USING CRITICAL REALISM TO EXPLAIN STRATEGIC INFORMATION SYSTEMS PLANNING

PAUL MORTON, RMIT University
School of Business Information Technology, GPO Box 2476V, Melbourne VIC 3001, Australia.
Email s9602014@student.rmit.edu.au

ABSTRACT

This paper shows how the philosophy of social science known as Critical Realism (CR) can inform information systems (IS) research. CR is particularly helpful for IS research where natural science methods (e.g. controlled experiments) are difficult to apply such as in organizational settings, involving IS, where complex interactions occur and outcomes are not predictable. CR shows how an open systems ontology of social reality better explains the nature of causation in complex social interactions and accounts for the fact that outcomes are not predictable. A key advantage of CR is its adoption of an objective ontology (a reality independent of the researcher) while acknowledging the socially constructed nature of knowledge (a subjective epistemology) that can, nevertheless, be assessed for validity thus avoiding the problem of relativism. CR has been used in sociology, economics, organization and management studies, marketing studies, geography, and legal studies but not much in IS research. The second part of the paper illustrates the application of CR principles in an excerpt from case study research to explain the outcomes of the interaction between organizational context and management interventions to develop and implement strategic IS plans

INTRODUCING CRITICAL REALISM

Realist Ontology and Epistemology

Critical realism is a philosophy of social science that shares with positivism the belief that there is a reality, both natural and social, which is independent of human knowledge. However, against positivism but with the interpretive tradition, CR accepts a subjective epistemology or that knowledge is a product of the mind's interpretive activity and is also socially constructed. CR rejects however the assertion, of the strong social constructionist strand of interpretivism, that there is no independent means of establishing the validity of socially constructed knowledge claims. There can be different explanations about a given phenomenon but the adequacy of these explanations, in terms of explaining the causes of the phenomenon in question, can be assessed by reference to an independent reality. In other words CR accepts epistemic relativity, "all beliefs are socially produced" but not judgmental relativity "all beliefs

Mike Metcalfe acted as the senior editor for this paper.

(statements) are equally valid, in the sense that there can be no (rational) grounds for preferring one to another." (Bhaskar 1998a, p. 57) Hence relativism is avoided.

A central idea of CR is that natural and social reality should be understood as an open stratified system of objects with causal powers. In the first strata is the domain of experiences or the empirical. The second is the wider domain of actually occurring events and 'non-events' or the domain in which causation is actualized but not necessarily experienced or resulting in events. Finally encompassing both these domains is the domain of the real, which contains the objects, which are the source of causation in the world and hence the cause of events. On this understanding an object is real if it has causal power capable of producing effects. This stratified conception of reality is illustrated in Figure 1.

This defines the ontology of reality as an open stratified system of natural objects with causal powers (mechanisms), which under some conditions are actualized to produce events some of which are experienced in the domain of the empirical. Sayer (2000, p. 11-12) comments:

The real is whatever exists, be it natural or social, regardless of whether it is an empirical object for us, and … the real is the realm of objects, … Whether they be physical, like minerals, or social like bureaucracies, they have certain structures and causal powers, … the actual refers to what happens if and when those powers are activated, to what they do and what eventuates when they do, such as when the bureaucracy's powers are activated and it engages in activities such as classifying and invoicing, or the previously idle person does some work.
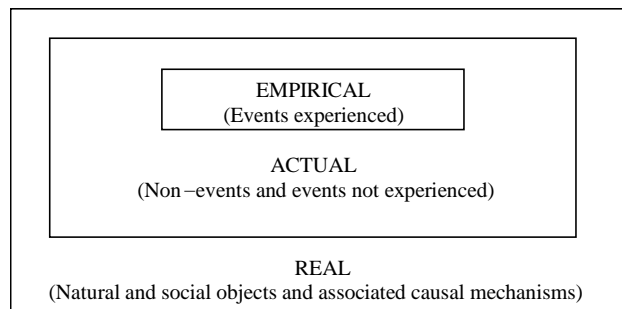
Figure 1 The Open Stratified Nature of Reality
(After Mingers in Mingers and Willcocks 2004, p. 384)

CONTRIBUTION

The paper provides IS researchers with an overview of the philosophy of social science known as critical realism (CR) to show how causal explanations for IS research involving a social dimension can be developed where natural science methods are difficult to apply, such as in organisational settings where complex interactions occur and outcomes are not predictable. The paper makes a contribution by:

1. Showing how the open systems ontology of social reality established by CR better explains the nature of causation in complex social interactions and accounts for the fact that outcomes are not predictable.

2. Showing the practical relevance of CR to IS research through an example from research on the practice of strategic information systems planning (SISP). In this respect, as far as the author is aware, this is the first paper to apply CR principles specifically to research on the practice of strategic information systems planning (SISP).

The paper should be of interest to IS PhD students, experienced IS researchers not familiar with CR and SISP practitioners.

www.mana

Where do the causal powers of objects come from? Bhaskar makes use of the argument concerning natural necessity to explain the causal powers of things (Harre and Madden 1998, p. 109). This means that the powers and liabilities (Sayer 1992, p. 104-105) of a mechanism originate in the structure of the object with which it is associated. In an open system of many different objects the causal mechanisms of any given object may or may not be activated. If they are activated they may then encounter other active mechanisms and be altered in some way that changes the kind of effect, if any, they are able to produce. An object retains its causal powers whether or not its mechanisms are activated (Fleetwood 2001, p. 211). The outcome of a mechanism being activated is not predictable because of the ever-present potential of other mechanisms to counteract it partially or in full. These ideas are depicted in Figure 2 Necessary Causal Powers and Liabilities (Mechanisms).

The important research implication, of this open context of interacting objects with causal mechanisms is that the mechanisms may be out of phase with patterns of events and experiences. Figure 3 depicts this point. This is very different to a closed system, such as a scientific experiment; where objects are protected from external effects, do not undergo internal change (Sayer 1992, p. 122) and where regular cause and effect relationships can be established between the causal mechanisms active in the experiment. In contrast, in an open system "Causal powers and liabilities may … be attributed to objects independently of any particular pattern of events; that is, not only when 'C' leads to 'E', but also sometimes when 'C' does not lead to 'E'" (Sayer 1992, p. 105).
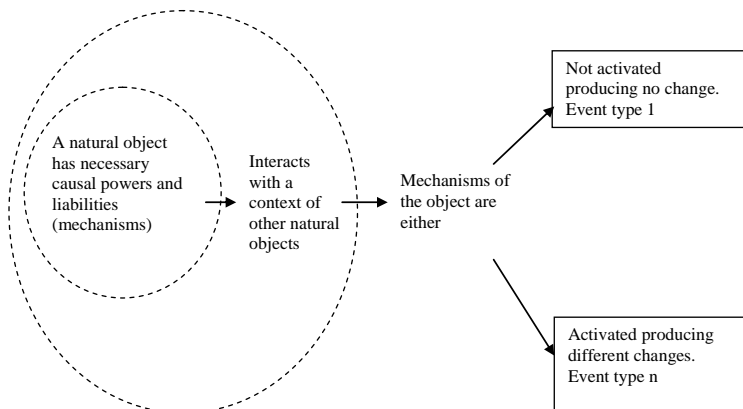
Figure 2 Necessary Causal Powers and Liabilities (Mechanisms)
After Sayer (1992, p. 109)
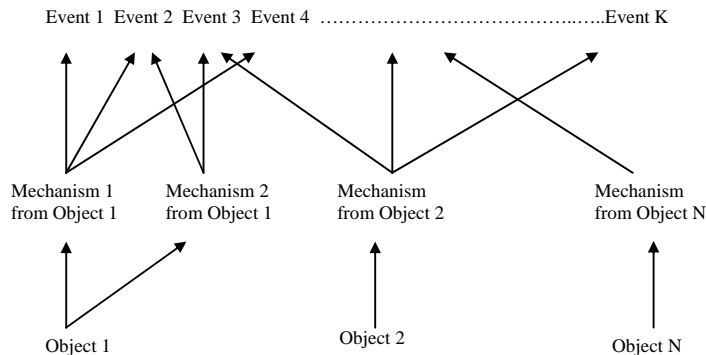
Figure 3 Relationships between Objects, Causal Mechanisms and Events
(After Sayer 1992, p. 117)

