Dialectical hermeneutics: a theoretical framework for the implementation of information systems

M. D. Myers
Department of Management Science and Information Systems, University of Auckland, Auckland, New Zealand

Abstract. Despite the proliferation of information technology, the implementation of information systems remains problematic. Many systems fail to live up to expectations and some end up as disasters. Research on implementation has been conducted for the past two decades, but no theoretical framework for IS implementation has been widely accepted. This paper proposes dialectical hermeneutics as a theoretical framework for IS implementation research. Dialectical hermeneutics, as an integrative theoretical framework, combines both interpretive and critical elements, and addresses those social and organizational issues which are critical to the successful implementation of information systems. The case study research method was used to examine the implementation of systems in three organizations.

Key words: critical theory, hermeneutics, information systems development, information systems implementation.

1 INTRODUCTION

Today we are seeing the tremendous proliferation of information technology. Organizations are using information systems in an attempt to gain competitive advantage, to increase the efficiency of their operations and so on. Despite this proliferation of technology, the implementation of systems remains problematic. While some organizations have been successful in implementing information systems, many systems fail to live up to expectations and some end up as disasters. As Abel-Hamid & Madnick (1990, p. 39) point out, 'We continue to produce too many project failures, marked by cost overruns, late deliveries, poor reliability, and user dissatisfaction'.

Research on implementation has been conducted during the last two decades. However, despite the abundance of literature dealing with the subject of the implementation of information systems, no theoretical foundation for researching IS implementation has been widely accepted (Kwon & Zmud, 1987; Alavi & Joachimsthaler, 1992). Most models highlight only a particular aspect of information systems implementation, and none provides an overarching framework within which IS implementation research can proceed.
This paper proposes dialectical hermeneutics as a theoretical framework for IS implementation research. It is argued that the work of Hans-Georg Gadamer, Paul Ricoeur and Jurgen Habermas can be usefully applied to IS implementation. This approach builds on earlier work in philosophy (Bernstein, 1983) and the work of other scholars such as Markus (1983), Boland (1985, 1987, 1991), Lyytinen & Klein (1985), Winograd & Flores (1987), Markus & Robey (1988), Boland & Day (1989), Klein & Hirschheim (1991), Lee (1991), Ngwenyama (1991), Orlikowski & Baroudi (1991), Orlikowski & Robey (1991) and Rathwohl (1991). As many scholars recognize that information systems development is primarily a social process (Hirschheim & Newman, 1991; Newman & Robey, 1992), dialectical hermeneutics offers information systems researchers a useful theoretical framework for understanding the social and political process of IS implementation. Three recently published case studies are used to illustrate how dialectical hermeneutics can help in understanding the implementation of information systems.

The paper proceeds as follows. Section 2 defines implementation and briefly reviews the existing theoretical frameworks in the field. Section 3 proposes dialectical hermeneutics as an alternative theoretical framework for research in IS implementation. Section 4 summarizes the essential features of three case studies. In section 5, the three case studies are analysed in terms of dialectical hermeneutics and some of the implications of the theory are outlined. The final section presents the conclusions.

2 THEORETICAL BACKGROUND

Implementation defined

In the implementation literature, the term ‘implementation’ has often been used in different ways. I believe that there are three distinct uses of the word: these can be summarized as follows:

1 ‘Implementation as coding’. In this view, implementation refers to the realization of a system design in hardware and software (Swanson, 1988).
2 ‘Implementation as a step in the systems development life cycle’. This use of the term is frequently adopted by MIS professionals and refers to all the activities that are involved in introducing information technology to an organization at a particular stage of development.
3 ‘Implementation as the successful use of information technology by an organization’. In this view, implementation is identified with the entire process of systems development. As Lucas (1990) describes, ‘(Implementation) is part of a process that begins with the very first idea for a system and the changes it will bring. Implementation terminates when the system has been successfully integrated with the operations of the organization.’

It can be seen that all three views of implementation are significantly different in scope and emphasis; in this paper, the term ‘implementation’ is used in its broadest sense as referring to
Dialectical hermeneutics

the successful use of information technology by an organization. This is consistent with the use of the term in most of the IS implementation research literature.

Implementation frameworks

There is now a large body of published research on information systems implementation, most of which has accumulated over the past two decades. Numerous reviews of the implementation literature have been done (Dickson, 1981; Ginzberg, 1981; Lucas, 1981; Ives & Olson, 1984; Kwon & Zmud, 1987; Swanson, 1988; Lucas et al., 1990; Keil, 1991; Alavi & Joachimsthaler, 1992; Delone & McLean, 1992; Newman & Robey, 1992), revealing that, on the whole, implementation studies have yielded conflicting and somewhat confused findings. While some progress has been made, researchers continue to lament the lack of an agreed theoretical framework within which IS implementation research can proceed.

A number of different theoretical frameworks and models of implementation have been suggested. Generally, the literature has been grouped into two dominant research streams: factor research and process research.

The factor research stream has been the dominant paradigm in IS implementation research. Factor studies of implementation have tried to identify variables associated with some measure of implementation success. However, only a few factors have been shown to be important across multiple studies, e.g. top management support has been identified with implementation success in many systems. Overall, the lack of consistency in the research has been disappointing, and has led some researchers to conclude that the factor research approach is too narrow (Kwon & Zmud, 1987).

The process research stream has focused on the development of a project; the studies have focused on issues such as the relationship between designers and users and the impact of a system on the organization. However, the process research stream has also achieved only limited success. The most important finding is that the process matters (Keil, 1991).

