

Organisational Learning - A Critical Systems Thinking

Discipline

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This paper deals with the application of critical systems thinking in the domain of organisational learning and knowledge management. Its viewpoint is that deep organisational learning only takes place when the business systems' stakeholders reflect on their actions and thus inquire about their purpose(s) in relation to the business system and the other stakeholders they perceive to exist. This is done by reflecting both on the sources of motivation and/or deception that are contained in their purpose, and also on the sources of collective motivation and/or deception that are contained in the business system's purpose. The development of an organisational information system that captures, manages and institutionalises meaningful information – a knowledge management system - cannot be separated from organisational learning practices, since it should be the result of these very practices. Although Senge's five disciplines provide a useful starting-point in looking at organisational learning, we argue for a critical systems approach, instead of an uncritical Systems Dynamics one that concentrates only on the organisational learning practices.

We proceed to outline a methodology called Business Systems Purpose Analysis (BSPA) that offers a participatory structure for team and organisational learning, upon which the stakeholders can take legitimate action that is based on the force of the better argument. In addition, the organisational learning process in BSPA leads to the development of an intrinsically motivated information organisational system that allows for the institutionalisation of the learning process itself in the form of an organisational knowledge management system. This could be a specific application, or something as wide-ranging as an Enterprise Resource Planning (ERP) implementation. Examples of the use of BSPA in two ERP implementations are presented.

Introduction

The original motivation for the work reported in this paper was a search for a better way to develop information systems for businesses. However, what actually happened was a 'journey' (research) into the world of knowledge produced by researchers, practitioners, and philosophers in the fields of management, organisational behaviour, information systems, systems analysis, cybernetics, soft systems thinking, chaos theory and critical systems thinking. This led us to consider the development of information systems from the viewpoint of organisational learning and knowledge management. Rather than viewing them as three separate activities, we see them as very closely related. In this paper, we first summarise the elements we encountered on our research and then outline the methodology for information systems development which resulted, called Business Systems Purpose Analysis (BSPA).

The Business System's Contemporary Social Environment and The Political Metaphor

A business system is a designed system with a human activity content (Checkland, 1989) that facilitates economic transactions, ideally, in a less costly manner than the market; in other words, in Weberian terms, a bureaucracy (Weber, 1947). Business systems exhibit human attributes such as the need for direction and purposefulness, as well as the need to remain viable (Beer, 1979), namely to preserve their identity. The purposes of these systems are formulated through a process of interaction among different purposeful stakeholders, each having an explicit or implicit stake in the organisation's operations. These stakeholders can reside within the official boundary of the organisation, or beyond it.

These business systems are embedded in an objectified social system, where the economic sphere has colonised the other subsystems of the lifeworld (Habermas 1984a and 1984b). The institutionalisation of the contemporary business system is the result of a power game between stakeholders (Habermas, 1984a) seeking to define and control the system's

instrumental purposes, for their own perceived benefit. Therefore, the configuration of organisational power ultimately defines the organisation's purposefulness and is best described by the political metaphor, which depicts the relationships between the organisational stakeholders as full of power, coercion and false consciousness (Flood, 1990).

In such a political organisation, the definition of the business system's boundary and systemic purposefulness is the result of a process of subjectively conflicting claims made upon the organisation's material and informational assets. Any consideration of organisational learning or knowledge management on an organisation-wide scale must be situated within this context. This requires an analysis of the stakeholders' material and informational interests in the light of their subjectivity. Our view is that information systems not only influence organisational learning but are also part of that learning. Equally, even if not explicitly developed for knowledge management, information systems are part of the process of managing knowledge in an organisation. We share with Ulrich (1983) the view that the learning practices of many contemporary organisations are confined by theoretical reason, namely reason that produces understanding or knowledge of what is or of what happens but not of why it happens. The learning that results from such practices is therefore shallow rather than deep.

A mix of theoretical, practical, and critical elements is therefore needed to meet the variety exhibited by the organisation's purpose itself.

In this paper, the Habermasian project's emancipatory elements (Habermas, 1989) regarding the system/lifeworld distinction and the lack of scientific proof in regard to the predominance of the language's discourse-communicative action over the strategic serve as an ideal that we work towards for the development of a methodological framework. It should however be

noted that these theories have been much criticised in the philosophical and sociological literature, especially for their utopian nature (Mingers and Gill, 1997; Panagiotidis and Edwards, 2000). Nevertheless we believe they represent a valid target at which to aim.

Developing Business Systems

Various methods have been suggested for the analysis necessarily involved in the development of business systems. Based on Habermas's knowledge-constitutive interests (Habermas, 1984a), the analysis paradigms may be segmented into three:

- a) methodologies that concentrate on the technical interest, thus addressing the instrumental elements of purpose –hard systems approaches;
- b) methodologies that concentrate on the practical interest, thus addressing the social elements of purpose –soft systems approaches;
- c) methodologies that concentrate on the emancipatory interest, thus addressing the political elements of purpose –critical systems approaches.

Broadly speaking, hard systems methodologies like Information Engineering are confined to the generation of technical knowledge that usually functions quite well for the development of electronic document and/or workflow systems. With hard systems approaches, an organisational problematic is seen as either means selection or systemic integration between different organisational subsystems and systems in general, on the basis of predetermined ends. Issues such as power and (organisational) purpose are not considered.

Soft systems methodologies move towards the direction of effectiveness in regard of the contemporary organisational learning problematic by recognising the perceptual aspects of the systemic purpose, but fall short of analysing the mechanism that underlines the very process that produces those perceptions in the first place.

The critical systems paradigm goes beyond the soft systems one by seeking the causes that produce perceptions and the process that defines perceptual exchange in the first place. The definition of organisational purpose is perceived to be the result of the resolution of organisational conflict, which is subject to the exercise of power in the form of coercion and false consciousness. This implies that material and informational assets have to be analysed in order to deal effectively with the causes of shared perceptions prior to their exchange.

The distinction between these three categories, as with most categorisations, is in actual fact somewhat blurred.

