

**Towards Improved Project Management Practice:
Uncovering the evidence for effective practices
through empirical research**

by

Terence John Cooke-Davies

ISBN: 1-58112-128-8

DISSERTATION.COM



USA • 2001

*Towards Improved Project Management Practice: Uncovering the
evidence for effective practices through empirical research*

**Copyright © 2001 Terence John Cooke-Davies
All rights reserved.**

**Dissertation.com
USA • 2001**

ISBN: 1-581 12-128-8

www.dissertation.com/library/1121288a.htm

Towards Improved Project Management Practice

Uncovering the evidence for effective
practices through empirical research

Terence John Cooke-Davies

**A thesis submitted in partial fulfillment of the requirements of Leeds
Metropolitan University for the degree of Doctor of Philosophy.**

August 2000

Abstract

Projects are important to industry, but **project** performance continually disappoints stakeholder expectations. Organizations react to this performance problem in many ways, and purchase **consultancy**, training, methods and tools as **possible** solutions.

There is no published evidence that any of these solutions are consistently **successful** in improving project **performance**. This thesis answers the question, "What can be done to improve **project** management practices, and thus project performance?": by demonstrating that a novel **form** of **continuous action** research can contribute such evidence.

Firstly a community of practice was formed from practitioners with major corporations interested in answering the question, and commercially motivated to implement changes. A programme was developed that centred around **project management**, but linked to **project and corporate performance** and success.

A well-resourced support structure was established to administer the programme, facilitate **dialogue**, hold confidential data securely, and provide data analysis. Members provided data for **the** anonymous databases about their practices and about specific project results, and **first-hand** case studies for discussion at workshops. They discovered, shared and created **both** tacit and explicit knowledge through the formal programme and through informal contact.

Secondly, the thinking of practitioners, theorists and researchers was challenged. The literature on **project management** was found to reveal an unbalanced worldview that lacked coherent **underlying** theory. The literature on theory was found not to distinguish adequately **between** one-off "discrete" projects and the ongoing continuous operations of an organization. The academy's "paradigm wars" were found to have discouraged the creation of an appropriate research **methodology**.

Thirdly, different pieces of research **using** the community's data showed that some practices (notably aspects of risk management) lead to superior **performance** independently of context, while others appear to be **context**-dependent. No companies were found to have all the answers, and each member of **the** community has been able to learn from others.

Dedication

This work is dedicated to two remarkable women. Doreen, my wife, without whose constant support I would not have stayed the course, and Nora, my mother, who made great sacrifices to give me the foundation of my education.

Table of Contents

1.0	<i>Thinking about projects and project management</i>	17
1.1	Summary	17
1.2	What projects are and what some key terms mean	17
1.3	The importance of projects to industry	20
1.3.1	The conceptual basis to project management	21
1.4	Project management in its social and economic environment	23
1.4.1	Projects in a pre- and proto-capitalist society (before c. 1850).....	24
1.4.2	The era of classic capitalism: project management from c.1850 to c.1950.	27
1.4.3	The era of "managerial capitalism": project management from c. 1950 to the mid-1980s.....	29
1.4.4	The era of "intellectual capitalism": project management since the mid-1980s.	32
1.5	Project management today – how industry thinks about projects	34
1.5.1	How project performance is measured in industry.....	35
1.5.2	The need for improvement: why so many projects are seen to fail. ...	38
1.6	Research questions that this thesis will attempt to answer	40
1.7	Conclusion	40
2.0	<i>The worldview of the project manager</i>	43
2.1	Summary	43
2.2	Which practices have been correlated to project success and project failure?	44
2.2.1	Baker, Murphy and Fisher	46
2.2.2	Pinto and Slevin.....	46
2.2.3	Lechler	48
2.2.4	The implications of "critical success factors"	50
2.3	What a worldview is and how it can be made visible	50
2.4	The project management "worldview"	52
2.4.1	"Praxis" – What a project manager does.	52
2.4.2	Salient elements of the "praxis"	53
2.4.3	Validation of the core "praxis" elements	57
2.4.4	A review of the "praxis" elements	58
	Summary of themes, topics and terms.....	59
	Theme 1: Practices relating to the nature of the particular project.....	60