Although the distinction between factor and process research has been the most common way of categorizing the IS implementation literature, Keil (1991) suggests an alternative way of categorizing the implementation research. He suggests three models of implementation research based on Markus & Robey's (1988) analysis, which categorized research on the basis of causal agency (i.e. beliefs about the nature of causality). Keil's three models are as follows:

1 implementation as technology acceptance;
2 implementation as organizational change;
3 implementation as organizational problem-solving involving mutual adaptation.

The first model represents a technology-biased view of implementation. In this research the emphasis has been on the 'impact of information technology'; technology is seen as an exogenous force which determines or strongly constrains the behaviour of individuals and organizations. Some of the limitations of this model are that it takes a very static view of implementation and virtually ignores organizational issues (Keil, 1991).
The second model is a process-oriented organizational change model that was originally suggested by Lewin (1952) and Schein (1961). The Lewin–Schein model of unfreezing–changing–refreezing represents an organization-based view of implementation. Some of the limitations of this model are that it virtually ignores technological issues (Keil, 1991) and it oversimplifies organizational change by assuming that the normal state of an organization is for it to be 'frozen'. This model overlooks the mutual adaptation and continual gradual changes which may occur in information systems and organizations.

The third model is a process-oriented model of implementation based on a synthesis of concepts from the management of innovation literature and organizational problem-solving literature. This model represents a technology–organization interaction view of implementation, in which mutual adaptation is seen as an iterative process. Keil argues that this model is more realistic than either model 1 or 2 because it explicitly considers both technology and the organization. Also, it provides a more complete understanding of the problem than either of the other models (Keil, 1991, p. 303). However, a limitation of this model is that it generalizes too much: it does not provide a framework for striking an appropriate balance between technological and organizational adaptation (Keil, 1991, p. 302).

In summary then, it can be seen that, while many studies have been completed, and a variety of theories of implementation have been suggested, no one theory of implementation has been widely accepted (Kwon & Zmud, 1987). While some progress has been made, each of the models is rather narrow and highlights only a particular aspect of information systems implementation. None provide an overarching framework within which IS implementation research can proceed.

3 A HERMENEUTIC DIALECTIC THEORY OF IMPLEMENTATION

I believe one of the reasons for the lack of a theoretical foundation in this area is that most of the models have been borrowed from the natural sciences, especially engineering (hence the term 'systems engineering'). This simply reflects the dominant paradigm in informative systems research which, as Orlikowski & Baroudi (1991) show, is essentially positivist.

Postivist studies 'are premised on the existénce of a priori fixed relationships within phenomena which are typically investigated with structured instrumentation. Such studies serve primarily to test theory, in an attempt to increase predictive understanding of phenomena' (Orlikowski & Baroudi, 1991, p. 5).

However, the argument of this paper is that real progress in understanding the implementation of information systems will never be made as long as an inappropriate research paradigm continues to be used. Positivist assumptions are invalid when they are applied uncritically to social reality. For example, the relationships between people, organizations and technology are not fixed but constantly changing, and they will continue to change. The natural science model ignores the fact that people think and act, that people are active makers of their physical and social reality (Orlikowski & Baroudi, 1991, p. 13), and that new histories will always need to be written. Also, the positivist predilection for a predictive understanding of phenomena...
Dialectical hermeneutics

(in a deterministic way) ignores the fact that people continue to learn, and that it is the especially
human prerogative to change one’s mind.

If, then, the implementation of information systems is primarily concerned with people,
organizations and organizational change, then a theoretical approach that is appropriate to its
subject matter is required. From a positivist engineering or computer science perspective, the
key question is how technology works. But as Winograd & Flores (1987) point out, this
perspective does not support an adequate understanding of what computers do in a context of
human practice. Neither does it support an adequate understanding of what information sys-
tems mean to people. It is how computers are used, it is what computerized information sys-
tems mean to people in an organization — these are the key questions for the implementation
of IT.

The argument of this paper, then, is that a richer, integrative view of information systems
implementation is required. One such approach is proposed in this paper: the critical herme-
neutics of Gadamer and Ricoeur. Today hermeneutics is used in education, medicine,
anthropology, sociology, architecture and many other disciplines (Vattimo, 1988). Although
hermeneutics as a discipline originally dealt with the interpretation of literary, judicial and
theological texts, in contemporary social science the focus has broadened to look at societies,
cultures and organizations as text analogues. Interestingly, there is a growing interest amongst
IS researchers in the use of critical theory, interpretive studies and hermeneutics (Boland, 1985,

Dialectical hermeneutics described

Although, following the Burrell & Morgan (1979) framework, the interpretive and critical theories
have often been seen as quite distinct (see, for example, Orlikowski & Baroudi, 1991), in the last
few years critical or dialectical hermeneutics has emerged as an integrative perspective
(Thompson, 1981). The philosophical basis for integration is provided by Bernstein (1983), who
argues that there is common ground between the critical theory of Jurgen Habermans and the
hermeneutics of Hans-George Gadamer. Hoy (1988), likewise, argues that it is possible to
integrate the interpretive and critical approaches. Hoy finds that the writings of Paul Ricoeur
provide such an integrative framework.

Walsham (1992) argues that constitutive process theories, which emphasizes both the
importance of subjective meaning for the individual actor and the social structures which
condition and enable such meanings, provide a new approach to research on the social aspects
of computer-based information systems. Critical hermeneutics is one such constitutive process
theory; it is in effect a meta-theory, and provides a framework for the integration of multiple
perspectives.

