

# **DEVELOPING INTRINSICALLY MOTIVATED INFORMATION SYSTEMS**

**- A CRITICAL SYSTEMS APPROACH -**

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## Abstract

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This paper deals with the problematic of development methodologies for organisational information systems and especially with their application to business systems. Historically, information systems development methodologies tend to fail, because either they take the organisational purposefulness for granted, or they do not analyse it thoroughly. This paper's position is that the analysis, and the definition or redefinition of the systemic purpose are regarded as the utmost expression of the system's purposefulness. This is to be achieved by ensuring the participation of all the stakeholders who affect, or are affected by, a particular business system's operations. The nature of participation, defined as a process of the stakeholders' perceptual exchanges, is deemed to be problematic in itself, due to the influence exerted upon it by organisational power, coercion and false consciousness. The paper highlights the philosophical reasons for the failures of information systems development methodologies, and provides a conceptual solution to this problematic as well as a strategy for the development of intrinsically motivated organisational information systems. The intrinsically motivated information systems methodology outlined here (BSPA) is intended to yield organisational information systems that demonstrably improve co-ordination of organisational activities, by enabling the development and maintenance of a single/multifaceted view of purpose throughout organisations.

**Key Words:** Business Systems, Power, Coercion, False Consciousness, Complementarism, Methodology.

## 1. Introduction – the Failures of Information Systems Methodologies

Historically, Information Systems (IS) methodologies seem not to adequately incorporate ideas of organisational purpose into their methodological paradigms, in the main by making simple assumptions that amount to ignoring purpose or taking it for granted.

In this paper we argue that there are three causes for the failure of IS development methodologies to come to terms with the organisational reality:

- 1) Failure to analyse thoroughly the most important aspect of the organisation, namely its systemic purpose.
- 2) Failure to analyse organisational power relations and conflict; these are critical in terms of the organisational action in the real world that is expressed in explicit or implicit business strategy.
- 3) Failure to come to terms with the emergent systemic attributes of a business organisation such as its special nature and its dominant position in our civilisation.

A methodology has been developed that explicitly incorporates consideration of business purpose by changing the focus of IS development from data/information transactions to interpersonal transaction support that effectively provides and implements organisation purpose.

The methodology is intended to provide Information Systems that demonstrably improve co-ordination of organisational activities by enabling the development and maintenance of a single/multifaceted view of purpose throughout organisations. In other words, Information Systems that will produce meaningful knowledge to the extent that they make their users (the business system's stakeholders) reflect on, and thus inquire about, their purpose(s) 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.

The initial conception was to produce an Information Systems methodology dealing adequately with the above problematic. But the special nature of business organisations, namely the fact that they are both designed and Human Activity Systems (Checkland, 1989), meant that the proposed methodology had to be a problem solving methodology, without losing sight of its original intention to be an information systems methodology also. This goal was achievable; information systems methodologies are a subset of business systems problem solving methodologies, as we will see in section 3.

In section 2 we attribute the failures of information systems development methodologies to the side effects of modernity that are being sustained in our age by the dominant institution in Western society, namely the business system. In section 3, we evaluate and categorise contemporary problem solving and IS development methodologies, based on Habermas's knowledge constitutive interests (Habermas, 1989), in order to highlight the need for the development of an intrinsically motivated information systems development methodology. Finally, in sections 4 and 5 we offer a conceptual solution to the above problematic and a way to achieve the objective of producing an intrinsically motivated information systems approach on the basis of the critical systems philosophy.

## **2. The Philosophical Dimension of IS Failures - a Critical Systems Thinking**

### **Interpretation**

Weber (1947) interpreted the world-historical process of modernisation as a process of progressive rationalisation (a progressive increase of rationality) in accordance with the Enlightenment tradition in which history appeared to be a

progress toward Reason. Wellmer (1991) argues that in its narrowest sense Weber defines rationality as the most efficient choice of means in the name of predefined, and unquestionable, ends. This type of rationality, however, leads to deep changes in human social actions and interactions. The characteristic of these changes is the departure from the communal to the associative forms of human social action. Weber himself concedes that this particular rationalisation process produced serious side effects for human freedom, termed the discontents of modernity. Weber's diagnosis was confirmed as being representative of contemporary Western society's modes of action by the critical philosophers [Lukacs and Adorno in (Lunn, 1982); Horkheimer (1968)] and Habermas (1984a) himself.

Modernity's selective process of societal rationalisation led to the triumph of functional and instrumental reasons in contemporary Western society, that promotes practical utility, functional relations and knowledge of "what is" or "what happens" but not "why". The discontents of modernity are made apparent in the de-coupling of systems (bureaucratically organised administrations) from the lifeworld (the cultural imperative systems or worldviews) and, according to Habermas, the subsequent colonisation of the lifeworld by the economic subsystem. This evolution of modernity that upholds reason and believes that rationality can be used to promote and perfect human life, has led to: the domination of human life by impersonal economic forces; the subsequent reification of human life, namely the identification of human consciousness with the means and fruits of production; and to the fragmented forms of life (loss of unity) that are dominated by power relationships, coercion and false consciousness. The latter appears in such forms as propaganda, misinformation and unethical advertising.

The programme of the early critical theory was one of human emancipation from instrumental reason. However, it failed, owing to the fact that it remained hostage to subject-centred reason, thus leading to pessimism in regard to the very project of modernity and to pessimism in regard to finding a solution to the discontents of modernity; a way out of the contemporary human “iron cage” (loss of freedom). Habermas attempts to overcome the limitations of subject-centred reason and redeem the project of modernity with a new paradigm of communicative action and communicative reason, through the transition from the philosophy of consciousness to the philosophy of language. The success of Habermas’s philosophical shift rests in part on the viability of the claim regarding the transparency of language as a medium for critical reflection and human emancipation and the notion of history as the progressive realisation and emancipation of the human subject. Habermas’s claims though are rejected by the counter-Enlightenment contemporary French poststructuralist and postmodernist philosophers (Foucault 1974, 1980; Derrida, 1981; Lyotard, 1984).