One such blurring is to link methods from two of the categories. It is now quite common for a soft systems method, especially Checkland's SSM (1989) to be used as a front end to a harder approach. Atkinson (2000) also describes the SISTeM approach, with a first cycle similar to SSM followed by one more closely allied to hard systems development approaches, but still allowing the multiple perspectives that are central to soft approaches. SISTeM can be used as a contingency framework to deploy a wide range of hard and soft systems techniques in a particular system development. SISTeM also has a strong focus on learning throughout, although it appears to be on learning about information systems needs rather than the whole of organisational learning as we define it in this paper.

It is also possible, with effort, to "move" methods from one category to another. Consider for example Peter Senge's "Fifth Discipline", (1990), that did much to popularise the notion of the "learning organisation", and thus is worthy of specific discussion here. System Dynamics, the fifth discipline of the title, is characterised as a hard systems approach by Flood and Jackson (1991) or rather as a methodology that is based on "simple" and "unitary"

assumptions. However, the links to the other four disciplines, namely personal mastery, mental models, shared vision, and team learning, amount to the “softening” of the “hard” aspects of the methodology so that it may be classified as a soft systems approach. Within the Fifth Discipline framework the social world is not made up of “hard”, objectively identifiable, business systems and business problematic areas, but is made up of systems and problematic areas that exist in the mind of the observer.

Panagiotidis and Edwards (2001) have argued that no methodological paradigm deals with the organisational purposefulness in its totality; none of the methodological paradigms addresses all three knowledge-constitutive interests simultaneously. This implies that all can be characterised as reductionist (to some extent) in terms of the organisational purpose problematic and the organisational learning problematic.

Therefore in this paper we propose the use of a critical systems methodology that we have developed, called “Business Systems Purpose Analysis” (BSPA) (Panagiotidis, 1998). BSPA supports a critical stance in regard to the organisational/individual ideological process mechanism and the organisational/individual purposefulness in the light of the ethical justification that boundary judgements raise by definition, and in regard to the creation of organisational learning mechanisms that will lead to the continuing production of deep organisational knowledge.

The Role of Ideology and the Development of Deep Knowledge

In this paper we define ideology, after Lodge and Vogel (1987), as a process connecting values (social ideals that we regard as driven by knowledge constitutive interests) and relevant context (the collection of events, phenomena, institution and forces that affect the

community from within and without). We also concur that the outcome of the ideological process might have two facets, following Eagleton (1994). A positive one expressed as class-consciousness and/or (the distinction is fuzzy) a negative political coercive one that corresponds to the Marxist definition of ideology (taken from Habermas, 1984a and 1984b). The positive side of the ideology can provide an organisation with a shared vision, systemic cohesiveness, coordination and synergy, facilitate team learning and reduce transaction costs. The negative side can produce complex-coercive relationships (Flood and Jackson, 1991) between the organisational stakeholders, namely relationships that are defined by power and coercion, and confine the organisational learning practices to the production of false consciousness in forms such as the production of half-truths, propaganda, unethical advertising, censorship, misinformation from the media in order to preserve the existing organisational power structure.

In terms of the political metaphor, where ideology assumes its negative aspect, we argue that the very relationship between organisational power and the resulting organisational ideology determines and confines the stakeholders' personal mastery, mental models, shared visions and team-learning and subsequently the type and the production of organisational knowledge itself. This implies that the systems paradigm chosen to facilitate organisational learning and to unify all the above disciplines in the political organisation should deal with the relationship between power and organisational ideology at the level of the organisation's purpose in order for real organisational learning to take place.

Since power originates from material and informational possessions, and since one of the ideological process's purposes is to preserve those material and informational possessions, then it can be argued that in this way ideology is the reflection of the situational power

structures and vice versa. Habermas (1989) defines three types of knowledge attached to human interests: technical knowledge, communicative knowledge and self-knowledge correspond to humans' technical, practical and emancipatory interests. Further, Habermas defines the nature of human interests as being transcendental, or at least relative-universal, being the result of biological evolution. The detachment of knowledge from interest, according to Habermas, is made possible only in the case of self-reflection or rather self-knowledge; the level of deep knowledge to which we refer in this paper.

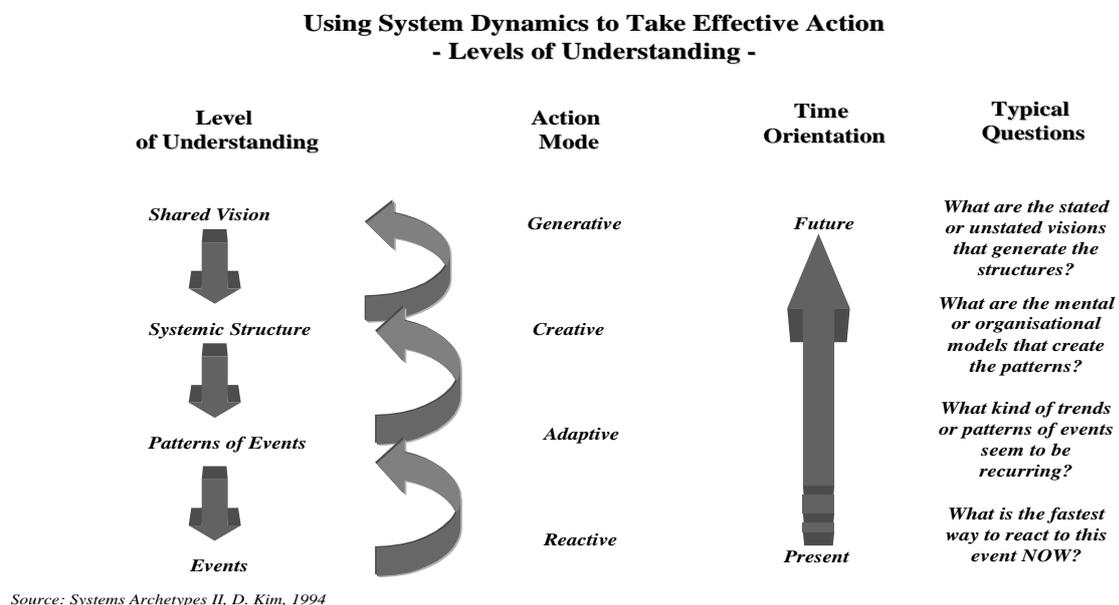


Figure 1 Using Systems Dynamics to Take Effective Action – Levels of Understanding-

Returning to the systems dynamics perspective, Kim (1994) argues that there are multiple levels from which we can view and understand the world in order to take effective action (and, we would add, to learn). He argues, using the systems dynamics concept of system archetypes, that from a systemic perspective there are four distinct levels, namely the events, the patterns of events, the systemic structure, and the shared vision, as shown in Figure 1.