What follows, then, is a description of dialectical hermeneutics; in this discussion dialectical
hermeneutics will be distinguished from ‘pure hermeneutics’ and from critical theory as it has
been traditionally represented.
Hermeneutics is primarily concerned with the meaning of a text or text analogue. The basic question in hermeneutics is: What is the meaning of this text? (Radnitzky, 1970, p. 20). Taylor (1976, p. 153) says that

Interpretation, in the sense relevant to hermeneutics, is an attempt to make clear, to make sense of an object of study. This object must, therefore, be a text, or a text-analogue, which in some way is confused, incomplete, cloudy, seemingly contradictory — in one way or another, unclear. The interpretation aims to bring to light an underlying coherence or sense.

The idea of a hermeneutic circle refers to the dialectic between the understanding of the text as a whole and the interpretation of its parts, in which descriptions are guided by anticipated explanations (Gadamer, 1976, p. 117). As Gadamer explains, 'It is a circular relationship... The anticipation of meaning in which the whole is envisaged becomes explicit understanding in that the parts, that are determined by the whole, themselves also determine this whole.'

It follows from this that there is an expectation of meaning from the context of what has gone before. The movement of understanding 'is constantly from the whole to the part and back to the whole' (Gadamer, 1976, p. 117). Ricoeur (1974, p. xiv) points out that 'Interpretation... is the work of thought which consists in deciphering the hidden meaning in the apparent meaning, in unfolding the levels of meaning implied in the literal meaning.'

Although the traditional concern of hermeneutics has been inter-subjective meaning (e.g. by looking at social reality in terms of shared beliefs, symbols, language and so on), hermeneutics can equally well be applied to the design and implementation of information systems, as some researchers have shown (Boland, 1985, 1991; Winograd & Flores, 1987; Boland & Day, 1989).

In case studies dealing with the implementation of information systems, the ‘text’ is social and political action: case study notes, interviews and documents record the views of the actors and describe certain events and so on (see Ricoeur, 1981, p. 197 ff.). This material needs to be ordered, explained and interpreted in order to ‘make sense’ of the case. The ordering is done according to the researcher’s theoretical position, and the researcher’s role as interpreter involves the comparison of one text with another (e.g. the statement of an informant with that of a document). The researcher’s understanding of the whole has to be continually revised in view of the reinterpretation of the parts.

Dialectical hermeneutics builds on the theoretical basis provided by ‘pure’ hermeneutics, but goes one step further. The early hermeneuts such as Dilthey advocated a ‘pure hermeneutics’ which stressed empathic understanding and the understanding of human action from the ‘inside’. As Radnitzky (1970, p. 20 ff.) points out however, pure hermeneutics is uncritical in that it takes statements or ideologies at face value. He cites Gadamer as saying that ‘we don’t have to imagine oneself in the place of some other person; rather, we have to understanding what these thoughts or the sentences expressing them are about (Radnitzky, 1970, p. 27). According to this view, then, the researcher needs to become aware of his or her own historicality. This awareness of the dialectic between the text and the interpreter has been brought to the fore in contemporary hermeneutics. Pure hermeneutics ignored this dialectic in the attempt to understand a text in terms of itself.

The contemporary hermeneutic dialectic approach, therefore, as outlined by Gadamer (1975)
and Ricoeur, overcomes most of the weaknesses inherent in a purely interpretive approach. Some of these weaknesses are summarized by Orlikowski & Baroudi (1991, p. 18) as follows:

First, the interpretive perspective does not examine the conditions, often external, which give rise to certain meanings and experiences. Second, research in this perspective omits to explain the unintended consequences of action, which by definition cannot be explained by reference to the intentions of the humans concerned. Third, the interpretive perspective does not address structural conflicts within society and organizations, and ignores contradictions which may be endemic to social systems. Finally, the interpretive perspective neglects to explain historical change; that is, how a particular social order came to be what it is, and how it is likely to vary over time.

These weaknesses of the interpretive perspective, inherent in 'pure hermeneutics', are overcome in the critical hermeneutics of Gadamer and Ricoeur. Dialectical hermeneutics does emphasize the fact that social reality is historically constituted. And one of the key differences between a purely interpretive approach and dialectical hermeneutics is that the researcher does not merely accept the self-understanding of participants, but seeks to evaluate critically the totality of understandings in a given situation. The researcher analyses the participants' own understandings historically, and in terms of changing social structures. The hermeneutic dialectic perspective, therefore, as an integrative approach, emphasizes both the subjective meanings for individual actors and the social structures which condition and enable such meanings and are constituted by them. The theory can be used as a meta-theory to integrate research emphasizing subjective meanings (Boland, 1985) and research which focuses on the institutional character of information systems (Kling & Iacono, 1989).

Although the hermeneutic dialectic approach is critical and not purely 'subjective', there are differences between dialectical hermeneutics and critical theory. Unlike most critical theorists, who have focused their research on a critique of class-based societies and capitalist forms of production, a researcher informed by dialectical hermeneutics does not assume from the outset what the most important oppositions, conflicts and contradictions are in contemporary organizations (see Poster, 1989, 1990). Rather, the interpretive hermeneutics must go hand in hand with a critical analysis of organizations and societies. There is, then a dynamic interplay between a hermeneutic analysis and theoretical critique, in which the critique is firmly grounded in social reality. A summary of the differences between the three theoretical frameworks is shown in Table 1.