In addition, Habermas claims that communicative discourse is emancipatory and that communicative forms of discourse are primary to the strategic ones. This implies that the evolution of society is reflected in an isomorphic manner in language, that the original mode of language is communicative, that a clear distinction between system and lifeworld exists, and that the colonisation of the contemporary lifeworld by the system keeps taking place on the basis of the system’s steering media of money and power. Communicative action, according to Habermas, is based on the ordinary communicative (non-instrumental) uses of language, aimed at reaching understanding in order to coordinate the actions of different participants. Conversely, strategic action

(purposive-rational action) is based on the rhetorical (instrumental) uses of language. This claim draws on Austin's (1984) distinction between illocutionary (communicative) and perlocutionary (strategic) discourse, and on Apel's (1980) reconstruction of the philosophy of language, which advocates the use of the communicative thesis for the interpretation of major problems in the history of philosophy. Therefore, Habermas argues that the original mode of language is communicative while the instrumental uses of language are parasitic.

The justification for these claims has been criticised on two counts. Guller (1985) criticises the Habermasian view of the communicative mode of language, because illocutionary actions can lead to strategic actions as well. Honneth (1993) disputes the assumption that a functionally integrated action system (system) can occur independently of the normative building of consensus of a communicatively integrated action sphere (lifeworld), as well as the assumption that the lifeworld can occur independently of power relations. These assumptions result in criticism of the Habermasian project's emancipatory elements where the system/lifeworld distinction contradicts the emancipatory use of language by restricting or excluding the communicative mode of language from the system formation, while the lack of scientific proof in regard to the predominance of the language's discourse-communicative action over the strategic admits elements of utopianism according to Zimmermann (1984). However, the utopian elements of the Habermasian project may still serve as the ideal that we work towards for the development of a methodological framework, as in this paper. A methodological framework that will allow and promote the dominance of communicative actions over strategic ones in the formulation of the business system's purpose, and will promote a business environment where the

communicative mode of language becomes dominant over the strategic one. This is not a unique position within the IS field; the work of Lehtinen and Lyytinen (1986) also focuses on communicative action, in the shape of the communicative purpose of an IS, drawing on illocutionary logic as part of its theoretical base.

In order to achieve our aim, it is necessary to shift our attention towards finding novel ways for the application of critical theory to management science, for the critical systems enquiry into the communicative actions and purpose(s) of the dominant institution in contemporary Western society, namely the business system. Mintzberg (1983) sees business organisational purposeful behaviour as the result of a power game in which various players (strategic action oriented), called influencers (stakeholders), seek to control the organisation's decisions and actions. How they succeed determines what configuration of organisational power emerges, and in the contemporary organisation is described best by the political metaphor (Flood and Jackson, 1991), that depicts the relationships between the organisational stakeholders to be full of power, coercion and false consciousness. It is possible to conclude from Mintzberg's analysis that contemporary business systems' purposeful behaviour can be described in terms of the world-historical process of modernisation as a process of progressive rationalisation in the Weberian sense, although that process seemed to backtrack between the 50s and the 70s where the assumptions of the old classical economic theory or profit maximisation were questioned. The culmination of the organisational rationalisation process is expressed best in Friedman's (1962) amoral and instrumental theory of profit maximisation, and is characterised by the complexity of the organisational stakeholders' power game, to influence the organisation's orientation mostly towards more efficient economic forms. The business system's

generic systemic purpose has evolved from the one actor, one goal doctrine [a profit maximising owner – classical economic theory] to the political arena and the contemporary political metaphor describing the business system's purposive behaviour. This corresponds to a shift from apparent teleology (where developments happen as a result of the ends served by them) to teleonomy (describable by an observer as serving a purpose) (Checkland, 1989). The very complexity of the stakeholders' interaction also requires an ever-increasing administrative efficiency, especially in the light of the demands made by the organisation's ever-increasing economic efficiency. This implies that business systems in our age remain purposeful in economic terms, but the very complexity of their purposeful behaviour makes them appear purposive in teleonomical terms, and purposive rational in Weberian terms. Thus Mintzberg's analysis confirms Weber's rationalisation process; the disease of the discontents of modernity has infected the dominant contemporary institution, namely the business system. The political metaphor of the contemporary organisation is representative of modernity's dispatch from the communal to the associative forms of human social life and social action. The contemporary purposeful behaviour of the business system's human activity system is oriented towards impersonal social actions dominated by instrumental considerations in the context of bureaucratic organisations (business systems) and in the wider context of market relationships.

Therefore in this paper we define business systems as special nature systems that are neither wholly social systems, nor wholly expendable tools. The difference from a social system is that a business system is a man-made system, a designed system, but its content is a Human Activity System (HAS) (Checkland, 1989) primarily responsible for the definition of the organisation's ends.