According to Kim, Events are the things we encounter on a day-to-day basis; it rains, we see a movie, we produce a report, etc. Patterns of Events are the accumulated memories of events that are strung together by the ideological process, as we will see later. Systemic Structure can be viewed as an event generator, responsible for the production of the Events. Similarly Kim views Shared Vision as a Systemic Structure generator because it is the guiding force behind the creation of all kinds of structures, an argument that we shall dispute later.

At the Shared Vision Level, according to Kim, one makes a conscious effort to become generative by asking what the process is that produces the systemic structures themselves. In other words, to dissolve one's perceived problem. One becomes aware that one has to change the nature of the entity that produces the problem or the entity's environment in order to remove the problem altogether.

In action research terms (Maruyama, 1996), the systems dynamics practitioner tries to become aware of the dissolving problematic (and in the best case succeeds), but he/she cannot understand the process that produces the shared vision he/she holds at a particular point in time. We argue that, at this level, one still feels the effects (or better the symptoms) of a hidden mechanism that one believes exists but cannot fully comprehend. This happens because system dynamics and soft systems methodologies in general do not include in their paradigm the ultimate level of understanding. This level is that of critical hermeneutics (Flood, 1989) where one synthesizes explanations and interpretations about shared visions in order to understand why one adheres to a perceived shared vision, for what reasons a shared vision might have been erroneous, and how any such errors or false consciousness might be dealt with.

The critical hermeneutics level is the level of the interpretation of meaning or knowledge about knowledge. At this level, one engages in communicative action; one understands one's partial view of the world and one's limited ability to explain and interpret the mechanism that produces shared visions and makes them shared realities. Therefore one endeavours consciously to bring into being a situation where understanding can be exchanged in a sincere and coercion free manner with other stakeholders who might hold different views in an everlasting search for the truth. In other words one endeavours to answer questions that produce knowledge regarding one's sources of motivation in the light of one's purpose(s) and in the light of the organisational purpose(s) that one perceives one has a stake in.

At the critical hermeneutics level the stakeholder engages in communicative action to create the organisation's future; Interactive Action, in Ackoff's (1981) terms. Only at the critical hermeneutics level of understanding can one comprehend the ideological process, the mechanism that produces shared visions. The ideological process takes as its inputs the stakeholders material, informational and emancipatory interests and brings into life shared visions that become shared realities, and the subsequent systemic structures. The linking of the ideological inputs with the ideological outputs, in the light of the stakeholders' and the organisational purposefulness produces (in critical hermeneutics terms) knowledge of why a shared organisational vision is dominant; or why it might be challenged consistently; or why it exists in the first place; or why it exists alongside other organisational visions; or why a particular stakeholder identifies erroneously or not with a particular vision and creates particular systemic structures.

Soft systems methodologies are confined in the appreciation of the shared visions and the underlining of the corresponding mental models and systemic structures with no direct links

between the organisational learning produced, at this level, and the organisational ability to manage these knowledge processes for further learning.

Senge's first four disciplines are human knowledge-constitutive interest driven, and subsequently ideologically conditioned. Deep organisational knowledge is produced when we link the ideological inputs and outputs in order to make transparent, and thus to understand the workings of the ideological mechanism that conditions the organisational purposeful actions. A business stakeholder's ability to perceive events, patterns, and systems and be aware of the relevant mental models depends on his/her material and informational interests and is conditioned by his/her individual ideology and the business system's ideology.

From the above discussion we conclude that the ideological process's material and informational inputs are directly related to human knowledge constitutive interests and thus to Senge's first four disciplines. This implies that any reference to organisational learning practices has to address the material and informational origins of all these disciplines in a particular business environment in order to produce deep knowledge. Knowledge is termed here as deep to the extent that it makes the business system's stakeholders reflect and thus inquire about their purpose in relation to the business system and the other (perceived) stakeholders, by reflecting both on the sources of motivation and/or deception that are contained in their purpose and also on the sources of collective motivation and/or deception that are contained in the business purpose itself.

At this level the production of deep knowledge in the form of organisational learning as well as its management in the form of an intrinsically motivated information system becomes

possible with the use of a novel critical systems methodology, namely the “Business Systems Purpose, Analysis” (BSPA) methodology.

The BSPA Methodology

In common with most system development methodologies, BSPA begins by analysing the business system that an information system is intended to support. It does this in two complementary phases, the Outside View and the Inside View; the business system is analysed from the outside as a relatively objectified system, and from the inside as a human activity system (HAS). From the BSPA “Outside View”, we can only draw superficial conclusions about the dynamics of the system. To go further, we have to “enter” the system and examine its HAS content. We only use the outside view in order to enter the HAS in a structured way. Space does not permit a more detailed description of BSPA here; further details may be found in Panagiotidis (1998) and Panagiotidis and Edwards (2001).

BSPA on problematic and solution and the BSPA Outside View

In this section we will explain the BSPA concept of an organisation’s Steady States Range (SSR), and connect the SSR concept with a classification of generic problematic areas in business systems and the role of the analyst called to undertake an analysis of perceived problematic areas.