<table>
<thead>
<tr>
<th>Theory</th>
<th>Primary focus</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Pure&quot; hermeneutics</td>
<td>Meaning, intentions</td>
<td>Interpretive, 'subjective'</td>
</tr>
<tr>
<td>Critical theory</td>
<td>Contradictions, unintended results</td>
<td>Critical, 'objective', historical</td>
</tr>
<tr>
<td>Dialectical hermeneutics</td>
<td>Social reality, intended and unintended results</td>
<td>Interpretive and critical, subjective and objective, historical</td>
</tr>
</tbody>
</table>
Dialectical hermeneutics applied to IS implementation

Applied to information systems implementation, the object of the interpretive effort is to make sense of organizations as text analogues, in which the different stakeholders may have confused, incomplete, cloudy and often contradictory views on many issues. The aim is to make sense of the whole and the dynamic relationship between the organization and the implementation of new information technology.

Bronsema & Keen (1983, pp. 37–38) discuss the importance of the interpretive effort during implementation.

Implementation is a dynamic process: it includes cognitive and affective components. The stakes are often high; people see computers as affecting their sense of self, their jobs and their skills, politics, and organizational relationships. It is hard to elicit these perceptions and processes except by letting people express their views in their own way. We thus view our research as a form of detective work and discovery. There are contradictory perceptions of 'fact', subjective perceptions, and historical factors that shape the context of the implementation effort. The data collected via the structured interviews is a form of text that is to be analysed in terms of themes, motifs, and key words in the same way as a literary text is.

It is clear that Bronsema & Keen are viewing organizations as text analogues, which can be understood in the same way as text itself; in this case, the 'text' includes interviews with people, which in the first instance is oral in nature.

The idea of the hermeneutic circle draws attention to the way in which an organization is understood as a text analogue. In qualitative research, the movement of understanding 'is constantly from the whole to the part and back to the whole'; in other words, the more interviews conducted and the more information gathered, the better the understanding of the organization as a whole and of its constituent parts. This hermeneutic process continues until the apparent absurdities, contradictions and oppositions in the organization no longer appear strange, but make sense.

The hermeneutic dialectic approach does not accept uncritically participants' own views on a particular topic; rather, it recognizes that the researcher (or developer) attempts to critically evaluate and transform social reality, a reality that is historically constituted. This perspective is well suited to information systems development, which is first and foremost about organizational transformation through new technology. However, dialectical hermeneutics requires that researchers and developers develop a more critical awareness than they have in the past of the relationship between organizations and information technology; it also suggests that researchers should acknowledge and explore their own historicality and the relationship between the text and the interpreter.

The advantage of the hermeneutic dialectic approach is that it enables one to portray the real complexity of organizations as social, cultural and political systems. A hermeneutic dialectic analysis of IS development requires a researcher to look at IS implementation from many different perspectives: it is necessary to look at the meaning of a new information system for various stakeholders in an organization and the real value conflicts that there may be; it is also
necessary to look at the objective social impacts which are part and parcel of implementing information systems.

4 THREE CASE STUDIES

In this section the value of the hermeneutic dialectic approach will be illustrated with reference to three case studies. As all three cases have been recently published (see Sheffield & Myers, 1992), in this section only a brief summary of the essential features of each case will be presented; in the following section the theoretical framework outlined earlier will be applied to the salient aspects of each case.

The research methodology adopted was a contextualized, interpretive one, employing the techniques of case study research. The case study material was collected from unstructured interviews, published and unpublished company documents, archival records, newspaper and magazines reports and informal social contact with some of the participants over a 2½-year period from February 1989 until September 1991.

The cases, each drawn from a different industry, are as follows:

1 Case 1: New Zealand Army (defence industry).
2 Case 2: Television New Zealand (entertainment industry).
3 Case 3: New Zealand Education Department (government).

Case 1 documents implementation success, case 2 is a mixture of success and failure, while case 3 is mostly concerned with implementation failure. The three cases are summarized in Table 2.

<table>
<thead>
<tr>
<th></th>
<th>NZ Army</th>
<th>TVNZ</th>
<th>NZ Education Department</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System type</strong></td>
<td>DSS</td>
<td>News Management</td>
<td>Payroll</td>
</tr>
<tr>
<td><strong>System description</strong></td>
<td>Gives legal advice to army</td>
<td>Electronic news processing</td>
<td>Centralized payroll system for teachers</td>
</tr>
<tr>
<td></td>
<td>commanders</td>
<td>for TV</td>
<td></td>
</tr>
<tr>
<td><strong>Key stakeholders</strong></td>
<td>Legal staff officer,</td>
<td>Senior programmer,</td>
<td>Director of Management Services, 28 salary units,</td>
</tr>
<tr>
<td></td>
<td>commanders, students</td>
<td>vendor, Director of News</td>
<td>teachers and teachers’ union, Principals’ Association</td>
</tr>
<tr>
<td></td>
<td>and instructors, Director</td>
<td>and Current Affairs and staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of Legal Services and staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Evaluation of system</strong></td>
<td>Positive acceptance by all</td>
<td>Initially negative, positive</td>
<td>Hostile reaction initially, mixed response later (even though the system worked eventually)</td>
</tr>
<tr>
<td></td>
<td>stakeholders and outside observers</td>
<td>later</td>
<td></td>
</tr>
<tr>
<td><strong>Final assessment</strong></td>
<td>Success</td>
<td>Mixed</td>
<td>Failure</td>
</tr>
</tbody>
</table>
New Zealand Army

This case study is concerned with the successful implementation of a decision support system which gives legal advice to New Zealand Army commanders about the laws of armed conflict. This system was conceived and developed by Major Rebecca Ewert, legal staff officer for the Land Force Command.