Realism and the Social World

In his book *The Possibility of Naturalism* Bhaskar (1998a) addresses the possibility of a science of the social world. In the social world the concept of an open stratified system of interacting objects with causal powers also applies but this time the objects are social rather than natural and originate in society. Bhaskar argues for an ontological distinction between society and people because "all activity presupposes the prior existence of social forms" (Bhaskar 1998a, p. 34) and the properties of society become evident in the properties of the constituent social structures. Bhaskar proceeds to establish the reality of social structures by appealing to the realist causal criteria, which states that a posited object is real if it has the capacity to bring about changes in material or social reality (Lewis 2000, p. 252). The causal efficacy of social structures both constrains and enables human activity (Bhaskar 1998a, p. 40). Porpora (1998, p. 344) explains how this occurs:

The causal effects of the structure on individuals are manifest in certain structured interests, resources, powers, constraints and predicaments that are built into each position by the web of relationships. These comprise the material circumstances in which people must act and which motivate them to act in certain ways.

How then is structure linked to agency and how are such structures constituted? Bhaskar's answer (1998a, p. 40) is the position-practice system:

Such a point, linking action to structure, must both endure and be immediately occupied by individuals. It is clear that the mediating system we need is that of the positions *(places, functions, rules, tasks, duties, rights, etc) occupied (filled, assumed, enacted, etc.) by individuals, and on the* practices *(activities, etc.) in which, in virtue of their occupancy of these positions (and vice versa), they engage.*

Social structures are only relatively independent of actor's current activities (Archer 1995, p.148-149). This avoids the problem of reification of social structure. A defining characteristic of social structures is their relational nature (Bhaskar 1998a, p. 40) that is social structures depend for their existence on internal or necessary relations between the social objects within the structure (Sayer 1992, p. 89). A simple example of a social structure is that between the employer and employee as illustrated in Figure 4 Necessary Relations of the Employer - Employee Social Structure. In this example the employer and employee are in a necessary relationship by virtue of the obligation on the employer to pay a wage or salary and an obligation on the employee to do work.
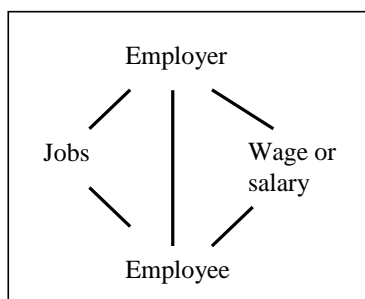
Figure 4 Necessary Relations of the Employer - Employee Social Structure (After Sayer 1992, p. 93)

Explaining Social Change through the Interaction between Social Structure, Agency and Culture

The aim of social science is to explain social change (Bhaskar 1998a, p. 41) that is how social forms evolve and why particular outcomes occur. The process of social change occurs through the interaction between social structure, culture and agency via 'established human practices' (Joseph 2002, p. 177) where social practices are defined as "a relatively stabilized form of social activity. Examples would be classroom teaching, television news, family meals, medical consultations, or work situations inside innovation projects" (Chiapello and Fairclough 2002, p. 193). The interaction of these key entities of social reality is represented in Figure 5 Interaction of Social Structure, Agency and the Cultural System. Social structure was discussed in the previous section so a brief explanation of agency and culture as conceptualized by CR follows.
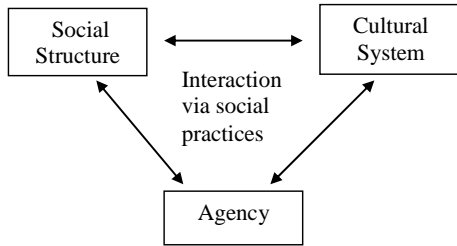
Figure 5 Interaction of Structure, Agency and the Cultural System

The Cultural System

Broadly speaking, for critical realists the cultural system includes practices, symbolic and material objects as well as ideas and beliefs including theories, propositions and arguments (Parker, Mars, Ransome and Stanworth 2003, p. 82). In the interaction model of Figure 5 "ideas / belief systems have 'causal powers' and as such explanatory relevance" (Parker, Mars, Ransome and Stanworth 2003, p. 92). It is '*the ideas which at any given time have holders*' (Archer 1996, p. xxi, italics in original) which become important in the causal effects of social interaction and this is "intimately allied to the use of power and influence" (Archer 1996, p. xviii). Agents can use knowledge, ideas and beliefs to determine, justify and pursue their interests through actions in particular settings. Managers may seek to change working arrangements in an organization based on ideas from practitioner literature, consultants or beliefs about the best way to organize work based on prior management experience.

Agency

Agency refers to the causal powers of people. Archer (1995 p. 190) defines agency as a concept that encompasses individual actors, collectivities of people (primary agents) and organized groups (corporate agents). This is helpful for understanding the role of agents in organizations. Ackroyd comments that 'Organizations should be analyzed as configurations of different groups (with their own distinct priorities and agendas)' (Ackroyd and Fleetwood 2000, p. 101). On this basis studies of organizational behavior involve studies of groups of agents within organizational settings or as Downward, Finch and Ramsay (2002, p.489) state the 'analysis

of causal mechanisms should be devoted to exploring and articulating human agency in its institutional context'.

To summarize a social setting will be composed of agents who use elements of the cultural system to pursue their interests and this takes place in a context of social structures that have causal effects on people. These social structures can be understood through the research processes of social science but because of the absence of closed systems 'the criteria for the rational development and replacement of theories in social science must be *explanatory and non-predictive*' (Bhaskar 1998a p. 45, italics in original). Although specific outcomes in an open systems context cannot be predicted a realist analysis helps to explain how and why a particular outcome occurred. John Mingers (Mingers and Willcocks 2004, pp.388-393) discusses some criticisms of the philosophy of CR. For reasons of space the details of these criticisms are not discussed here and the interested reader is referred to Mingers's commentary.

Operationalizing Critical Realism

CR is a metatheory, which "provides guidelines about the necessary form of theory" (Fleetwood and Ackroyd 2004, p. 21). This means that CR can be used as the basis for the development of new theory or the critical analysis of other theories from a realist perspective. For this reason there is no prescribed method for conducting CR based research (Mingers and Willcocks 2004, p. 397) and adoption of a realist ontology and epistemology does not preclude the use of research techniques from the natural science and social constructivist perspectives, providing their status in relation to the ontological and epistemological principles of CR is understood and accounted for (Sayer in Fleetwood and Ackroyd 2004, p. 17). Case studies are particularly appropriate for research based on CR (Tsoukas 1989; Tsang & Kwan 1999; Dobson 2001b) because they provide an opportunity to focus in depth on the factors and their interaction that lead, in a causal way, to observed outcomes. Interpretive techniques can be used to identify the relevant beliefs, theories and ideas that motivate behavior of agents.