In the SSR, Lewin’s field concept (1952) is modified to represent the life space of the individual managers and the life space of the management group as a whole. The group’s life space is treated as the aggregate life space of the individuals that make it up. This concept we will call the Specific SSR implying the management group’s aggregate life space, where the

perception of problematic areas and potential solutions (as well as learning) becomes possible. The definition of the management group's life space leads us to the problem of defining the boundaries of the group's social field in terms of the syntactic, semantic, and pragmatic dimensions of its decision-making process, as well as in terms of the interdependency between these dimensions. We argue that the boundary of the Specific SSR is identified with the group's ideological limits, while existence, interdependency, and contemporaneity (Lewin, 1952) are defined as the management group's decision process dimensions; the semantic and pragmatic content of which exist within the management group's aggregate ideological limits.

Therefore individual intentions or motivations can be represented as vectors of forces; the opposing direction of which represents conflict as part of a dynamic process that produces a quasi-stationary equilibrium between opposing forces.

In the Specific SSR the question "what business are we in?" represents the current organisational strategic domain labelled as the Current-State Position (CSP). The question "what business do we want to be in?" represents the desirable organisational strategic domain labelled as the Desirable-State Position (DSP), while the middle point, labelled as the Intermediate-State Position (ISP) is defined as a change in strategic positioning (type of competitive advantage) implying no change in the current strategic domain ("what business are we currently in). The above range is divided into a skills part, a structure part, a systems part, a purpose part, and a values part.

The range of the Specific SSR spreads from the ideological plus point, a stakeholder's ideal strategic domain defined in the specific SSR as the DSP, to the ideological minus, the current strategic domain defined in the specific SSR as CSP. The correspondence of DSP and CSP

with the SSR's plus and minus signs is not made arbitrarily. The correspondence is used to express graphically the organisational closure of the business system in focus (Maturana, 1991a taken from Mingers, 1995) that allows for structural change which is conditioned and limited by organisational ideology (organisational spontaneous activity). The plus sign/DSP, represents the limit of structural change that does not threaten the organisation or in other words the dominant ideology. We have to make it clear that when we talk about the business organisation that is defined by organisational ideology we mean the relationships between the organisational material and informational interests that define and specify a system as a composite unity and determine its properties as such a unity. This means that different strategic domains can be chosen as long as they do not seek to destroy the existing relationship(s) between the dominant stakeholder's organisational material and informational interests. The minus sign/CSP represents the present consolidated structure being always at a disadvantage because it is always embedded in a dynamic process or better in a state of quasi-stationary equilibrium, as Lewin (1952) argues. The disadvantage is that every consolidated structure runs the risk (by being in a dynamic environment) of becoming pathologically autopoietic.

The management team's SSR mapping starts with inquiry into the views of the Chief Executive Officer (CEO). In cybernetic terms the CEO embodies, or at least should embody, the system's identity by providing the system with closure. Therefore, the mapping of the rest of the management team, meaning the first line managers, is performed against the CEO's SSR, on a one-to-one basis.

A strong organisational ideology (high MCI) will employ a short SSR because strong ideologies tend to minimise the chances of critique and rely mostly on symbolic

communication for their reproduction. At one extreme, if total and absolute agreement exists between all the stakeholders regarding all the aspects of the system, then the SSR will diminish to a single point. This leads to the loss of equifinality and thus transforms the organisation into a closed system, since the system's purposeful behaviour would be predetermined. Alternatively, when there is a clash of two stakeholders with opposing ideologies, their (conscious or unconscious) strategy is to destabilise the opponent by increasing his/her SSR, thus increasing the chances of critique, and the possibility of rejecting the ideology itself. In the case where an analyst is called to undertake a project in an organisation that is in such a state of ideological cleavage, the analyst would be asked to find a solution or to resolve the conflict within a particular SSR. This particular SSR has to be shortened in order for the organisation to become more stable in its operations, or in other words for its steady state to become more stable. The stakeholders in this case will engage in politics employing their power bases to shorten the organisation's SSR by trying to increase each other's individual SSR thus increasing its instability.

Only self-reflection undertaken by the stakeholders, regarding their own ideological limits, can bring real change. This implies a critical disposition with the use of the psychoanalytic paradigm (Freud, 1985), as well as noise-free communicative action. The role of the analyst is to facilitate the stakeholders' process of acquiring self-knowledge, as a psychotherapist would do, in regard to their ideologies' material inputs or material and informational interests, thus enhancing the chances of achieving a coercion-free consensus. In BSPA we have classified the organisational stakeholders' motivations leading to the perception of a problematic area into three generic classes, defined as "losing money", "conflict", and "self-knowledge". These three classes correspond to Habermas's three knowledge constitutive interests, and represent

general cases of business problematic areas. For each generic problematic area there is also a generic solution type corresponding to those of Ackoff (1981):

- dissolve (change the nature of the entity that produces the problem or the entity's environment in order to remove the problem);
- resolve (select the best means 'possible' to produce a satisfying result); and
- solve (select the means that is believed to yield the best possible outcome, that optimises).

These are displayed in Table 1.

<i>Generic problematic areas</i>	<i>Solution type</i>	<i>Collective mode of solution</i>	<i>Epistemology</i>	<i>Analysis paradigm's domain</i>	<i>Types of organisational knowledge produced</i>
1. Acquiring Self-Knowledge	Dissolving	Dialogue that leads to a Coercion free Consensus	Critical Hermeneutics	Critical Systems Thinking	Self-knowledge about ideological inputs, outputs, and limits
2. Stakeholders' Conflict	Resolving	Advocacy based discussion that leads to Compromise and/or Coercion	Naturalist Hermeneutics	Soft Systems Thinking	Appreciation of different mental models and the underlying systems
3. Losing Money (as a problem and not as a symptom)	Solving	Symbolic Oriented Communication	Positivism Functionalism	Hard Systems Thinking	Technical knowledge for the reaffirmation of the current ideology

Table 1: Generic problematic areas and solution types

Based on the management group's views, as expressed in their SSRs, BSPA's "Outside View" goes through a series of stages in an attempt to detect the presence of ideological conflict. Space does not permit a full description of the stages, but one element is the use of an ideological cohesion score for the management team as a whole, the Management Cohesion Index (MCI). This necessarily arbitrary method might be regarded as inappropriate for mapping the phenomenon of ideological conflict due to its low variety. In a sense, this is true. However, as an analogy, the mapping of the brain on the electroencephalogram's low variety homomorphic model is able to detect brain disorders that it cannot explain. Our

purpose at this point is detection of incipient instability by tracking changes in the MCI over time. Although soft systems approaches and critical systems approaches, such as TSI (Flood and Jackson, 1991) or CSH (Ulrich, 1983), do not employ such scoring systems, they have exactly the same limitation as to their material and informational sources. Even if we detect ideological conflict within the management group or the organisation as a whole, at this point this only indicates “what is going on” or “what is about to emerge”, but not the question of “why”, even if we are critically disposed in our inquiry. This can be made apparent only if we search for the material and informational inputs of the ideological conflict identified in the first place.