The application of Habermas's critical theory to management science, with the aim of developing a critical management science, is not a novel idea and draws initially on Mingers (1980, 1997) and subsequently on Jackson (1985, 1989, 1990, 1991), Jackson and Keys (1984), Keys (1988), Oliga (1989, 1992), Flood and Jackson (1991), Flood (1989, 1990, 1993, 1995, 1999), and Flood and Romm (1997). The novelty of the BSPA methodology proposed in section 4 lies in the linking of the organisational ideology with the stakeholders' knowledge-constitutive interests within the context of special nature systems, as explained below. Critical systems enquiry into the business system should aim at subjecting the system's instrumental purpose(s) to the scrutiny of practical reason (Ulrich, 1983), namely the reason that helps us to determine what ought to be or ought to be done, expressed through coercion-free discourse (Habermas, 1984b) situations where the stakeholders' communicate actions are predominant over the strategic ones. In these particular situations the force of the better argument (Habermas, 1984b), in order to exist and be effective, demands a conscious analysis of the ideological process with a critical disposition (driven by practical reason). In this paper we define ideology as the process that feeds on human's knowledge constitutive interests, though in most cases it appears to be independent of its inputs namely the interests of work, communication and emancipation (Habermas, 1989), and produces worldviews, shared realities, systemic functional integration and systemic purpose.

The ideologically produced business purpose(s), namely what an organisation exists to do and why (Campbell and Tawadey, 1989) limits the range (explicitly or implicitly) of strategic choices [the commercial-instrumental rational; namely

strategic domain, strategic positioning and the type of competitive advantage (Porter, 1985)] that needs evaluating [information semiotics: syntactic, semantics and pragmatics (Habermas, 1984b)]. In addition, it limits the range of structure moulds (organisational design), function/process (value chain) as well as the semiotics of organisational information flow by restricting and/or conditioning the instances and the content of the stakeholders' communicative actions in the name of organisational autopoiesis (Mingers, 1995). The latter term refers to the business system's ability to sustain its identity in an organisationally closed and structurally open manner; changes in the system's components and their relationships (structure) do not lead to changes to its identity (organisation) or to its stakeholders' latent knowledge-constitutive interest superstructure (from which it results).

Therefore a critical systems analysis paradigm, as a notional system, should minimise strategic actions, and should facilitate the business system stakeholders' (including the analyst) communicative actions to reach an understanding in regard to the business system's purpose instead of only consensual action (Habermas, 1989). The stakeholders' effort to reach understanding through communicative action (Habermas, 1989) should concentrate on the search for the identification of their (ideologically produced) rationality limits. Stakeholders who are made aware of their rationality's limits and causes, at a particular point in time in a particular situation, are equipped with the ability to overcome them through discourse where the validity claims raised for statements and norms are hypothetically bracketed, thematically examined and made meaningful under the force of the better argument, until they reach other limits in an ever-lasting bracketing/limit-breaking process. This continuous process of self-examination of the stakeholders' rationality's limits should

be institutionalised in the form of an intrinsically motivated (Ulrich, 1983) Organisational Information System that will facilitate communicative action and at the same time record the sources of deception for further learning and understanding in different historical situations in the light of the stakeholders' individual/collective and organisational purposes. This is a very important issue that current Information Systems fail to address. For example Kling and Star (1998) observe that Enterprise Resource Planning systems (ERPs) are strong examples of information systems that are organisation-centred, rather than human-centred. Here functional systemic integration tends to take precedence over the purpose(s) of the HAS content.

### **3. A Categorisation and Evaluation of IS and Problem Solving Methodological Paradigms**

In this section we consider the major types of intervention undertaken in business systems, in the light of their purposefulness, on the basis of Habermas's knowledge constitutive interests. We argue that a natural relationship exists between the methodological paradigms of IS, systems, problem solving and critical systems.

Habermas (1989) distinguishes between human technical, practical and emancipatory interests. In systems development methodologies the information system is regarded as a subsystem that has to be optimised in reference to the business system's systemic purpose; along with the optimisation of the other organisational subsystems identified. In other words information systems development becomes a subset of systems development. This amounts to greater sophistication in regard to the servicing of human technical interest.

Soft systems methodologies' obvious focus on the practical interest makes system development methodologies appear to be a subset of the problem solving ones. In other words, the soft systems methodologies seem to claim that one can optimise the operations of the organisational subsystems only if the stakeholders' perceptions regarding the definition of the organisational boundary are co-ordinated on the basis of the purpose(s) they attribute to the system.

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. Power itself, in this paper, is defined as the possession of and/or control over the organisational material and informational assets by organisational stakeholders seeking to maximise (in terms of their perceived utility function) and/or preserve their grip upon them. In this case the perception of a problematic area and the definition of the organisational system boundary is the result of a process of conflicting claims made upon organisational assets. This implies that material and informational assets have to be analysed in order to deal effectively with the causes of these shared perceptions prior to their exchange. In other words, soft systems problem-solving approaches become a subset of the critical systems problem-solving ones. The focus then on the emancipatory interest becomes the last link in the chain connecting the IS methodologies with the systems ones, and with the critical problem-solving ones. In other words, the Information Systems methodologies become a subset of the systems methodologies, that are a subset of the problem

solving ones, that themselves are a subset of the critical systems thinking ones (see Figure 1).

