opposite are taken from a message distributed world-wide regarding "solid waste management". They provide context for the remainder of the data. This document gave the researcher some idea of the company-wide intentions regarding waste management and guidance on how to progress within the UK Sales Region.

As a first step the researcher arranged to meet the Amen Corner Site Facilities Manager. In advance of the meeting, the researcher devised a set of questions as shown in the Log Book excerpt opposite. In terms of the volume of waste, the manager was aware that four skips of known volume were removed twice a week (normally) from the site but they did not know the equivalent weight of waste. The waste was compacted and weighed locally. All wastes went to the same place; a local landfill site. The contractor was chosen because they had been used reliably for some time. The manager had considered sending the waste to be incinerated but decided it was too far to send the waste and would be too expensive. Additionally, at this time, there were two recycling streams, white paper and plastic cups, but these were not measured. The researcher was quite surprised by the manager's response, particularly that they did not know the weight of waste being disposed to landfill or the quantities being recycled.

1994 SWM Survey Results

As we move towards meeting our 1995 goals the 1994 survey results are not only a gauge of our past progress, but are an indicator of what type of effort will be needed over the remaining months. By now all HP sites should have a designated SWM co-ordinator to facilitate this effort.

The company's landfill diversion rate increased 7% in 1994 to 68%. Paper and packaging materials continue to lead the mix of solid waste streams accounting for 38% of the total waste generated. (95 goal: HP performance for landfill diversion will be measured against the following goals:

Company - 10% improvement for landfill diversion

Sites - 15% improvement over 1994 if less than 39%, 10% improvement if rate is 30%-60%, 5% improvement if the rate is between 60%-75%

The "R3" hierarchy (Reduce, Reuse, Recycle) will be employed wherever possible to minimise the environmental impact of wastes generated by HP operations. Landfill should be utilised only after a thorough review of their options.

Log Book - 24th February 1995

Meeting DB Facilities UKSR

Questions sent in advance of meeting.

- 1) How much waste (volume or weight) is generated at A/C per week/ month / year
- 2) Where does that come from?
- 3) Where does it go, do we have someone who comes and transports it away?
- 4) If so where do they take it?
- 5) What was the process for deciding how to get rid of the waste i.e. why that particular contractor.
- 6) What about building and / or electrical waste

Story Board 5 - Improving Waste Management Policy and Practice

Towards the end of FY95 a UK Sales Region "Waste Management Committee" was being discussed. A message sent by the researcher to several site facilities managers on the subject of setting up a waste management team is shown. As a result of earlier indications from HP employees, the researcher was aware that "quality" (in particular TQC) methodology was widely used internally to manage improvement projects. Furthermore the researcher wanted to approach an environmental programme in this way to establish whether or not it was an appropriate tool for environmental management.

A short while after this message, the researcher asked for volunteers to join the team. It should be noted that the researcher was suitably empowered in the organisation to do this without appearing to be an intruder.

At each site, a representative from the Facilities' organisation volunteered (or was delegated) to join the team. There were no management-level "Facilities" staff wishing to join the team at this stage. Also offering to join the team around that time was a colleague from the Support Service organisation with TQC project experience.

One of the key factors in getting that team together was the personal commitment to environmental issues shown by the Pinewood site's Facilities Co-ordinator. Within the first year of the research project, this employee had also attended a night school course on environmental issues, to assist her in her job.

18th October 95 - From Researcher to SFM's

I am looking to set up a team with facilities (or a suitable volunteer in the satellites) representatives from A/C, CSC, Pinewood and the Satellites, myself and possibly a couple of others to have a look at the way we manage our waste.

The team would look at the waste originating from the sites, assess whether there was any scope for minimisation and determine the best practical disposal option for their waste.

The project has a potential to become a TQC project but I think we should start by simply trying to improve the process and then see if we can get somewhere with it.

Can you all please suggest who a suitable representative would be for such a project.

From AB to the Researcher.

JB and I discussed this project last week and I am willing to act as facilitator if you wish.

There may be potential for a TQC in this but I think it needs careful assessment first as this kind of activity can be quite time consuming so the gains should be substantial.

E-mail 20/11/95

Guys

Just one more notice about the meeting on Thursday (23rd). I have invited SF to attend the first meeting. He is the environment manager at Bristol and has some experience in setting up waste management projects. He is there to be probed about his experiences so please feel free to think of any questions he could help us with.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

The group started very promisingly using the TQC format, but after a while it became somewhat tedious to document all stages of the project when all the team wanted to do was "get on with it". The format did prove to be extremely useful in the early stages of the project when the problem needed defining and objectives setting. Once the implementation of solutions started, the need for the TQC format appeared to fade. Several references were seen in the story board data which allude to the effectiveness of this approach. The use of Total Quality Management in this project was a good example of attempts to "use the culture to change the culture" as described in Story Board Four.

10.2) Waste Management FY96

The waste management project was officially launched one month after the start of these discussions on 23rd November 1995. The researcher had invited a colleague from the, more experienced (in waste management terms), Bristol site to advise the group.

During the meeting, the group devised the phrase "Let's talk waste not rubbish" as the theme of the group. The excerpts opposite are taken from the minutes. They show the group's decision to continue with TQC methodology and the "Issues statement" that was devised. The focus of the group was to reduce costs, maximise revenues and minimise environmental impact. The EHS Audit is shown here to be a driver for the project.

Excerpts from Waste Management meeting

23rd November 1995

To Quality or not to quality.

It was decided that for the time being we should progress along quality axis, so to speak, conducting a structured improvement project. On a regular basis we will evaluate the project's potential for TQC, but the important thing was considered to be making improvements and not winning awards.

Issue Statement

The purpose of the project was discussed and the preliminary Issue statement was agreed to be; " **Build a waste management system to reduce costs, optimise revenues and minimise environmental impacts as indicated by the EHS audit score.**"

This issue statement is intended for the UK Thames Valley sites although other sites can be used for best practice sharing and consultation.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

By January 1996, the team seemed to be having "spin off" effects (see e-mail opposite). There were still some problems encouraging one manager to think about recycling, the researcher noted the comments shown opposite in her log book. Notes from the researcher's log book in February 1996 describe her reflections after another waste management meeting. The quality advisor had helped the group focus, with the outcome that a survey of employee perceptions of recycling would be carried out.

The recycling survey was carried out in March 1996. Each member of the team was asked to conduct interviews with employees at their respective sites, either by telephone or face to face. In all over seventy people were surveyed. They were asked several questions relating to the "recycling facilities" at their sites.

The results suggested that most people were aware of some recycling facilities, but there was room for improving the "advertisement" of existing facilities. Also, about half the respondents had seen information relating to recycling at the sites (in particular at the Pinewood site). All respondents felt that recycling was a good idea. On average, roughly half the respondents had seen recycling information around the sites, most of the remainder expressing a wish to see more. At the Pinewood site in particular, nearly all of the respondents had seen recycling information. This was good feedback for the researcher who had spent some time trying to increase the awareness at that site in particular during early stages of her research.

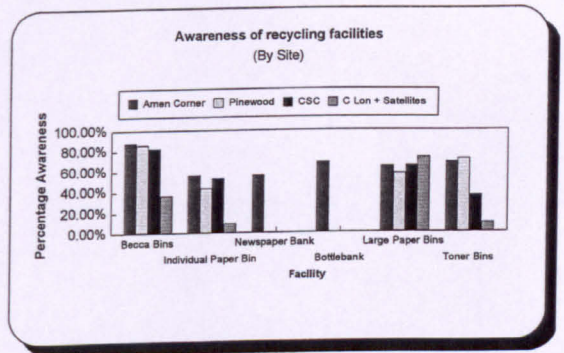
30/1/96 Log Book entry

Chatting to DB (Facilities). She starts to tell me about a *shredding service* and waste management at the sites. She said "the cost of sorting our paper doesn't make it economical even if we get paid for it". I am not sure how much of this is guesswork or real calculation. The new system will be in place in May, probably for all sites - note the "multi-site" approach. Is this a spin off from the waste management team?

08/02/96 Log Book entry

The waste team on Monday

AN took over and really helped us to generate our process and do a fishbone analysis. I didn't mind the take-over and I don't think anyone else did. The quality approach works again. The outcome of the meeting was that we would run a survey to prove whether our perception of the problem of waste management is actually the problem - good idea.



Story Board 5 - Improving Waste Management Policy and Practice

Despite this, throughout the research, comments from employees suggested that there was still not enough information about recycling and that people weren't interested anyway. An example of this, taken from some interview notes with a manager at HP is shown in more detail opposite.

After the next waste management meeting, the researcher made the comments shown opposite. These remarks show the emphasis of the team being very much "action" oriented. In particular the comments from one member were indicative of the hands-on approach desired by the employees in the Facilities organisation.

Over the next few months the waste management team collected data on the quantities of waste arising at their site and the cost of its disposal. This activity took some time and caused the group to get slightly off track from a TQC perspective. Having identified the quantities of waste arising at the sites and the employees' attitude towards recycling, the group started to consider the following: using the "web" as a source of recycling information for employees, providing "gifts" to people as incentives and reminders, and re-negotiating waste contracts.

At this point the team encountered a problem. In order to improve waste management arrangements with the waste contractor, involvement from Facilities Managers was required. At that time the team did not include these managers, although they fully supported the project. Consequently, in September 1996, the team decided to split its activities. The e-mail messages shown here describe this split in more detail. This split was also described in Story Board Three in more general terms.

Interview notes with CM (July 1996)

"I would say that if you ask people they would say it is very important. If you observe what they do. You would say that it isn't very important. Like for example. I don't see people recycling paper. Which we use and waste in huge quantities. We have some recycling bins, in the Xerox room. But I think people would not make a journey back to those bins. I think the paper ends up in the wastebasket. Which is an indication of how important people regard an environmental issue."

26/04/96 Log Book entry

We had a meeting to discuss the findings of the recycling survey. The team was not really interested in the results as such, as ever they just wanted to get on with finding a solution. I think facilities managers are very much like this i.e. "fix-it" types.

Quite a surprising turn of events actually - VB jumped up (literally) and said "we don't want to ask people what to do - we want to tell them!" - "We want to say that this is HP's policy" - "you put those things here and these things here". So I guess that is what we will do!

E-Mail Hewlett-Packard UK Sales Region: EHS Engineer. Message: *Waste Project 02/10/96*

Everyone,

After talking to some of you recently, I have the following suggestion for our waste management project.

The original team focuses on raising awareness in the workplace... launching a campaign etc etc. At the same time.. I work with the Facilities Managers on getting new contracts organised.

I think this might be more practical as it would enable us to get the project more visible more quickly and get people used to the idea of recycling etc and would enable the contract owners more time to change etc etc.

E-Mail

UK Sales Region: Waste Team Member.
Message: *Waste Project 02/10/96*

As discussed earlier, I also feel this is the best way forward. Some of the decisions with regard to contract renewal can only be taken by the SFM's involved and there will be a time lapse as contracts elapse. I don't think it will be feasible going out to tender as a group and we won't be able to do it across the sites simultaneously.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

September 1996 also saw a Corporate EHS assessment of the UK Sales Region. This was in preparation for a full EHS audit roughly eighteen months later. One of the assessment criteria was "solid waste management". Whilst the Sales Region did not fail this section, there were several recommendations made relating to solid waste management. Comments from the Assessment report are shown. Specifically the auditors recommendations were to "Assess opportunities for improvement in the site's solid waste reduction efforts and establish appropriate business goals and metrics" and "Ensure that pollution prevention objectives and accomplishments are communicated on a region-wide basis". At the end of FY96 this showed the group that, although progress had been made in collecting site waste data and educating employees, more attention to this area was required.

UK Sales Region Environmental Management Second Assessment - September 23 - 27, 1996

This section deals with the UK Sales region's efforts to reduce pollution at its sources and minimise solid waste going to landfill. Given the climate around the world, and Europe in particular, companies are being pressed to reduce their volumes of solid waste. Currently, UK Sales generates about X tons of trash per year, and of this only x% is being recycled, reused, or diverted from the landfill.

The recycling program is relatively new. In order to make the program successful and get the necessary attention and resources, a formal plan with business goals, objectives, and measures needs to be developed. Once developed, the effective communication of the plan and results to management and all employees needs to occur. Many interviewed were aware of a waste reduction program, but did not know how it impacted them specifically.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

10.3) Waste Management FY97

At the start of FY97 an EHS newsletter¹ was distributed to follow up the corporate EHS assessment. This included the auditors recommendations on solid waste management. An employee responded to the newsletter with a detailed message about environmental issues in the office shown opposite. The researcher was pleased that the employee had read the newsletter and bothered to respond in such detail. Secondly she was surprised by the broad environmental awareness shown and the emotional tone used. In addition, the use of the Bristol site as a comparison showed the importance of internal consistency between UK sites. This employee's response confirms that raising environmental awareness needs to be a cultural change. He states - "Something isn't quite right - it may be the culture or it may be to do with the working environment". This employee seems to be referring to a negative side of HP's culture where people are too busy or don't care about the environment.

The researcher responded to the employee as shown in the e-mail opposite. The tone of this message highlights the role of the researcher in the organisation; she assumes an employee's perspective. The contents of this and other messages were analysed in more detail.

E-Mail 24/10/96

"Zoe, Thanks for the newsletter which makes interesting reading. I've a couple of comments which you may wish to follow up on.

In general in the Amen Corner office, if not the UKSR, I think we have more problems than just "solid waste reduction" when it comes to resource usage. You may find a trip to the Bristol site would provide an interesting comparison with Amen Corner. In general I get the impression that there is a far more advanced attitude to recycling - with prominent bins for disposal of paper, batteries, ring binders etc. I know we have bins for paper in Amen Corner - but nearly everyone just throws everything into the waste paper bin under their desk. Batteries are a source of serious environmental pollution if treated as normal waste - and again in Amen Corner they just get thrown into the normal bins (I take mine to facilities, who can arrange for them to go to the right disposal process, but I doubt whether many other people do). There is a very low usage level for pottery mugs - we must get through an amazing number of plastic cups for drinks. There can't be a good excuse for that - in Bristol they have glasses, and apart from being a more civilised way to drink, it should cost less to wash glasses than to throw away plastic cups. Even if it doesn't HP should take the "greener" option. Something isn't quite right - it may be the "culture" or it may be to do with the working environment."

Richard, 24/10/96

...I absolutely agree that we have more problems than "solid waste reduction" in Amen Corner. Our programs include

1) Resource Conservation i.e. looking at energy, water and material usage. 2) Pollution Control.. not too much at this site but some "facilities impacts". 3) Product Stewardship i.e. moving towards customer and internal product recycling as well as waste management.

The reason this was highlighted in the newsletter was that the recent assessment picked it up as an area in need of significant improvement.

I also agree with you about Bristol. I work closely with Simon Forsyth and use him as a "consultant" to our waste management programs here. I think the culture is slightly different at Bristol, but only for the continual efforts of the EHS staff and other green people. I think we can develop a similar "culture", but only through consistent and appropriate communication and motivation. In FY97, I plan to raise the profile of green issues in the UKSR through green teams or volunteers.

You will also be glad to hear that at the moment we have a waste management tgc running to raise the amount and awareness of recycling facilities in the UKSR.

Cups... this is an interesting one.. in Amen Corner only we buy 36,000 cups a week. This is a large number accounting for about 5-6 cups a day each which is not surprising. We do recycle a large proportion of these through the Becca Bin scheme. The decision to use ceramic mugs is not an easy one. continual washing of these has an environmental impact as well, but the real problem is again a cultural one. Would everyone wash their cups enough or would this put an added strain on the cleaners? However... I really like the idea of glasses in the restaurant. I am going to consider this and talk to facilities and the catering staff about the possibility.

I hope this answers some of your concerns, if we do implement

¹ See Story Board Two - Getting the message across

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

In general, the need for waste management was expressed in terms of cost reduction, compliance and stakeholder pressure. From a cost perspective two opposing positions were seen in the opinions of employees. One employee thought that HP should not spend additional monies on "paper separation" even if environmental benefits would be seen, but another employee (example to follow) thought that HP should spend additional money on washing glasses (as opposed to recycling cups) just because it was the right thing to do. This suggests that these employees would respond to quite different motivators in order to adopt environmental practice. As a consequence of this particular message, the researcher received another reply shown opposite.

Around this time efforts were being made to highlight the issue of waste management to employees, and as a result of the previous messages the researcher asked the catering staff to put a poster up in the "coffee rooms" describing the amount of plastic cups used for drinks. One employee commented on these notices and suggested using ceramic mugs instead. This was a popular concern for employees at HP, although not one which was ever resolved.

Zoe, thanks for your reply.

...Anyway, I agree that pottery mugs are a problem. The choice seems to come down to:

- 1) Every time you use one, clean it before/afterwards, just using a running tap and a scourer. I must admit I can never find the time for this.
- 2) Allow the mug to develop a patina of dried tea/coffee - this has the advantage that nobody will "borrow" the mug in question. However it looks nasty, and I always leave it too long between trips back home for a cycle or two in the dishwasher.
- 3) Have dishwashers (machines not people) in the office...? I think they have one in London. However, if you wash a cup every time you use it I guess the resources used must come close to a plastic cup.