Table of Contents

Theme 2 (Topic 6): Practices relating to the stages the project will need to pass through.....	72
Theme 3: Practices relating to "beneficial change" that the project is intended to accomplish.....	73
Theme 4: Practices relating to the people that are associated with the enterprise.....	81
2.5 A systemic view of the project manager's worldview.....	90
2.5.1 Correlations of empirical research with the systemic worldview.....	92
2.6 How can the search be conducted for improved project management practice?	95
2.7 Conclusion.....	96
3.0 Research methods and underlying theory.....	99
3.1 Summary.....	99
3.2 Fundamental research issues of philosophy, knowledge, reality and language.....	100
3.2.1 Preliminary considerations of philosophy.....	102
3.2.2 What is going on when people gain "knowledge"?.....	104
3.2.3 Epistemic Considerations.....	107
3.3 Developing an appropriate research procedure.....	112
3.3.1 The role of Community in the Acquisition of Knowledge.....	117
3.4 A new research methodology.....	119
3.5 Conclusion.....	125
4.0 Developing and applying the new research model.....	127
4.1 Summary.....	127
4.2 Three Cycles of Action Research.....	128
4.3 The First Cycle of Action Research.....	130
Step 1: Assemble the network	133
Step 2: Agree Topics.....	133
Step 3: Write questions and scoring guidelines.....	133
Step 4: Analyse data and publish report	134
Step 5: Select topics for individual workshops	134
Step 6: Hold interactive learning workshops.....	135
Step 7: Review the year's learning and consider a second cycle of activity	135
4.3.1 Experience gained in practice.....	136
Assembling a network.....	136

Table of Contents

Defining the programme of work.....	137
Identifying and gathering the data.....	138
Sharing and learning from the information.....	138
4.4 The Second Cycle of Action Research: Challenging Perceptions.....	140
Step 1: Hold SD modelling workshop.....	140
Steps 2 and 3: Develop project-level database structure and build project-level database Mk I.....	141
Step 4: Populate database with 10 pilot projects.....	142
Step 5: Collect additional project data.....	142
Step 6: Analyse project-level data.....	142
Step 7: Workshops on specific topics.....	143
4.5 The Third Cycle of Action Research: Refining the Method.....	143
4.5.1 Developing the Mk II data collection instrument. and establishing the habit of continuous learning.....	145
4.5.3 Developing the Corporate Practice Questionnaire version 3 and an organisational project management maturity model.....	149
4.6 Adding the Final Element: Interpretation and In-house Support.....	150
4.7 Conclusion: The Origins of the Research Method in Three Cycles of Development.....	151
5.0 What does the data show? Illustrative analyses from two data sets.....	155
5.1 Summary.....	155
5.2 How data are used by the networks.....	156
5.2.1 Applying the data in workshops.....	156
5.2.2 Building on the data in working parties.....	158
5.2.3 Combining insights with fresh analysis.....	159
5.3 The Corporate Practice Questionnaire.....	161
5.3.1 How organisations use the CPQ.....	162
5.3.2 Illustrative results produced from the CPQ.....	164
5.3.3 Individual company indications.....	173
5.4 The data collection instrument (DCI).....	176
5.4.1 Project type and industry environment.....	177
5.4.2 Project results.....	184
5.4.3 Strategic decisions.....	189
5.4.4 Project management practices.....	192
CHAID Analysis.....	194
Bivariate Correlations.....	197

Further investigation of the correlations	199
5.4.5 Conclusions about effective practices	202
5.4.6 A "relative" spin-off from a "positivist" search	204
5.5 Conclusion: The link between project management practices and project performance.....	206
6.0 Conclusions and further work to be done.....	209
6.1 Summary.....	209
6.2 Answers to the research questions.....	209
6.3 The contribution made by this research programme	211
6.3.1 A research driven approach to project improvement	212
6.3.2 An innovative research method	212
6.3.3 Enhancement of the project management worldview.....	213
6.3.4 An international inter-company community of practice.....	213
6.3.5 Specific results that pave the way for project management benchmarking	213
6.3.6 Locating projects in the context of strategic bus. improvement.....	214
6.4 Developing benchmarking techniques for use with projects....	214
6.4.1 Three difficulties to overcome	214
Few pmjct management processes produce the project's primary product or service directly.	214
Different projects contain different profiles of risk	215
Projects are executed within differing organisational environments.....	216
6.4.2 Two ways to progress towards a benchmarking capability	216
Incorporate existing performance data.....	216
Extend the range of performance measures	217
6.5 Improving comparability of data.....	218
Improved comparability for the CPQ	218
Improved data categories for the DCI.....	219
6.6 Applying systems thinking and system dynamics	219
6.6.1 Deepening understanding of the project management worldview....	220
The "people side" of project management	220
Benefits management.....	221
Understanding project strategies.....	222
6.6.2 Developing a predictive model.....	223
Developing a new research instrument	223
Developing a Wight simulator"	225
6.7 Conclusion.....	225
Reference List	227