An analysis based on CR looks for causal mechanisms in the three key elements of agency, culture and social structure. It then theorises the nature of these mechanisms or how they work. In relation to agency, or action by individuals and groups in the setting, the researcher needs to understand what actions are being taken, by whom, for what reasons and what the effects of these actions are. Parker, Mars, Ransome and Stanworth (2003, p. 110) point out that it is also important to find out where agent's reasons for acting come from such as the "cultural mechanisms and economic and political interests generating their reasoning." In relation to the causal effects of the cultural system it is necessary to identify the key ideas and beliefs that agents may draw on to advance their interests or in what ways these elements limit their freedom of action. However the causal power of these elements will depend on the particular context in which they are used so that "ideas will have to be linked to non-ideational factors and the interaction between them specified" (Parker, Mars, Ransome and Stanworth 2003, p. 92). The link to non-ideational factors suggests the second or deeper social structural analysis required for a full realist explanation. Taylor and Bain (Fleetwood and Ackroyd 2004, p. 276) comment:

> *Complete explanation, in fact, is achieved where the mechanisms connecting social and economic structures (real), and the powers and relations of particular entities (actual) at work behind the flux of perceived and actual events (empirical) are revealed (Fleetwood 2002, p. 5)*

A deeper level analysis carries the focus beyond the actions of agents and their use of ideational elements from the cultural system to examine the structural relationships within the setting, which may play a causal role without agents being aware of this (Sayer 2000, p. 26). Critical realists seek an understanding of the nature of a social structure in terms of its constitutive necessary relations (Sayer 1992, p. 89-91) such as the hierarchical relations of a bureaucracy (Parker, Mars, Ransome and Stanworth 2003, p. 211). As with the elements of the cultural system a second step is to identify how agents use the resources of social structure to advance their interests or in what ways social structure limits their freedom of action.

APPLYING CRITICAL REALIST CONCEPTS TO IS RESEARCH

Why CR is relevant to the study of IS

IS researchers such as Hirschheim have argued that "information systems are, fundamentally, social rather than technical systems" (1985, p. 1335) and Heeks (2001, p. 55) observes that "Information systems are social systems; that is to say, information systems are rooted in a context of people and of social structures and are themselves made up partly of people and social structures." The planning, design, development and implementation of IS in organizations involves human agents (managers, system developers, technical experts and consultants) as well as information based relationships including the market for information technology products. Implementation of information systems necessarily includes processes of organizational change. As well there is a continuing flow of ideas, beliefs, concepts, issues and other cultural material associated with the purposes and visions put forward about the role of IS in public and private, educational, governmental, profit and not for profit organizations. All of these things occur in many different contexts involving a wide range of interacting causal mechanisms in the open systems ontology of the social world as manifest in organizational settings.

If it is accepted that information systems are a form of social system then IS research falls into the domain of social science and CR provides the necessary philosophical underpinning for such research. Accordingly IS research needs to be based on a recognition of the open systems ontology of social and natural reality. Explanation based on a CR perspective can also accommodate the occurrence of unpredictable outcomes from social interaction. As Markus and Robey (1988, p. 585) note: "organizational change emerges from an unpredictable interaction between information technology and its human and organizational users." A small but growing number of researchers have argued that the critical realist perspective can and should be used for research in the IS field

(Mingers 2002; Mutch 2002; Dobson 2001; Carlsson 2005; Smith 2005).

A Realist Analysis of Strategic Information Systems Planning (SISP) and case study

Senior management of organizations and SISP practitioners have regarded SISP as an important activity for well over a decade and continue to do so (Salmela and Spil 2002). SISP is believed to provide a number of benefits to organizations particularly the identification of strategic uses of IS, alignment with business needs (Lederer and Sethi 1996; Earl 1996; Prakash 1998; Salmela and Spil 2002) and exploiting IT for competitive advantage (Porter and Millar 1985; Earl 1996; King 1997; Min, Suh and Kim 1999). However the experience of many organizations, which have attempted to use SISP, has been problematic in terms of the process of developing strategic IS plans and the actual benefits of implementation. Earl (1993, p. 4) in a two-stage survey of 27 United Kingdom companies reported that only 10% of respondents claimed their SISP experience had been "highly successful". Lederer and Sethi (1992, p. 33), in their survey of eighty information systems planners, found that "Satisfaction scores for the different dimensions of SISP were also only slightly favourable." These kinds of experiences have led researchers such as Hackney, Dhillon and Burn (1999, p. 123) to conclude that:

the assumptions underlying the objectives of SISP do not represent the existing research evidence. The central notion of aligning an IS/IT strategy with an organization's business strategy are fundamentally problematic. The diversity and complexity of organizational strategic processes are clearly not being considered through SISP.

The prevalence of SISP in both private and public organizations together with the somewhat problematic experiences of organizations, which have attempted SISP projects, motivates the following research question: What are the causes of the outcomes of attempts to develop and implement strategic IS plans in organizations?
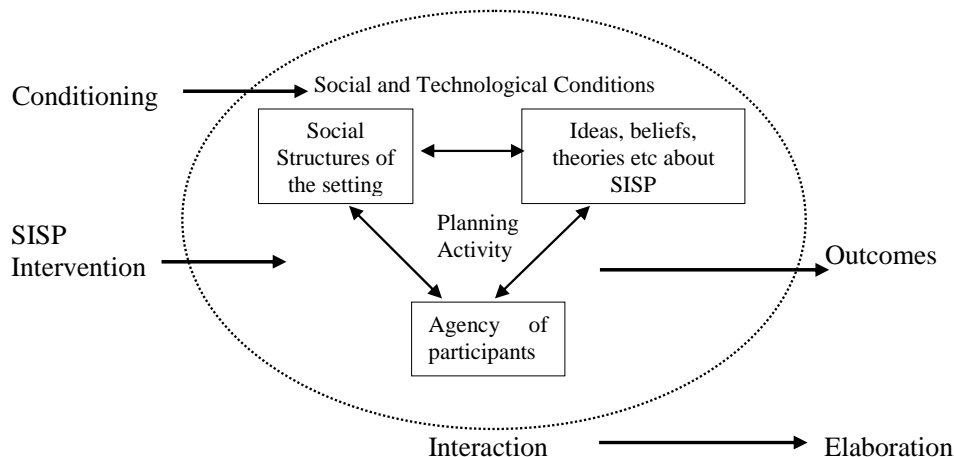
A Realist Conceptualization of SISP

Rather than the rational design model of SISP from the positivist literature or a structurally limited analysis of SISP from the interpretive perspective (Walsham 1993) a preliminary realist reconceptualization is that SISP should be seen as a social intervention into the open system of the organizational setting in which the interaction between social structures, technological conditions, key agents and influential cultural or ideational aspects occurs through the social action of planning activity. Conceptually this is similar to the context, mechanism and outcome (CMO) realist model, of social intervention, put forward by Pawson and Tilley (1997) but endeavors to improve on this model by addressing the deeper level of social structures and the sources of mechanisms (Sayer 2000, p. 23). Charles Lawson (2004, p. 17) argues that it is the dual presence of technology and the social structures of the organization that form the structural conditions for human action and its outcomes. The outcomes of this interaction represent the elaboration of the organizational setting in social, cultural, technological (Mutch 2002, p. 488) and agential terms. As such the SISP initiative is itself a mechanism that triggers various kinds of responses from existing social structures and agents. Some are supportive and some resistant and the outcome is unpredictable but an analysis of the setting may allow tendencies and possible outcomes to be identified. The open systems view of SISP is shown in Figure 6 A Realist Conceptualization of SISP.

This forms the conceptual framework for the realist analysis of the phenomenon of interest. The analysis itself requires the postulation of the particular mechanisms that are present within the setting, how they operate, whether they are activated and what causal effects they tend to have. Observable outcomes are the empirical manifestation of the interaction of these mechanisms.

Social Structures

SISP takes place within organizations that exhibit hierarchical structures of formally related positions. These positions, with associated resources and rules, provide the

Figure 6 A Realist Conceptualization of SISP

occupants with structural powers that can be drawn upon as they carry out their assigned roles and fulfil their responsibilities. Informal structures may also be present or develop that have the ability to influence events within the setting and counter or reinforce formal structures.