36,000 a week is an awful lot though. That's nearly 2 million a year! Do we know what happens to the ones that are recycled (there's no excuse for not putting them in the recycling bins, but I suspect that a lot of people don't bother)? Are they made back into cups? I find plastic is far and away the worst household recycling problem. I try not to buy things in disposable plastic containers, but inevitably we acquire some - I take the plastic bottles to the dump once in a while, but they take up a lot of space waiting to go, and there's no sense in driving to the dump specially.

Anyway, I'm glad to hear it's a subject that is being thought about. I think a lot comes down to individual motivation, but some corporate encouragement can only help.

"I have just read the notice about plastic cup recycling in Amen Corner and the fact that we are recycling over 100,000 cups per month in Amen Corner alone. Even though I think it is admirable that we are now recycling these cups, wouldn't it be better to go one step further and get rid of the majority of these as much as possible by asking people to bring in their own cups/mugs from home and using these?"

Story Board 5 - Improving Waste Management Policy and Practice

Another message in early 1997 which came to the researcher's attention referred to a process for recycling unwanted (used) Christmas cards. This process had been set up without the EHS department's involvement. The researcher noted that other groups in the organisation were aware of environmental issues and without being asked to, were implementing specific solutions. This was entirely consistent with the objective of institutionalising environmental management. In addition, the researcher believed that this type of self driven approach should be encouraged at every opportunity.

As part of the waste management team activities, in November 1996 a new paper recycling processes was piloted at the Pinewood site. This trial was to determine the effectiveness of a recycling company that approached HP for business. Their proposed process was positive, both financially and environmentally, and the company would also donate money to charity on the company's behalf. This company would take mixed paper waste (as opposed to the previous "white paper only" arrangement. The waste management team intended to implement the new process to other sites over time.

In December 1996 the same process was adopted at the CSC site and by the end of January, the new paper recycling bins were installed in the Central London Office. This left the main Amen Corner Headquarters site. The group decided that a "launch" would be required at this site and not just an overnight change.

03/01/97

Amen Goods-In

"Please do not throw away your unwanted Christmas cards

The Amen Corner post room is operating a recycling project for all of your unwanted Xmas cards. Please give them a call or just drop them off at the post room which is situated at the rear of building one on the ground floor."

1st November 1997.

From Site Facilities Co-ordinator PWD site. (General Distribution)

"Recycling of Office Paper"

New Blue *Company* recycling bins have appeared in the office today.

Please use these bins for - All white and coloured stationery - Envelopes / Manilla folders - Trade journals & brochures. If you are sorting out a lot of paper please ask "X" in the post room to bring you some blue sacks.

For every tonne of waste paper we recycle, £10 will be donated to *A Charity* - watch this space for amount donated in the first month.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

The details of the launch day took several months to organise. By then it had grown into a more general "Green" day. In April 1997 the launch went ahead. The new recycling process was launched at the Amen Corner site on that day, over 100 employees expressed interest in receiving an "individual" recycling tray for their desk area. The image shown opposite shows the article which featured the Green Day in the company's internal magazine.

Shortly afterwards, in May, there was evidence that the new process was starting to create more awareness. One employee commented on what he termed "new emphasis being given to the recycling of paper". This message, shown opposite, reflects employee practice at this time. It also shows some of the personal opinions of the employee.

Another employee commented on some minutes from the EHS team at the Pinewood site. He was suggesting further improvements in waste management at that site in the area of organic waste. This message demonstrates an example of where an employee was bringing his environmental values from home into the workplace. In an interview in July 1996 another manager alluded to the linkages between home and work practice. Later it will be proposed that this is an important phenomenon to encourage, if changes are to be seen at an individual level. This was also discussed in Story Board Four.



12th May 1997

I was pleased to see new emphasis being given to the question of recycling paper at HP. However, I'd like to discuss a couple of points with you if possible:

The first is that I'd be interested to know how the new system will be monitored, and improved if necessary. My initial impression is that in the CSO/PSO area (first floor building 1), we still have a problem with the amount of paper that people simply put into the plastic bins immediately under their desks. Maybe we will have to resort to having the cleaners sift all the paper (and cups!) out at the end of the day....I certainly put all my waste paper into the new recycling bins, but I can't see an easy way to persuade other people to if they, don't care. There is a dearth of those new blue cardboard collecting bins (the little ones) in our area, and for most people like me (who are "hot-desking") there is nowhere to put them anyway except maybe on the floor (one under every desk?).

Secondly, I'd like to know whether we have any flexibility regarding the choice of charity to whom donations will be made in proportion to the amount of paper that is collected. Will the nominated charity be reviewed from time to time, and will employees have any opportunity to nominate one? I'll be quite honest with you - personally I don't donate money to Imperial Cancer Research because of the vast amount of animal experimentation that they fund. However, regardless of my opinion, it would seem reasonable to consider the possibility of identifying charities (not pressure groups, e.g. Greenpeace) who are closely involved with protecting the environment, as potential beneficiaries of a recycling scheme which is itself aimed at reducing resource consumption.

06/07/97 Diane Gill / Steve Bacon E-mail

"I noted the minutes on waste recycling. What about removing vegetable matter from the rest of office waste? My apple cores and banana skins ferment a treat in Pinewood's environment, so I tend to wrap them up to keep the smell down, thus wasting two resources! Wokingham district council is currently encouraging home composting by selling the equipment at discounted prices - and has a source of lidded bins which may be used for recycling the significant quantities of vegetable waste generated in the office area - particularly on Tuesdays and Thursdays!"

Interview notes with PT (July 1996)

"I guess the interesting thing is -is change, because of the conscious activities of the company, or is that change because the rest of the media making people more aware? Therefore they relate to things a little bit more. I know you did a survey on peoples awareness on recycling and so on and so forth. But is that simply because they are used to doing it their domestic life?"

Story Board 5 - Improving Waste Management Policy and Practice

After the "Green Day" at Amen Corner, the original waste management team, now working on just the awareness side, did not meet again. Despite this, the Facilities' managers continued to consider formalising their relationship with their waste management contractor. Rather than go out to tender (as originally planned) the team decided to strengthen the relationship with the existing contractor to determine whether they could meet HP's needs. The researcher had a preliminary meeting with the contractor about this as shown in the e-mail message opposite.

As a result of this exercise a new team was born, this time with involvement from the facilities managers as well. The team met with the waste contractor and arranged for meetings to be held on a quarterly basis in the future. The team identified cardboard as the next waste stream to target for recycling. New processes were set up at the CSC and Amen Corner sites. A message from one facilities manager to the researcher shows a suggestion to include the cleaning contractor in these meetings. The researcher was pleased that this manager was starting to pro-actively suggest improvements. Representatives of the cleaning company were invited to join the team. They commented that attending the meeting was very useful to them and it made it easier to communicate HP programmes to their own staff.

A note from the researcher at the end of July 1997, suggests that she had been "left out" of the team's communications. The researcher was pleased by this, she wanted the group to carry on working on waste management issues without any prompt or suggestion from the EHS department.

Dear all,

I have just finished having a very interesting conversation with two people from a *company*, our current waste contractor. One was the UK Sales Manager. Despite the sales pitch, I was very encouraged by what they had to say.

They are interested in improving our relationship with them, in particular having more dialogue on new trends such as the landfill tax and the packaging recovery regulations.

We had a good scoping conversation about how we can improve our working relationship with them in line with our EHS and service expectations.

What I would like to propose now is that some of us get together with them in a brainstorming type session on how we can improve the existing waste disposal process.

They would then like to go away and put together a presentation for us on some solutions to our needs. ie start with a clean sheet. I told them that we might want to keep some "recycling" contractors such as X, Y and Z. They are happy to work along side these companies. I also said that I would like to have any new relationship set up well before the next EHS Audit!

I think the most appropriate team of people for the initial scoping discussion would be those responsible for the actual operational side of the waste contract. I also think we could involve the cleaners. Perhaps, JB, CL and LB? along with myself and someone from footprint. Bev (in her EHS role) swanston may also be a good idea....

...If we can get a good management contract going with BFI, I think we will be able to meet our Audit criteria a lot more simply.

8th July 1998

Zoe,

As we have now completed the first stage of our recycling procedures and the cardboard is going to be offered to a paper mill, have we or will we be meeting with *the waste contractor* in the near future?

To ensure that we have the commitment of the cleaning company and their staff, I feel that all the relevant people within the cleaning company organisation should be invited to attend the next meeting.

As part of the first stage we (facilities) had a meeting with CM and BM from *the cleaning company* and we found this an essential first

30/07/97 - Researcher to waste team

Cardboard recycling etc

I was wondering how the cardboard recycling process was going. I heard that building two had started, as had CSC but I have not heard how things are going.

Part Two - Action Research

Story Board 5 - Improving Waste Management Policy and Practice

In September 1997 the researcher received another e-mail message from an employee regarding waste management. The same employee had previously contacted the researcher in response to the EHS newsletter. This time, his comments were as shown. On this occasion, TD, the director of environmental affairs, provided the employee with a response (also shown below).

24th September 1997

Paper recycling.

Zoe, Tom, I'm about to leave the office (CO/PSO area in Floor 1 Building One, Amen Corner), and the cleaners are doing the rounds of the desks and bins.

It's painful to see how they are emptying bin after bin of general waste, most of which is paper, into bin liners. The many plastic cups that remain on desks are being rounded up separately though.

I'd be interested to know whether the new paper recycling scheme has been successful in increasing the amount of paper that we are recycling. I suspect not in this particular work area...

I realise that it is very very difficult to persuade busy people to think twice before throwing paper into the nearest bin, but I can think of two or three suggestions which might improve things:

- 1) Add a paper recycling bin, in addition to the plastic "general waste" bin under every desk. This would leave too little leg room, and is effectively a hazard, as highlighted on the recent SLIP training course that I attended.
- 2) Remove all the waste bins from under the desks. Replace with several sites prominently located around the work area, with three large bins each - one for cups, one for paper, and one for whatever other junk people throw away (though we should of course have separate collection bins for toner cartridges, batteries etc!). Any such bins should have lids to open, with big labels on them - anything that makes people take longer to throw something away may be helpful in making them take time to decide whether it is the right bin.
- 3) Ask the long-suffering cleaners to sift the contents of the bins and take out all the paper separately.

6/10/97 TD to employee

Thanks for your comments and your interest. A number of people have asked for results of the new scheme, and we're working on that. However, behaviour change is another matter. It's a VERY slow process, and needs constant prodding. But we're getting there.....

Story Board 5 - Improving Waste Management Policy and Practice

Despite feeling, earlier, as though the waste management team was working fine without her, a series of messages led the researcher to believe that the team was not quite self sustaining yet. The researcher received a message from one facilities manager asking her to organise another meeting with the waste contractor. The message, as shown here, also indicated that this manager was expecting the researcher to co-ordinate all the waste management data. This was not the case. The researcher was under the impression that the site managers were receiving the data. The researcher suggested that this should be the appropriate process with only an overview maintained by the EHS department.

At this stage, it looked as though a meeting would not go ahead without the researcher - but the reply shows some degree of ownership.

The EHS Manager also became involved in the discussion. In doing this, it appears that the manager is trying to build bridges between her own organisation (Support Services) and EHS. Note that despite being the EHS manager, she refers to EHS as the researcher's group, possibly to associate herself more with the Facilities team on this occasion. Another Facilities Manager contributed to the discussion; a meeting was scheduled for when the researcher was available but this manager was showing clear signs of wanting the information for her own management processes.

17/08/97 Log Book entry (Excerpts)

For the first time I feel like we have the right people in the room talking about waste.

The dependency has almost gone - but not quite, still early days. They are actually telling me as opposed to asking. They would like some assistance from an "advertising" point of view though.

15th October 1997

A/C facilities Manager to Researcher

It has been some time since our last meeting with *the waste contractor*. Would it be possible for you to let the sites have their waste figures, i.e. tonnage for compactors etc. It seems after a discussion with *the waste contractor* that we are still sending partially full compactors to the mill.

20th October 1997

Researcher to SFMs

They have actually stopped sending me figures. I did think that might mean they were sending them straight to you but no such luck eh!

I think that the figures should go straight to you guys in the future though and I should only maintain an overview.

I am not really available (for a meeting) before w/c 10th November. If you would like to resolve any issues with *the waste contractor* before that, I am happy to assist in the organisation but would not be

20th October 1997

I don't know that there is any need for a meeting with BFI, I would just like to receive the figures on a regular basis. Can you organise this for us all or would you like me to do it.

20th October 1997

Might as well add my bit. We have a meeting set for 13th - we do need the figures not only for what the EHS group require but at site level we need to ensure that the landfill tonnage is reducing as we implement different recycling procedures.

20th October 1997

Not sure if I can, but I would be prepared to try and help if you feel I can add value to this exercise.

I have already asked Zoe to give an indication of what information is required by her group with regards to the audit criteria.

10.4) Waste Management FY98

Story Board 5 - Improving Waste Management Policy and Practice

The Waste Management meetings continued throughout FY98 roughly once a quarter. The researcher continued to attend these meetings but was not actively involved in the waste management programme between meetings.

In January 1998, one of the main employees who had been involved in the waste management programme moved to another position in the organisation. When asked if she would still be involved or interested in the programme the employee commented that she would definitely remain interested but not involved. This was a good example of where the employee's personal motivation for environmental protection led them to be involved in the waste management programme for over three years. Once her job changed however, she could see that she would not be able to be as involved as previously possible. This supports one of the key findings of this research, specifically that a large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.

During FY98 site facilities managers had accepted responsibility for waste management. They were making pro-active requests for more recycling and taking decisions with regard to the waste contractor's services. An example is shown from March 1998 where a facilities manager originates further discussions on new recycling streams.

As a result of this and other similar events, the researcher was beginning to feel less and less important to the success of the waste management programme. This was a positive result in terms of the objective to institutionalise environmental management.

12/01/1998

"I shall be handing over the practical side of Pinewood's waste to Petula - I think in answer to your question - I shall remain interested but not involved. Certainly if you are looking for interested people, you can look in my direction!!"

March 1998

Dear All

I believe at the last waste meeting (that I missed) you discussed CDs and Transparencies and Footprint Cleaners believe we might be able to recycle or burn rather than landfill.

Avril phoned me from Cheadle as she has a large number of CDs to dispose of - when we resolve the above can we inform her of the best way to dispose of them.

Liz was querying the transparency situation.

Regards

CL

Story Board 5 - Improving Waste Management Policy and Practice

However, it was difficult for the researcher to remove herself from waste management programme completely. To date the researcher still attends the waste management meetings on a consultative basis.

During FY98 the waste management programme was incorporated into general discussions of environmental management. In particular, a programme to measure the environmental performance of the UK Sales region included the waste management programme. A message is shown opposite where this performance measurement is referred to. A site facilities manager is commenting on the need for environmental data. Of particular note, a specific employee is identified in this message who has some responsibility for capturing this environmental data.

The UK Director of Environmental Affairs was often "copied" with messages relating to environmental management and on this occasion he responded with some comments as to the significance of the changes seen in the waste management and related programmes. In the message opposite the Director refers to organisational change at three levels within the organisation. These levels are embraced by the overall findings for this research. Additionally, this message highlights the role of the researcher in achieving organisational change at the company.

In July 1998 the UK Sales company was preparing once again for the Corporate EHS Audit. As a reminder, comments from the previous audit had made strong recommendations for improvement in the area of solid waste reduction. These comments had spurred the waste management team to take action in the intervening years.

E-mail to the researcher: 16/04/99

Further to our meeting yesterday could you please list all the data you require with the reporting frequency you require for this info - as discussed we all felt that it was important to capture this information on an ongoing basis rather than back-track over each passing year.

As I understand this information is required for reporting purposes plus we will in the future need to be able to prove that we are improving our efficiency in recycling and also to prove we have become more efficient in the control of the electric, gas, water usage on an ongoing basis.

Regarding the waste control, landfill, tonnage, recycling etc., I'm not sure if all the data can be captured by a central area - I would suggest we discuss this with <Waste Company> at our next recycling meeting in May. If we have specific purchase order for recycling, landfill etc., this might be a route for the costs but obviously not the tonnage. The costs for pallets, as it is adhoc, might have to be logged differently as I'm not sure if DB or <Logistics Company> order these.

Can you please send the above information requirement to JH and RI, copying me - JH will then find out if we have a central means of capturing some of this data for you.

April 1998

From TD, Director of Environmental Affairs

To ZJ, Environmental Research Engineer

Ref Your Meeting with SFMs

Thank you for updating me on the outcome of your meeting with the Site Facility Managers. I believe that this "data" is very significant, and should not pass unrecognised, since it demonstrates visible behaviour change at all "Three Levels":

Firstly, the SFMs as individuals are clearly motivated to act, and to receive your inputs and advice. Indeed, the one SFM who has been least committed is now being pulled in by peer pressure; Next, as a group/department, they clearly see this as a legitimate job function, and worthy of their attention; and finally, your assertion that this should be a change in behaviour by the Company as a whole has been well accepted.

None of this could have come about without the researcher who drove the programme which changed the attitudes which modified the behaviour, and I would like to congratulate you on this tangible outcome.

Story Board 5 - Improving Waste Management Policy and Practice

Just prior to the EHS Audit in this year the researcher took the opportunity to remind the waste management team of the progress which had been made in solid waste management. Contents of the message are shown opposite. This message also serves as a good example of the changes that had been achieved since the start of the project.