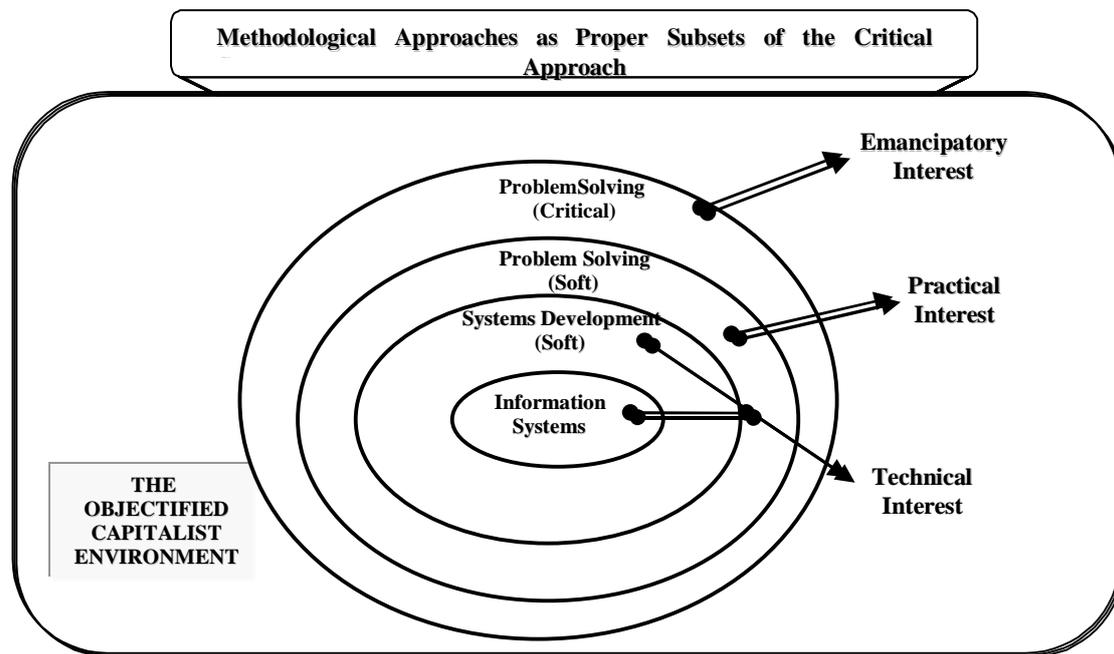


Figure 1

The link connecting IS methodologies to the critical problem solving ones implies a special link between the emancipatory interest and the other interests; the emancipatory interest becomes the superset that contains the practical one which in its turn contains the technical interest. Organisational IS development then, to fulfil the emancipatory interest, should focus not only on providing the system with processing power or enhanced control of its operations, but should also provide the system with information regarding the sources that motivate its HAS content, for continuous critical examination. This link becomes the core of the proposed methodology's complementarism, like a set of Russian dolls. When one focuses on the emancipatory interest (the outer doll), one simultaneously deals at the systemic level with all its subsets (the inner dolls). This way one is able to deal with the organisation's emergent attributes such as the organisational systemic purpose in the light of conflict and coercion located on the organisational structure and functions.

Therefore we argue that the relevance of a critical problem solving methodology to IS development is that IS development should not be talked about solely in IS terms, nor even in systems terms or problem solving terms, but in more general critical systems terms. The decision to develop an organisation's database system, for example, cannot and should not be justified only in Information Engineering terms (Martin, 1989). Nor can it or should it be justified only in business terms either, such as regarding the organisation's competitive advantage, but rather in critical systems terms in the light of the organisation's objectified environment. In critical systems terms we aim to answer first why such a system should exist in the first place; or better still why the business purpose demands the development of such a system. Kling's perspective of social informatics (1999) operates in similar terms to those of critical systems: what are the uses and consequences of the information system and its associated technologies within the institutional and cultural context of a particular business system that is embedded in a particular social environment?

According to Habermas (1987), the emancipation of the humans that make up a particular business system from false ideas (emancipatory interest) should be based on a communicative process that aims to reach a coercion free consensus (practical interest) regarding the definition of systemic purpose, structure and functions, in teleological terms (where purpose defines the organisational structure and functions). On the basis of the subset example above, we can argue that it is not enough to be effective or efficient, but it is necessary to be effective and efficient at the same time.

Critical problem solving methodologies such as Total Systems Intervention (TSI) (Flood and Jackson, 1991) advocate the selection of different methodologies, under

the concept of methodological complementarism. But the approach of Flood and Jackson seems to be impracticable and flawed in critical systems terms because it is based on the rather reductionist distinction between means and ends (technical, practical and emancipatory interests). This results from the reductionist focus of the methodological paradigms explained earlier; paradigms that are drafted in to dissolve organisational complex-coercive relationships (Flood and Jackson, 1991).

From the above we conclude that we need a total (integrated) solution for the analysis of the business systems problematic, instead of fragmented ones that, at best, are pieced together in a cut and paste manner where problematic areas are made to fit existing methodological paradigms. This solution should lead to the development of human-centred systems that encompass and institutionalise the analysis of the complexity of a special nature system and its purposeful behaviour, with a critical systems disposition that aims to achieve human emancipation through the development and institutionalisation of an intrinsically motivated information system.

#### **4. A Conceptual Solution to IS Development Failures**

In the previous two sections we attributed contemporary IS development failures to the fact that IS methodological paradigms do not make provision for the thorough analysis of the most important aspects of the organisation, namely its special nature, power relationships and subsequent conflict, and most important of all its systemic purpose.

Therefore we argue that, in Critical Systems Thinking terms, contemporary information systems do not produce meaningful knowledge. Conceptually, we argue

that any solution to the above problematic must include the analysis of the business purpose as an a priori condition to determining the appropriate information systems to be developed. Though, in conceptual terms, this explicit or implicit inclusion of the reference to business purpose is not a novel idea in IS development, no solution in terms of methodological paradigm has been developed to tackle the above problematic.

The most difficult step in the analysis of the systemic purpose is the definition of the system's boundary and its strategic positioning (purposefulness expressed as the commercial rationale) in the light of organisational power and politics. This type of analysis introduces the analyst to 'uncharted waters' that generate enormous variety in epistemological terms. Thus it becomes essential to adopt complementarist thinking (Flood and Jackson, 1991), namely the reconciliation of paradigm incommensurability at a meta-theoretical and meta-methodological level.