Table of Contents

Appendix I: Portrait

Appendix II: Landscape

List of Figures and Tables

Figure 1: Where projects fit into the spectrum of work.	19
Figure 2: The context for projects.....	22
Figure 3: Different types of project metric	37
Figure 4: Pinto & Slevin's Model of Project Success. (Pinto and Slevin, 1988b, p. 69)	47
Figure 5: Lechler's Causal Analysis.....	49
Figure 6: Systemic relationships in the pmject manager's worldview.....	90
Figure 7: Gaps in the systemic worldview.	91
Figure 8: First- and second-order cybernetics (Schwaininger , 1997).....	92
Figure 9: A framework based on Habermas' three worlds. Adopted from Mingers, 1997.....	101
Figure 10: Research methods and underlying paradigms.	104
Figure 11: The classic shape of single-paradigm research.	119
Figure 12: The concept of a continuous research methodology.	120
Figure 13: The Benchmarking Process.....	130
Figure 14: The First Cycle of Action Research.....	132
Figure 15: The Second Cycle of Action Research.....	140
Figure 16: The First Structure of a Pmjects Database.....	141
Figure 17: The Third Cycle of Action Research.....	145
Figure 18: The Second Pmject Database Structure.....	146
Figure 19: Structure of Project Analysis.....	148
Figure 20: The Third Structure of the Project Database.....	148
Figure 21: Two Levels of Capability.....	149
Figure 22: The Seven Components of the Research Method.....	152
Figure 23: Transferring 'lessons learned ' from project to pmject.....	158
Figure 24: Pmject start-up and Post Project Reviews.....	160
Figure 25: Range of appmach scores.	166
Figure 26: Range of deployment scores.....	167
Figure 27: Range of appmach scores by perspective.	168
Figure 28: Comparison of CPQ deployment scores over time.....	169
Figure 29: CPQ Scores for Topic 1: Integration.....	171
Figure 30: Individual Company CPQ Scores.....	174
Figure 31: CPQ scores for topic I.....	174
Figure 32: CPQ scores for topic I a compared across three networks.....	175

Table of Contents

Figure 33: CPQ Scores for individual questions.	176
Figure 34: Project cost categories across industries.	178
Figure 35: Types of project undertaken by industry.	179
Figure 36: Number of projects in each life cycle phase.	181
Figure 37: Percentage of cost categories for each type of project.	182
Figure 38: Duration of projects within each type.	183
Figure 39: Project cost (£'000) and project duration (weeks).	184
Figure 40: Relationship between time and cost predictability.	187
Figure 41: Relationship between cost and scope predictability.	188
Figure 42: Types of project strategy.	191
Figure 43: CHAID analysis. showing practices influencing time predictability. .	195
Figure 44: Practices correlating to cost predictability.	196
Figure 45: Influence of company-wide risk education on time predictability.	199
Figure 46: Effect of assigning risk owners on time predictability.	201
Figure 47: Comparison of relative cost & time predictability by company.	204
Figure 48: Variability of Mean Risk Management Adequacy between Companies.	206
Figure 49: Benefits management and the relationship between projects and operations.	221
Figure 50: How practices relate to performance.	224

Summary of Thesis

This thesis describes a programme of continuous action research, involving an international network of major organisations to which projects are important. The research concerns the development of methodology and content to build this network into a learning community for project improvement. The research started with six quite basic questions about project management practices but it has led to significant developments in: -.

- A research-driven approach to project improvement.
- An innovative research method.
- Enhancement of the existing project **management** worldview.
- **A** growing international network of project-based organisations.
- Specific **results** that pave the way for project management benchmarking.
- **A** means of relating project performance to business improvement.

The thesis contains six Chapters.

Chapter 1 **describes** what projects are and the role they play in business, and explains why the research **questions** are important.

Chapter 2 reviews the corpus of project management literature, and extracts an account of the way a project manager views the world. This view is **consolidated** into eleven topics and given a form and substance that shows how they inter-relate. Comparison with prior empirical research identifies a number of gaps.

