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

# Circuits of Power

## A Study of the Development of Computer Software and its Use in General Medical Practice

A thesis presented in partial fulfilment of the requirements for the degree of

Master of Arts in Sociology

at Massey University, Palmerston North,

New Zealand

Elizabeth Phillipa Cornford

2000

# Abstract

This thesis explores several phases in the life history of a software package developed in New Zealand for the primary healthcare market in order to show how the package is implicated in maintaining or changing existing distributions of power.

The theoretical concepts which inform the study come primarily from Wiebe Bijker who works within the constructivist tradition of technology studies. The methods include documentary research and fieldwork, including open-ended interviews with five people involved with the package at the development site and seven who work in large and small general practice sites.

The study concludes that the introduction of computers into general medical practice is associated with a small shift in the balance of power within general practice which has significant consequences for those who are unable or unwilling to acquire computing expertise. It also concludes that computerisation of general practice is associated with changes in the autonomy of general practitioners as their work becomes open to greater surveillance and in the GP-patient relationship where the computer has the capacity to substantially alter the nature of the interaction.

The main findings of the study are that the groups most influential in the development of the package continue to exercise their influence as the package is deployed and used in a general practice setting. In this way the package both reflects and reinforces their power as it moves between development and use. The study also shows that those most influential in all phases of the package's existence draw on a number of skills and resources such as business acumen, clinical knowledge and computing expertise but that the most significant resource is money in the form of purchasing power or economic authority.

# Acknowledgments

I would like to acknowledge my debt to the people who agreed to be interviewed who gave me more time than they could spare from their busy working lives. Without the information and insights that the interviews provided, this thesis could not have been written.

My thanks go to Mary Murray for her support and encouragement during the last few months as I struggled to bring the thesis together. It went beyond what could be expected from any supervisor. I would also like to thank my sister Yvonne for bringing her experiences with the New Zealand health system and her considerable editing skills to what I thought was final text. I will always think twice before writing 'however' or attempting to end a sentence with 'with'.

Finally, my thanks to Bart for living with this thesis for much too long. It wasn't always easy I know but your understanding of computer development was crucial when I began to lose sight of the significance of purchasing power in a modern capitalist society.

# Contents

**CHAPTER 1 INTRODUCTION** ..... **1**

**CHAPTER 2 LITERATURE REVIEW** ..... **9**

*Technological determinism: power exercised by technology* ..... *9*
*Technological power derived from the social relations of production* ..... *10*
*Technological power derived from the social relations of development* ..... *17*
*Technological power as the outcome of human and non-human interaction* ..... *21*

**CHAPTER 3 RESEARCH METHODS** ..... **39**

*Case Studies: approaches and methods* ..... *39*
*Initial Contact* ..... *41*
*Research plan* ..... *42*
*Interviewing* ..... *43*
*Going out into the field* ..... *44*
*Transcribing and analysing the material* ..... *48*
*The follow up discussions* ..... *50*
*Writing up the findings* ..... *51*

**CHAPTER 4 SETTING THE SCENE FOR THE EMERGENCE OF PRIMETECH2** ..... **53**

*1960-1976: The emergence of the PC and application packages* ..... *53*
*1976-1983: The early years of Healthserv* ..... *55*
*1983-1990: Automating the business of general practice* ..... *56*
*1991-1996: Accelerating change* ..... *58*
*The Health Reforms of the 1990s* ..... *60*
*Meeting the needs of a maturing market* ..... *64*
*Discussion* ..... *67*

**CHAPTER 5 DEVELOPING THE PACKAGE** ..... **69**

*Developing a Windows-based system* ..... *71*
*Duplicating existing business functionality* ..... *72*
*Additional business requirements* ..... *72*
*Third party organisations* ..... *74*
*Other user involvement* ..... *76*
*The outcomes from development* ..... *78*
*Discussion* ..... *79*

**CHAPTER 6 MOVING THE PACKAGE INTO USE** ..... **83**

*Computerising general practice* ..... *83*

*Purchasing Primetech2* ..... 85
*Selling more than the package* ..... 87
*Configuring the user site* ..... 88
*Training the users* ..... 89
*Converting the data* ..... 90
*The outcomes from moving the software into use* ..... 91
*Discussion* ..... 92

**CHAPTER 7 USING THE PACKAGE** ..... **95**

*Managing the work with Primetech2* ..... 96
*Managing the work with Primetech1* ..... 99
*The patient at reception* ..... 101
*The consultation* ..... 102
*Dependence upon the computer* ..... 105
*Outcomes for staff within a general practice setting* ..... 105
*Outcomes for GPs and patients* ..... 109

**CHAPTER 8 CONCLUSION** ..... **113**

*So what can be done?* ..... 116
*Comments on the research* ..... 117
*Opportunities for future studies* ..... 118

**APPENDIX 1 GLOSSARY OF COMPUTER TERMS** ..... **121**

**APPENDIX 2 THE SITES AND THE PARTICIPANTS** ..... **125**

*Healthserv* ..... 125
*The small general practice site* ..... 127
*The large city practice* ..... 127

**APPENDIX 3 COMMUNICATIONS WITH THE PARTICIPANTS** ..... **129**

*3.1 Management Letter* ..... 129
*3.2 Management Agreement* ..... 131
*3.3 Information Sheet* ..... 132
*3.4 Consent Form* ..... 134
*3.5 Sample Interview Guides* ..... 135
*3.6 Covering Letter* ..... 137

**BIBLIOGRAPHY** ..... **139**