Agency

At least four significant sets of agents are evident in organizations that engage in SISP. First, managerial groups who initiate and sustain the SISP process until a strategic IS plan is formulated and implemented. Second, the owners of pre-existing information systems including major corporate systems meeting a wide range of organizational information needs as well as smaller local business unit systems. Third, consultants with expertise in SISP who are hired to develop the strategic IS plan and fourth, senior executive managers who make the final decisions about the acceptability or otherwise of consultant proposals.

The Cultural System – SISP and Management Imperatives

SISP engages with technological, organisational and managerial aspects of the setting in which it occurs and through this with the associated beliefs, concepts, methodologies and ideas. Tillquist (2000, p. 146) proposes that "models of technological and organizational change carried in the broad managerial discourse shape the organizational planning process by defining the way

participants can talk about computerization and work, and by predefining the taken-for-granted assumptions of IT and work organization." Managers are also encouraged to see information technology as a way of improving organizational efficiency and in this concepts and ideas associated with information systems become entwined with concepts of management. There are also the beliefs and ideas promulgated by the market and consultants about the role and benefits of information technology in organizations.

Planning Activity as Social Practice

Interaction takes place via planning activity which is clearly a social practice involving stakeholders with various levels of power and interests. For Forester (1993, p. 24) "planning and policy analysis can be understood as forms of social action". This action is communicative which is "always interaction between persons, thus political in a very broad sense, reproducing, whether maintaining or altering, social and political relations." (Forester 1993, p. 24) Those involved in forming the IS strategic plan have a role in shaping the practice of planning and their ability to do this comes from being in a position to set the agenda of attention, manage client uncertainty, provide meaningful images of the future, facilitate the development of communities of action, through the control of information access and finally by coopting potential sources of resistance. (Forester 1981, pp. 175-176)

Outcomes

The outcomes of SISP activities will include the identification of strategic decisions which are either taken or not taken (eg commission or decommission of IS), changes in the ideational aspects associated with IS, changes in the beliefs or attitudes of agents involved in SISP and changes in social structures. A particularly important set of outcomes will be those resulting from the attempt to implement the strategic IS plan such as new information systems and work arrangements in the organization. Outcomes can then be compared to the initial conditions and the intentions of the initiating managerial group to decide what changes have occurred and a causal explanation offered.

Case Study - Using the Realist Conception of SISP for Explanation

The setting is a large multi-divisional public sector organization. Divisions have a tradition of independence and a strong program service delivery focus stemming from their history as once separate departments. The Department also has a number of district offices responsible for direct service provision and coordination of a large number of contracted service providers for the bulk of program service delivery. The Corporate Services Division (CSD) is responsible for the corporate service functions including Human Resource (HR) Management, Financial Management, Computer Services and Provider Contracts Management (PCM). Each of these functions is performed by a branch of the CSD, headed by a branch manager and supported by an associated information system. All divisions and district offices of the department access these systems via the departmental network, which is the responsibility of the Information Technology Branch (ITB).

Initiating the SISP Consultancy

The Divisional Manager of CSD initiated the SISP consultancy project. He gave his reasons for this in a facilitated workshop with his branch managers in early 2002. The purpose of the workshop was to discuss a draft tender for the proposed IS planning consultancy, which had been prepared by the Manager of IS Planning within ITB, and seek agreement to its objectives. First there was anecdotal evidence of duplication between CSD systems and those systems in the service delivery divisions second, there was no strategic plan identifying priority areas of need to focus limited IT resources and finally there was a perception at the Board level that the ITB represented a large overhead, so there was a need to raise awareness of the corporate IS contribution to the overall departmental achievement. There was general agreement from the branch managers at the workshop that a consultancy to develop an IS strategic plan for CSD systems was justified. The scope of the consultancy was confined to those systems, which were the responsibility of CSD as distinct from the service delivery information systems controlled by the other divisions.

The Consultant's Analysis

After a lengthy tender evaluation process local consultants were selected. During the initial phase of the consultancy the consultants interviewed and surveyed users of CSD systems within CSD, in the other divisions of the organization and in district offices. A key finding by the consultants was that dissatisfaction with the central corporate systems was lowest amongst CSD users, increased amongst users in the other divisions and reached its highest level with district users. This was accompanied by a corresponding development of shadow systems, which increased in number according to the distance, organizationally speaking, from the centre. Shadow systems (Boudreau and Robey 2005, p. 11) were locally built desktop systems, developed by end users outside of the corporate computer network and tailored to local needs but without the benefit of corporate system development standards and security measures.

The consultants set up a workshop between CSD system owners and district and divisional users of these systems to confirm their diagnosis. The workshop was tense and surfaced strong disagreements between CSD systems owners and the users. Three systems in particular came in for strong criticism, the Finance system, the Provider Contract Management system (PCMS) and the HR Management System (HRMS). Central

www.mana

systems were not designed for the operational level work of these staff so that when using these systems it was necessary to disaggregate the corporate data on service provider, funding and HR related information to reconcile it with the detail held by the districts on contracted service providers. Users had to manually reconcile information between systems, formats were inconsistent from system to system and centrally maintained data was inconsistent with local records. The CSD system owners from head office rejected these criticisms. While the Branch Manager PCM acknowledged there were issues with the PCMS both the Finance system (FS) and HRMS owners refused to accept there were any significant problems with their systems and argued that users were not using them properly. They claimed training had been provided to staff in decentralized locations but they were unwilling to follow central procedures.

The second issue the consultants identified was related to management information. A key issue for the Board of the department was the difficulty of obtaining reliable whole of department management information. The consultants found that CSD systems each possessed a limited degree of reporting functionality but it was not possible to obtain reports that incorporated all the relevant information from each system. Compounding this problem was the presence of shadow systems each with their own local stores of data relating to district and provider HR and financial performance. This information was not integrated with that held in the CSD system and constituted a separate source of information about the department's activity. Shadow systems tended to generate different versions of the same reporting information and reconciling the different versions to get a reliable whole of department picture involved substantial overhead effort by the central office.

The Recommended Solution

The consultant's solution to these problems was to propose an integrated application architecture. The lack of consistency of information between the CSD systems and the limited ability to exchange information would be addressed with Enterprise Application Integration (EAI) technology. The EAI technology would reduce the need for point-to-point interconnections between different applications and allow the automatic transfer of information between applications. Problems of reporting would be solved through a Corporate Reporting Portal that would enable a range of comprehensive reports to be available at call from anywhere within the department using information drawn from the CSD systems that would now be integrated via EAI technology. Functional inadequacies in the FS, HRMS and PCMS would be addressed through the development of additional system modules, redevelopment or, as in the case of provider finance management, development of a new system. With these improvements the need for shadow systems should diminish.

Establishing the Business Case

The Divisional Manager of CSD was particularly concerned that the recommendations to the Board highlight the potential for significant cost savings in the department thus demonstrating the cost effectiveness of an investment in corporate systems. Cost savings could be achieved through staff savings as a result of better central systems, which would remove the need for manual reconciliation of information from different systems and the need for shadow systems in districts and service delivery divisions. There would also be savings of staff time through quicker more accurate management reporting that would be available to all areas of the department.

Establishing a convincing business case for the integrated application strategy intensified towards the end of the consultancy with the Board's approval of a new Major Business Systems (MBS) project. This systems project, which was unrelated to the CSD consultancy, provided direct support for two service delivery divisions. These divisions were required to contribute most of the funding but there was a significant shortfall that had to be made up from the CSD corporate IT budget. The key issue was that MBS was likely to be viewed by the Board as more important than the CSD consultancy proposals, which were now referred to as the

Corporate Services Systems Plan (CSSP). Without clear savings for the latter it was unlikely to be adequately funded.