Major Ewert decided to develop a laws of armed conflict expert system to ensure the dissemination of legal knowledge pertaining to the laws of armed conflict throughout the New Zealand Army. In New Zealand, the dissemination of legal knowledge throughout the armed forces was at best 'random'. Lack of resources, lack of suitably trained staff and other commitments relegated the dissemination of legal knowledge throughout the armed forces to a relatively low priority.

However, the New Zealand government formally ratified, on 7 February 1988, the 1977 additional protocols I and II to the Geneva conventions. This re-emphasized the requirement for the New Zealand government to disseminate legal knowledge pertaining to the laws of armed conflict throughout the armed forces. To fulfill its obligations under international law, therefore, an effective method by which to disseminate knowledge concerning the laws of armed conflict would have to be found. Major Ewert, in consultation with staff at the University of Auckland, decided to use expert system technology to effect the dissemination function.

Major Ewert decided to introduce the system into the New Zealand Army, restricting its applicability to the area of law relating to determination of target legitimacy, an aspect of the laws of armed conflict pertaining to the conduct of hostilities on land.

At the start of the project Major Ewert identified who would be affected by the introduction of the expert system, how such people might react and what pre-emptive action might be taken to facilitate its implementation. Major Ewert believed that this approach was crucial as expert system technology had not been used in the New Zealand Army before.

Major Ewert identified three groups of people would be directly affected by the introduction of the expert system: commanders, students and instructors within the training environment, and the director of legal services and his legal officers. While Ewert believed that most commanders and the students and instructors at Tactical School would react quite positively to the new system, she believed that the Director of Legal Services might resist its implementation. The director might fear that the expert system was about to replace the directorate’s primary input into the operational decision-making process; he might also resent the fact that the system would make him lose any further opportunity to increase staff numbers.

To minimize any possible resistance to change, Major Ewert employed a number of tactics with the three affected groups: top level commitment, education and the use of change agents were some of the tactics used.

After some prototype development, the system was introduced to various targeted officers ‘top down’. The Director of Operations and Training was invited to use the system and proved to be very enthusiastic. The director indicated that the system should be introduced into the training environment at the earliest available opportunity, and that he would approve of the system being accorded the status of an official army publication. He also approved the use of
the system by all three New Zealand services (i.e. navy, army, air force) in an operational as well as training environment.

In the light of the positive acceptance of the product by the Director of Operations and Training in New Zealand, the system was demonstrated to a meeting of the New Zealand Committee for the Dissemination of International Humanitarian Law held in Wellington, New Zealand, in September 1989. Attendees considered that the system was an effective method by which to disseminate the laws of armed conflict and thus an effective means by which New Zealand might discharge its obligations regarding the dissemination of such laws under international law.

Subsequently, the laws of armed conflict expert system has been used successfully in simulated operational settings during army field exercises. The system has been designed to be used in an advisory capacity, as a consultant, or as an aid to either the expert or an inexperienced user. The system assists the decision maker to come to a legally correct decision. This person is either a commander during military operations or students/instructors in a training environment.

Television New Zealand

This case study is concerned with the implementation of an electronic news management system for Television New Zealand. The first in-house system developed was abandoned; subsequently a second system was implemented in a facilities management contract with Digital New Zealand Ltd.

In 1988 the New Zealand government passed legislation deregulating the broadcasting industry, thereby opening up what had been a tightly controlled market to new competition. At the same time, the government split the Broadcasting Corporation of New Zealand into two state-owned enterprises, Television New Zealand and Radio New Zealand. As a state-owned company, Television New Zealand (TVNZ) was now required by the government to meet certain business objectives in a new competitive environment. Today TVNZ operates two TV channels nationwide in competition with five other private TV channels.

In late 1988 Television New Zealand decided to replace its existing electronic news processing system. The existing system was based on a number of unsupported Parallel computers and a package called BASYS. The senior programmer in the MIS department was charged with recommending an appropriate solution. He recommended developing a new in-house system using Digital Equipment Corporation's fourth-generation language Rally on a MicroVAX 2000.

Development of the new system started in February 1989. By April the developing system, now called Newsman, had outgrown the MV2000; software development was shifted to a larger MV3500. By June 1989 concern was starting to surface at management level about the Newsman system. Several planned test sessions had been cancelled. In August it was acknowledged that the planned implementation date of 30 September would have to be postponed.

Despite vigorous protests from TVNZ's MIS manager and senior programmer, TVNZ
executives decided to ask Digital New Zealand Ltd (DEC) to conduct an audit of the system. A few weeks later, TVNZ's senior programmer and another IS employee left the company to travel overseas. As Paul Norris, TVNZ's Director of News and Current Affairs, commented at the time, 'They seem to have disappeared — to have fled the country. We had no warning, no word'.

DEC's report stated that 'the application's internal coding and overall design are not deemed suitable for a production quality system'. Also, there was no project plan for prototyping, and no documentation existed to define the prototype or its aims. TVNZ management decided to abandon the Newsman software.

After considering a number of alternatives, TVNZ management decided to enter into a facilities management contract with DEC, in which DEC would have primary responsibility for the project and install a complete solution. TVNZ executives wanted the autonomy of their own in-house computer system but now felt that they did not have the management expertise to build systems and to manage their own information systems department. Subsequently, DEC installed a configuration of dual MV3800 computers running Ultrix with an updated version of the BASYS Newsroom software. On 27 December 1989, the BASYS news management system went 'live'.