The BSPA Inside View

The inside view is an iterative process, unlike the outside view, which is intended to be done in a single pass, although it may be necessary to backtrack at times. As with the outside view, there is a series of steps, each producing graphical output. The inside view works its way down the business system in sets of four levels, these being the organisational levels depicted on the official organisation chart. Each stakeholder identified in the official organisational chart has to define the perceived level immediately above and the two perceived levels immediately below, in terms of functional activities/tasks and by identifying the persons responsible for those activities/tasks. The one exception to this is the CEO - “System Five” in Beer’s terms (1979) - for whom there is no higher level. If the stakeholder’s perception of the actual hierarchical organisational levels is different from the official organisational chart, then their view is recorded. Later, the causes of such a difference will be investigated in terms of organisational power and politics at the level of conscious motivation, and at the level of the stakeholder’s unconscious motives. Ideally the perceived organisational chart should be identical with the official one, because that would imply that either the system has clearly

defined official areas of responsibility or that there is a low degree of politics in the organisation (or indeed both).

In further steps of the analysis the stakeholders are asked to describe the business system in focus in terms of activities, inputs and outputs on the basis of a modified version of Porter's value chain (Figure 2). The organisation's management hierarchy runs vertically from top to bottom. Its primary activities are shown horizontally from left to right, and the support activities are shown as segments, one behind the other. The stakeholders are asked to map the perceived organisational chart onto this modified value-chain, thus defining the areas of control for the one perceived hierarchical level above and the two perceived hierarchical levels below themselves. Finally, the stakeholders are asked to identify the informal organisation and its communication channels. In the case where perceptions of control of parts of the value chain overlap, then the material and informational inputs of a political area of actual or potential conflict have been identified. Figure 2 shows such a control overlap, shown by the shaded area, over second line management in inbound logistics, where no fewer than three claims appear to be in force.

The next step is to ask the stakeholders to decompose the major perceived value chain activities into more detailed tasks, and to add the perceived communication lines connecting them with other tasks and with activities/tasks of the outside stakeholders. Further they are asked to distinguish the communication links on the basis of the content they are perceived to convey, namely the object that they perceive as being communicated: material, informational or report objects. Finally, the stakeholders are asked to rank these activities/tasks and communication links in order of importance to them.