The Divisional Manager CSD decided to approach the Board for combined funding, for a three-year period, for both his contribution to the MBS project and the CSSP initiative. He argued that the costs of the current fragmentation of systems between CSD and districts were much greater than the costs to rectify the problem and the integrated application architecture, when implemented, would give the Board reliable whole of department management information. The replacement of shadow systems by the implementation of better central systems was also an objective of the strategy. The savings would not be solely in terms of staff reductions, of which there would be some over time on an attrition basis, but also in removing the deficiencies in central systems and improving the performance of the IT infrastructure.

The possibility of better management information across the whole department and an improvement in the effectiveness of corporate systems for divisions and districts was well received by the Board. The Board accepted the arguments put forward by the Divisional Manager CSD and approved a multi-million dollar budget for implementation of the ten initiatives in the CSSP. In the Board approval for the CSSP the ITB was given an overall implementation coordination responsibility. Specific project responsibility was divided between ITB, for IT infrastructure projects such as the introduction of EAI technology, and the other branches of CSD for the business systems projects such as the new Provider Financial Management System (PFMS) for districts.

This outcome was seen as an outstanding win for the Divisional Manager CSD, the ITB and the consultancy as a whole. The remaining tasks were to complete the project briefs for the ten initiatives. Unfortunately by this time the consultancy had run over the allotted time period and the consultants had used up their budgets so the project briefs were not fully completed.

Implementation

Buoyed up by the 'win' at the Board meeting the Planning Manager ITB began the process of implementation by establishing a Program Management Office (PMO) within the IS planning unit and took on responsibility for the management of the implementation budget. The approach to implementation was project based and a new project management methodology was introduced because, in the opinion of the ITB Planning Manager, CSD branches lacked project management expertise especially in relation to IT projects. He then decided to allocate funds to the branch managers when they had completed the project brief documentation, which had been left unfinished by the consultants, and he hired business analysts to help them complete this work and obtain agreement to this documentation from all stakeholders.

From the outset these arrangements required continual intervention by the Branch Manager ITB and his Planning Manager to protect what they saw as the integrity of the strategic direction set out by the consultants. The process to develop the project briefs revealed deep disagreements between the Planning Manager ITB and CSD branch managers about the appropriate conceptualization of the recommended initiatives. There was also opposition to the new project management methodology as it was onerous and unfamiliar to most of the branch managers and their system owners. They resented the Planning Manager's control of the budget and insisted on funding being provided as an initial step rather than after project briefs had been prepared.

Replacing shadow systems with better CSD systems was a key argument of the consultants to the Board but as the PFMS project investigated the district level business requirements for provider finance management functionality it became clearer that these were much more complicated than originally understood to be. The complexity arose from the need to apportion provider funding across a complicated business output funding structure for the many programs of the department that had made the management of funding for providers more complex at the district level. For this reason the PFMS

project manager argued that his project couldn't be expected to pick up all functionality currently provided by shadow systems in districts. While this debate was occurring at the central office of the department some districts were unwilling to accept another central system. At a Project Steering Committee meeting for the PFMS a district manager rejected the suggestion that her district would have to adopt central standard processes and that district staff roles would have to change to accommodate them: "we all know about being driven by (or having our local practices driven by) systems and what a problem this is for us". The issue was raised at the highest levels in the department. District managers asked the General Manager of the department why money was being spent on a project for a system that might provide less functionality than they already had with their shadow systems.

As these issues intensified a new problem emerged for the ITB. ITB was responsible for the creation of the integrated application architecture for the CSSP using EAI technology but this technology was also critical for the MBS. This work involved the development of numerous application interfaces to allow the MBS to interface with other service delivery systems in the department. Within the ITB only one person possessed the technical expertise to do this work and this person was subsequently assigned full time to the MBS requirement. The inability of ITB to build the integrated architecture for the CSSP as scheduled had an impact on the PFMS because it needed to use EAI technology to effect integration with the central Finance System as recommended by the consultants. The expectation was that ITB would have sufficient resources to meet the demand for EAI expertise but EAI expertise was also in short supply in the private market for IT contractors who could command higher contract rates than the ITB, as a government entity, could afford to pay.

In relation to the Corporate Reporting Portal progress was stalled by the impasse between the Planning Manager ITB and the Branch Manager PCMB over project management arrangements particularly funding and disagreements about the focus of the project, the nature of the reporting problem

and how best to address it. Subsequently, the Branch Manager PCMB was able to convince the Divisional Manager CSD that the reporting problem for the Board could not be solved in the way proposed in the CSSP and further consultancy should be undertaken. The scheduled delivery of the PFMS was postponed to the following financial year pending the resolution of the EAI requirement and resource problems with the contracted developer. The overall position eighteen months after the end of the consultancy was that the delivery of new corporate systems, as intended by the CSSP, had not occurred and no shadow systems had been closed down.

Explanation of Causal Mechanisms and Outcomes

In this case study supportive and unsupportive mechanisms are proposed as the basis of a causal explanation of the eventual outcomes of the SISP consultancy. This is similar to Pawson and Tilley's (1997, p. 75) distinction between mechanisms that generate a problem in a social setting and those that are introduced to neutralize or block the problem mechanism. The supporting mechanisms are described here as challenging, integrating and controlling while the unsupportive mechanisms are described as fragmenting and resistance. How these mechanisms work is now briefly described and summarized in Table 1 Causal Mechanisms of the Case Study.

Challenge Mechanism

The consultancy can be seen as an intervention into the social setting of the organization that acts as what Moren and Blom (2003, p. 56) call a 'challenge' mechanism. This results from the diagnostic aspect of the SISP process, which proposes a critical assessment of the organization's existing information systems policies, arrangements and quality. This mechanism results in the case for change and therefore challenges existing arrangements.

Integration Mechanism

The implementation of the integrated application architecture required the interconnection of the CSD systems using EAI technology. This had the effect of forcing the CSD branch managers and their system owners to consider the informational

relationships and technical interfaces between their own system and the other systems of CSD. A second change was the modification of systems to better meet the information needs of districts and the Board. This meant the diversity inherent in both the independently developed CSD systems and the locally focused district shadow systems had to be reduced. To achieve these changes a more interdependent and standardized approach to systems development had to be adopted. The idea of integrated systems was also used by the Divisional Manager CSD to persuade the Board that, once implemented, this would provide a solution to the Board's lack of integrated management information. Margetts (1999, p. 45) notes the prominence of the idea of integrated computer systems through networking in the UK and US government sectors.

Approval and Control Mechanisms

The Board was the most organizationally powerful group in the case study and its approval of funding for the CSSP was crucial for the CSSP to have any chance of being implemented. The Board's approval also granted organizational legitimacy to the proposal. The Planning Manager ITB used two mechanisms to manage the implementation of the CSSP. These were the introduction of the new project management methodology and his control of the CSSP budget. This provided a powerful means of controlling not only what would be done, by withholding or granting funds, but also how it would be done.

Resistance Mechanisms

Branch managers of CSD resisted the attempt to control the way projects were funded and managed by the ITB Planning Manager by not complying with the project management methodology and insisting on early allocation of project funds from the CSSP budget. The branch managers and their system owners also resisted the new conception of the organizational role of their systems by arguing that the consultant's understanding of their functions was inadequate. The Branch Manager PCMB was eventually able to convince the Divisional Manager CSD that the reporting problem for the Board could not be solved in the way

proposed in the CSSP. Simultaneously district managers resisted the attempt to close down shadow systems by arguing that the proposed new central systems were unlikely to meet their needs. These actions could be seen as elements of a resistance mechanism that were a direct response to the implementation of the Plan and countered the control mechanism of the ITB Planning Manager. Coombs, Knights and Willmott (1992, p. 69) comment that the significance of new information systems in organizations are "embedded in strategies and mechanisms of control (and counter-control) … of those whose identity has been constituted through the enactment of these strategies and mechanisms."