In this paper, theoretical complementarism at a meta-theoretical level, which implies methodological complementarism at a meta-methodological level, is deemed as essential in order to tackle the above variety problematic in a critical and systemic manner. This must be achieved through an analytical framework that does not act as a simple selection mechanism between different existing methodologies made to suit particular problematic areas, but instead exhibits emergent properties that must depict homomorphically different (ideologically produced) organisational power forms. Contemporary business problematic areas exhibit emergent properties that cannot be tackled by existing methodologies, including TSI and Critical Systems Heuristics (CSH) (Ulrich, 1983). These emergent properties can be defined as the different forms

of power that have penetrated every aspect of the lifeworld, originating from the stakeholders' organisational material and/or informational interests, possessions and/or control (current or intended). If the variety generated by the different power forms is not dealt with a priori in a complementarist, critical, systemic and rigorous manner, this will introduce reductionism into the critical systems field, by reducing the organisational problematic areas into inadequate made-to-fit methodological models. In the age of the knowledge-based society (Drucker, 1993), where technical tasks are becoming ever more complex, co-operation, learning and understanding become essential for the survival of Western business organisations, because knowledge itself is locked into the heads of the knowledge workers. Forms of power expressed as ideological constraints, false consciousness, and coercion inhibit the productivity of the knowledge-based worker by introducing noise into the organisational information system communication channels. Instead these communication channels should convey new ideas, learning and understanding aimed at reaching a coercion-free consensus in regard to the business system's instrumental and social purposes.

This implies that the solution must draw on a wide variety of disciplines for its theoretical base. These must include: strategic thinking in order to deal with the organisation's commercial rationale; organisation theory in order to deal with the organisation's structure and process; economics in order to deal with the organisation's transaction costs; sociology and psychology in order to deal with the stakeholders' purposeful behaviour at the individual, organisational, and social levels in systemic terms; general systems theory and cybernetics in order to deal with the organisation's overall functional integration in terms of its purposefulness and in

terms of its viability, overall cohesiveness and synergy; soft systems thinking, critical systems thinking, philosophy and fuzzy logic in order to deal with the complexity of the perceptual nature of the stakeholders' purposeful organisational behaviour at the individual, organisational and social levels in the light of the ideal of human emancipation; and Information Engineering (IE) in order to deal with the physical development of an intrinsically motivated organisational information system.

In methodological terms, the new methodology must be based on the same complementarist principles as the theoretical one, and must be guided by Habermas's classification of knowledge constitutive interests/methodological paradigms. Information Engineering, soft systems, and critical systems methodologies are the methodologies on which the new methodological solution draws most, but it should not share IE's positivist, managerialistic connotations. IE is nevertheless a complete IS methodology, while soft systems recognise human purposefulness and subjectivity and the limitations of human perception. Critical systems thinking can 'connect' soft systems and IE in a complementarist manner through the application of critical science, "the science of emancipation from hidden presuppositions" (Flood, 1990), with a systems perspective. This way organisational information systems could produce meaningful knowledge about the stakeholders' ideological constraints by linking the inputs of the ideological process, namely their organisational material and informational interests, with the ideological outputs, namely the stakeholders' worldviews, shared beliefs, value systems, information system semiotics, and the business systemic purpose itself at the level of the stakeholders' interaction.

The outcome of the ideological process might have two facets: a positive one (class-consciousness) and a negative one (political and/or coercive). The positive side of the ideology (an autopoietic process) provides a social group, an organisation, or the society itself with unity in perceiving the social world. In addition, it provides a HAS with homeostasis, cohesiveness, synergy and orientation in regard to pursuing technical and social goals, and with a framework for perceiving and solving problematic areas. The negative side of ideology (a pathologically autopoietic process) helps to legitimise a dominant political force. It resists social change, and can be used to distort communication systematically, thus creating false consciousness about the reality of the social world. Organisational mission (purpose, strategy, company values, standards and behaviours) is the product of organisational ideology. Thus the analysis of the ideologically produced purpose will have to precede the organisational systems development. In addition the information systems produced in this manner will only produce meaningful knowledge to the extent that they are ideology-related.

Therefore, we have developed two novel concepts in order to explain what has to be done to develop information systems with the type of meaningful knowledge mentioned above. These are the Steady States Range (SSR), and the Overall Organisational Entropic Number (OOEN). The SSR is defined as one or more stakeholders' ideological limits, depicted diagrammatically as a straight line extending between a plus sign, representing a stakeholder's identification with a particular organisational ideology, and a minus sign, representing a stakeholder's rejection of a particular organisational ideology. Intermediate states are allowed. A

stakeholder's perception of problematic, solution and action is made meaningful within the ideological limits.

The organisational ideology is expressed by the ideology of the Chief Executive Officer (CEO) of the business system; "system five" in cybernetic terms (Beer, 1979). The CEO is, or at least he/she should be, the embodiment of the system's identity; the person responsible for the systemic management of the organisation, who provides the organisational system with closure (Beer, 1979). In the ideal case, for example in an organic organisation (conflict-free) operating with democratic processes, he/she is the embodiment of organisational identity. The quantification of agreement or disagreement between the members of the management team is performed against system five's SSR, measured on a fuzzy scale that we define as the Management Cohesion Index (MCI).

The OOEN is a measurement of the organisational entropy (Flood and Carson, 1993) that originates from the stakeholders' perceived and fuzzy material and informational conflict for the control of the organisation's material and informational assets located upon the organisation's value chain (Porter, 1980).