In just over three years HP's UK sales region had improved significantly in terms of waste management. From early beginnings when the researcher was surprised that the company did not know the quantity of waste being sent to landfill, through to co-ordinated site processes and regular meetings with contractors, a great deal of gradual change had occurred.

These gradual changes were also reflected in the quantity of waste going to landfill from the company, demonstrating that environmental performance improvements had actually been achieved over the same time. Costs associated with waste management had also been reduced as shown in the message opposite. Also shown in this message is the room for further improvements.

The EHS Audit report in FY98 (endorsed by HP's Chief Executive Officer) recognised these improvements and described the programme as having significantly improved since the first assessment some eighteen months earlier. Excerpts from the auditors comments in FY98 are presented later, in Chapter 12 since they show more than just waste management progress.

E-mail

Researcher to Waste Management team 2nd July 1998

If any of you would like to discuss any aspect of waste management in advance of the imminent EHS audit let me know...

Good points I think we can be proud of include:

- * Improved measurement of waste data - I have all the figures
- * Increased paper recycling - all offices
- * New cardboard recycling - all offices
- * Getting rid of Wheely Bins - CSC (a particularly nice story)
- * Regular meetings with waste contractors, cleaners and HP
- * Co-ordinated processes
- * Reduced number of waste contractors
- * Regular spot checks of waste contents
- * Recycling awareness day
- * Plans for acetate, disks etc.
- * Audited contractors - BFI, Footprint
- * Waste segregation at CSC

All in all I think we have come a long way.

Message to Site Facilities Managers 10/09/98

Please find attached a spreadsheet detailing our waste management progress in FY98.

Key points.

* Positive

Over six months (April - September 1998), we (Thames Valley) spent approximately £12,250 LESS than the same six months last year!!!!

Over the last twelve months, our waste to landfill figures have decreased from an average of 60 tonnes per month to an average of 40 tonnes per month.

We are now recycling an average of 6 tonnes a month of cardboard.

Our cost per "tonne of waste disposed" has reduced from around £80 per tonne to around £60 per tonne.

* Negative

Cardboard recycling is by far the most expensive disposal route (especially at CSC recently). This is because we are not filling the packers enough. We either need to fill them more or reduce the frequency of collection.

The ESO area appears to have a relatively cheap disposal method BUT these are not real quantities. It was shown earlier this year that the wheely bin process at CSC gave very unrealistic figures.

In one month at Pinewood we were charged the same price to dispose of 2 tonnes and half a tonne. This is because we are not managing collections appropriately.

The open skip at Amen Corner is roughly twice as expensive to use as the compactor. This remains the largest cost at A/C.

Story Board 5 - Improving Waste Management Policy and Practice

10.5) Story Board Five - Summary

The story board data presented in the preceding pages have shown that the programme area of "waste management" improved beyond recognition over four years. At the outset waste management was not recognised as a distinct programme. There was no clear ownership and there was a perception that this was not an area requiring attention. Four years on and the Solid Waste Management team were recognised for significantly improving waste management by the Chief Executive Officer of the company. During that time several pertinent issues emerged which contributed to the researcher's understanding of how to "institutionalise environmental management". By taking a single issue focus in this way it has been possible to bring together elements of the three previous story boards, and the themes emerging from them. This story board showed indications of the motivational aspects of the institutionalisation of environmental management. Specifically the waste team was "using the culture to change the culture". From an individual perspective, the importance of employee's home values were alluded to and, organisationally, problems in the development of the waste management team were described.

Also in this story board, the use of e-mail as a research tool was demonstrated. The excerpts from electronic mail messages, shown in this story board, date back to November 1995. To someone not familiar with the project, it may be difficult to deduce the specific meaning of terminology used in these messages. However, a participant involved with these events may recall their meaning more readily. Alone, the e-mail messages are not sufficient to generate research insights, but in combination with other methods their usefulness for this project was significant. In addition, the excerpts shown in this story board were often written by the informants themselves, adding to their validity. Later, in Chapter 12, all aspects of the research methodology are reviewed.

This was the last in the series of five story boards, presented here as a representation of the project to institutionalise environmental management at HP over a four year period. After a summary of the material presented in Part Two, Part Three of the Portfolio is presented. This is the final part of the Portfolio, discussing and analysing the data presented in Part Two and evolving the framework for the "Institutionalisation of Environmental Management".

Part Two - Action Research

Summary

Part Two - Action Research

Summary

Part Two of this Portfolio described an account of the Action Research project at HP from a number of different perspectives. Specifically, it was a presentation of the qualitative research data collected during the project from the many and varied sources involved. Firstly, an introductory chapter described the process of data analysis which led to the development of the framework for the institutionalisation of environmental management. This was described in terms of the analysis carried out both during and after fieldwork. In this introduction, the reader is presented with the rationale behind the story boards' format and themes. Five story boards were then used to present the data. The first was slightly different to the other four, providing a chronological account of milestones in the research process as opposed to environmental management changes. This was considered important since the research methodology is of particular interest in this project. The second story board focused exclusively on the approach taken to institutionalise environmental management by examining the company's environmental management planning documentation and processes. The third, moved away from the specific approach taken and looked, instead, at how environmental management were distributed throughout the organisation. Of particular note, the second story board contains two aspects of the framework for the institutionalisation of environmental management which, it will be shown later, challenge conventional wisdom on the role of employees in environmental management programmes. The fourth story board took a closer look at the tools used to "sell" environmental management to employees within the company. In this story board, it was shown that tools which utilised existing organisational or personal values were prominent. Taking a slightly different format, the fifth, and final, story board described one environmental management programme area over time, showing, more definitely, the longitudinal aspects of the project. Each of these story boards introduced specific themes which were seen in the data. As shown in the Executive Summary, these themes developed into the framework for institutionalising environmental management.

Part Three of this portfolio is now presented. This part, reviews the project in its entirety, grouping the themes seen in the data for the first time in the framework presented in the Executive Summary. Additionally, Part Three re-examines the methodological aspects of the project raising questions and recommendations for environmental management and other organisational researchers. To round off, the Portfolio recommendations are made to both environmental management industrialists and researchers wishing to implement or study similar processes in industry.

End of Part Two.

Part Three
Evaluation

Part Three - Evaluation

Understanding the Institutionalisation of Environmental Management

Part Three - Evaluation

Introduction

Part One of this Portfolio provided a detailed background to the project at Hewlett-Packard including a description of the research participants, a literature review, and a description of the research methodology. Following this, Part Two described the details of the project in the form of five story boards. These story boards introduced some themes seen in the research data. In addition, the story boards introduced some of the methodological challenges and opportunities associated with this project. Part Three now takes a closer look at the critical findings of the research and discusses their wider implications.

The chapters which follow will close the description of this research and evaluate its findings. The first chapter will consider the researcher's findings about environmental management at Hewlett-Packard, given the insider-based nature of the project. This chapter will discuss several levels of organisational change at HP and in doing so will develop a framework for the "institutionalisation of environmental management". The second chapter takes a fresh look at the research methodology in light of the researcher's experience and makes recommendations for future researchers in this area. The final chapter discusses the implications of this research for Hewlett-Packard's future environmental management programmes and deduces its wider applicability to other industries. Together these chapters will show (from an environmental management perspective):

- ♦ Fresh findings available through insider-based research,
- ♦ Perspectives on the significance of corporate culture and values,
- ♦ The significance of linkages between individual values and group behaviour,
- ♦ Gaps and weaknesses in currently available literature,
- ♦ How the methodology used in this project could be adapted for future research.
- ♦ How the findings from this case study can be applied more generally.

Understanding the Institutionalisation of Environmental Management

Chapter Eleven

Understanding the "Institutionalisation of Environmental Management" from an Insider's Perspective.

11.1) Introduction

In Chapter Three it was shown that several authors (Newton and Harte, 1997; Welford, 1998; Cramer, 1998) have expressed dissatisfaction with the research methodologies used by researchers in the field of environmental management. Each of these authors questions the over-reliance on outsider-based research. Partly as a response, and partly because of the opportunities provided by this project, the objective of this chapter is to demonstrate the value of an insider-based research strategy to facilitate, observe and record the institutionalisation of environmental management.

In this chapter the researcher's empirical findings are derived from the data, as introduced in the five story boards. The high degree of organisational access afforded to the researcher contributed significantly to the formation of these findings. Consequently, both the findings and the research techniques used to uncover them are demonstrated here. This chapter will show that the insider-based methodology used in this research led to discoveries about the institutionalisation of environmental management which might not have been obtained with other methods. Further, this chapter will show that, due to its integrated nature, understanding the process of institutionalisation benefits significantly from insider-based observations.

The iterative and progressive nature of this project adds complexities to its presentation. The researcher was involved constantly with the organisation. As a result, some of the findings of the research were integrated into HP's planning before the end of the project¹, whereas others were not. Preliminary ideas about the institutionalisation of environmental management often took hold within the company's plans and activities before the research was complete. This makes the description of the research findings in the Portfolio partly descriptive and partly reflective. The descriptive aspects describe occasions where the research learnings were integrated into HP's practices during the project, and the more reflective aspects where the learnings were uncovered later, during the post-fieldwork analysis. Both are presented in this chapter.

¹ Note that this, in itself, is an example of the value of longitudinal insider-based research over other methodologies. It demonstrates the need to carefully record "initial conditions", so that changes do not become absorbed unnoticed.

Part Three - Evaluation

Understanding the Institutionalisation of Environmental Management

11.2) Reflections on Research Design

Before moving on the main findings of the research at Hewlett-Packard, it is worth reflecting on the complexities of the subject under study. In constructing the Portfolio the researcher was forced (somewhat inevitably) to fit a sphere of information into a linear document. To explain this in more detail, and as a pointer for future researchers using this methodology, the researcher believed that the data in this case were complex in (at least) three dimensions.

- ♦ Firstly, there were no data that could be considered in isolation from surrounding events at the time. Events and programmes were linked to each other through people, business climate and other contextual factors.
- ♦ Secondly, the research data was inextricably linked to the development of the researcher in the organisation, both as a researcher and a practitioner of environmental management.
- ♦ Thirdly, the collection of research data was constant and thorough, but it was also based on opportunities to create or observe change and not on a predetermined research schedule.

The five story boards, presented from slightly different perspectives, were designed to highlight these dimensions. In the sections which follow they will be discussed in more detail.

The following sections will discuss the findings of the research. Three concepts guided the researcher's analysis of the data which led to these findings:

- 1.) HP's definition and understanding of the "Institutionalisation of Environmental Management"
- 2.) The types or levels of organisational change recommended and/or achieved during the process of "Institutionalisation"; and
- 3.) The initiatives within HP that were recommended, or successful, in achieving change at these levels.

The researcher's position in the organisation allowed these concepts to be considered from an informed and engaged but relatively independent perspective. This will be demonstrated in the sections which follow.

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11.3) Defining Institutionalisation

The first aim of the project was to help the company to *understand* and *achieve* the institutionalisation of environmental management. By assisting the company with this aim over four years, the researcher uncovered, first hand, new knowledge about the organisational change required for the institutionalisation of environmental management in one comprehensive study. This section explores the meaning and implications of institutionalising environmental management for HP as uncovered by the research.

Although articulated as the research title, there was no explicit reference to the concept of "institutionalisation" in Hewlett-Packard Ltd's environmental management plan throughout the duration of the research. Indeed at Hewlett-Packard it was not untypical to observe the development of special vocabularies which particular members of the organisation then internalised, sometimes differently to each other. Consequently, the researcher had to deduce HP's understanding of this objective from a number of sources. As shown in Story Board One, during the first year of the project the researcher asked (via electronic mail) several managers at the company what they believed the institutionalisation of environmental management to entail. The researcher received a range of responses to this question from experienced Environment, Health and Safety managers who were attempting to achieve the same objective world-wide. Their responses were friendly (many of them had met the researcher previously), informative and detailed. To demonstrate this, two of the responses are provided here. In the first it is evident that this manager is interested in the topic of institutionalisation, believes it to be an important issue for HP, and is trying to be helpful in his response. Similarly the second shows an experienced perspective on the subject and an acquaintance with the researcher. Additionally, the second shows that the concept of institutionalisation could have both positive and negative interpretations. In these examples some significant statements have been underlined which highlight the importance of institutionalisation to HP, the openness afforded to the researcher, and specific recommendations for achieving the institutionalisation of environmental management.

Example #1

Hello Zoe,

I hope the following thoughts are close to what you need. As we work on the HP ergonomics program, we encounter this issue constantly, so your work may be timely and beneficial.

Q. What does IOEM (Institutionalisation of Environmental Management) mean?
A. Environment, Health and Safety activities and criteria are considered integral components of business activities and are critical to the business success of an organization. EHS programs and processes are part of every person's responsibilities.

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Q. What would IOEM look like

A. Commitment by upper management to support budgets which include environmental management (EM). Employees at all levels would be recognized on performance against EM criteria. EHS staffs are resources and consultants rather than program owners. (More in original document)

Q. What would IOEM require?

A. Treating deficient environmental management performance as a Quality fault. This would include:

* A decision at the highest level that the organization needs to incorporate environment, health and safety into operational requirements.

* Education of existing managers, engineers and employees so they are aware of this commitment.

* Continual tracking and reporting of these EM metrics

* Clear rewards and disincentives are given for EHS performance

* EHS education of all high school students, so expectations are established early.

* EM education of engineers and business managers as part of degree programs so their EHS role is part of the status quo.

Example #2

Hi Zoe!

Just a few thoughts:

"Institutionalization" has both negative and positive connotations in my mind. For many people the positive comes easily to mind:

Something is so well integrated in the organization that it is second nature. People incorporate EHS concerns into their jobs without even realizing that they are doing so.

But there can also be negative aspects. If the institution in question is one that is mired in bureaucracy, then institutionalization can be meaningless. One of my concerns is that by institutionalizing EHS issues, we wrap them in a web of analysis paralysis and meeting-itis.

(More in original document)

Given the typical, somewhat conservative approach that HP's EHS organisation have taken, it is important that any attempt at institutionalisation also be fresh and compelling.

That's it for now. Hope you're doing well.

There were, of course, other responses but these two alone highlight some important issues.

- ♦ In the first, the term Environmental Management is used synonymously and interchangeably with EHS. This was seen throughout the research and will be discussed shortly in this chapter.
- ♦ Also in the first, some specific recommendations are made as to the level at which organisational change needs to occur in order to institutionalise environmental management. This is also discussed in this chapter in more detail.
- ♦ Both examples indirectly highlight the employees' perceptions of the researcher within the organisation. There does not appear to be any caution or sensitivity in their responses and the greetings in both cases are friendly.

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- ♦ The second example shows the possibility for institutionalisation to be perceived in a negative way. This is explored in a little more detail in Chapter 13 when the relevance of this research for other companies is considered.

In addition to asking managers specifically what they believed the institutionalisation of environmental management would entail, the researcher was also involved directly in the development of the UK Environmental Management plan. Since the company's environmental management objectives were mostly consistent with the research objectives, these activities were vital. The researcher would review the progress of environmental management programmes and feed any input into the company's planning process for the subsequent year. This is consistent with the recognised "Plan, Do, Check, Act" cycle, encountered in other action research projects. This cycle of input and reflection is discussed more in Chapter 12 along with other methodological reflections. The researcher's influence over the long and short term strategy of the EHS department was organised and legitimised to be significant. This provided plentiful opportunities for testing new academically-based ideas and approaches that were not only welcomed, but even expected by Hewlett-Packard's management. These opportunities could not have been gained from outsider-based research because the trust and familiarity afforded to the researcher was crucial for the development and testing of new ideas in the company.

During these activities the researcher identified four "levels" at which change needed to occur for the institutionalisation process. These four levels were first articulated by the researcher in February 1996, roughly one third of the way into the project. The remainder of the project was spent further defining these levels and analysing information relating to organisational change at each level. The articulation of these levels was partly to simplify the complex organisation processes, partly to identify with internal perspectives and partly to provide an analytical framework for the research data. Additionally, as shown in Chapter 3, previous researchers had set the scene by describing different organisational "levels" for integrating environmental management which required further exploration. A discussion at the end of these sections discusses the applicability of such a framework and its limitations.

The four levels described by the researcher were:

- ♦ Individual Values;
- ♦ Individual Action;
- ♦ Business Activity; and
- ♦ Company Values.

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Before these levels are considered in light of the research data a brief description is provided here. Firstly, the researcher believed that individual values for environmental protection were an important element of achieving the institutionalisation of environmental management. The literature review provided earlier (Chapter 3) showed that care for the natural environment is a growing value among individual members of society and, as a consequence, these values may transfer to the workplace. The researcher concluded that, in order to achieve the institutionalisation of environmental management, individuals within the organisation should be encouraged to have such personal concern for issues relating to environmental protection. Without personal concerns, changes may have resulted from compliance with the company's environmental policy but this was not consistent with the intention of institutionalising environmental management.

This conclusion was consistent with assertions in the environmental management literature at that time and with early comments made by representatives at Hewlett-Packard, where much is made of the importance of individual opinion and contribution.

"A lot of it comes down to your personal standing on it. If you recycle at home you will recycle in the office, and it should be the other way."

In addition to having individual concern for improved environmental performance, the researcher concluded that "individual action" was also important (and different). Notes from the second research log book provided in Story Board One suggested the importance of employees being able to take action in respect of their concerns otherwise frustration may occur. Literatures available at that time did not differentiate between individual concern and action for environmental management. However the researcher believed that one did not necessarily lead to the other and that either was possible to obtain separately.