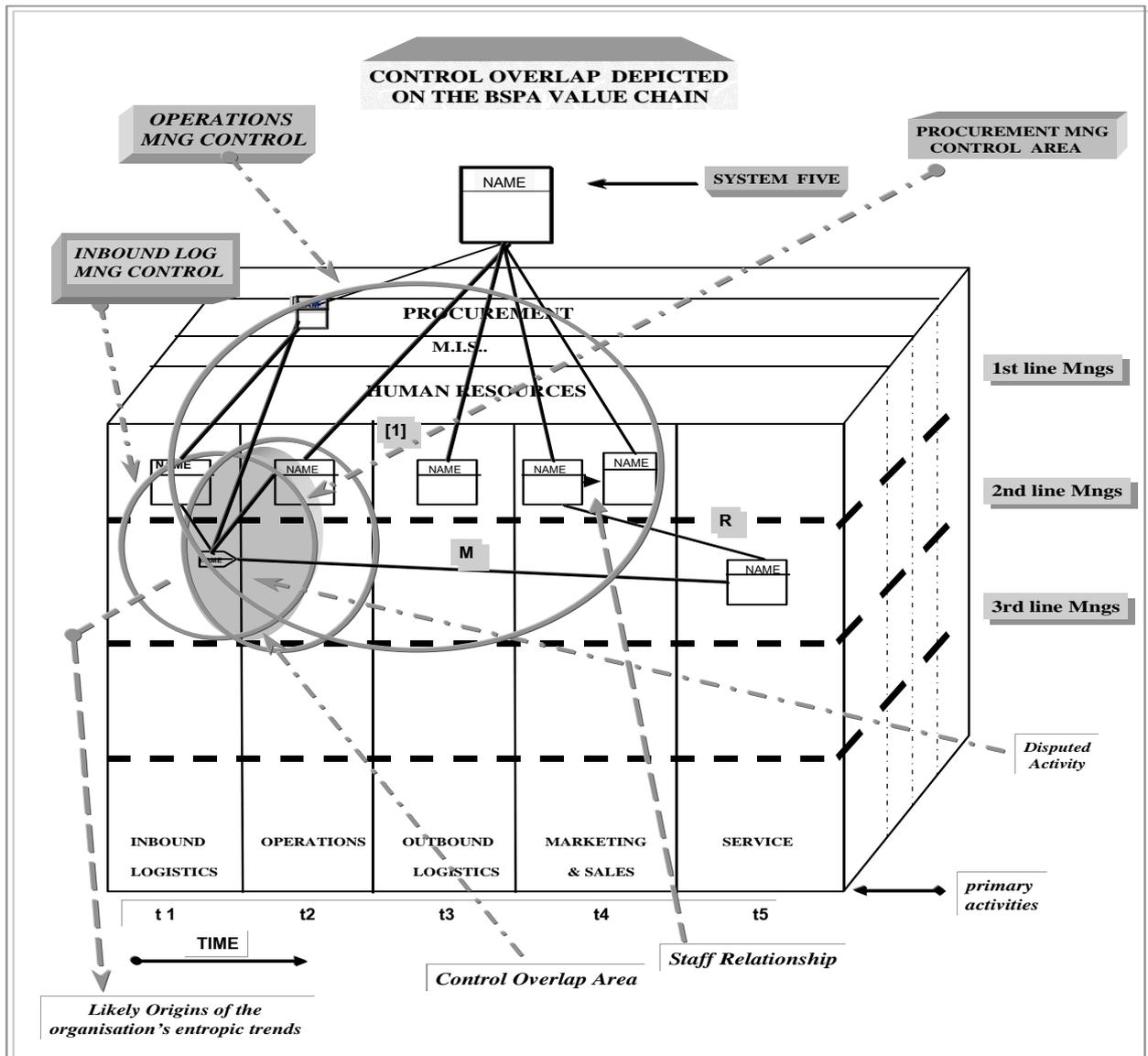


Figure 2: Conflict represented on a modified value chain diagram

By asking the stakeholders about relative importance we lead them implicitly to define, in their opinion, the type of power possessed by those stakeholders who in their opinion control these activities/tasks or communication links. In addition, the stakeholders are asked to elaborate further on the other stakeholders' power bases by distinguishing the type of power other stakeholders are perceived to possess in terms of being communication nodes, reward nodes or reward filters. In the above analysis a special power base is also identified in the

form of the possession of a time asset. The fact that someone controls the timing of an input essential for the workflow of the value chain amounts to a very powerful asset. The influence of outside stakeholders in the organisational game of power and politics is identified explicitly through the identification of communication links (material, informational, report); through the analysis of the informal organisation; and through the identification of a stakeholder's perceived type of power base.

The value chain's systemic framework enables us to assess the systemic implications of the organisational conflict itself as a source of organisational entropy that threatens systemic integration. The control overlap areas are regarded as the areas where organisational entropic trends are developing. Again, BSPA includes a measure, the Overall Organisational Entropic Number (OOEN), for the overall organisational entropy due to conflict.

In summary, BSPA's analytical framework is separated into two major parts that correspond to the business system's special nature. The outside functionalist view treats business systems as designed systems pursuing instrumental purposes that demand a particular type of social integration by the instrumental design's HAS content. This should, in a coercion free manner, in the inside view, define the instrumental purposes and the type and content of its systemic integration in the first place.

The development of an intrinsically motivated information system

The relationship between the inside and the outside views is expressed as a relationship between the SSR and the OOEN, and can be characterised as a double loop learning relationship (Argyris, 1990) for the business system's stakeholders and for the solution's biases. This particular relationship is based on a simple fuzzy rule that is the expression of the methodology's initial bias, namely that when ideological conflict exists within the

management group, it originates from the control overlap areas in the organisational value chain.

The measurement concepts (MCI, OOEN and others) provide feedback for the institutionalisation of self-knowledge into the double-loop format. They also protect the methodology itself from positivistic applications since the methodology's bias itself becomes the subject of evaluation by the stakeholders.

The SSR, the OOEN, and the relationship between them are captured, managed and institutionalised in an information system. This could, for example, take the form of a specific application or part of an ERP system such as SAP or JD Edwards. In the remainder of this section, we concentrate on ERP systems as our examples. The fact that an ERP is concerned with the SSR elements in terms of the organisation's purposefulness and power structure makes it subject to the SSR probing. Equally, the semantics and the pragmatics of the individual/organisational ideology that an ERP can influence and be influenced by, makes it subject to the OOEN probing of BSPA's inside view in terms of the ERP implementation's change management risks.

Example: The use of BSPA in ERP implementation

According to SAP's ASAP implementation methodology, the management of change is defined as "the ability to uncover the human resource and organisational risks that may threaten an implementation as well as the ability to develop plans to mitigate those risks". The fact that the ASAP methodology recognises the organisational impact of an ERP implementation makes it a soft systems methodology. It recognises such factors as culture, expectations and support, but it does not deal with organizational politics and power. ASAP's process-oriented implementation (Keller and Teufel, 1998) is based on a software oriented

reengineering that overlooks the risks and dangers which arise when old organizational and functional-orientated power structures are challenged by the process oriented view that SAP and most contemporary ERPs avowedly champion. It is interesting to note that Keller and Teufel cite the increase in complexity brought about by the implementation of integrated business processes as one of the risks in business process redesign. They also refer to the importance of the integrated process criteria that correspond only to the syntactic and the semantic components of the integrated flow semiotics (comprehensibility, correctness, user friendliness, reliability, documentation and maintainability), but not to the pragmatic component. In a contemporary business system described in terms of the political metaphor, a process-oriented ERP implementation can serve either to emancipate or further subject its HAS content. Therefore, an ERP implementation needs to be subject to critical systems thinking in order to secure the development of what Kling and Star (1998) have termed a human-centred organisational information system.

BSPA's focus on complex-coercive relationships can be used in order to discover and define not only the semiotics component of an integrated organisational flow but also the integrated organisational processes during the ERP implementation.

BSPA has now been used in two major ERP implementations, one using the JD Edwards package and one using SAP. Company confidentiality restricts our discussion here to generalities rather than specific details. Although ASAP is the official development methodology for use with SAP, it was actually used in both examples. ASAP consists of five main phases:

- Project Preparation
- Business Blueprint

- Realization
- Final Preparation
- Go Live and Support

These are followed by a sixth phase of Continuous Change/Improvement.

BSPA was used in both case examples in the Project Preparation and Business Blueprint phases, and in the Continuous Change/Improvement phase after going live. The usage of BSPA differed somewhat between the two examples. In the first implementation (JD Edwards), BSPA was used by the project leader explicitly while in the second case (SAP) it was used implicitly, in what the soft systems methodology literature would term a mode 2 manner (Checkland, 1989) as part of an ERP Risk Management Consultancy Service.

In the Project Preparation phase BSPA was used to define the project goals and objectives; clarify the scope of the implementation; define the implementation strategy; establish the project organisation and assign resources. A crucial element in clarifying the scope of the ERP implementation is the drafting of the “project charter”. The project charter is a collection of documents that together establish the foundation of an ERP implementation, relevant dimensions and completion criteria.