Porter's value chain concept was chosen here because it represents the business organisation as a system. The value chain is a theory of the firm (Porter, 1985) that views the firm as being a collection of discrete but related production functions, if production functions are defined as activities. The value chain formulation focuses on these activities' systemic integration, coordination and synergy, defined, in non-linear terms, as the value added that exceeds the sum of individual activities.

The value chain concept helps us to locate the stakeholders' perceived conflict as the control overlap over the possession of one or more value chain activity(ies)/task(s) and the organisational material and information assets assigned to those activity(ies)/task(s). But most important of all the value chain 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 themselves are regarded as the areas where organisational entropic trends are developing, namely areas where systemic uncertainty and disorder develop.

In other words the OOEN measures the degree of uncertainty and disorder to which systemic integration is subjected by the overlap areas. The measurement of organisational conflict, located in the control overlap areas, is used for the development of an organisational entropic monitoring system. This is based on the product of the measurement of the overlapping claims made upon the organisation's material and organisational assets and the number of the stakeholders who make a claim on a particular asset. The control overlap areas are regarded as the product of conflicting motivational forces representing the stakeholders' intentions to control, possess, and/or defend existing control or possession, over organisational material and informational assets. The degrees of control sought (full or partial), plus the time length of the conflicting motivational forces, namely the subjective time horizon over which those motivational forces demand gratification, define the intensity of the conflict itself.

Both the SSR and the OOEN are measured and compared based on a fuzzy rule (shown in Figure 2), which expresses our bias about what a solution needs to look like, as expressed in the preceding paragraphs

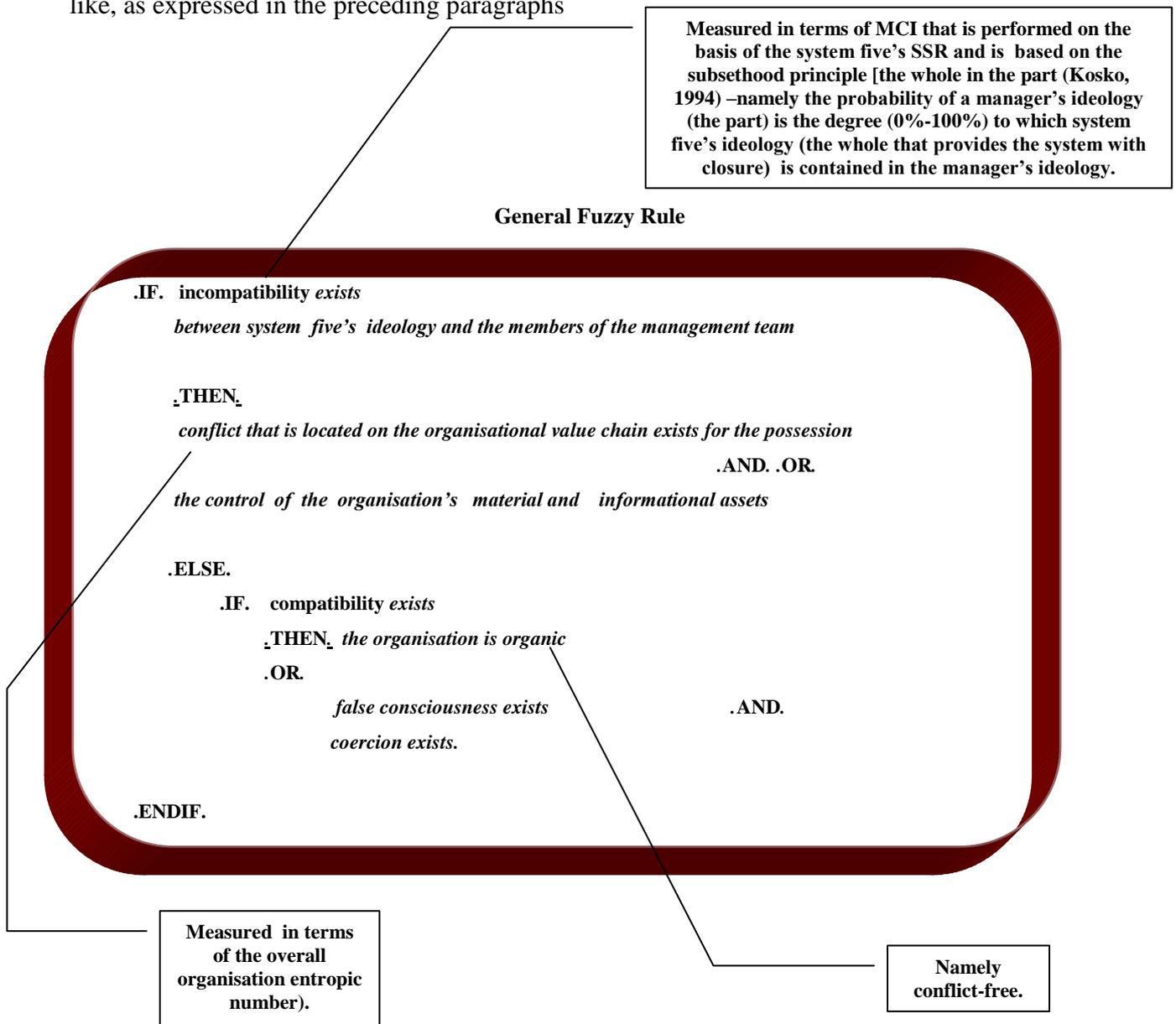


Figure 2

In addition, in the fuzzy rule we implicitly express our bias that the ideological process's outputs, namely the organisational value system, shared realities, cultures, worldviews or Weltanschauungen and beliefs, that tend to appear as independent ideas, originate from material and information interests produced by the ideological process. Further, the fuzzy rule expresses our bias that in the contemporary

*Developing Intrinsically Motivated IS*  
*- A Critical Systems Approach -*

organisation environment, described by the political metaphor, the value chain's conflict areas are the areas where the stakeholders engage in power relationships. In the conflict areas the most powerful stakeholder not only possesses and/or controls organisational material or information assets that are disputed by other stakeholders, but is also better positioned to control the ideological process's outputs due to this possession and/or control of ideological inputs, thus leading to the subjection of the other stakeholders. This implies that human emancipation and the resolution of conflict is only possible, in critical systems terms, when the stakeholders are made aware of the link between the ideological process's inputs and outputs in terms of their material and information interests as well as in terms of the origins and the effects of the conflicts over them.