As well as change at the individual level the researcher also decided that, in order to achieve the institutionalisation of environmental management, change would be required on a more collective basis. The term "business activity" was chosen to describe any activities aimed at improving environmental performance which were not driven by individuals within the organisation but by the processes of business practice.

"Institutionalisation means: 'Environmental, Health and Safety (EHS) activities and criteria are considered integral components of business activities and are critical to the business success of an organisation', and 'It means that the EHS function has been totally incorporated into the main stream business processes where EHS issues are part of the business discussion regarding day to day decision making processes'.

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The researcher found that change at the business activity level was not related to individual concerns for environmental performance. Instead traditional business drivers such as profit and employee satisfaction were more appropriate. Environmental management literature available at the time supported the notion that business activity needed to change in order to institutionalise environmental management but specific advice on how to define or achieve this was not provided.

Finally, the researcher concluded that company-wide values for environmental performance were important in order to achieve the institutionalisation of environmental management. Specifically, based on early indications the researcher believed that a company's culture would have to support the objectives of environmental management in order for such sustained change to occur.

From HP's point of view, environmental management is an obvious extension of our traditional corporate objectives, starting with "Citizenship".

As described earlier, literature available at the time supported this cultural argument but there was little advice on how to achieve such change.

By singling out these levels in the organisation, the task of monitoring organisational change was made easier. However, the researcher realised over time that there were no clear boundaries between these levels and in fact in some cases the boundaries were very blurred. This is explored further after the levels have been discussed in turn.

Before pursuing a more detailed discussion of these levels, an obvious question at this point is whether any actual change has been achieved at HP. In other words did they succeed in achieving their (and the researcher's) goal of institutionalising environmental management? In simple terms the answer is "not yet", but there was evidence that the seeds had been sown and that significant changes in each of the organisational levels had taken place. In September 1998 (the final month of the project), an EHS audit report received from HP's Chief Executive Officer contained the following summary:

I've just finished reading the Closing Conference report from the recent Environmental Health & Safety Audit of the UK Sales Region. I wanted to let you know that I am quite pleased with the overall result. You have continued to make good progress since your last assessment in 1996. The fact that you have done so during a time of considerable expansion is even more impressive.

I am very pleased the audit team found deep management commitment for EHS programs. I am also pleased that the "Virtual Organization" has worked well for you. This is a somewhat unique approach, which will probably be adopted by others in time. Finally, the dramatic improvement in your solid waste management program is quite impressive.

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Thank you very much for your obvious attention to the important EHS issues. Please pass along my thanks to those who helped you get your program on track and especially to the following people who were pointed out as deserving special recognition by the audit team; the members of the Field EHS Council, HW, PL, NG, JP, RM, MC, ZJ, LB, CL, LS and KM.

Regards,
Lew

This message serves as a reminder to the reader of some of the central concepts in the UK environmental management programme and some of the changes which were seen during the research period. It also recognises the researcher's role in achieving change and demonstrates the potential of action research. The next sections now consider each of the levels previously described in turn and describes the research findings for each area.

11.5) Individual Values

The first level which the researcher focused on to achieve and understand the institutionalisation of environmental management was "individual values". At this point it is worth reminding the reader of the dual objectives of the research. Not only was the researcher hired to help HP *understand* what the institutionalisation of environmental would entail, they were also hired to help the company *achieve* this goal. Two principal observations were made which relate to the "individual values" level. At HP there was evidence that, during the institutionalisation of environmental management, the EHS department had appealed to the concerns of individual employees to achieve change. This was seen notably in the internal environmental management communications described in Story Board Four. Also, there was evidence that individuals at HP had articulated concerns about environmental management at work in relation to their environmental behaviour at home.

"I know why we have to be responsible. As a person and as an HP employee because I live in this world too. I go home and I have a home life. If Hewlett-Packard is contributing to some ecological nightmares without precaution, then I would as a person want, would want to do something about that, as well as an Hewlett-Packard individual"

" I feel there is a difference between work and personal values. In the quality movement there is no personal value associated with it, whereas there is more of a personal value commitment with environment."

In the first example the employee makes a distinction between himself as "a person" and as "an HP individual" suggesting that these are different somehow but that environmental improvements could come from both. In the second, the employee makes a distinction between quality and environmental management concepts within the work environment suggesting that environmental management is related to personal values as well as business practice. Both of these comments were obtained during semi-structured interviews roughly half way through the project. These interviews helped to confirm themes that had already started to emerge in the data from other on-going observations.

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To explain the importance of individual values for environmental issues to HP, the researcher devised a model, known internally (to HP) as the "Golden Bridge" theory. The diagram used to accompany this model internally (Fig. 9) was presented in Story Board One and is presented here again for reference. This concept was developed by the researcher based on experiences in the organisation at that point.

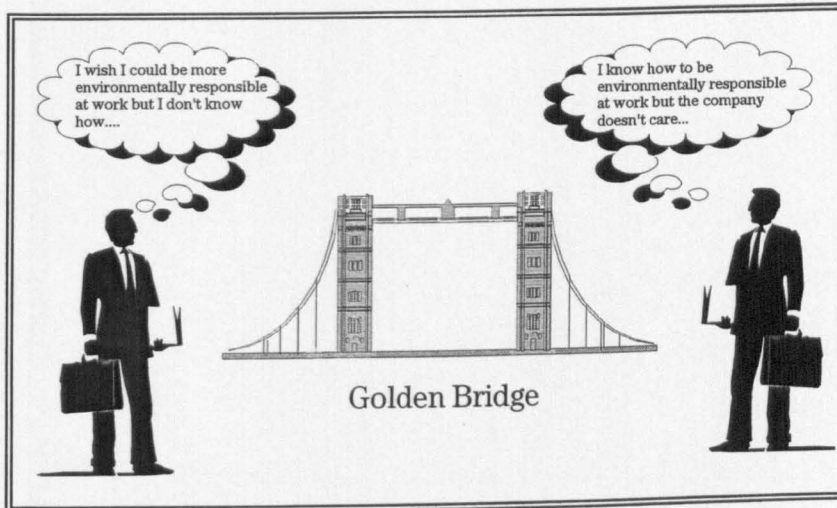


Fig. 9 Bridging Personal and Company Values

Potential problems for HP, depicted in this diagram were identified as

- 1.) Occasions when the company did not share an employee's personal commitment the environment and
- 2.) Occasions where an individual did not know where to address his environmental concerns within the organisation.

An example of the first instance was seen regarding the topic of waste management in Story Board Five and is presented again below. This employee seems frustrated that more can not be achieved in the work-place to resolve environmental issues. He also appears to believe that individual motivation is a significant factor for achieving change.

36,000 (cups) a week is an awful lot though. That's nearly 2 million a year! Do we know what happens to the ones that are recycled (there's no excuse for not putting them in the recycling bins, but I suspect that a lot of people don't bother)? Are they made back into cups? I find plastic is far and away the worst household recycling problem. I try not to buy things in disposable plastic containers, but inevitably we acquire some - I take the plastic bottles to the dump once in a while, but they take up a lot of space waiting to go, and there's no sense in driving to the dump specially. Anyway, I'm glad to hear it's a subject that is being thought about. I think a lot comes down to individual motivation, but some corporate encouragement can only help.

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There was no conclusive evidence that employees became dissatisfied with HP, purely for a lack of environmental concern. However messages like this one highlighted that HP employees did perceive environmental issues to be important and that their concern was not driven by HP's existing programmes. Instead, their personal lives were influencing their opinions of environmental issues at work.

The diagram suggested that by building a "Golden Bridge" between individual and organisational values, these frustrations would not occur. Based on experience to date, the researcher concluded that this bridge has not yet been built within HP, although the concept has been well received as a catalyst. Developed during the research, the concept of a bridge between personal and organisational concern for environmental issues led to two specific recommendations for achieving the institutionalisation of environmental management. Both are presented here and are listed in the main findings of the project at the end of these discussions.

Recommendation #1

Link environmental programmes to personal concerns for environmental protection

Recommendation #2

Demonstrate and provide sinks to capture employee environmental concerns.

Further discussion as to the congruence between organisational and individual concerns is provided in *From Issues to Actions: The Congruence of Organizational values and Individual Concerns in Facilitating Organization Adaptation* (Bansal, Jackson and McIntyre, 1999), which the researcher co-authored. The paper, submitted to *Administrative Science Quarterly*, is contained in full in *Portfolio Volume 2* and some relevant extracts contained here.

Issues pertaining to the natural environment often generate concerns because they are often valued. Hence, the role of the individual in issue development is evident in the study of natural environmental issues. The role of the individual was made clear throughout the interviews, "People are doing it. People are turning off lights, personal computers. People are making an effort. When we bring it down to the individual then it makes a lot more sense, doesn't it? People will make a contribution to the environment. I think they want it quite naturally" (RX member). A similar remark was made by a member of HP, "Within HP I am very happy to align my personal commitment with our objectives on environmental management and put all my energies into making them really happen". Specific individuals had an instrumental role in shaping organizational adaptation not only because of their organizational role, but also because of their own concerns. This point is supported by the following comment, "He [Director of Environment] says it [environment] is important, and he says it with a passion, and he says it consistently. ... He feels quite strongly about it, I think both personally and socially" (RX member).

When the organizational agenda differs from the individual agenda, it is difficult to effect organizational change. Individuals are less willing to engage in activities the top management team dictates and, similarly, the top management team is less willing to mobilize the resources to gain wide-scale buy-in among organizational members. The impediment created by the incongruence between the organizational and individual agendas is reflected in the following comment, "I do remember the recycling of the cups. I remember the site facilities staff even saying pile up the cups on the edge of your desks, don't chuck them away. People still threw them away" (HP member).

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Several employees at HP articulated concern for environmental issues to the researcher during the project. Seemingly there were many employees who shared those concerns but who never came in contact with the researcher. Equally, and probably more likely, there was a large number of employees who did not have concerns for environmental protection, although a lack of concern is much more difficult to measure in this type of research. This raised the question of whether *all* employees were required to have concerns for environmental protection for the institutionalisation of environmental management which was a popular recommendation in the literature at the time (See Chapter 3).

To illustrate this, *individual values* for environmental protection can be taken to two extremes represented by the number of "individuals" involved. At one extreme, if there were *no* employees that valued environmental protection, would it be possible to create environmental change? At the other extreme, was it desirable or necessary that *all* employees share environmental values? Neither the researcher nor the company intended to encourage all employees to have concerns for protecting the natural environment. However, where evident, those employees who demonstrated such concern were encouraged to take further action. The absolute situations described above are both unlikely. Environmental values have become prevalent in many groups of society suggesting that at least some individuals will bring environmental values into the work place. Examples of this were seen in the project at HP and the results show that only a relatively small number is required particularly if this includes some well-respected "champions" who act as missionaries. In particular, Story Board Four showed how individuals articulated their values in relation to their environmental behaviour at home.

Although individual concerns for environmental issues were seen as an important factor in achieving change at HP, it was evident that unless these concerns transpired into some kind of action they would be wasted. The next section explores the conditions when individuals took action to improve HP's environmental performance.

11.6) Individual Activity

The possible range of influence that a single employee may have over environmental performance improvements has not been discussed in the literature at all. In Part One the literature review showed that a common trend in the green business literature is to perceive environmental management as everyone's responsibility and/or that *all* employees need to be involved in an environmental management change programme. Arguably as a result of this common assertion, at the start of the research, the accepted wisdom amongst managers and employees at HP, including the researcher, was indeed that environmental management was "everyone's responsibility".

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A selection of examples are shown here.

"EHS programs and processes are part of every person's responsibilities".

"Employees at all levels would be recognised on performance against environmental management criteria"

"EHS processes are fully known by all employees and each employee knows that they are as important as any other business process and must be considered in every decision they make".

"EHS Responsibilities are clearly delineated in each individual's position plans"

Despite these comments, roughly half way through the project, the researcher had reason to question this common perception. Story Board One showed that involvement with the Pinewood site's "green team", and subsequently the waste management team, led the researcher to conclude that employee actions towards improved environmental management depended on their role and discretion within the organisation. In other words the achievement of change at an individual level depended on the employee's location in the organisational hierarchy. This seemed to suggest that, although arguably environmental management was "everyone's responsibility", there were a number of possibilities for what that responsibility entailed. This was confirmed by related research carried out during the project.

If the individual's role in the organization affords sufficient discretion, the individual may be able to respond to the issue. This action can be as small as putting waste paper or cups in the recycling bin or turning off computers and lights at the end of the day. If the individual has more discretion, the action can even involve organizing Earth Day activities. The individual role in this stage is made in the following comment, "Throughout the organization their individual initiatives and commitment will ensure that RX continues to find new and better ways to conduct business in harmony with the environment" (RX member) (Extract from Bansal, Jackson & McIntyre, 1998: 25)

To articulate these ideas further, the researcher devised four types of employee involvement in environmental management discussed next.

Type 1 General Involvement

As was introduced in Story Board 3, data at HP suggested that the first type of employee involvement in environmental management is where employees can take environmental action, irrespective of their role within the organisation, by following general company practices such as recycling paper or switching off their computer at night. These actions have little, or no, relationship to the role which employees fulfil in the organisation, rather they are related to individual concerns for environmental protection discussed in the previous section. As an example, in December 1996 an employee from the Information Technology department wrote:

"I have just read the notice about plastic cup recycling in Amen Corner... Even though I think it is admirable that we are now recycling these cups, wouldn't it be better to go one step further and get rid of the majority of these as much as possible by asking people to bring their own mugs from home and using these".

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Since the researcher was familiar with the responsibilities of this employee within HP's structure, which weren't related to the purchase or otherwise of plastic cups, it was clear that the employee's suggestion has been driven by their own concern for environmental protection. Additionally, at that time, there had not been any internal communications relating to the use of pottery mugs for drinks at the company, making his comment unlikely to have been driven by an outside suggestion. Further specific lessons were learned about this type of employee involvement activities role during the researcher's involvement in the Pinewood "green team" activities. The team's remit was to tackle the general environmental issues encountered in the work place (such as paper recycling and wildlife protection). However the team's members organised themselves to devote additional time to these issues by attending regular meetings. Eventually the team disbanded, apparently because the activities were taking over their other work responsibilities. Members of the team had told the researcher that whilst they remained committed personally to improving the environment, and would continue to do so whilst at work, the additional work involved with the team was taking up too much of their time. A memo sent out by the researcher around that time describes this in more detail.

A review of "Green Team" activities at the end of 1995 revealed that although there was still interest in improving the environmental performance of the Pinewood site, time available to commit to meetings about such activities was becoming difficult to find.

Thus, for FY96 we have decided that in terms of reporting "Green Progress" to the EHS team JB and I will form a "Partnership" of EHS and Facilities to promote greener activities.

Other "Green Team" members will now act as "ambassadors for our cause" within their department or area. It is likely that we will encourage more people to become these ambassadors and help us spread the message. These people will not attend regular meetings together relieving them of any formal time commitment.

One member of the "green team" was the Facilities Co-ordinator at the site, a position whose responsibilities including the co-ordination and management of waste disposal contracts and building management services. Other members of the team were from other departments such as Software Development and Literature Services. Only the facilities' organisation representative was addressing these environmental concerns as part of her normal role within the organisation. When the team disbanded the researcher believed that this employee did not experience the same level of conflict as other members because environmental improvements were already part of her job. Another member of team reported to the researcher that he was happy to continue making environmental improvements in his "spare" time, but that additional meetings were imposing on his normal job.

This, and other experience at the company, led the researcher to conclude that addressing wide-spread, low level environmental issues such as office paper recycling should not involve additional organisational tasks or structures that compete with existing responsibilities, without first ensuring that such duties had first received official organisational support.

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Related to individual activity towards environmental management, the researcher also found that a *change* of role in the organisation may affect employees' influence over environmental management. In January 1998, a former Facilities manager wrote:

"I shall be handing over the practical side of the Pinewood waste to PT - I think in answer to your question - I shall still remain interested but not involved. Certainly if you are looking for interested people, you can look in my direction".

This employee makes a distinction between being interested and involved. This demonstrates the difference between having concerns for environmental protection as an individual and being able to influence change in an official capacity, stressing again the need for goal congruence.

Type 2 Occasional Involvement

The second type of employee involvement with environmental management that the researcher observed was where employees needed to be aware of company environmental programmes in order to fulfil their responsibilities at work. These tended to be predominantly outward-facing employees, involved with customers or other stakeholders. An example of this was the marketing communications manager who wanted to organise a newsletter to contain environmental management information for their customers.

SM from CPO Marcom called and confirmed that we were the right side of the deadline for getting env'l information into their newsletter. Should be a really good initiative. I have initiated that we get included on the feedback questions - 10,000 corp accounts!

Although this employee helped HP portray an environmental profile to their customers, this was the first and last time that she was involved with the EHS department's activities. Her need for involvement with environmental management was only an occasional one. Within a sales company, as in the one under study, these types of employee represent the majority of the company. For consistent communications with external stakeholders, it was important that individuals within the organisation knew enough about the environmental impacts (and indeed solutions) of the company's products and operations. One Salesman made this point himself (relevant section underlined).

What is their average fuel consumption on company car? Could it be better? Do they drive within speed limits? Do their home work areas reflect HP's office "Dirty Dozen?" Do we promote awareness with our customers about our commitment to environmental stewardship.
Regards

GM Test and Measurement Sales

Sorry about the handwriting. Did it on train.