Chapter 3 considers the epistemic foundations for a research **method** that **has** seven explicit components, making allowance for **the** fact that neither a pure positivist nor a pure constructivist philosophy provides a sufficiently rich basis to research into project management.

Chapter 4 traces the historical development of the seven components of the research method, and summarises the answers to three of the research questions.

Chapter 5 illustrates the results obtained from data analysis, answering a **further** two research questions by describing both observed variations in project **performance**, and practices that partially account for these.

Chapter 6 summarises the contribution made by the research programme, and lists the current plans for further work.

Contributions

In the course of this research, two things have been happening in parallel. One has been the commercial creation and support of a network of major organisations to improve project **management** practice. **The** other has been the development of research in terms of both methodology and content, which has transformed **that** network into a learning community. It is this research, quite separate from the commercial activities, that is submitted for the degree.

The original research concept came to me during 1993, at a time when I saw many organisations making far-reaching decisions **about their** project management practices with very little evidence to support them. I was driven by the desire that decisions should be based on the foundations of solid evidence, and to create a method for obtaining that evidence.

My personal contributions to the programme have been in:-

- * Developing the conceptual design of the study, including the **overall** process steps and the epistemic underpinnings described in Chapter 3, the method of choice that was used for significant decisions, the structure of all workshops involving network **members** during the first few years, **the structure** of all analysis carried out and reports issued, **and** the **commercial** relationships between network members and Human Systems Limited.
- **Developing** the analytical **framework** and performing analysis on the data, as well as directing additional analysis from time to time from members of Human Systems working under my instructions.
- Formulating theories that have **guided** each stage of **the** work.
- Assembling and maintaining the networks, or ensuring that **suitably qualified members** of the Human Systems team working **under** my **instructions**, assemble and maintain **the** networks.
- Facilitating the dialogue that results in agreement on the information to be collected from the networks and the form that it will take, and obtaining agreement for this from network members.
- Ensuring that data is collected, and assuring its quality.
- Facilitating the discussion between network members and members of the Human Systems team that result from the announcement of

insights arising from the analysis, and the framing of more detailed research questions as a result of these discussions.

- Writing all research proposals and submissions, including the whole text of this thesis.

Clearly I could not have done **this** work without the support of **many** people, and I wish to acknowledge the **assistance** received from the following. Throughout the programme, **I** have received the financial and practical support of Human Systems **Limited**, the company of which I am Managing Director.

My colleagues at Human Systems Limited have each been involved in different aspects of the programme. John Gandcc, one of the first people to be approached at ICL when the idea of forming the community was first **mooted** in 1993, has been continually involved. From the output of the initial workshops he wrote the first version of the corporate practice questionnaire, he has attended each of the workshops for and performed much of the **management** activity involved in supporting and administering the work of the first two networks, and more recently he has produced the **Foxpro** version of the corporate practice questionnaire and its derivatives, and has overseen and augmented development of **the** commercial Access version of the DCI. John facilitated the first working party on "learning lessons on projects".

Brian **Trefty**, the first representative of **Wellcome** in the first network, has subsequently been a stalwart member of the Human Systems team. It was largely through Brian's effort that the joint venture with CMR International came about that has resulted in the creation of two global pharmaceutical networks. Apart from leading that effort, Brian has **worked** closely with John Gandee in the creation and support of Europe 2, the second network to be created. He has facilitated working parties on "real risk management" and "implementing process improvements". Alan Cumberland, a fellow Director of Human Systems Limited has continually supported the venture, and played a significant part in decisions about the management of the commercial aspects of the programme. Alan has facilitated several of **the** network's workshops, and the working party on "measuring project performance". Jean Adams, Matthew **Nixon** and Debbie Garrett have also provided generous and professional support to the activities, in addition to which

Jean very kindly assisted with the unenviable task of proof reading this text.

As the networks took on an international aspect, Lynn Crawford, Frank Davies, Chivonne Watts and Andrew Durbridge headed the effort to create **commercial** networks and to apply the research method in Australia, and did an excellent job in recruiting thirty additional **organisations**. Lynn has provided valuable encouragement and support to me and to the **Human Systems** team, and Frank **has** been tireless in his professional efforts to assemble and support the Australian **community**, and to manage the network activities based in Sydney. As the programme rolls out to USA, Dalton Weekley, Peter Rogers and Steve Neuendorf of CCG LLC have become joint venture partners, and Steve has contributed the excellent Excel spreadsheets that enrich the presentation of relative data to members of all current networks.