In epistemological terms the fuzzy rule implies that the analysis of organisational ideology leads us to the identification of possible conflict of material and informational interests, power relationships, perception standards (Weltanschauungen), as well as information flow semantics and pragmatics. The importance of information systems as having a mediating role in organisational discourse has been recognised elsewhere (Lyytinen, 1985; Lehtinen and Lyytinen, 1986). Therefore their construction entails a consideration of the communicative purpose of the information system in an organisation, which is potentially subject to all the influences that we have been discussing. Unfortunately, as Lehtinen and Lyytinen admit, this "does not lend itself easily to formal analysis", although they and co-workers have endeavoured to use illocutionary logic (speech acts theory) for this purpose (Auramäki, Lehtinen and Lyytinen, 1988). Our approach here is a fuzzy one, based on reflection, discussion and negotiation, rather than a formal one.

The stakeholders' reflection on their ideological limits, in terms of their organisational material and informational interests, aims towards creating the necessary conditions for building a coercion-free consensus between the stakeholders for the definition of the business purpose itself. Increasing entropic trends feed on the stakeholders' overlapping claims, and severely limit the co-ordination and synergy of the organisational activities. Intense conflict can threaten the organisation's very viability. A coercion-free consensus leads to a situation where the sources of increasing organisational entropic trend over the medium to the long-term are reduced until the very process that leads to reaching coercion-free consensus, namely the process of ideological self-reflection, becomes institutionalised.

We now use the SSR concept to consider what happens when the socialisation mechanisms of the dominant organisational ideology have failed to socialise all the stakeholders, and organisational conflict surfaces. If the organisational ideology cannot evoke natural identification, then cohesiveness and synergy would be achieved through coercion. The ability of the dominant stakeholder to threaten with losses of rewards or social rejection will evoke conformity. But in this case lateral forces develop which become apparent as they gain in power. These forces might lead to organisational cleavage, where two or more opposing forces, expressing different ideological positions or conflicting interests, are fighting to control the organisational material and informational assets, in order to define the organisational purpose(s) for their own benefit. The organisational steady states range then would be located between the plusses of the conflicting ideologies, because the equilibrium achieved will have to be acceptable to at least one of the conflicting ideologies. A stakeholder's perception of a problematic area and the domain of solutions for the perceived

problematic areas will be located between the ideological limits as well. Solutions or spontaneous activity positioned outside the ideological limits will demand the termination of the ideology itself and will be resisted. An organisation's steady states range, where there is ideological cleavage, can be depicted as in Figure 3.