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This employee and other similar individuals may or may not have taken action to improve the environmental profile of the company themselves but were important resource for environmental management during the project as communicators. The example presented here can also be used to demonstrate the occasionally opportunistic research strategy which was pursued. The researcher was trying to raise employees' environmental awareness by producing an EHS newsletter. This particular employee responded to the newsletter in person by scribbling some comments whilst on a train and then forwarding them to the researcher. Such spontaneous comments could not have been elicited without being resident and visible in the organisation throughout the project.

Type 3 Part Involvement

Unlike the communications role described previously, the third type of employee involvement observed during the project at HP occurred when individuals made a difference to the organisation's environmental performance by slightly altering elements of their existing role. These tended to be employees located at points of "resource" input. The word "resource" is used here to encompass sources of human, financial, or material capital. These employees were in positions to influence the choice of (say) goods purchased, money invested or employees hired. One example at HP, not presented in the story boards, is the Purchasing manager who applied some environmental performance criteria for suppliers. Once again, as individuals, such employees may or may not have chosen to follow the general practices (say paper recycling) which reduce environmental impact (type one), but within their job aspects of environmental management were a performance criterion.

Type 4 Full Involvement

The fourth type of employee involvement with environmental management observed at HP included individuals who were able to affect the company's environmental profile consistently within the realms of their existing responsibilities. These were individuals located at points of direct (potential) environmental impact. An example would be the facilities manager at each site responsible for negotiating waste disposal services, as referred to in Story Board Five.

This typology of employee environmental management involvement is the first of its kind for environmental management and one of the findings of the project. The types of involvement chosen represent only one way of segmenting employees in order to maximise environmental performance improvements. However until now there have been no attempts to analyse the role of individuals in achieving environmental management at all. In this regard the model makes a contribution to knowledge by providing focal points from which to obtain leverage

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It is asserted here that previous researchers have not articulated these levels because they have not been able to obtain prolonged access to different types and levels of employees within an organisation. Contrary to other perspectives provided in the literature, environmental management can not just be described as "everyone's responsibility". There are clearly occasions when improvements can only be made by specific individuals or groups within the organisation.

The most striking example of this in the project was shown in Story Board Five when an early, enthusiastic project team was not able to achieve any change due to their limited decision making scope.

As discussed earlier, I also feel this is the best way forward. Some of the decisions with regard to contract renewal can only be taken by the SFM's involved and there will be a time lapse as contracts elapse. I don't think it will be feasible going out to tender as a group and we won't be able to do it across the sites simultaneously.

In this model, some aspects of environmental management are "everyone's responsibility" but others require a more directed approach if significant improvements are to be seen.

Further substantiation of this typology with targeted empirical research is required before any conclusive links between this type of employee segmentation and performance improvements can be assumed. However, on the basis of experience at Hewlett-Packard it is suggested that employee training and awareness programmes are targeted to suit these different types of employee within an organisation. Three specific recommendations are made for this level of organisational change, listed here².

Recommendation #3

Organise individual training and awareness according to employee roles and responsibilities

Recommendation #4

Involve appropriate levels of employees according to environmental management objectives

Recommendation #5

Minimise effort put into generic company-wide programmes / Maximise effort put into specific improvement programmes

In addition to the role of individuals in institutionalising environmental management, the researcher also considered the role of sub-organisations such as departments and also of company culture. The next section explores the first of these from two perspectives.

² In sequential order from the recommendations for the previous section

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11.7) Business Activity

The third level of organisational change which the researcher had chosen for the institutionalisation of environmental management was related to business activity. Over the course of the project, two dimensions to this aspect of change were identified. The first related to sub-groups within the organisation such as departments or teams and secondly, the role of different hierarchical levels. This can also be seen in terms of vertical (sub-organisational) and horizontal (hierarchical) aspects of HP's organisation. It is not surprising that these dimensions appeared evident to the researcher. Hewlett-Packard is renowned for "matrix management" practices. In this management style, employees may have a reporting manager, usually above them in the organisational hierarchy, and a second manager to whom they may have a "dotted line" reporting requirement³. There are many examples of where HP uses matrix-type analogies to describe their organisation and one was seen in Story Board Three relating to environmental management in particular. Presented here as a reminder only, Fig. 22 taken from that story board shows how HP viewed environmental management in terms of horizontal and vertical risks represented in a matrix-style format.

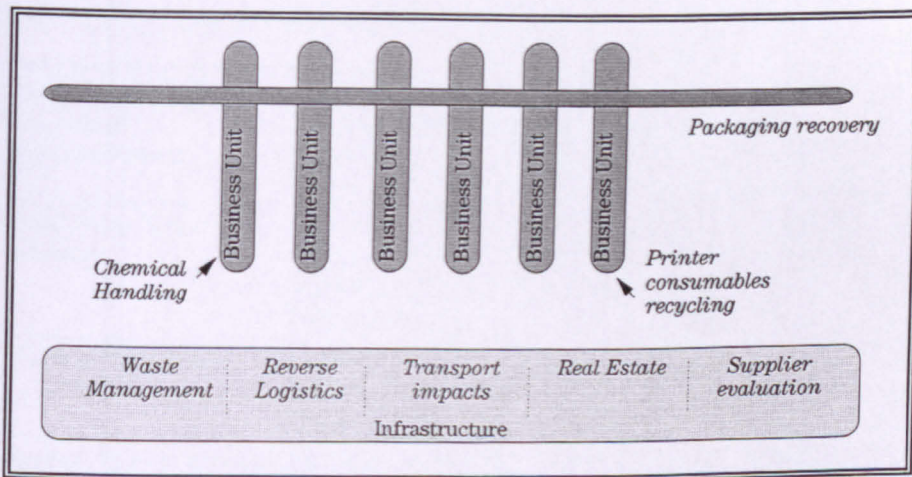


Fig. 22 Vertical and Horizontal Risk

Unfortunately describing an organisation in terms of its sub-structures and levels is crude. However, themes did emerge in the data which could roughly be grouped into these two categories for simplicity. These are discussed below.

³ For further information see Davis, S.M., and Lawrence, P.R., *Matrix*, Addison-Wesley, 1977

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11.7.1) Sub-organisations

Whilst helping HP to achieve the institutionalisation of environmental management, the researcher was encouraged to identify opportunities for communicating environmental management to different parts of the company. Over time it became evident that environmental management could be framed in different ways to achieve change throughout the organisation. For example, aspects of environmental management that enhanced brand image were used to encourage Marketing and Communications departments to adopt environmental management in their organisations. Another example was where environmental management was communicated in terms of operational efficiency and cost reduction for Facilities Management staff. Semi-structured interviews carried out with managers at Hewlett-Packard revealed different perspectives towards environmental management depending on the manager's role in the organisation. These managers were asked to comment on the "value-add" or benefits of environmental management to HP's business. Extracts from the interview transcripts are included in Table L. These differing perspectives confirmed the efficacy of framing environmental management in different terminology to achieve organisational change in different parts of the business.

Table L The Value of Environmental Management to Business Managers at HP

Role in Organisation	What Value does EHS Add?
Director of Communications	<u>EHS adds value by building the HP brand</u> through responding to questionnaires on what HP are doing for the environment when asked to do so by customers or suppliers
Information Technology Manager	EHS can add value to the business by making itself the second priority of business. We need to make <u>business unit managers consider EHS as their second thought</u> when making a decision.
BU Support Manager	EHS adds value by creating awareness amongst stakeholders about what environmental issues are at stake. <u>EHS is a business differentiator.</u>
Support Services Manager	EHS adds value to the business as it portrays HP as having <u>best environmental and health and safety working practices</u>
BU Support Training Manager	EHS adds value to the organisation by <u>tracking legislation</u> and keeping out of trouble with the law. It <u>packages the corporate message</u> about what HP is doing for the environment.
Quality Engineering Process Manager	<u>EHS is seen as a necessary evil</u> by the business units
BU Product Manager	EHS adds value to the business as being a source of information and communicating a corporate message which should <u>enhance our brand image.</u>

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Each of these managers views environmental management (or EHS) in a particular way consistent with their existing role in the organisation. This is perhaps not surprising but has quite significant implications for institutionalising environmental management. By focusing on the varying perspectives of environmental management at HP the researcher began to appreciate the implications of institutionalisation. In an effort to portray how environmental management could feature throughout HP's organisational structure the researcher drew a diagram called "Environmental Management with no EHS department" seen in Story Board One. Fig. 8 is shown here as a reminder.

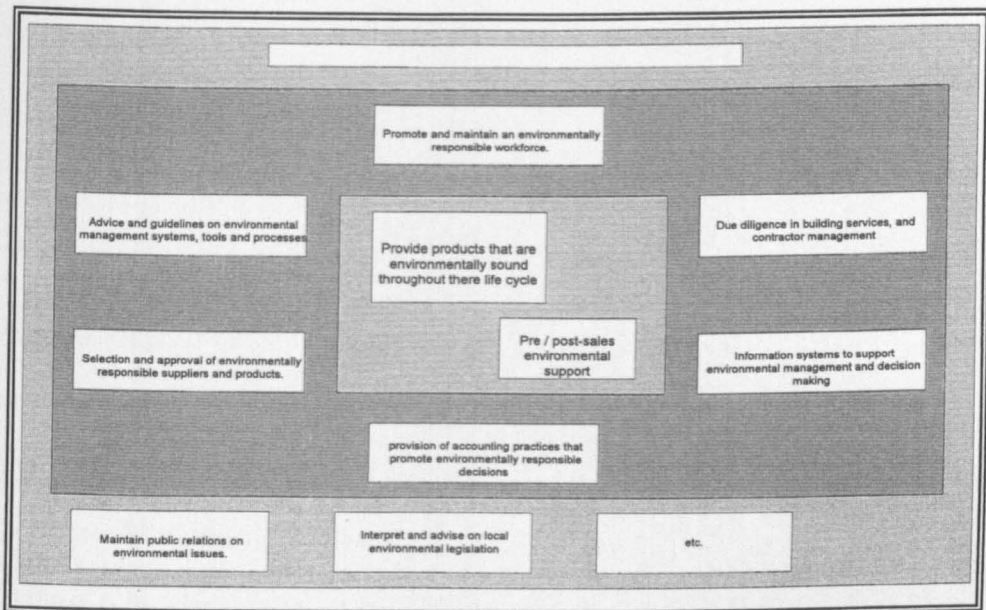


Fig. 8 Environmental Management with no EHS department

This diagram was designed as a device to portray the institutionalisation of environmental management in simple, familiar terms to HP's managers. The diagram was used as a vision of HP's Environmental Management function by the European EHS Manager at the time. Fig. 8 depicts HP's organisational structure; a number of business units with supporting functions providing the "infrastructure" to do business. At the centre of the diagram, the business units are represented. The researcher suggested that, in environmental management terms, they were responsible for providing products and services which are consistent with HP's environmental policy. In addition, the researcher suggested that other supporting functions also had a relevant part to play which depended on their competencies.

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The examples depicted include the role of Legal, Communications, Personnel, Facilities, Information Technology and other departments. The researcher believed that each of these departments could make a contribution to environmental management by extending their normal responsibilities only slightly. At a different level, this is consistent with the model of individual action, presented in the previous section, where the actions taken by individual employees depend on their location in the organisational structure. This degree of familiarity with organisational linkages can not normally be gained by "outsiders" highlighting the value of the research methodology used in this case.

HP's approach spread environmental management throughout their existing structure rather than as a separate function. Over the four years of the project this was successful in a number of departments or sub-organisations. During this time it was impossible to focus on achieving change in the entire HP Ltd organisation, instead the EHS department and the researcher were forced to focus on areas of high risk or exposure in environmental management terms for their change programmes. Additionally there were instances where relatively low risk areas were tackled where high visibility for the change programme could be received. Some of these changes were presented in the story boards.

Positioning environmental management throughout existing organisational structures is consistent with previous recommendations seen in the literature. In particular Rothenberg et al (1992) argue that a new structure for environmental management should fit with the company's overall organisational structure. This was exactly the approach which was most successful at HP. The research did not start out to achieve this objective, but nevertheless it became an integral part of the institutionalisation of environmental management over time. Although recommended here as a suitable approach for firms to take for environmental management, there are some implications which have been uncovered by this research due to its insider-based perspective. These are discussed next.

When environmental management can be distributed in this way, a logical concern is the definition or need for attention to "environmental management" as a separate organisational issue. The researcher found that environmental management was not a discrete function at HP, nor a static set of issues. The boundaries between environmental management and other general management issues were blurred. As an example, at first, the topic of waste management appeared clearly part of HP's definition of environmental management. However, it soon became apparent that improvements associated with waste management were part of good "facilities management" the responsibility for which already existed in the organisational structure.

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The borderline between the two was a question of degree. During occasions when the facilities management organisation was not encouraging waste reduction, staff from the EHS department were necessary to provide motivation and guidance. This was particularly true at the start of the project as seen in Story Board Five. However, once waste was being managed in an environmentally responsible manner, as part of the norm, employees from the EHS department were effectively redundant. A message sent from the researcher to those responsible for waste management is shown as an example.

I was wondering how the cardboard recycling process was going. I heard that building two had started, as had CSC but I have not heard how things are going.

This message shows that although initiated by the researcher, improvements to office waste management were being carried out by the appropriate Facilities organisation at this time and more significantly that the researcher was no longer "copied" on all activities. In the researcher's mind, the most appropriate part of the organisation had taken on board its environmental management responsibilities.

This example was not unique to waste management at HP. From the researcher's experience, it is argued here that most "environmental" issues arise because of a business decision (or lack of one) - it is only business decisions which can reverse or minimise any subsequent environmental impacts. In summary, the researcher found that action at a business group level was dependent on the group's specific objectives and the discretion of employees within the group to effect change. Although a fairly obvious statement previous descriptions of environmental management in organisations have not discussed existing organisational frameworks or employee responsibilities, in effect isolating environmental management from normal business practice. This conflicts directly with the aim of institutionalising environmental management and is therefore counterproductive in the longer term. By assigning new organisational roles to improve environmental management, existing roles which may have significant influence have previously been ignored.

In addition to considering the distribution of environmental management responsibilities throughout the organisation the researcher also paid attention to the hierarchical organisational levels involved in the institutionalisation of environmental management. The research findings in this area are discussed next.

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11.7.2) Hierarchical Levels

As the researcher became more aware of HP's management style and techniques it became evident that change would be required at several hierarchical levels in order to institutionalise environmental management.

" I think this is one of the challenges that TD has. In getting this ownership of responsibility permeating through all levels of the employees"

The use of the word "levels" in this statement is consistent with the way HP managers segmented the company in their descriptions, as will be seen in various excerpts presented in this section. These categories were identified during the fieldwork and were used to simplify the description of organisational change at the company. Inevitably these categories are approximate, but they were consistent with HP's own terminology and therefore deemed an appropriate analytical device.

The levels most commonly referred to fell into three categories - top management, middle management and (other) individual employees. The role of individual employees in achieving the institutionalisation of environmental management was discussed in the previous section. The roles of top and middle management are discussed in more detail here. Neither of these levels are specifically defined in HP and there are no doubt managers who are neither top or middle. Based on experiences at the company the researcher believes that top or senior management is highest layer of management staff at the company, in this case a combination of business unit and infrastructure management. Middle-management is more difficult to define but probably includes all managers with responsibility for supervisors as opposed to the remainder of managers who have only direct employees under their supervision.

Firstly, some data suggested that top management commitment was required. A collection of quotations relating to this are shown here.

Q: "What would institutionalisation of environmental management require?"

A: "A decision at the highest level that the organisation needs to incorporate environmental, health and safety into operational requirements".

"If you ask at the senior level you'll get, they (EHS issues) are very important . I would suggest that if you went to the lower levels they don't associate the importance of them in the same way" (PT, July 1996)

"...Institutionalisation will require even more "active buy-in" by senior and then middle management".

"I believe that EHS institutionalisation will only occur if there is top level HP management support and push for it.....Education of existing managers, engineers, employees so they are aware of this commitment"

"We have a long way to go, but I think <The Director of Environmental Affairs> is probably the best thing that ever happened to us. That is my view anyway"

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Despite these comments, HP's senior management in the change programmes at HP were notably absent, apart from the Director of Environmental Affairs. Other senior managers at the company perceived that environmental management was his responsibility and therefore did not pay too much attention to the issues. When interviewed in June 1996 a surprising number of managers recalled the appointment of the Director as the most significant recent change, despite being some three years earlier. This dependence on the EHS department and in particular the Director of Environmental Affairs was described in Story Board Three in more detail. Such dependence seemed to be in direct conflict with the need to institutionalise environmental management. Rather than adopt aspects of environmental management within their role, these managers had isolated environmental issues from their normal responsibilities by creating the Directorship. Although most senior managers actually knew very little about environmental management programmes, their visible support for such programmes was unquestionably strong. In an interview with the Quality Manager, he comments on a similar process which was successful for implementing quality management at the company.

First you need sponsorship from the top. You need the person at the top to walk the talk. We've got evidence that this has worked in quality initiatives in this company. In other companies, the quality initiatives have gone off the rails because the mgt were seen to not buy into it.