As discussed earlier, these activities involve an examination of the organisational strategy. The main device within ASAP for this is the set of generic questions which make up what is known as ASAP’s Q&A database. This may be thought of as ASAP’s equivalent of a knowledge management system. These generic questions are associated with “Business Strategy”, which includes general enterprise strategy, enterprise positioning, markets, competitive situation and enterprise organisation (concerned mostly with organisational chart issues and centralisation-decentralisation issues).

In the cases considered here, these were supplemented with the SSR analysis. Generic Q&A database questions like “Describe your company’s mission statement and business philosophy”; “Which management strategy are you following to achieve your strategic

goal?"; "Describe at a high level in which business sectors you are operating?"; and "Describe the main steps (process chains, high level description) of how you perform your business.", were answered on the basis of the rigorous and comprehensive SSR concepts. The SSR was used in order to track, measure, and report on the management team's organisational systemic/functional integration in terms of the organisational ideological cohesion. This defined the scope of the ERP implementation as well as the project goals and objectives (articulated in the project charter) in accordance with the principles and the methodology of the BSPA outside view.

In the Business Blueprint phase of the two projects, BSPA was used in the organisational change management work to address the organisational and human resources factors that impact the ERP implementation and vice versa. In this phase BSPA was used in the creation of the "Business Impact Map" that is used by the implementation team to prioritise components of the change plan by gauging the magnitude and timing of the anticipated changes based on the stakeholders' "Perceived Organisational [ERP] Impacts". The key considerations of the business impact map, according to the ASAP methodology are: "divisions or business units impacted by the change project; the timing of the impact; the magnitude of the impact on given divisions or business units or the organisation as a whole; and the management's perceptions of the impact on the division or the divisions." In this phase BSPA was used to identify and gauge the entropic trends that originate from the stakeholders' perceived control overlap areas of the business processes, as described earlier.

However, as well as identifying the control overlap areas, the management team's ideological differences on the definitions of the integrated processes that were to be implemented on the ERP were also traced. This was again done in accordance with the principles and methodology of the BSPA inside view. The formal organisation chart was mapped on the integrated processes along with the corresponding overlapping material, informational, and emancipatory interests and the conflicting stakeholders' power bases (material, informational, timing, etc). Based on the control overlap areas it was possible to locate on the organisational value chain the integrated processes' complex-coercive relations. Thus the project leader was able to track, measure and report on the organisational entropic trends in terms of the stakeholders' conflict for the control and/or possession of the organisation's material and informational interests that defined the ERP implementation's scope and project goals in the first place.

In addition, the stakeholders' conflicting motivational forces that could threaten the ERP's successful implementation were identified and gauged in accordance with the BSPA inside view. This approach fulfilled ASAP's need for the creation of a business impact map as part of the ERP implementation change management process. ASAP's generic guidelines for the development of a mechanism that will "gauge the perceived impacts of the SAP system [or indeed ERP systems in general] implementation across the organisation" that will enable the implementation team to "plan a risk assessment approach" were fulfilled by the use of the OOEN concept. In addition, BSPA was used to achieve the ASAP change management objective to "most effectively leverage information across the enterprise's value chain to ensure return of information". This became possible because the use of BSPA addressed the pragmatic dimension of information, not only the syntactic and the semantic ones, within the web of the stakeholders' complex-coercive relationships that characterise the contemporary organisation's operations. ASAP itself only includes very generic guidelines for these tasks, with no specific "how to do it" detail.

Finally, in the Continuous Improvement phase BSPA was used to further refine the business processes and to establish the mechanisms for the development of an intrinsically motivated information system. The implementation of the BSPA double-loop learning concept, based on the BSPA fuzzy rule, was used to continuously refine the ERP business processes by tracking and comparing the organisational ideological cohesion with the organisational entropic trends in order to provide the stakeholders with deep knowledge and the ability to transform the ERP into a genuinely intrinsically motivated information system.

In general, the power of BSPA in this phase stems from the production and potential comparison of "as is", "to be" and "should be" views. Comparison of the pre-live "should be" (in the stakeholders' opinion) with the live "to be" when it is becoming the new "as is" after Go Live shows what is happening to the organisational entropic trends. Do they still persist? Have they been addressed? Have the stakeholders now changed their perception of the idealised design? If the latter, is this because it now fulfils their knowledge-constitutive interests, or has false consciousness set in?

In the other three ASAP phases, namely Realization, Final Preparation and Go Live, the use of BSPA was supportive in the sense that the BSPA input in the other phases helped ensure the success of these three phases.

The use of BSPA as part of ASAP has therefore proved to be successful, whether BSPA was used as an ERP project management or a risk management tool. In both cases BSPA was able to link management ideological differences to actual tangible control overlap areas on the organisational value-chain by addressing ERP related complex-coercive relationships and the corresponding organisational information semiotics of the ERP integrated processes.

We conjecture that BSPA could play a similar role in any evolutionary systems development methodology. The use of BSPA on such development methodologies removes from these methodologies the utopian elements (Grint, taken from Burke and Peppard, 1995) of the software-oriented process-based re-engineering approaches that base the integration of organisational processes on the rational assumptions of the software's blueprints and their self-evident legitimacy.

With the assumption that the ASAP methodology is supplemented with the BSPA methodology and that ASAP's Q&A database would be amended to encapsulate the information produced by BSPA, then we can claim that a direct link could be established between the organisational learning processes, one form of knowledge management system, and the ERP that is called upon to play the role of intrinsically motivated information system. An ERP implementation based on BSPA, in the context of the knowledge-based society and the needs of knowledge management, can lead to the integration of business processes and make transparent power-oriented and fragmented organisational structures, thus emancipating the HAS content. This stands in contrast to a software-oriented implementation that is usually based on a hard-systems reengineering paradigm, and/or downsizing to serve the needs of the existing organisational power structure.