The programme has been built around a “**community of practice**”, and it would not have been possible **without** the active participation and support of the representatives of the many organisations that have been **members** of the networks since their inception at the beginning of 1994. They have been generous in their provision of **time**, data, **knowledge**, expertise, resources and support. It is wrong to single out some more than others for mention by name, since **many** have made invaluable contributions, and I would like to acknowledge every one of them. It would equally be wrong, however, to fail to acknowledge the special contribution made by two people. In the early days of creating **the** first network, Steve Grey of ICL worked tirelessly with me to assemble **the** first community of practice, and to refine the proposal that was **put** to prospective **members**. Without Steve's help, I doubt that the programme would have got off the ground. Paul Armstrong and **his** team at BT Group Projects have also made a unique contribution. Not only has Paul been continually associated with this activity as **BT's** representative since the formation of the first network, but in the development of the data collection instrument, Paul and his **team** took the lead in developing the prototype Microsoft Access application, that was subsequently refined by **commercial** software developers into the instrument that it now is.

Finally, I would like to express my heartfelt appreciation for the unstinting guidance, encouragement and **support** of my supervisor, Professor Eric **Wolstenholme**.

Confidentiality

There is a **commercial need** to protect the confidentiality of information provided by members of the networks. For this reason, the data and other material included in the thesis have been presented in such a way as to protect the interests of the network members **after** this thesis has been published.

Terry Cooke-Davies. August 2000.

Chapter 1:

1: Thinking about projects and project management.

1.1 Summary.

The term "project" is used widely and in a variety of contexts, and a **technical** vocabulary has grown up to describe different aspects of projects. Industry throughout the world today uses the concept of a "project" to talk about particular kinds of work (generally unique, self-contained pieces of work that are intended to create a product or service that will lead to beneficial change), and this kind of work is of **great** economic and social importance. The development of the concepts and language about **projects** is considered briefly in relation to its social and economic environment throughout history and in the present day, before the present worldview held by private sector commercial and industrial **organisations** is sketched out in relation to projects. The question of how these organisations measure the performance of projects is introduced, and it is shown that there is a widespread perception that many projects "fail". The social and economic cost of this failure is reviewed.

1.2 What projects are and what some key terms mean.

The literature of project management offers a variety of definitions, which **have** classically included the three characteristics of a **common** objective, a set of activities that are **complex** enough to need managing, and a defined start and finish time.

A complex effort to achieve a specific objective within a schedule and budget target, which typically cuts across organisational lines, is unique, and is usually not repetitive within the organisation. (Cleland and King, 1983, p.70)

More recently, definitions have been modified to reflect the existence of a "product" or "service" that the project creates.

*A temporary endeavour undertaken to create a **unique** product or service. Temporary means that the project has a definite ending point, and unique means that the product or service differs in some distinguishing way from all similar products or services. (Duncan, 1996, p. 4.)*

Rodney Turner develops this theme even further, by including the concept of the "beneficial change" that the product of the project is supposed to deliver.

An endeavour in which human, material and financial resources are organised in a novel way, to undertake a unique scope of work, of given specification, within constraints of cost and time, so as to achieve beneficial change defined by quantitative and qualitative objectives. (Turner, 1993, p. 8.)

One in particular, however, illustrates just how widely the term "project" can be applied in common parlance:-

Any plan, scheme or task - including the writing of this book - can be and is referred to as a "project". (Stallworthy and Kharbanda, 1983, Preface.)

In order to provide appropriate boundaries for the definition of what a project is, it is perhaps appropriate to approach the topic from the other end, as it were, and ask the question, "What kinds of endeavour cannot legitimately be regarded as projects?" That yields very different answers, and in practice, they seem to boil down to four different categories:

1. Sets of activities that are repeated indefinitely, such as the continuous operations of a process plant. These are perhaps more usefully thought of as "processes".
2. Sets of activities that are repeated in a predictable manner, such as batch manufacturing, the raising of invoices, or the conduct of annual appraisals. These can be thought of as processes, but can equally well be thought of as "operations" in the business context.'
3. Sets of activities that may well include projects, but which are sufficiently large and complex and have sufficient flexibility about