Fragmentation Mechanism

This mechanism originates in the different organizational functions within the department, which generate unique information needs and drive the development of independent single function information systems. The mechanism was active in some of the central service delivery divisions but strongest in relation to districts. Districts were much more closely involved with operational service delivery than the CSD functions while the latter were more focused on the central management requirements of the department and the Board. In the absence of comprehensive systems that can meet a wide range of information needs different organizational entities try to develop their own systems. Districts and some service delivery divisional users of CSD systems were able to meet their needs through the ready availability of desktop computers to develop 'good enough' local shadow systems. In organizational information and systems management terms this constitutes a fragmentation mechanism. There is support for the concept of a fragmentation mechanism originating in the divergent interests of subunits of an organization. Referring to the work of Goodhue, Kirsch, Quillard and Wybo (1992a) and Goodhue, Kirsch and Wybo (1992b), Premkumar and King (1994, p. 98) suggest that:

Large firms may have coordination difficulties in instituting a comprehensive IS planning system and be splintered by divergent interests … and that "data

integration", a major outcome of strategic IS planning, becomes more difficult when organizations become complex and there is significant heterogeneity among the subunits

Structural Analysis

An analysis of social structure carries the focus beyond the actions of agents and their use of elements from the cultural system to examine the structural relationships within the setting which may play a causal role independently of agents intentions (Sayer (2000, p. 26) as well as being the source of causal mechanisms. Three structural relationships with causal powers in the case study are discussed below but there is also a fourth one originating in the wider government sector known as New Public Management reforms (Lynn 1998), which have increased the focus on resource management and market dependency of government organizations. This latter factor is not discussed here for reason of space.

The first structural factor relates to the opposing tendencies of centralized versus decentralized management in the department. The Board's requirement for overall management information reflected the central management nature of its organizational role and this resulted in a centralizing tendency in terms of organizational information management. This tendency ran counter to the more differentiated information generated away from the centre and most clearly demonstrated in the service delivery points (districts) or organizational periphery of the department. This created the conditions for a structurally generated "core-periphery" (Heeks 2000, p.134) information management problem, which helped to produce the opposing integration and fragmentation mechanisms.

The second structural factor originates in the organisational autonomy of the branches within CSD, which stemmed from the fact that they had equal status within the division. This meant that without the Divisional Manager's support ITB had no organisational authority to compel the other branches to comply with the implementation arrangements for the CSSP. In addition since each branch manager was responsible for one or more of the CSD systems, collectively, they could control the overall agenda for these systems independently of the one set out in the CSSP.

Table 1 Causal Mechanisms of the Case Study

SUPPORTIVE MECHANISMS	UNSUPPORTIVE MECHANISMS
Challenge • Critique of existing system arrangements not meeting district needs and the needs of top management **Integration** • Integrated application architecture required interconnection of previously autonomous systems to exchange information for consistent management information • Modification of CSD systems to better support district information needs • Central management role of Board requiring integrated sources of management information **Approval and Control** • Compliance with Planning Manager to obtain project funding • Compliance with project management methodology • Board approval of the CSSP and provision of budget	**Resistance** • Rejection of problem diagnosis and project conceptualization of solution • Refusal to comply with project management arrangements • District reluctance to accept central systems • Influence of branch managers on Divisional Manager CSD **Fragmentation** • Different organizational functions generate incompatible information needs • Ability to build shadow systems using desktop technology • Limited usefulness of central systems for districts • Autonomous CSD systems

The third structural factor at work in the case study setting originates in the relationship between the Government's policy agenda for the department and the Board. Service delivery performance by the department was tied to government policy commitments hence enabling service delivery was more important to the Board than enhancing corporate services. The role of CSD was to support the internal management and operation of the department and hence was seen to make only an indirect contribution to the department's service delivery priorities and capability. For these reasons justifying investments in corporate services initiatives, particularly IT related projects, at the Board level was more difficult than for service delivery projects. The Divisional Manager CSD said at a planning workshop "it is really hard to get the Board to invest in IT projects". This structural factor constrained the agency of the Divisional Manager CSD in pursuing corporate service initiatives and also explains the priority given to the MBS project over the CSSP initiatives for resources to develop and implement EAI technology. Figure 7 shows the relationship between these structural factors. The arrows are intended to suggest the direction of causal power and the bi-directional arrows that this causal power may be in opposition.

Outcomes

In overall terms the consultancy can be seen as a centrally initiated intervention that confirmed the inadequacy of CSD systems and produced a proposal premised on integrated systems leading to staff reductions and fewer shadow systems. This proposal was a powerful ideational mechanism that supported the central management role of the Board and won its approval. It could not be implemented properly however because underlying agreement to the proposals was not achieved with CSD branch managers, replicating shadow system functionality in central systems was more difficult than anticipated, districts were wary of the losing the usefulness of their shadow systems and the work involved required resources beyond what could be made available in a context of competing demands for corporate IT resources. Thus the mechanism causing shadow systems in the first place remained unchecked by the proposed integrating mechanism so no shadow systems were closed down.

Critical Realism and Alternative Explanatory Approaches

This section responds to the question of why CR might be more useful than alternative explanatory approaches or why only a CR based analysis could account for the causal factors in a SISP episode. Because CR is based on a conception of social reality as an open system it better accounts for the nature of social action and its outcomes. On this basis, because SISP is a social phenomenon, it is more usefully researched from the open systems perspective of CR. Theories which use a closed system ontology of social reality assume regular, or law like, relationships between constructs used to capture the causal
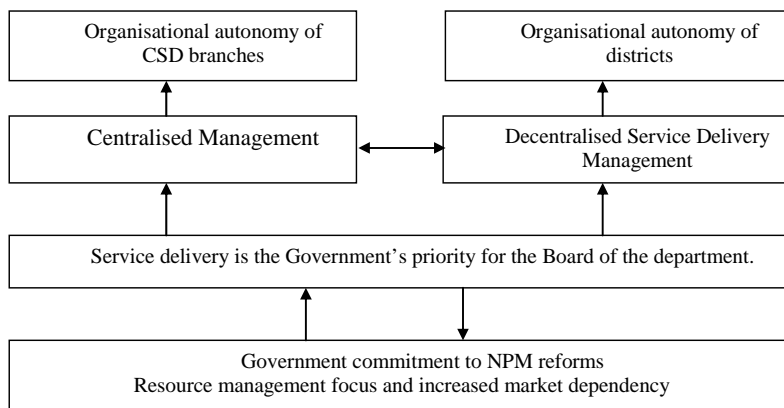
Figure 7 Structural Factors of the Case Study

factors of the setting and on this basis make predictions about the dependent variable. But law like regularity does not generally characterise open systems phenomena and predictions based on dependent - independent variable relationships are problematic (Downward 1999, p. 30), as the example below will seek to show. An associated characteristic of positivist or closed system research approach is its basis in an empiricist perspective (Fleetwood and Ackroyd 2004, p. 27) insofar as the relationships between constructs that are sought are based on the detection of empirical patterns, regularities and associations. But empirically manifest event regularities may or may not be indicative of causal relationships in an open system. Sayer's comment, previously mentioned in part one (Sayer 1992, p. 105) is that that in an open system causal mechanisms may be active independently of observed patterns of events. As Tsoukas (Ackroyd and Fleetwood 2000, p. 35) observes:

An empiricist view is informed by an ontology that collapses the domains of real and actual into the domain of empirical and, consequently, it is unable to define an object of study in terms of its causal capabilities. As Hales (1986: 110) has aptly remarked, an empiricist approach '[is reluctant] to treat managers' observable behaviour as problematic and to ask – or keep asking the question: why these behaviours and activities?''