A good example of how this process is used most effectively in HP is in the Corporate EHS Audit. After each audit, HP's Chief Executive Officer sends out an Audit report under his name to the audited site staff. Although valid and accurate comments, the CEO does not have first hand experience of the audit in question. He is using his position in the organisation to provide recognition and further motivation for employees. Although employees know this, they (the researcher included) still felt honoured to be addressed, personally, by the company CEO for the work in their respective areas. Based on personal experience, the researcher believed that this simple act was motivating to company employees. This and other evidence of where a visible leadership figure was used to motivate change are provided in Story Board Four.

In summary, this research partly confirmed the need for top management attention, specifically there was evidence that employees in the organisation responded to environmental management when senior managers were visible in their support. Despite this, senior managers were not the most important people in actually achieving improvements in environmental management performance. This was evident from their lack of involvement, which is unfortunately more difficult to demonstrate to an outsider, who is more likely to take professed statements at face value.

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Another level within the organisation which was described by HP employees as needing to change was termed "middle management", examples of which are shown here.

"But I do know there is this big gulf between the theorist at the top who are saying the right thing, the practice of employees who are right down at the end, trying to do the right thing. And then there is a big slug of people in the middle who are just carrying on and doing their daily work."

The second thing is that you need the wide degree of the workforce buying it. Where we launched process improvement activities at the low levels in parallel with senior mgrs saying that it is a good thing to do. The middle mgt gets squeezed out because of enthusiasm from the bottom and drive from the top. The other is that you need a burning reason for people to change and the tools to make the change. It makes it easier to change.

"The company needs top down communications. If JG recycles then we will all jump on the bandwagon. You need top management commitment" and later "The message needs to come from higher up in the value chain. If it is brought in from everybody it will feed down to everybody. Although you fight that you need to do it bottom up rather than top down - but actually you need both at the same time."

Of these quotes, one manager recognises what he calls a "big slug of people in the middle" who seem difficult to change. Other managers recognise the middle layer, but suggest that this can be squeezed out through top management attention and buy-in from the wider workforce acting at the same time. This perception of organisational change from two directions acting as a pincer to force middle-management to change was popular among HP managers even to the extent that the relationship between the researcher, at a lower level of organisation, and the Director of Environmental Affairs was viewed in this way. As a result of these perceptions, the researcher focused efforts away from senior managers, to those in a "middle-management" position, as this was where day to day decisions were made. A focus on middle-management was noticeably seen in the Environmental Management plan as a "Success Enabler" (see Story Board 2).

The need for "middle-management" attention was arguably due to HP's overall management style. One of HP's core values is trust for individuals which allows for increased freedom to make decisions at lower levels within the organisation. This practice, referred to internally as "Management by Objective", is described in more detail below.

By this we mean that, insofar as possible, each individual at each level in the organisation should make his or her own plans to achieve company objectives and goals. After receiving managerial approval, each individual should be given a wide degree of freedom to work within the limitations imposed by these plans, and by our general corporate policies.

"Management by objective," as opposed to management by directive, offers opportunity for individual freedom and contribution; it also imposes an obligation for everyone to exercise initiative and enthusiasm.

As seen, the company does not rely or respond to corporate mandate⁴ well and does not implement policy or programmes in a top down manner.

⁴ Except on a small number of compliance or core values such as their "Standards of Business Conduct"

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The problem with this, as described by Manfred Kets de Vries (1980: 9) was a resulting ambiguity in the patterns of responsibility and authority within the organisation and hence confusion as to where the institutionalisation of environmental management should start.

Whilst considering the different hierarchical levels of organisational at HP, the researcher learned that although important, senior management commitment was not likely to create wide-spread organisational change. HP's decentralised decision making practices meant that, instead, middle-management involvement was more useful. By also paying attention to the involvement of HP's sub-organisations in environmental management programmes, the researcher also found that action at a business group level was dependent on the group's specific objectives and the discretion of employees within the group to effect change. Both of these findings are a direct result of being involved with members of the organisation at all levels throughout the project, and are not widely reference in currently-available literature. Two recommendations which apply to this level of organisational change are presented here. All recommendations from these sections are repeated as a group in the summary section to follow.

Recommendation #6

Identify business group competencies and implement environmental management programmes accordingly

Recommendation #7

Focus on "middle" managers and supervisors in addition to top management to achieve wide-spread change.

The final aspect of organisational life that the researcher considered in relation to achieving the institutionalisation of environmental management was company culture. This is explored in the next section.

11.8) Company Values

Earlier the literature review showed that one of the main approaches recommended for achieving improved environmental management is that of culture change. Additionally, early signals at HP suggested that when environmental management is institutionalised it would mean that it was seen as being part of their culture - The HP Way⁵. From a very early stage however, there were data which explicitly argued that environmental management was already part of HP's culture. This seemed to contradict a number of other observations.

⁵ Described earlier in Part One.

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- ♦ The researcher had recorded data from employees who were frustrated at HP's lack of environmental commitment (shown throughout the story boards)
- ♦ HP was not renowned for being a leader in the field of environmental management.
- ♦ There were no specific environmental management activities being pursued at the start of the research

The researcher was also intrigued by indications of employees' somewhat automatic belief that "HP is an environmentally responsible company". Employee Satisfaction Survey data in 1996, and again in 1998, showed that over 80% of employees believed this to be the case. Certainly in 1996 there was little evidence on which employees could base this assertion. To explain this, the researcher noted that the data which suggested environmental management was already part of HP's culture was only based on one aspect of HP's culture - Citizenship. Hewlett-Packard's culture has many attributes; these are described in the Research Context section earlier in the portfolio. The Citizenship objective calls for Hewlett-Packard to be an asset to each community in which it operates world-wide. References to the Citizenship objective in association with environmental management were seen particularly in the internal communications about environmental management (see Story Board Four).

From HP's point of view, environmental management is an obvious extension of our traditional corporate objectives, starting with "Citizenship".

By doing this, HP will be disposing of its equipment in a responsible manner whilst at the same time fulfilling its legal obligation and being a good citizen.

Hewlett-Packard is a model of good environmental citizenship. Their policy is one of honesty and partnership with Lothian Regional Council.

Hewlett-Packard's commitment to the environment is deeply rooted in the cultural values on which this company was built. It stems from the corporate objectives we established in 1957 that call for us to be an asset to each community in which we operate.

However, as was argued by the Director of Environmental Affairs, environmental management needed to be associated with other aspects of HP's culture as well as just the Citizenship objective.

It is interesting that when I started looking at this job, I looked at the environmental statement at that time, as was done by our previous environmental director, and he based the whole case on the Citizenship objective. I told him that he was going to get nowhere on citizenship alone. We have seven corporate objectives and No.7 is Citizenship. So we had better translate it, if we can't show that Environmental Management is linked to profit then there is no future with it as a major issue. It is more a business issue than a citizenship issue, of course, it is both.

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Also evident in this statement is the business focus taken towards environmental management by HP in this project. In fact, a dual approach was used that emphasised a business case or a citizenship concern depending on the situation. Consistent with this, during the project, the researcher observed that environmental management was either framed as part of business objectives or relating to personal concerns or both. Firstly there was a strong sense that using a business argument for environmental management would achieve results, for example;

HP managers do respond to the right thing to do for HP, and also to social considerations, but if EHS can show a cost improvement, a productivity gain, or other business case it would help.

The further that he veers away from the business line, the more difficulty he has selling his concepts

Conversely, others suggested that environmental management was the "right thing to do".

The real reason we do EHS is because it is the right thing to do. Not because it contributes x% extra to the bottom line

It should cost less to wash glasses than to throw away plastic cups. Even if it doesn't HP should take the "greener" option.

Both of these approaches were shown in the story boards. In the first two, it is assumed that environmental concerns must have an additional business benefit in order to be sold successfully within the organisation. In the second cases, these employees believe that environmental concerns should be addressed simply for their own merits.

To explain this duality of approach at HP, very early in the research, the concept of the "Green Formula" was derived. This formula was the first indication that there were in fact dual objectives to environmental management at HP; namely, citizenship and business results. Both perspectives were valid and successful at HP depending on the business impact of the issue and the personalities involved.

Additionally, experience at HP suggests that it is sometimes necessary to dress environmental improvement goals in business language and occasionally, conversely, to dress a business improvement in environmental language, in order to achieve change. As an example, the identification of a biodegradable packaging alternative for HP's repair centre, appeared to originate as an environmental improvement. However, the change was communicated in terms of cost savings to the rest of the organisation. Additionally, when the company was short of car parking spaces and needed to identify a solution, more attention was paid to the environmental impacts of commuting and whether this could be reduced by reducing the number of cars coming on to site. This complex interplay between business and environmental language further suggested their interdependence and inseparability, confirming the blurred nature of environmental management within the organisation.

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Consistent with this, in addition to positioning environmental management as part of the existing *Citizenship objectives*, throughout the project the researcher would use other aspects of the company's culture to create change. In particular, Story Board Four showed that whilst attempting to achieve its institutionalisation, environmental management was positioned in relation to HP's existing Quality Management, Leadership, and Partnership practices, all of which are mentioned in HP's company objectives. Table M provides some examples of these along side relevant wording from the company's objectives and values.

Table M Examples of Company Objectives in the Data

Extract from Research Data	Theme	HP Objective / Value
For HP this focus on improvement underpins the way we run our business - making environmental management a natural extension of Total Quality Management	Quality	<u>Quality has a long tradition at Hewlett-Packard.</u> From the earliest days, our founders wanted an extra measure of quality in every box we shipped. As Bill Hewlett put it, "...one of our basic objectives was to develop a reputation for quality, both in engineering and in the equipment we produced."
SouthQueensferry has received BS 7750 certification for environmental management- one of the UK's first large operations to receive this certification and HP is respected world-wide, as a leading contributor to environmental practices and standards	Leadership	Our customers expect HP products and services to be of the highest quality and to provide lasting value. To achieve this, all HP people, especially managers, must be <u>leaders who generate enthusiasm and respond with extra effort to meet customer needs.</u> Techniques and management practices which are effective today may be outdated in the future. <u>For us to remain at the forefront in all our activities</u> , people should always be looking for new and better ways to do their work.
HP's Chemical Analysis Group <u>is working with a number of UK companies</u> to improve the quality of our drinking water. HP's Real Estate Manager, CH <u>joined forces</u> with other major companies and Bracknell Forest District Council to oppose Berkshire's Waste Local Plan	Partnerships	We recognize that it is only through <u>effective cooperation within and among organizations</u> that we can achieve our goals.

These and other items were used on various occasions as a "hook" to legitimise the value of environmental management issues. This assumes that at HP the value of environmental management was not immediately evident without such hooks, which is consistent with the researcher's experience. It therefore is argued here that although visible reference to environmental management in company culture is helpful, environmental management is more likely to be adopted if it can be shown to link to existing company objectives of which organisational members are already aware. Three final recommendations are presented here that relate to the importance of company values in achieving institutionalisation.

Recommendation #8

Identify and demonstrate existing company objectives and strategies which are related to environmental management

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Recommendation #9

Demonstrate linkages between Environmental Management and both "hard" and "soft" objectives

Recommendation #10

Reinforce company values with both communications and action

The four levels that have been discussed are now summarised and the main research findings highlighted. From this a framework for the institutionalisation of environmental management emerges.

11.9) Summary & Discussion

The previous sections have described four levels of organisational activity that the researcher continuously observed and influenced over four years. The researcher's experiences of creating and analysing change at each level led to the findings which have just been presented. In this section the findings are drawn together and presented as a framework for institutionalising environmental management.

Firstly, data indicated that the institutionalisation of environmental management would require change at a number of different levels within the organisation. Four levels of change were subsequently defined by the researcher and used as an analytical framework. There were two observations which resulted from this framework. The first was that the boundaries between organisational levels were blurred and the second was that environmental management was indistinguishable from other business processes at the company. These will be considered in turn.

In viewing HP in terms of four levels, the processes of data analysis and collection were made more easy. However, the boundaries between these levels were occasionally blurred. As an example, there were occasions whereby a large scale or specific change occurred when an individual embraced environmental management concepts. One such example is clearly the influence of the Director for Environmental Affairs. Although still an individual, this manager's influence over environmental management change was significant as seen particularly in Story Board Three. The question is whether changes in this manager's actions would represent change at an individual, group or organisational level. Clearly it can be considered at all three; he can either be an individual, a representative of the EHS department or a senior company manager depending on the context in which he is working. This is an extreme case but it shows that certain individuals can have influence which is seemingly greater than most and more consistent with changes at a sub-organisational or company level. The position and influence of individuals within an organisational structure is an important consideration for institutionalising environmental management.

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At HP it would not have been possible to target a particular "level" within an organisation for improved environmental management. The organisation does not readily fall into such neat categories. Arguably, this would be different in a more traditional and bureaucratic organisation, or with a command and control approach.

Further to this, the study of environmental management as a subject at Hewlett-Packard was organisationally difficult. The researcher showed that environmental management was not a discrete function at HP, nor a static set of issues. Attempts to understand the environmental management issues at HP were frustrated since the boundaries between environmental management and other general management issues were vague. At first, the topic of waste management appeared clearly part of environmental management. However, it soon became apparent that actions associated with waste management were part of good "facilities management" which already existed in the organisational structure. The borderline between the two was a question of degree. If a facilities management organisation was not encouraging waste reduction, staff from the EHS department were required to provide motivation and guidance. However, once waste was being managed in an environmentally responsible manner, as part of the norm, employees from the EHS department were effectively redundant. This example was not unique to waste management at HP. Consequently, it is argued here that most "environmental" issues arise because of a business decision (or lack of one) - it is only business decisions which can reverse the trend. This evolving nature of environmental management within HP made the analysis of a "bounded" set of issues extremely difficult. In addition to the vague identity of environmental management in the organisation, there were also differences in employee perceptions as to the associated issues. This was particularly described in Story Board Two where some employees considered the term "environmental" to include problems with the health of their immediate working environment as well as "global" concerns. The study of environmental management was multi-faceted at HP, simply because employees and managers alike had different interpretations of its meaning.

Despite these observations, the researcher continued to analyse the organisation in terms of environmental management at four levels in the organisation. This was in order to simplify the analysis process and to provide some structure on which to base the description of the project. The following sections return to these levels in turn and draw together the ten recommendations that have been presented throughout the text so far into a framework for institutionalising environmental management.

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Firstly, the research at HP considered the role of individuals in achieving the institutionalisation of environmental management. Previous authors have tended to claim that *all* employees need to be involved with environmental management, or that *every* individual should have personal values associated with environmental protection. As a result of the research at HP, it is argued here that this broad-brush approach is not particularly useful or realistic for managers wishing to improve environmental management. Additionally, the research data suggested that employees' values *and* actions were important determinants in achieving environmental management change. In particular, during this research, a model was devised depicting the range of responsibilities that an employee can have towards environmental management depending on their role. This model makes a contribution to knowledge by clarifying that all employees can be involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation and the extent to which environmental management is a legitimate organisational concern.

Secondly, the research also took a closer look at the business activity required to institutionalise environmental management. Previous environmental management researchers have tended to ignore the role of middle management in the achievement of change suggesting that either top management or employee awareness are more appropriate strategies for achieving change. This idea of targeting middle management complements existing strategies for achieving change and it is argued here represents a more effective way of approaching environmental management change. As seen in Story Board One, some way into the project the researcher questioned whether in fact the key to "institutionalisation" at HP was strongly linked to middle management commitment. It proved to the researcher that in order to achieve change throughout the organisation, these employees would have to be the main target of change. However, this had not previously been identified within Environmental Management literatures. Instead, either/or top management commitment and individual employee involvement were described as essential.

The previous sections have shown that although important, top management commitment alone would not achieve the institutionalisation of environmental management and neither was it practical to seek the involvement of *all* employees. The researcher concluded that something was missing in the previous descriptions of successful environmental management. The missing factor was an attention to "middle-management" and their responsibilities within the organisation. More significantly, it is asserted here that the use of an insider-based methodology was critical for identifying this missing factor.

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In addition to considering the hierarchical aspects of business management, the research at HP examined the role of sub-organisations and their role in environmental management. The research found that action at a business group level was dependent on the group's specific objectives and the discretion of employees within the group to effect change. Previous descriptions of environmental management in organisations have not discussed existing organisational frameworks or employee responsibilities, in effect, isolating environmental management from normal business practice. This conflicts directly with the aim of institutionalising environmental management and is therefore counterproductive.

Finally, this research considered the role of company culture in terms of environmental management. The researcher found considerable value in using existing corporate objectives and core values as legitimising tools during the project. This confirms previous analyses which suggest the efficacy of this approach. In addition, the research at HP also provides specific examples of its application. Between these four levels ten practical recommendations have been identified for firms wishing to institutionalise environmental management. These are presented once again in Table A with a summary the research findings. Table A is presented as a framework for institutionalising environmental management.