The new system was seen to be successful by TVNZ management and the vendor. Graeme Booth, TVNZ's Resource Manager for News and Current Affairs, commented that 'Its value to the organization is absolutely immense . . . Six o'clock news and the Holmes show (current affairs) are our top-rated programmes. This system is vital to them'. As for the facilities management contract with DEC, Booth commented that 'We decided it was best to stick to our knitting. We know how to make television programmes, but we aren't computer people'.

**New Zealand Education Department**

This case study is concerned with the failed implementation of a centralized payroll system for the New Zealand Education Department. Although the system did achieve some measure of success, in the end the centralized payroll system was abandoned.

The New Zealand Education Department, a government department based in Wellington (the capital of New Zealand), decided to introduce a centralized payroll system in 1989. The new payroll system was to be introduced as part of the government's plan to restructure educational administration in New Zealand. All payroll processing would be done in Wellington, processing over 50,000 payments per fortnight. Previously, the payroll processing for preschool, primary and secondary school and technical institute teachers had been done manually by 28 separate salary units. Some of the largest units were called regional education boards.

The new system, when fully complete, would allow for each of the 28 salary units to input salary data directly into the Education Department's system. For most of 1989, however, it was planned that all data would be entered at the Education Department's head office in Wellington. Each of the 28 salary centres would have to send details of each teacher's pay to the Education Department. The pay details for each teacher would include data such as appointments, promotions, resignations and transfers.
Malcolm McDonald, the Education Department's Director of Management Services, said that the new system would save the government millions of dollars. The system would eliminate preholiday payments covering 10 weeks over the summer holidays and 3-4 weeks in May and August, saving a significant amount of interest for the government. Under the previous system, employees received all of their holiday pay by cheque, in one lump sum. Under the new system employees would be paid fortnightly regardless of holidays, as money could be direct credited to a bank account.

On 8 February, the first pay day for teachers for 1989, thousands of teachers found that they had not been paid correctly and hundreds did not get paid at all. Unfortunately many of the data which had been submitted by the salary centres to the Education Department for processing had been omitted or incorrectly keyed in. Graham Wilson, the General Manager of the Wellington Education Board, pleaded for calm from teachers who found that they had been paid incorrectly.

Wednesday, 22 February, was not an easy day for any of the 28 regional salary units. In Auckland, for example, Auckland Education Board staff had to write 744 cheques for teachers wrongly paid or not paid at all. The unfolding drama now became a regular front page news item in most of the country's newspapers. The New Zealand Herald (23 February, 1989) blamed the problems on a 'computer jinx'. In the same newspaper, an Auckland Education Board spokesman said that errors were being made at both ends — the board staff who provide the information and the Education Department payroll operators. Poor communication between the salary centres and the Education Department was hindering the error-checking process.

Lionel Devaliant, Chairman of the Post Primary Teachers' Association (the national secondary teachers' union), blamed the delays and errors in teachers' pay on the State Services Commission, which had failed to provide adequate resources for the project. The State Services Commission is the employer of people in the state education system. Devaliant said, 'We appreciate the work done by clerical workers in the department and in the boards, who are struggling under extreme difficulties. The buck stops with the commission which should have provided enough staff for the job.'

Malcolm McDonald said that most of the problems would disappear once pay staff became used to the new system's requirements and the system was completed with online terminals for all of the salary units. This time of the year had usually been a difficult one with delay and errors on some teachers' pay, but the introduction of the new system had added to the problems. 'But in a few months this will be just an unpleasant memory.'

Rosslyn Noonan, the National Secretary of the Educational Institute, said that the institute was going to seek compensation for teachers for the costs inflicted by problems associated with the new payroll system. Many teachers had been forced to pay bank charges for bounced cheques, and some had been hit with penalties on late mortgage payments, overdraft charges and other late payments costs because their pay had not arrived.

Two months after the centralized computer system was introduced, up to a quarter of some schools' staff were still affected by teachers' pay errors. Relief teachers and some part-time teachers had not been paid by mid-April.

The President of the Auckland Secondary School Principals' Association, Brother Pat Lynch,
said that school principals were becoming convinced that there was something wrong with the software, and these were not just temporary problems as claimed by the New Zealand Education Department. A spokesperson for the Education Department, however, said that most of the problems were teething problems which involved salaries staff who were not used to the new system (New Zealand Herald, 10 April 1989).

Malcolm McDonald denied that the software was not suited to the needs of the Education Department. He said that it was not a hardware or software problem. The payroll software was an international package used throughout New Zealand and the world and the hardware was very reliable. The fundamental problem, according to McDonald, was the proficiency of the salaries personnel in the salary units. These staff had had difficulty in adjusting to the procedural differences of the new system. The payroll problem 'was a purely human problem', exacerbated by an underestimation of the training required for payroll staff. Additionally, many of the previous manual records were inaccurate and outdated. While these records were benign in the old system, the inaccuracies became malevolent in a computerized system. Also, whereas staff were used to taking short cuts to get things done in the old system, the new computerized system rejected short cuts. McDonald said that staff would have to learn that the new system was more exacting and demanded accuracy.

By June 1989, McDonald was able to announce publicly that the Education Department's computerized payroll system was on target to meet its object of saving the government millions of dollars. The first regular payments during holiday time had gone out correctly in May. However, a representative of the Post Primary Teachers' Association said that teachers were still complaining about the new system, even though it was now working correctly. 'Big payments were useful for those who, say, went overseas for holidays,' he said.