As an example of this kind of research, which is relevant as an alternative explanation of the outcomes of the case study, are the findings of a survey-based test conducted by Gottschalk (1999) of the hypothesis that a more useful information plan produces greater plan implementation. This hypothesis was drawn from an input-process-output model of SISP published in 1996 by Lederer and Salmela. Gottschalk used ten predictors (content characteristics) about the construct 'information plan' such that "the greater the extent of description of the content characteristic, the greater the extent of plan implementation." (Gottschalk 1999, p. 82) The content predictors are shown in Figure 8.

Gottschalk found that "the full multiple regression equation with all ten independent variables explains 19% of the variation in implementation" (1999, p. 85) hence "81 percent of the variation in the implementation is unexplained by the theory" (Gottschalk 1999, p. 89) and while "there is a significant overall relationship between content characteristics and IT strategy implementation … none of the content characteristics are individually significant implementation predictors" (1999, p. 85). A perplexing result of Gottschalk's findings is that resourcing, management support and solutions to potential resistance during implementation were not found to be significant as an explanation of the variation in implementation. This finding seems untenable given that implementation of computer systems could hardly be expected to succeed without these factors being addressed as in fact was apparent in the case study. An earlier article by Premkumar and King (1994)
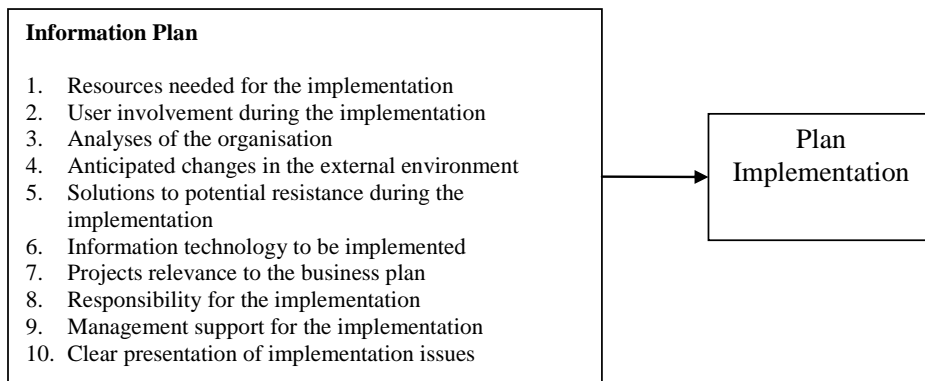
Information Plan

1. Resources needed for the implementation
2. User involvement during the implementation
3. Analyses of the organisation
4. Anticipated changes in the external environment
5. Solutions to potential resistance during the implementation
6. Information technology to be implemented
7. Projects relevance to the business plan
8. Responsibility for the implementation
9. Management support for the implementation
10. Clear presentation of implementation issues

Plan Implementation

Figure 8 Conceptual Research Model (Gottschalk 1999, p. 83)

www.mana

suggests one factor that might explain why the hypothesis could not be confirmed "research in IS planning and models of IS planning have predominantly subscribed to the rational approach to planning" (1994, p. 81) but such approaches do "not consider other organizational models such as political, system resources, and strategic constituencies" (1994, p. 80). Gottschalk (1999, p. 89) suggests that "much more complicated causal relationships might exist" and "the importance of various implementation predictors may vary depending on contingency issues". A CR perspective would agree with this statement and argue that this complexity and unpredictability arises from the nature of the social reality of the setting, including the characteristics suggested by Premkumar and King and which CR better explicates as an open system of interacting causal mechanisms than the closed systems model of SISP implicit within Lederer and Salmela's theory.

CONCLUSION

CR is a metatheory, which can be used to evaluate, from the realist perspective, the underpinning ontology and epistemology of other social theories. This is useful for IS researchers considering the applicability of other theory to understanding IS related phenomena. The argument of CR is that the ontology of both the natural and social reality is an open, stratified system of social objects with causal mechanisms that interact and in which the outcomes of interaction are unpredictable. With this ontology of reality CR shows why causal explanation rather than

prediction is the appropriate methodology for social science. Causality can be better understood as the confluence of multiple sources of causal mechanisms, originating in the agency of people who use ideas and beliefs and other elements of the cultural system to seek to advance their interests. The agency of people takes place in a context of relationally constituted social structures, which constrain and enable their ability to act. Explanation of social processes involves identifying causal mechanisms, how they operate and under what kinds of circumstances they may be activated. (Sayer 2000, p. 14) A realist analysis can help to identify the tendencies of causal entities present within the setting and provide an explanation of why particular outcomes occurred in terms of causal interactions. Critical realism has been advocated by IS researchers such as Mingers (2002), Mutch (2002), Dobson (2001) and Carlsson (2005). It is hoped that this paper is of some use to IS researchers in providing an introductory outline of CR for IS research involving a social dimension.

References

Ackroyd, S. and S.Fleetwood (eds.), *Realist Perspectives on Management and Organisations,* Routledge, London, 2000.

Archer, M.S., *Realist social theory: the morphogenetic approach*, Cambridge: Cambridge University Press, 1995.

Archer, M.S., *Culture and Agency*, Cambridge: Cambridge University Press, 1996.

Archer, A., R. Bhaskar, A. Collier, T. Lawson and A. Norrie (eds.), *Critical realism: Essential Readings*, Routledge, London 1998.

Bhaskar, R., *The Possibility of Naturalism*, London: Routledge, 1998a.

Bhaskar, R., "Part 1 Transcendental realism and science," In *Critical realism: Essential Readings,* Archer, A., R. Bhaskar, A. Collier, T. Lawson and A. Norrie (eds.), Routledge, London, 1998b, pp. 1-119.

Boudreau, M.C. and D.Robey, "Enacting Integrated Information Technology: A Human Agency Perspective," *Organization Science*, 2005, 16:1, pp.3-18.

www.mana

Paul Morton

Carlsson, S. "A Critical Realist Perspective on IS Evaluation Research," In *Proceedings of the European Conference on Information Systems 2005*, 2005. Available at: http://www.ecis2005.de, last accessed 1 September 2006.

Chiapello, E. and N. Fairclough, "Understanding the new management ideology: a transdisciplinary contribution from critical discourse analysis and new sociology of capitalism," *Discourse and Society*, 2002, 13:2, pp. 185-208.

Coombs, R., D. Knight and H.C. Willmott, "Culture, Control and Competition; Towards a Conceptual Framework for the Study of Information Technology in Organizations," *Organization Studies*, 1992, 13:1, pp. 51-72.

Dobson, P.J., "The Philosophy of Critical Realism – An Opportunity for Information Systems Research," *Information Systems Frontiers*, 2001, 3:2, pp. 199-210.

Downward, P., *Pricing theory in post-Keynesian economics: a realist approach*, Edward Elgar Publishing, Cheltenham, UK, 1999.

Downward, P., J.H. Finch and J. Ramsay, "Critical realism, empirical methods and inference: a critical discussion," *Cambridge Journal of Economics*, 2002, 26, pp. 481-500.

Earl, M.J., "Experiences in strategic information systems planning," *MIS Quarterly*, 1993, 17:1, pp. 1-20.

Earl, M.J., "An organizational approach to IS strategy-making," In *Information Management The Organizational Dimension*, Earl, M.J. (ed.), Oxford University Press, 1996, pp. 136-170.

Fleetwood, S., "Causal Laws, Functional Relations and Tendencies," *Review of Political Economy*, 2001, 13:2, pp. 201-220.

Fleetwood, S., "What kind of theory is Marx's theory of value? A critical realist inquiry," In *Critical Realism and Marxism*, Brown, A., S.Fleetwood and J.M. Roberts (eds.), Routledge, London, 2002, p.5.

Fleetwood, S. and S. Ackroyd, (eds.), *Critical Realist Applications in Organisation and Management Studies*, Routledge, London, 2004.

Forester, J., "Questioning and Organizing Attention," *Administration & Society*, 1981, 13:2, pp. 161-205.