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Table A Framework for the Institutionalisation of Environmental Management

Framework for the Institutionalisation of Environmental Management		
Overall Findings	Levels	Practical Recommendations
<p>1) <i>The institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred.</i></p> <p>2) <i>Environmental management is not a distinct organisational issue and should be analysed along side other business practices.</i></p>	<p>Individual Values</p> <p>A broad-brush approach which expects every employee to value environmental protection is not particularly useful or realistic for managers wishing to improve environmental management</p>	<ul style="list-style-type: none"> - Link environmental programmes to personal concerns for environmental protection - Demonstrate and provide "sinks" to capture employee environmental concerns
	<p>Individual Action</p> <p>A large number employees can be actively involved in environmental management programmes but they can only do so to a certain extent depending on their position in the organisation.</p>	<ul style="list-style-type: none"> - Organise individual training and awareness according to employee roles and responsibilities - Involve appropriate level of employee according to objectives - Minimise effort put into generic company-wide programmes / Maximise effort put into specific improvement programmes
	<p>Business Activity</p> <p>Action at a business group level is dependent on the group's specific objectives and the discretion of employees within the group to effect change.</p>	<ul style="list-style-type: none"> - Identify business group competencies and recommend environmental management programmes accordingly - Focus on "middle" managers and supervisors in addition to top management
	<p>Company Values</p> <p>Considerable benefit can be obtained by using existing corporate objectives and core values as legitimising tools during organisational change.</p>	<ul style="list-style-type: none"> - Identify and demonstrate existing company objectives and strategies which are related to environmental management - Demonstrate linkages between environmental management and both "hard" and "soft" objectives - Reinforce company values with both communications and action

Part Three - Evaluation

Understanding the Institutionalisation of Environmental Management

In this chapter the research findings, developed over a period of four years, have been discussed. It is suggested here that many of the insights gained by this research have not previously been obtained because researchers have rarely been able to access different organisational levels as part of their research. It has been relatively common in this field to interview senior executives within a firm, or review published company documentation. Likewise, there are studies of employee awareness in general, either through survey or interview techniques. Neither of these approaches examine the real implication of an integrated or institutionalised environmental management function because they do not normally gain access to the appropriate parts of the organisation.

In this project, it was difficult to separate the contribution to knowledge into methodological and critical components. It was *because* an insider based method was used that the framework for institutionalising environmental management could be developed. The action orientation of the project led to many acknowledged improvements which have furthered HP's environmental management knowledge beyond that which could have been gained with purely an HP employee or an outsider-based researcher. There were inevitably challenges with the insider-based research method used in this research. These are now explored in Chapter 12.

Part Three - Evaluation

Reflections on the Action Research Process

Chapter Twelve

Reflections on the Action Research Process

12.1) Introduction

In this penultimate chapter of Part Three, the research methodology is reconsidered. The previous chapter has shown that insider-based research methods used in this project led directly to the discovery of research findings and practical recommendations. This chapter is a reflective critique of the research methods used in the project. The discussion is divided into the same sections as those used in the description of research methodology in Part One. This starts with a discussion of the research design and is completed by looking at the specific methodologies used to facilitate and record the project at HP.

12.2) A case study of Hewlett-Packard Ltd

The project at Hewlett-Packard was, at its core, a study of organisational life. A single organisation was chosen as the subject of inquiry since a valuable opportunity was provided and there was a shortfall of detailed environmental management case studies within the green business and more general management literature. As mentioned, the research design used for this project was based on techniques familiar to organisational researchers and other social scientists. Within this methodology, there were distinct advantages to choosing a researcher who was not particularly familiar with Hewlett-Packard's culture. As Clyde Kluckhohn has said, "It would hardly be a fish who discovered the existence of water" (quoted in Sanday, 1979). The selection process for choosing a suitable researcher was based not only on experience in environmental management, other factors such as i) the suitability of the candidate for the company culture, ii) the level of personal maturity and iii) flexibility to adapt to the specific project, were also very important.

12.2) An Inquiry from the Inside

Evident from many of the previous chapters is the uniquely privileged insider-based perspective that the researcher was given. One of the main advantages of an insider-based methodology for this project was the ability to observe the mundane. Studies of exceptional events are more prevalent in organisational change literature than those of continuous adaptation. In his "Footnotes to organisational change", March (1981) calls for a greater analysis of processes within organisations by which change occurs, in particular when those changes are a consequence of standard procedures or ordinary adaptation. In other words there is a recognised need for understanding how normal organisational action can produce organisational change.

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Arguably the only research which can form a detailed impression of normal working life is research conducted from the inside. At HP, the opportunities for observing change were not based on a classification of significant events. There were opportunities to observe and influence both small and large scale changes at the company. Indeed in most cases, the size of change was not evident at the outset. Organisational data were recorded according to issue-based categories described in Part two but the significance of data was not considered until much later. This meant that a large volume of eventually insignificant material was captured.

The high degree of access afforded to the researcher also enabled regular checks as to the relevance of the project, and associated findings, to managers within the company. Since the researcher was perceived to be a legitimate member of the organisation, she was regularly "copied" on information relevant to environmental management as opposed to actively seeking data. The flip side to this was that, *because* the researcher was constantly inside the organisation, the pressure to collect as much data as possible, quickly, was removed. The researcher knew that people would always be there, or that a document was always in a file somewhere. This led to a tendency for delays in the analysis of data during the project. One criticism often directed to practitioners of insider-based research methods is the tendency to "go native" in an anthropological sense and hence jeopardise their ability to view the organisation objectively. Certainly, in this case, the proximity of the researcher to the organisation, particularly in the early stages of the project, caused conflicts in researcher identity, which independent, external, academic supervision helped to contain.

Approximately one year into the project the researcher began to clarify her different "roles" in the organisation and become more comfortable with their coexistence (shown in Story Board One). At times, especially during write-up, the researcher struggled to write *about* HP as an organisation when the same organisation also included the researcher. This tension was occasionally useful because the researcher was able to experience, first-hand, events as though she were a permanent member of the organisation. Despite disadvantages it is argued here that it is important to "go native", to some controlled extent, in order to fully understand the organisation under study. In this case the researcher was able to understand organisational processes because she was present, accepted and active in the organisation for the entire research period.

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Reflections on the Action Research Process

12.3) A Longitudinal Study

Another characteristic of this project was its longitudinal focus. Environmental management programmes were observed and influenced continuously for four years. In the field of environmental management particularly, the length of the project was significant compared to previous work. The longitudinal nature of the project allowed for repeat observations, continuity, and analysis of specific programme development such as the initiatives to improve office waste management detailed in Story Board Five. Since the changes being observed were quite mundane, the longitudinal nature of the project helped. In particular since the company being analysed was a relatively low-risk location, in terms of environmental management, there were unlikely to be any significant events over the research period that could be examined in any detail. Rather, the much lower-level, day to day, activities which formed the company's environmental management strategy were considered over a longer time-frame. Consistent with comments by Foote-Whyte (1991), actions proceeded through time, so it would have been insufficient to document actions taking place at any single point in time.

The project length also allowed ideas to develop and be tested "in situ" as opposed to after the event. Consequently, the process of research was largely iterative i.e. preliminary ideas developed during involvement in environmental management programmes refined with time, forming a smaller number of findings described in previous chapters. The iterative nature of the research led to complexities in writing up which were somewhat relieved by the development of the first story board. For example, key data themes did not arise at the end of the research process, rather they emerged throughout the project. That said, there were still some themes which emerged from the separate analysis of data at the end of the project. This highlighted the value of reanalysing the complete data, despite being very familiar with its contents.

12.4) An Action and Research project

As described earlier, the main research method used in this project was Action Research. It was considered an appropriate method to use given the objectives of the project and the high degree of participation in the organisation. One of the first considerations in Action Research projects is the identification of a "gate-keeper" who is willing to arrange access. In this case, access had already been negotiated through the Engineering Doctorate programme, providing the researcher with an appropriate route into the organisation. It has been argued (Foster, 1972) that the entry point into the organisation should be close to the higher echelons of the company, since this is where change can be effectively directed.

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Conversely, Schein (1976) argues that it can be more productive to effect change if the researcher is located somewhere in the "middle management" structures, especially if the topic is new to the company. "While entry near the top, and with the full support of the board, would undoubtedly have increased the chances of initial impact and success, we shared a sense that this new activity needed to earn the right to be accepted" (Schein, 1976:18)⁶.

For the project at HP, the researcher reported directly to the Director of Environmental Affairs, who reported in turn to the Managing Director, but her position was seen initially at a graduate level. The combination of senior management commitment and visibility, and lower level day to day activities, was, in hindsight, a useful tool for tackling multiple levels of change in the company. In addition, over the course of the project, the researcher also developed professionally which altered her influence at the company. This was shown in several of the story boards, in particular Story Board Two where the researcher's influence over business planning processes was shown to change significantly over time. The professional development of the researcher as a result of the research is considered in more detail towards the end of this chapter.

The research at HP was based inside the company, but more than that, it was designed to facilitate results and learning for the company's employees and managers. In addition to furthering the academic discipline of environmental management, this project was aimed specifically at generating results for the company. In their analysis of organisational research, Beer and Walton (1987) make a plea for research which is aimed at the needs of managers and which utilises the language which managers can understand.

The project at HP meets both of these requirements. Not only were the project objectives ratified by *both* academic and industrial supervisors but, as shown in the previous discussion, the specific techniques used to "institutionalise environmental management" latched on to business language and existing company practices to achieve change. Further the project was designed to meet the "Parnaby" recommendations described in Part One, which also aim at providing more industrially relevant research.

".. there is a need for a major new scheme providing engineering doctorate programmes in the processes and practice of engineering required by industry. Such an engineering doctorate would be distinct from, and complementary to, the traditional PhD, which has been criticised for its lack of industrial relevance." (Brunel University / University of Surrey, 1996/7)

⁶ Like the new role of sociology in Schein's project at Shell, in Hewlett-Packard the new activity called environmental management also needed to earn its place in the organisation. One of the first (and on-going) tasks of the researcher was to demonstrate the negative business impact associated with poor environmental management. This was a mechanism used to highlight the importance of environmental management to managers throughout the company. Many of the communications' activities described in Story Board Four also used this technique to legitimise environmental management.

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In line with this the researcher played an active role in the development of environmental management programmes for four years. One of the most striking characteristics of observing and influencing organisational change from the inside was that changes did not occur in neat packages of events to suit the needs of the researcher. It was impossible to plan for the events which occurred. Sometimes, what seemed to be very simple changes, such as changing the type of paper in photocopying rooms, took much longer than expected to occur. Conversely, significant changes, such as HP's position in the development of electronic waste recovery legislation, occurred very rapidly. As an aside, the reasons behind why some issues stalled at HP, and others did not, were the subject of separate but related research carried out at HP during the project (Bansal, Jackson and McIntyre, 1998). The results of this research are included in Portfolio Volume 2.

These different types of change meant that the researcher had to remain flexible in her methodology. It is argued here that organisational scientists should adapt their approach to suit the subject of inquiry, since it is impossible to achieve the reverse. That said, researchers should ensure the validity of any research and not lose complete control to the subject of enquiry. In this project, there were certainly benefits to following a flexible approach which was mindful of the organisation's operating context but inevitably this also caused tensions. In particular, since the researcher was effectively observing change all of the time, it was difficult to notice when changes had actually occurred until obvious data points were presented. Examples of such "obvious data points" included the Corporate EHS Audit and the EHS Quality Maturity Review. Both of these provided snapshots of environmental management performance each time they were carried out. Without these data points it may have been difficult to look back and analyse why, or even when, changes had occurred. Often changes seemed to just be a logical progression but, on looking back, large changes in actual practice had occurred. This research suggested that, in effecting organisational change, it is necessary for managers to create the climate for change and maintain momentum, even though changes seem to take time. This type of change is argued to be much longer lasting but unfortunately less easy to measure. In this type of ongoing change there are no "obvious" data points making the process of analysis very difficult.

One of the main aspects of the action research at HP was the concept of "diminishing dependency". The Research Methodology chapter in Part One described how, towards the end of the project, the researcher started to reduce the dependency on her support in line with the objectives of institutionalisation. This was also seen particularly in Story Board Five with the researcher's involvement with the waste management team. Reducing this dependency was not as easy as was first imagined.

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The researcher's desire to see improvements in environmental performance was often at odds with the desire to pull away from projects at a logical point. N.B a similar phenomenon is described in the Action Research literatures. "He (the change agent) may as a defence, find he is contributing to the client's inability to learn how to solve his problems, by attempting to take over the client's part in this for himself. Thus winning the temporary regard of the client but denying him the opportunity for development which comes partly from an understanding of the real underlying problems, as well as practice in resolving them" (Foster, 1972: 536). Occasionally, in these situations the researcher would light-heartedly threaten members of the organisation with the prospect of her leaving the company with the knowledge which they would need in order to continue making progress. The inevitability of over-reliance on the researcher is a particular problem in projects with an action focus. It is difficult to become associated with a project without making a contribution and busy managers might view this contribution as an additional resource.

To a large extent, the successful execution of a project of this nature depends on the congruence of research objectives between the company and the researcher. In this case, there were relatively few occasions where the researcher's activities as an "HP functionary" did not support the broader objectives of "institutionalising environmental management". In fact, the researcher's development at the company was often as a direct result of the research activities. The relationship between the project and the researcher's development is now presented in more detail.

12.4.1) Researcher Development

Over the four years of the project, inevitably both the researcher and the client organisation changed over time, sometimes as a direct consequence of the project. This majority of this Portfolio has focused on the changes that were seen in Hewlett-Packard's activities over the course of the project, with little mention of the researcher herself. The researcher did not remain a "constant" throughout, in fact it was *intended* that the researcher develop within her role at the company.

Three of areas of development can be considered.

- ♦ Professional
- ♦ Research
- ♦ Personal

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Professional Development concerns the researcher's progress over time in the organisation in relation to a particular career path or direction. Research development concerns the progress of the researcher in terms of the competencies to conduct organisational research. Personal development concerns the researcher's development as an individual member of the organisation and of society as a whole. Although somewhat indistinguishable, each of these changed over the course of the project. The first two are the most relevant for this Portfolio and are considered here separately.

Professionally, the researcher certainly moved forward as a consequence of this research. Examples were shown in the story boards of the different stages of the researcher's development, particularly in relation to the execution of the environmental management plan. This was achieved in three ways. Firstly, Hewlett-Packard provided the researcher with opportunities for professional development in the form of training and regular discussions with managers. Training needs were identified by the researcher in conjunction with supervising managers and (as a result of specific training) improvements were seen in:

- ♦ Writing Skills
- ♦ Quality Management techniques
- ♦ Time management
- ♦ Environmental Co-ordinator Skills
- ♦ Information technology

Secondly, the masters-level modules that form part of the Engineering Doctorate programme enhanced the researcher's existing knowledge of environmental technology, financial and project management, and leadership and communication skills.

Although not insignificant, neither of these types of training were the most beneficial to the researcher's professional development. The third type of development was less specific, more continuous, and was based on the researcher's practical experience of implementing projects during the research. An invaluable relationship with the project supervisor, the Director of Environmental Affairs, also contributed to this significantly. The project methodology also enhanced this process. In particular the reflective nature of action research, allowed the researcher to analyse particular situations and their outcome, including those that included the researcher in another role, say as change agent. This is shown in Fig. 24.

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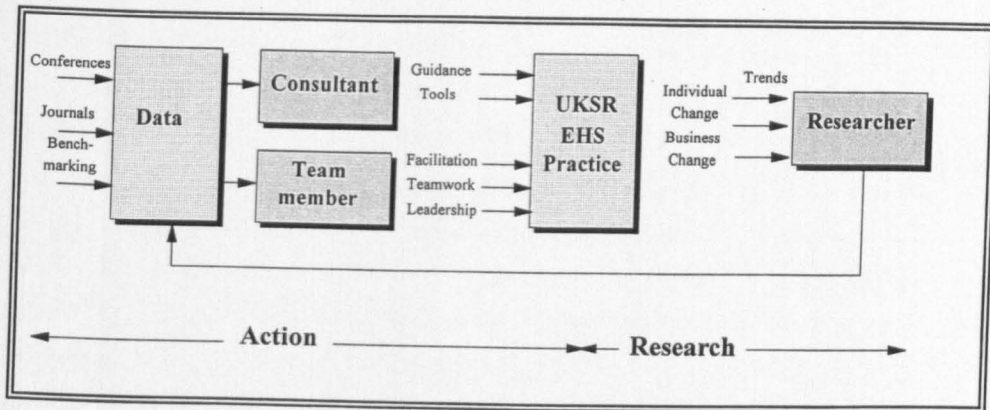


Fig. 24 The Action Research Process

During the project the researcher had roles relating to both action and research. As a change agent in the company, the researcher would gather data from conferences, journals and other industry benchmarking to find out how HP could improve its environmental management. Through various processes such as involvement with project teams or direct consultation the researcher would convey this information. During the project this occasionally led to changes in both individual and company practice, and occasionally did not. In a different capacity, the researcher was able to then analyse the success or otherwise of complete change processes, since she had been involved throughout. This included an analysis of the effectiveness of the researcher's own professional activities in the process. The results of this analysis were then mentally "stored" for use in future projects at the company. In this way the researcher was able to develop professionally, quite continuously, during the project and the company were able to benefit from the researcher's continuous reflections on the change process.

The second type of development, which links in parts to the first, was the researcher's development of research skills. Training in social research methods, writing skills and project management were provided as part of the Engineering Doctorate programme and the researcher supplemented these by becoming familiar with organisational research literatures. However, once again, by far the most useful training in organisational research was just "doing" it. Many of the skills required to conduct organisational research, such as negotiation, communication, problem solving, time management, creativity and flexibility, were required for the professional side to the project at the company. Uniquely "research" competencies such as knowledge of data collection methods, available research designs and broader academic disciplines, and the ability to find related information and structure a written and verbal case for the research, required more attention from the researcher.