Conclusion

BSPA aims to enlighten humans' knowledge in regard to the influences they are subjected to by power in reference to the contemporary business system, which is the dominant contemporary institution in the Western world.

BSPA deals in a critical systems manner with complex-coercive organisational relationships; relationships that the soft systems methodologies including the Fifth Discipline methodology cannot come to terms with. BSPA achieves this by combining, at the meta-theoretical and meta-methodological levels, the paradigms of strategic thinking, organisational theory, economics, sociology, psychology, general systems theory, information theory, cybernetics, systems analysis, and the best aspects of soft system thinking and, critical system thinking, into one complementarist epistemological framework.

We have demonstrated the value of linking BSPA to an ERP development methodology such as ASAP, in providing tools for use in the "organisational" phases that are more rigorous than ASAP's generic guidelines. We conjecture that BSPA could be equally useful in any evolutionary systems development methodology. Evolutionary systems development is especially relevant to the general role of information systems in knowledge management (as opposed to specific "knowledge management systems"). Evolutionary systems development under the organisational learning perspective links organisational learning (the process –e.g. prototyping) to the learning organisation (structure –ERP based). If the evolutionary systems development methodology is combined with the search for deep knowledge then organisational learning becomes an ever-lasting critical systems thinking discipline.

In the case of developing a more specific application than an ERP system, we believe that BSPA could be similarly useful. The BSPA methodology is designed on the basis of inter-

and intra- theoretical and methodological partitioning and recombination, and so, for example, could replace the top part of Information Engineering's pyramid, which is called Information Strategy Planning (Martin, 1989). This part is concerned with the analysis of the organisational goals and problems, critical success factors, technology impact and strategic systems vision. The other three levels of the IE pyramid, namely Business Area Analysis, Systems Design and Construction, are retained. The similarity between the potential use of BSPA here, and the examples described above with ASAP, should be apparent.

Overall, our conclusion is that the contemporary objectified social environment within which a business system is embedded within demands the use of a critical systems methodology instead of a hard or soft system one. This will facilitate organisational learning and knowledge management by producing deep knowledge, which should be institutionalised in the structure of the organisational information system to which BSPA ultimately leads. With BSPA we unify the process of organisational learning with that of knowledge management at the organisational level. Systems development takes place in a double-loop relationship where learning about the ideological constraints and their corresponding organisational material and informational interests becomes deep knowledge that is captured, managed, and institutionalised in an intrinsically-motivated knowledge management system. BSPA has not yet been fully tested, but parts of it have been used in ERP implementations whose details must remain confidential for the moment.

References:

ACKOFF R (1981) *Creating the Corporate Future*. Wiley, Chichester.

ATKINSON CJ (2000) The 'Soft Information Systems and Technologies Methodology' (SISTeM): an actor network contingency approach to integrated development. *European Journal of Information Systems* 9(2), 104-123.

BEER S (1979) *The Heart of Enterprise*. Wiley, Chichester.

BURKE G and PEPPARD J (1995) *Examining Business Process Re-engineering – Current Perspectives and Research Directions*. The Cranfield Management Series, London.

CHECKLAND PB (1989) *Systems Thinking, Systems Practice*. Wiley, Chichester.

EAGLETON T (1994) *Ideology*. Verso, London.

FLOOD R (1989) Six scenarios for the future of systems ‘problem solving’. *Systems Practice* 2, 75-99.

FLOOD R (1990) *Liberating Systems Theory*, Plenum, New York.

FLOOD R and JACKSON MC (1991) *Creative Problem Solving - Total Systems Intervention*. Wiley, Chichester.

FREUD S (1985) “*Freud’s Works*”. Greek edition, Smirniotis. The Greek translation was based on the French publication PAYOT and on the publication of the “*Gesammelte Schriften*”. Internationaler Psychoanalytischer verlag, Vienna, 1924-25.

HABERMAS J (1984a) *The Theory of Communicative Action - Reason and the Rationalisation of Society*. (Volume 1), Polity, Cambridge.

HABERMAS J (1984b) *Communication and the Evolution of Society*. Polity, Cambridge.

HABERMAS J (1989) *Knowledge & Human Interests*. Polity, Cambridge.

KELLER G and TEUFEL T (1998) *SAP R/3 Process Oriented Implementation*. Addison-Wesley, Reading, Mass.

KLING R and STAR L (1998) *Human centred systems in the perspective of organisational and social informatics*. *Computers and Society* 28(1), 22-29.

KIM D (1994) *Using Systems Archetypes to Take Effective Action*. Pegasus Communications.

LEWIN K (1952). *Field Theory in Social Science: selected theoretical papers*. (CARTWRIGHT D, Ed) Tavistock, London.

LODGE C and VOGEL EF (1987) *Ideology and National Competitiveness*. Harvard Business School Press, Cambridge, Mass.

MARTIN J (1989) *Information Engineering - Book I Introduction*. Prentice Hall, Englewood Cliffs, NJ.

MARUYAMA G (1996) Application and Transformation of Action Research in Educational Research and Practice, *Systems Practice*. 9 (1) 85-101.

MINGERS JC (1995) *Self-Producing Systems - Implications and Applications of Autopoiesis*. Plenum, New York.

MINGERS JC and GILL A (eds) (1997) *Towards Critical Pluralism*. Wiley, Chichester.

PANAGIOTIDIS P (1998). *Business Systems Purpose, Analysis*. Unpublished Ph.D. Thesis. Aston University, Birmingham.

PANAGIOTIDIS P and EDWARDS JS (2001) Developing intrinsically motivated information systems – a critical systems approach. *Information Systems Frontiers* 3 (2) 211-226.

PORTER M (1985) *Competitive Advantage: creating and sustaining superior performance*. Free Press, New York.

SENGE P (1990) *The Fifth Discipline – The Art and Practice of the Learning Organisation*. Century Business, London.

ULRICH W (1983) *Critical Heuristics of Social Planning*. Verlag Paul Haupt, Bern and Stuttgart.

WEBER M (1947) *The Theory of Social and Economic Organisation*. (Trans. A M HENDERSON and T PARSONS) Free Press, New York.