Less than 6 months later, the centralized payroll system was scrapped by the government. Although the government had intended that the centralized payroll system would be part of the administrative structure associated with the 'Tomorrow's Schools' reforms, the Education Department's system was now deemed to be politically unacceptable. When a new administrative structure for New Zealand primary and secondary schools was introduced in late 1989, payroll processing was decentralized.

5 DISCUSSION

In this section the implications of the hermeneutic dialectic approach for information systems implementation are outlined. The applicability of the theory is discussed by drawing upon pertinent examples from each of the three cases. Some of the main points can be listed as follows:

Implementation 'success' or 'failure' is a matter of interpretation

Perhaps one of the reasons that there has been so little progress in understanding the implementation of information systems is that some of the fundamental concepts have been so difficult
Dialectical hermeneutics

to define. When it comes to defining information systems success, for example, 'there are nearly
as many measures (of success) as there are studies' (DeLone & McLean, 1992, p. 61).

DeLone & McLean attempt to solve this problem of definition in a positive way by suggesting
six classification categories. However, DeLone & McLean themselves admit that all of their
classification decisions are somewhat arbitrary: some studies did not fit neatly into any one
category while others fitted into several.

An obvious conclusion that DeLone & McLean could have made, but did not, is that inform-
ation systems 'success' is itself a matter of interpretation. By attempting to define 'success' in
terms of six categories, they merely confuse matters. While the attempt at categorization is
useful as a summary of how information systems success has been seen in practice, it does not
help the researcher to decide if any particular system is successful or not. 'Success' is not a
unitary phenomenon; it is, by its very nature, a matter of opinion and genuine grounds for
debate.

A hermeneutic dialectic definition of information systems success, then, is as follows:

Information systems success is achieved when an information system is perceived to be
successful by the stakeholders and other observers.

Success, in this definition, allows for differing opinions within and outside of an organization,
for 'subjective' and 'objective' opinions and for a change of opinion over time. While it could be
argued that this definition is too 'subjective', I believe that this definition allows for both 'sub-
jective' and 'objective' opinions; more precisely, the subjective/objective distinction which is
commonly made dissolves as being of little value. The usefulness of this definition can be
illustrated with reference to one of the case studies.

The payroll system implemented by the New Zealand Education Department illustrates how
implementation success is a matter of interpretation. While the implementation of this system
received very bad publicity in the national press, and was perceived as a failure by some of the
stakeholders (e.g. teachers), the Director of Management Services proclaimed some 4 months
after implementation that the system was successful in that it had achieved its main financial
goal of saving the government millions of dollars in interest payments. The system, therefore,
was both a failure and a success. The system was a failure both subjectively (journalists' and
teachers' opinions) and objectively (correct salary payments were not made at the time of
implementation), and it was ultimately a success both subjectively (the opinion of management)
and objectively (after some months, it did work correctly). Saying that implementation success is
a matter of interpretation does not mean that all interpretations are equally valid. While the
various actors disagreed in their assessment, in the end the centralized payroll system was
abandoned by the government.

Dialectical hermeneutics allows the dynamics of 'success' in this system to be viewed in a
historical context. Any attempt to define the success of this system in terms of fixed categories
would simply miss the dynamics of what success and failure really mean in the context of social
and political life. One of the purposes of the hermeneutic dialectic approach is to examine
critically conflicts and contradictions in social reality. These conflicting interpretations among the
participants about what happened, who was to blame and the final outcome were part and parcel of the unfolding drama in the Education Department case.

Once we recognize that implementation success is a matter of interpretation, we are able to re-examine some of the assumptions that have been made in much of the implementation literature. For example, Alavi & Joachimsthaler (1992) conducted a meta-analysis of the DSS implementation literature. They describe their study as a 'rigorous and quantitative review of the empirical implementation literature' (p. 95) in which they investigated the relationship between user-related factors and DSS implementation success. However, in their quantitative analysis of 33 studies, Alavi & Joachimsthaler (1992) gloss over the fact that their main dependent variable, 'implementation success', is taken for granted. The assumption is made that implementation success is a static phenomenon and that it was defined consistently both within and between all 33 articles. But, as DeLone & McLean's (1992) research shows, this assumption is invalid. DeLone & McLean found that there was very little consistency in the definition of success from one article to the next. Dialectical hermeneutics allows us to re-evaluate Alavi & Joachimstahler's positivistic assumptions; it throws into a new light their comment that 'Disagreements (about coding and data) were resolved through discussion' (p. 99). It can be seen that the researchers themselves were the sole (albeit unreflexive) interpreters of the data.

The argument of this paper, then, is that dialectical hermeneutics provides a theoretical framework for analysing some of the key assumptions in the IS implementation literature. Applied to informative systems, constructs such as 'success' and 'failure' become, by definition, matters of interpretation.

The reality of systems development is that it is primarily a social process — it is conducted within a complex, intertwined set of social and political interactions

As was mentioned earlier, many scholars are starting to recognize that information systems development is primarily a social process (Hirschheim & Newman, 1991; Newman & Robey, 1992). The three cases confirm this perspective.