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One of the biggest tensions seen between these two areas of development related to the time-frames associated with providing deliverables. In a professional setting, particularly a fast moving sales organisation like the sponsoring company, project deliverables are often quite "short term" in line with the business' activity. In contrast to this, the deliverables of a four year research project are of a very different (long-term) nature. From a development point of view, this meant that the researcher inevitably received feed-back relating to professional development on a much more frequent basis than for developing necessary research skills. In cases like this project, the researcher must learn how to deliver a timely research project whilst simultaneously earning legitimacy and achieving short term results for the sponsoring company. Learning to balance these two types of work was extremely challenging and the most rewarding aspect of this project.

12.5) Application of Research Methodologies

In addition to considering the methodologies associated with facilitating and analysing change at the company, this section will now consider the issues (both positive and negative) associated with retrieving and recording the qualitative data during this research. In Part One, Chapter Four described how, in this project, several types of research method were used in combination to provide a complete picture of events at the company. This section reflects on each methodology used in the light of previous literatures that discuss their application.

In general, the researcher tried to use existing research methods in the organisation to avoid the perturbative effect of research instruments. In particular this was discussed in Story Board Two where the researcher was frustrated by changes in company practice (Platform Services Survey) that led to changes in her own data collection processes. This was an unusual approach to take, most organisational researchers employ distinct strategies to collect data the aim of which is to collect research data only. Conversely, the approach taken at HP was to look for existing data collection tools and modify them to suit the needs of the researcher. The technique of modifying existing tools (which the researcher recommends) spanned the different methodologies used to collect data as will be seen in the discussions which follow.

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There were relatively few self-administered questionnaires used in this research, a complete list is provided in Table F contained in Chapter Four. These questionnaires were useful for providing general trends year on year and for raising the awareness of environmental management within the organisation. This intentional side effect raises an interesting question. With this more perturbative approach to measurement there is a desired side effect of raising awareness for the subject being measured. In a more observation based approach these side effects tend not to be encouraged. This conflict highlights the value of using a mixture of methodologies within a broader research strategy. In the research at HP it was perceived as beneficial to help raise awareness for environmental management and therefore such questionnaires were employed.

Although the main focus of this research was based on participant observation, the small number of interview transcripts added significant value to the data analysis process. Once data themes had been identified, it was possible to return to interview transcripts and identify relevant quotes for inclusion in the Portfolio. In hindsight, a larger number of structured interviews would have been beneficial for further confirmation of the remaining observational data.

Access to documentary evidence in this project was significant. In fact, there was generally too much documentation available to use constructively in the data analysis process. Documentation tended to be a source of supporting information as opposed to a piece of data in its own right. A large collection of available documentation was used as a secondary source of information once initial findings were identified. Copies of electronic mail messages were however, a primary source of information. Story Board Five, in particular, gave examples of the type of messages which a researcher can access through this tool and the introduction to Part Two described the advantages of using this approach.

12.6) Summary

The previous sections in this chapter have explored the methodological insights gained in this project. They have shown some of the difficulties encountered in researching environmental management from within an organisation and some of the insights which could not have been gained by other methods. The chapter has also shown some of the challenges and advantages of conducting action-based research in a modern organisation.

The next chapter takes these insights together with the framework for institutionalisation of environmental management and presents the conclusions of the project. This conclusion includes reference to future research opportunities and some of the wider implications of the research for industry.

Part Three - Evaluation

Conclusions and Future Research

Part Three - Evaluation

Chapter Thirteen - Conclusions and Future Research

13.1) Introduction

Having described the process and detail of research at Hewlett-Packard in Parts One and Two, this part of the portfolio has discussed the main findings of the work. In the discussions contained therein the framework for institutionalising environmental management was derived and shown to have been supported by the research data. Additionally, some methodological perspectives were also provided. A series of recommendations were listed for future environmental management practitioners and researchers and some suggestions made for future research avenues. This concluding chapter returns to the objectives of the research and evaluates the extent to which they have been met and the possibilities for future research.

13.2) Revisiting the objectives

From the outset, it was the intention that, through participating in the development of the company's environmental management plan, the researcher would learn first hand the issues and factors which affect the institutionalisation of environmental management over a four year time frame. During this process, the researcher learned that neither environmental management nor organisational change at HP could be described simply to an outside observer. The research at HP suggested that the field of environmental management needs to be redefined in terms of the organisational sub-cultures or communities which exist within organisations. The most important insight from the process of engagement at HP was the difficulty encountered in studying environmental management as a bounded set of issues. This was impossible at HP and is suggested to be difficult to achieve for most organisations.

This raises the much larger question as to the relevance of environmental management research. Certainly research with the aim of clarifying the role of specific environmental management systems can still establish clear research boundaries. However, those researchers hoping to develop and test theory as to the mechanisms of improved environmental performance within organisations will have difficulty if they design their research strategies to involve just environmental management professionals or documentation. The elements of environmental management lie not in the department tasked with improving environmental performance, they already exist in the business decisions which are taken daily by employees at all levels of organisation. These are the organisational processes which require further examination if a better understanding of industrial environmental performance is to be obtained.

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Conclusions and Future Research

It was shown earlier that the objective of many managers is to integrate environmental management into normal business practice. Similarly, it is suggested here that environmental management should not have a separate research agenda. There are of course benefits to targeted research aimed at specific aspects of environmental management. However, to pursue this avenue ad infinitum will not help practitioners in organisations to achieve a more integrated approach. A careful balance must be struck between highlighting environmental responsibility to industry and separating out an issue which does not appear to be part of general management. To give environmental management a distinct identity does not convey its interdependence with existing organisational processes. The recommendation made here is that researchers should avoid treating environmental management as a distinct identifiable aspect of management and should instead focus on the organisational processes which lead to environmental improvements. This is entirely consistent with recent recommendations made by Wolff (1998) who suggests that environmental research needs to include more seriously relevant management research and that organisation and management theory do not need another new special subject. For future researchers, discovering the key determinants of environmental management change would require a cross-disciplinary focus including expertise from sociology, organisational theory and psychology. In particular, it is suggested that an understanding of the interplay between how values and actions is seen as crucial as industrial organisations move from environmental management into discussions of sustainable development.

Despite the vague identity of environmental management at HP the researcher was able to uncover some findings which support a model that depicts four specific levels of environmental management change. These were discussed in the previous section and summarised in the framework for institutionalising environmental management. The findings of the project which relate to these levels represent a first step towards identifying the factors which can help institutionalise environmental management in industry. Even as this portfolio is being written, there continues to be calls for such an approach. As an example, two articles in the November 1998 volume of *Business Strategy and the Environment* relate to a more integrated approach. The first (Stead, McKinney, and Stead, 1998) discusses whether (or not) institutionalising environmental performance is happening in US industry, the second, discusses integrating ethics into mainstream management (Wyburd, 1998). Unfortunately, despite its promising subject matter, the former does nothing more than to restate the significance and needs of the institutionalisation of environmental management.

The research at Hewlett-Packard has already taken this one step further and identified what institutionalisation would mean for a firm and what practical tools were used to achieve such change.

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A further emergent objective of this project was to demonstrate the validity of insider-based methodologies for environmental management research. Certainly, the definition and evaluation of the "institutionalisation of environmental management" at Hewlett-Packard was facilitated by the insider-based methodology in this case. This has been demonstrated throughout the story boards and particularly in Chapter 11. Such methodology is not without its problems though. In particular, the researcher encountered difficulties in defining boundaries for the research and in remaining a partially independent observer. There were also practical problems in terms of storing and analysing the potentially large amount of information that an insider can obtain, and in remembering to obtain it when the informant or source "will always be there"! Despite any difficulties, the researcher wholeheartedly believes that research carried out from an inside-perspective, and even work carried out from a researcher's perspective, is extremely useful for the future development of environmental management in industry. This portfolio has demonstrated that for HP at least this was the case. A testament to the value of the research project to HP is the continued employment of the researcher as an environmental engineer in the Regulatory Affairs department of HP's UK Sales Region. Additionally, two more researchers are now engaged with HP on a similar basis. To HP, at least, the value of insider-based research has been proven. However this value is exchanged for commitment and tangible results from the researcher's practical work. For them, one is impossible without the other. Although a difficult balance to strike, it is argued that the future of research in industry must include the kinds of opportunities presented by insider-based industrial research.

13.3) Theory versus Practice

The research methodology of this project allowed for a unique perspective on the relationship between theory and practice. It has already been demonstrated that theoretical perspectives on environmental management are lacking in the literature. This is not surprising given the few in-depth case studies of organisational life conducted today. Despite this, environmental management practice continues to move forward at a pace. This research attempted to bridge the gap between theory and practice. Significant benefit was gained from being a researcher in a practitioner environment and vice versa. The most significant benefit was the ability to reflect on practical processes as they related to associated literatures. In many cases, the researcher's practical experiences differed considerably from that which could be expected from reading the literatures. A good example shown in this portfolio was how numerous literatures appeared to advocate the involvement of *all* employees in an environmental management programme and yet practical experience at a large company confirmed to the researcher that this was impractical and that a new typology of environmental management involvement was required.

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There were also examples of where the literature actually provided clarity or direction to a desired action in the company. A good example of this was where the researcher had noted the concept of "goal congruence" in an article about employee involvement in environmental management. This observation led to the development of the golden bridge theory described in Chapter 11. For researchers wishing to capitalise on the benefits of a theory and practice driven approach, some recommendations are made. Firstly, in order to understand the relationship between company actions and theoretical work, it is a necessary to maintain a dual purpose log. Without this the boundaries and sequence between types of research activity become difficult to separate and hence to convey conclusively. Researcher's need to classify their research and somehow highlight events where specific advantage is seen from taking the dual approach. This was attempted during the research project at Hewlett-Packard, but was never fully realised. The second recommendation is that researcher's should take the skills from the domain of research in to the domain of practice (and vice versa). The analytical skills required to interpret literature and the development of critical thought are certainly skills useful in some practical situations. Conversely, and particular to this research, the skills of marketing or selling your services can be used in the research environment quite successfully, particularly for gaining access or permission from informants. The final recommendation made here is that managers can gain benefit from qualitative data collection and analysis, particularly longitudinal data. Evidence from the research carried out at Hewlett-Packard showed that the company's own "memory" was shorter than the research time frame and that members of the organisation valued the uniquely "historical" perspective that the research was able to offer.

13.4) Wider Application

This portfolio has shown that the research was of value to Hewlett-Packard in two ways. Firstly, during the project, the company was convinced of the value of insider-based research, sponsoring a second, and subsequently a third, Engineering Doctorate researcher. Secondly, the company was able to share in the specific findings of the project to "institutionalise environmental management" both during and after the project fieldwork. One of the objectives of this project was to identify trends in the HP case study that might have more wide applicability. It is argued that the findings from this project, both from a subject (environmental management) and a methodological (insider-based) perspective, are to a certain extent more widely applicable. These perspectives are considered now in turn.

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Firstly the framework for institutionalising environmental management is considered. The first finding of the research was discovering that the institutionalisation of environmental management can be viewed simply in terms of four levels of organisational change, although the boundaries between levels are blurred.

This finding is applicable to any organisational structure and recognises that simple organisational characterisations are not realistic. Nevertheless it is important to make some distinctions within an organisation's structure in order to target change more effectively. The second main finding suggests that environmental management is not a distinct organisational issue and should be analysed alongside other business practices. Once again, the terminology of this finding is intended to be more widely applicable than just to Hewlett-Packard's operations. Even where organisations have chosen to dedicate significant resources and established distinct organisational frameworks for environmental management, continuous improvement in environmental performance relies at some level on the co-operation of almost every department / business unit or function within the organisation and therefore can not be considered as a distinct organisational issue. Although a certain amount of dedicated resource for environmental management may be necessary for activities such as co-ordination, issue tracking, and compliance assurance, a large proportion of the activities required for environmental management are interspersed throughout an organisation, irrespective of its operating structure. Perhaps organisations whose decision making structures are very hierarchical and who are driven by command and control methods may be able to establish dedicated environmental management functions that are accountable for environmental performance. Even this case seems most unlikely if the true identity, or lack of identity, of environmental management is considered.

Moving on to the more practical recommendations contained in the framework for institutionalising environmental management. The first set of these, directed at the "Individual Values" level, can arguably be applied in any organisation, although perhaps more easily in those which have systems or cultures that support employee feed-back and empowerment. The second set, once again directed towards achieving change at the individual level, is designed to consider differing organisational structures and needs. These recommendations can be applied to any organisational structure, but the prevailing structure and responsibilities of employees must be considered otherwise environmental management "training" and "awareness" programmes will become irrelevant.

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The next recommendations relate to achieving change in "business activity" which was perhaps the hardest to define. Both of the recommendations are applicable to other organisations wishing to institutionalise environmental management, although the need to focus on middle-management as well as top management commitment may well be more appropriate for flatter organisational structures where decision making powers are decentralised.

The final recommendations relate to achieving a "culture" which embraces the concept of environmental management. Some businesses may not even purport to having a culture *per se* however the recommendations can still be applied. Perhaps one of the most significant themes of the project at Hewlett-Packard was termed "using the culture to change the culture". Whatever prevailing structure, culture or objectives exists within an organisation, it should be used where possible as a "hook" for environmental management. To create a "new" ethos is considerably more time consuming, resource intensive and ultimately might fail to capture the imagination of existing employees. At every level, Hewlett-Packard employees, managers, departments and business units responded best to communications in their own language, for other organisations no doubt the language will be different but the principle will be the same.

It is also worth reflecting on the wider applicability of the insider-based research that characterised this project. In part, the success of the insider-based methodology in this case was due to the Engineering Doctorate programme itself. Since the programme is designed to add value to the sponsoring organisation, both in the short and long term, the conditions of the placement are established up front and progress measured towards both industrial and academic goals continuously. The relationship between the University and the company was a success factor for this project. Also advantageous was the relative invisibility of a specific research agenda to most of the employees. Although every employee involved during the project was aware of the researchers position, they were rarely questioned or observed obtrusively. This portfolio has shown that the acceptance of the researcher was equivalent to her being "an employee". This undoubtedly helped the project to be executed more smoothly. These and other factors, which increased the access and legitimacy of the researcher, were vital to the success of the project. It is not possible to say conclusively whether insider-based research would be fruitful for any other organisations. However, if coupled with a realistic expectation of "give and take" from both parties, it can be a very beneficial strategy. These conditions may not suit all disciplines or all organisations, but where a match can be found such research will be of value.

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However, the researcher does not advocate that *all* environmental management (or general organisational) research be carried out in this way. For the subject of institutionalising environmental management it was an important methodological choice and would be recommended for similar studies again. For more specific research agendas it might not be such a useful choice. In short, based on the experience gained during this project, it is argued here that insider-based research, in particular that which is designed to provide value for both practitioners and researchers alike, deserves its place in the organisational research tool-kit.

13.5) Learning During Research

Before taking a closer look towards the future, it is worth reflecting briefly on the project as a learning exercise for the researcher. Often overlooked in the analysis of a project, the development of the researcher over time is a significant variable in the management and execution of research. During this project the researcher continuously had to learn new skills and information in order for the project to develop. These were both personal and professional skills as well as those relating to the research process (as described in Chapter 12). Research of this inside nature, particularly those where the researcher is immersed in the organisation for some time will inevitably (and more noticeably) "change" the researcher's perspectives. This undoubtedly has an effect on the research. It is recommended here that researchers actually take note of their own development, particularly during projects with longer time-frames, and subsequently analyse the impact that this might have had on the progress of the research. Unfortunately such individual learning patterns mean that research of this kind can never be repeatable to any degree of confidence. However, in the researcher's opinion, the social, personal and professional benefits of this research outweighed any desire to be more widely applicable. In this project there were also learnings that were unique to the Engineering Doctorate requirements. The opportunity to study a number of core modules of various topics (as mentioned in Chapter 1) allowed the researcher to learn about very specific topics relating to Environmental Technology and Management more generally. This was definitely helpful in the researchers development as an Environmental Management professional and researcher.

13.6) Future Considerations

In taking a final look at the objectives of this research, it is worth considering whether HP has achieved the institutionalisation of environmental management on a permanent basis. At this time, it is not apparent whether the results achieved by this project will stand the test of time. However, the signals to date have been positive, as demonstrated in the story boards presented earlier. The true test of this would be for successful environmental management to survive large scale organisational change at the company.

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At the time of writing, Hewlett-Packard announced its largest organisational change in the company's history. A company de-merger on a world-wide basis will lead to the existence of two independent and separately named companies (which in itself would make a very interesting piece of research material). The HP as described in this Portfolio will cease to exist in the future. The four years of action research carried out at the company has produced a platform for both companies to continue to pursue environmental management separately. Early signs are that they will both embrace environmental management, if somewhat differently, consistent with their product portfolios and business models.

New environmental management challenges will no doubt present themselves for both companies, including practices of "sustainability". In this respect, Hewlett-Packard's history of good "Citizenship" will serve both companies well in the future. New research opportunities will also develop. As mentioned already, two more Engineering Doctorate research engineers are already sponsored by HP, both in the environmental management arena. Whilst, the future for HP is uncertain, there are certainly plenty of opportunities for them to further improve their environmental management strategy and to continue to aim for the institutionalisation of environmental management.....and this is where I came in!!

End of Part Three

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