Forester, J., *Critical* Theory*, Public Policy, and Planning Practice*, Albany NY: State University of New York Press, 1993.

Goodhue, D.L., L.J. Kirsch, J.A. Qullard and M.D.Wybo, "Strategic Data Planning: Lessons from the Field," *MIS Quarterly*, 1992a, 16:1, pp. 11-34.

Goodhue, D.L., L.J. Kirsch and M.D. Wybo "The Impact of Data Integration on the Costs and Benefits of Information Systems," *MIS Quarterly*, 1992b, 16:3, pp. 293-311.

Gottschalk, P., "Implementation predictors of strategic information systems plans," *Information and Management*, 1999, 36, pp. 77-91

Hackney, R., G.Dhillon and J.Burn, "Challenging Assumptions for SISP: theoretical perspectives," In *Americas Conference on Information Systems 1999*, 1999. Available at: http://aisel.isworld.org, last accessed April 2005, pp 121-123.

Hales, C.P.,"What do managers do? A critical review of the evidence," *Journal of Management Studies*, 1986, 23:1, pp. 88-115.

Harmon, M.H. and R.T. Mayer, *Organization Theory for Public Administration*, Glenview, Illinois: Scott, Foresman and Company, 1986.

Harre, R. and E.H. Madden, "Conceptual and Natural Necessity," In *Critical realism: Essential Readings,* Archer, A., R. Bhaskar, A. Collier, T. Lawson and A. Norrie (eds.), Routledge, London, 1998, pp. 104-119.

Heeks, R., "A Core-Periphery Approach to Centralization/Decentralization Issues in Public Information Systems," In *Handbook of Public Information Systems*, Garson, G.D, (ed.), Marcel Dekker, Inc., New York, 2000, pp. 127-139.

Heeks, R. (ed) *Reinventing Government in the Information Age*, Routledge, London, 2001.

Hirschheim, R. "Information systems epistemology: an historical perspective," In *Research Methods in Information Systems*, Mumford, E., R. Hirschheim, G. Fitzgerald and T. Wood-Harper (eds.), North Holland, Amsterdam, 1985, pp 1335–1352.

Joseph, J., *Hegemony A realist analysis*, London, UK: Routledge, 2002.

King, W.R., "Strategic systems success," *Information Systems Management*, 1997, 14:4, pp. 57-59.

Knights, D., "Refocusing the Case Study, The Politics of Research and Researching Politics in IT Management," *Technology Studies*, 1995, 2:2, pp 230-254.

Lawson, C., (2004), "Technology, Technological Determinism and the Transformational Model of Technical Activity," In *Proceedings of the annual conference of the International Association of Critical Realism*, 2004. Available at http://www.csog.group.cam.ac.uk/iacr/structure.htm, last accessed 7 October 2004.

Lederer, A.L. and H. Salmela, "Toward a theory of strategic information systems planning," *The Journal of Strategic Information Systems*, 1996, 5, pp. 237-253.

Lederer, A.L. and V. Sethi, "Root causes of strategic information systems planning implementation problems," *Journal of Management Information Systems*, 1992, 9:1, pp. 25-45.

Lederer, A.L. and V.Sethi, "Key prescriptions for strategic information systems planning". *Journal of Management Information Systems*, 1996, 13:1, pp. 35-62.

Lewis, P., "Realism, Causality and the Problem of Social Structure," *Journal for the theory of Social Behaviour*, 2000, 30:3, pp. 249-268.

Lynn, L.E. (Jr.), "A Critical Analysis of the New Public Management," *International Public Management Journal*, 1998, 1:1, pp.107-123.

Margetts, H., *Information Technology in Government*, London: Routledge, 1999.

Markus, M.L. and D.Robey, "Information Technology and Organisational Change: Causal Structure in Theory and Research," *Management Science*, 1988, 34:5, pp. 583-598.

Min, S.K., E.H. Suh, and S.Y. Kim, "An integrated approach toward strategic information systems planning," *Journal of Strategic Information Systems*, 1999, 8, pp. 373-394.

Mingers, J. "Real-izing information systems: critical realism as an underpinning philosophy for information systems" in *Proceedings of the Twenty-Third International Conference on Information Systems*, 2002. Available at: http://aisel.isworld.org/search_title.asp, last accessed February 2003, pp. 295-303.

Mingers, J. and L. Willcocks, (eds.), *Social Theory and Philosophy for Information Systems*, John Wiley & Sons, Chichester, UK 2004.

Moren, S. and Blom, B., "Explaining Human Change," *Journal of Critical Realism*, 2:1, pp. 37-60.

Mutch, A., "Actors and Networks or Agents and Structures: Towards a Realist View of Information Systems," *Organization*, 2002, 9:3, pp. 477-496.

Parker, J., L. Mars, P. Ransome and H. Stanworth, *Social Theory A Basic Tool Kit*, Basingstoke UK: Palgrave Macmillan, 2003.

Pawson, R. and N. Tilley, *Realistic Evaluation*, London: Sage, 1997.

Porpora, D.V., "Four Concepts of Social Structure," In *Critical realism: Essential Readings,* Archer, A., R. Bhaskar, A. Collier, T. Lawson and A. Norrie (eds.), Routledge, London, 1998, pp. 339-355.

Porter, M.E. and V.E. Millar, "How information gives you competitive advantage," *Harvard Business Review*, 1985, July-August, pp. 149-160.

Prakash, A.C., "Leveraging the potential of strategic systems," *Information Systems Management*, 1998, 15:1, pp. 58-63.

Premkumar, G. and W.R. King, "Organizational Characteristics and Information Systems Planning: an Empirical Study," *Information Systems Research*, 1994, 5:2, pp. 75-109.

Salmela, H.and T.A.M. Spil, "Dynamic and emergent information systems strategy formulation and implementation," *International Journal of Information Management*, 2002, 22, pp. 441-460.

Sayer, A., *Method in Social Science: A Realist Approach* (2nd edn), London: Routledge, 1992.

Sayer, A., *Realism and Social Science*, London: Sage, 2000.

Smith, M.L., "Overcoming theory-practice inconsistencies: Critical realism and information systems research," *Working Paper*, Department of Information Systems, London School of Economics and Political Science, 2005.

www.mana

Taylor, P. and P. Bain, "Humour and subversion in two call centres," In *Critical Realist Applications in Organisation and Management Studies*, Fleetwood, S. and S. Ackroyd (eds.), Routledge, London, 2004, pp. 275-297.

Tillquist, J., "Institutional Bridging: How Conceptions of IT-enabled Change Shape the Planning Process," *Journal of Management Information Systems*, 2000, 17: 2, pp. 115-152.

Tsang, E.W.K. and K. Kwan, "Replication and theory development in organizational science: a critical realist perspective," *Academy of Management Review*, 1999, 24: 4, pp. 759-780.

Tsoukas, H., "What is management? An outline of a metatheory," In *Realist Perspectives on Management and Organisations*, Ackroyd, S. and S. Fleetwood (eds.), Routledge, London, 2000, pp. 26-44.

Walsham, G., *Interpreting Information Systems in Organizations*, Chichester UK: John Wiley & Sons, 1993.

Watson, T.J., *Management, Organisation and Employment Strategy: New Directions in Theory and Practice*, London: Routledge, 1986.

AUTHOR

Paul Morton, M.Bus.(IT) (RMIT, 1998) is completing a PhD at the Royal Melbourne Institute for Technology (RMIT) University in the School of Business IT. His PhD thesis is an analysis, informed by Critical Realism, of the theory and practice of Strategic Information Systems Planning. His work has appeared in conference proceedings including the European Conference on e-Government 2001, the Pacific Asia Conference on Information Systems (PACIS) Doctoral Consortium 2003 and the International Association of Critical Realism 9th Annual Conference 2005.