In the New Zealand Army project, for example, the instigator of the IS project was acutely aware of a complex, intertwined set of social and political interactions; she realized the impact of authority, power and legitimacy on the acceptance of a new IS within the organization. Part of the success of implementing this system was due to the way Major Ewert identified who the stakeholders were, and then comprehensively set about devising strategies to deal with each stakeholder group. This system was actively marketed by the systems developer to the various stakeholders groups. Interestingly, this approach was successful despite the fact that it goes against one of the classic maxims of systems development, that 'politics should not be the concern of the systems developer' (Hirschheim & Newman, 1991, p. 47).

The New Zealand Education Department case, in a different way, also illustrates how this system was part of a complex, intertwined set of social and political interactions. Although this system was, from an information systems point of view, a relatively common type of transaction processing system, the social and political interactions were extremely complex, and these interactions and relationships developed and changed as the case progressed. The new payroll
system became in effect a symbol of the government's intention to restructure educational administration in New Zealand. Many teachers, the teachers' union, some principals and staff in the regional education boards opposed this government initiative.

**An understanding of the organizational context and its history is crucial for those involved in an IS project**

As Swanson (1988, p. 11) points out, the information systems implementer is situated within a context of commitments and expectations. The instigators of a project thus need to understand the organizational context — they need to know who the stakeholders are and understand the politics involved. Systems developers need to recognize that it is often extremely difficult for all stakeholders to agree on the objectives for a new system; that is why much effort needs to be expended in trying to resolve differences between people and in marketing the new system to all the affected parties. Instigators of a system also need to understand the technological context — they may need to tailor the systems development methodology to the organization and to the scale of project, for no one methodology is likely to suit all situations.

The Television New Zealand case highlights the importance of understanding the organizational context and its history. It documents how the organization, faced with a new competitive business environment, redeveloped its electronic news processing system. In fact, the case itself is a history of how this new system was developed. Both this case and the Education Department case only makes sense if they are read as historical narratives of the IS projects.

One of the obvious implications of this point is that we may have to change the information science curriculum in colleges and universities. Although systems analysis has sometimes been likened to sociology, almost all existing texts in systems analysis gloss over the difficulties in coming to a comprehensive understanding of organizations and the context in which they exist; they do not deal with differences in stakeholders' perceptions except in a cursory way, and assume that a purely rational, non-interpretive definition of system requirements can be achieved. However, if an understanding of the organizational context and its history is crucial for information systems professionals, then new courses which allow students to gain a solid grounding in the social sciences, and in particular the interpretive sciences, may need to be developed.

**Successful implementation is based on mutual understanding**

Klein & Hirschheim (1991) discuss how Habermas' concept of communicative rationality has immediate applicability to systems development. They argue that mutual understanding among systems development participants should be an important goal in IS development, and they suggest that communication breakdown — the failure to achieve consensus by misunderstanding or trust — may be a major contributor to systems development failures (Klein & Hirschheim, 1991, p. 165).

All three case studies confirm the validity of Klein & Hirschheim's observations. In the New Zealand Education Department case, there was poor communication between the systems
development people at head office and the 28 salary units; there was a lack of consultation with users, teachers and the teachers’ union, both at the project’s inception and during implementation. Of course, this system did achieve some measure of success without mutual understanding. The New Zealand Education Department’s payroll system did actually work eventually, despite the communication problems. However, in the end the system was scrapped by the government.

By contrast, in the New Zealand Army case study there was good communication between the various stakeholders. In the Television New Zealand case study, there was poor communication at the start of the project, but excellent communication between the vendor and the company at a later stage.

6 CONCLUSIONS

This paper has suggested that critical or dialectical hermeneutics is a useful theoretical framework for IS implementation. As an integrative framework, dialectical hermeneutics combines both interpretive and critical elements; it is a constitutive process theory which emphasizes both the subjective meaning for the individual actor and the social structures which condition and enable such meanings.

One of the important implications of this study for future research is that new methodologies for information systems development now need to be developed which recognize that systems development is first and foremost a social activity. The vast majority of information systems methodologies, which are based on what Klein & Hirschheim (1991) call formal rationality, need to be drastically changed and re-cast, if not abandoned altogether. In my view, this does not preclude the use of formal engineering methods in systems development; it simply means that the engineering problems are seen in context, they become part of a much broader methodology which has, as its overall objective, social and organizational change. The development of the Multiview methodology is a start in this direction (Avison & Wood-Harper, 1990).

After two decades of research in the area of IS implementation, I believe it is time to re-examine the fundamentals of the field. This paper has argued that we need a new theoretical framework which can deal with the social and political nature of IS implementation. One such framework is dialectical hermeneutics

ACKNOWLEDGEMENTS

I am grateful to Allen S. Lee, M. Lynne Markus, Lorne Olfman and Wanda J. Orlikowski for their helpful comments on earlier drafts of this paper.

The empirical research was supported by a grant from the Faculty of Commerce and Economics at the University of Auckland. Much of the work for this paper was completed while I was a visiting faculty member in Information Science at the Claremont Graduate School.
REFERENCES


Boalad Jr, R.J. (1991) Information system use as a her-


Biography

Michael D. Myers is currently Senior Lecturer in Information Systems in the Department of Management Science and Information Systems at the University of Auckland. His PhD in Social Anthropology was obtained at the University of Auckland. Before joining the University of Auckland in 1989, he worked for IBM New Zealand Ltd. In 1992 he was a visiting faculty member in Information Science at the Claremont Graduate School, California. He is the author of a number of published papers and co-author of two books, including New Zealand Cases in Information Systems (2nd edition, 1992). His research interests are in the area of information systems development, interpretive research methods in information systems, and the social and organizational aspects of information technology.