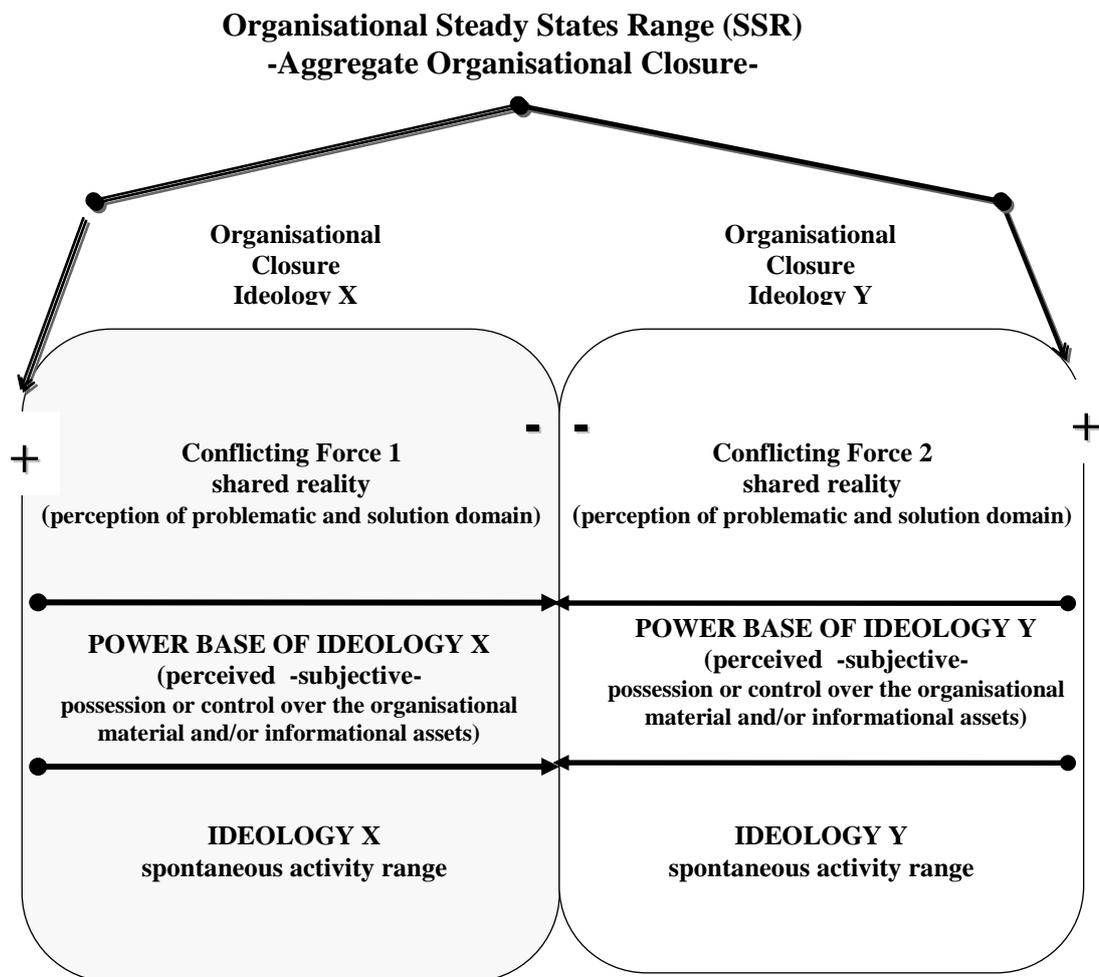


Figure 3

The ideological range of conflicting forces is inversely related to the forces' power bases and inversely related to the degree of group cohesiveness. The more strongly a group identifies with an ideology, and the more it can enforce that ideology the less it needs to create new structures and functions. In other words strong ideologies have a tendency towards the pathological form of organisational autopoiesis that excludes any critical probing into the ideological inputs and outputs. Figure 3 implies that

when two ideologies conflict, the steady state achieved becomes unstable because the range within which it can be located increases, as does the probability of the creation of new organisational structures and functions/processes. Hard systems methodologies that assume that the organisation functions as one (unitary metaphor) ignore the whole of the SSR when lateral conflicting forces exist. Soft systems methodologies that acknowledge the existence of these forces, but take for granted that by merely acknowledging them they can strike a compromise, or dissolve them, are flawed, for two reasons. Firstly a compromise might not be possible, and secondly in the case where one force developed as a reaction to the other, then the solution (a new steady state) might lie beyond the existing SSR. In other words a 'solution' might demand the dissolution of both forces because if the reaction force exists only to oppose action then it feeds on the action itself. Finally, any methodologies that do not examine the material and informational power bases of the forces ignore the sheer length of the SSR; thus they do not examine thoroughly the possibilities of compromise between the conflicting forces.

The SSR concept parallels Lewin's (1952) social fields and phase spaces where individual intentions or motivations are 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.

The SSR, as an applied concept for the analysis of the business systems mission and thus purpose analysis takes the following form: We assume that the answer to the question "what business are we in?" represents the current organisational strategic domain labelled as the Current-State Position (CSP). The answer to 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 midpoint, labelled as the Intermediate-State Position (ISP) can be defined as a change in strategic positioning (type of competitive advantage) only, with no change in the current strategic domain (the business we are currently in). The range can be divided into a skills part, a structure part, a systems part, a purpose part, and a values part. The values part corresponds to the “company values” component of the Ashridge Mission Model (Campbell and Tawadey, 1989), concerned with “what senior management believes in”. The organisation’s strategic orientation (the CSP-ISP-DSP points) is defined using Porter’s five forces model (suppliers, buyers, competitors, substitutes, and potential entrants) and competitive advantage model (differentiation, cost, and focus) (Porter, 1980; 1985). The staff factor, including matters of official “appraisal systems, pay scales, formal training programs and the like” and matters “at the soft end, about morale, attitude, motivation, and behaviour” (Waterman, Peters, and Philips, 1980) is treated as part of the critical and emancipatory analysis of the organisation’s HAS content that in BSPA we define as the inside view. The inside view, elaborated later, focuses on the elimination of the obstacles that a business organisation’s HAS content faces in reaching a coercion free consensus in regard to the definition of the overall business system’s instrumental objectives.

In addition, the SSR can be supplemented by an analysis of intended diversification in order to answer the question “with whom should we collaborate?” We use Galbraith’s (1983) concept of the centre of gravity and the splitting of an industry’s supply chain into upstream and downstream (Galbraith, 1983) halves for the organisation’s diversification strategy(ies).

Based on the above we argue that, in the applied version of the SSR concept, the boundary of the business system stakeholders' life space (defined as the steady states range) is identified as the stakeholders' ideological limits in regard to the business systems' purpose (what business are we in/should be in and why? and with whom should we collaborate?), strategic orientation and positioning, functions and structure, while existence, interdependency, and contemporaneity are defined as the stakeholders' decision process dimensions, the semantic and pragmatic content of which exist within the stakeholders' aggregate ideological limits that are defined in terms of the stakeholders' identification with system five's SSR.

## **5. The Relationship between SSR and OOEN**

The relationship between the SSR and OOEN can be characterised as double-loop learning (Argyris, 1990) for the business system's stakeholders and for the solution's biases expressed above in the general fuzzy rule.

The measurement of the SSR (performed with the MCI) and OOEN concepts provides feedback for the further development of an intrinsically motivated organisational information system. It will also protect the methodology itself from positivistic applications since the methodology's bias itself also becomes the subject of evaluation by the stakeholders themselves. This relationship is depicted in Figure 4.

In analysis terms the definition of the concept of SSR, concerned with the ideological systemic integration of the business systems in terms of its purpose, and the OOEN, concerned with the sources of the stakeholders' ideological disposition on

the organisation's value chain, lead us to the development of a twofold analysis paradigm that corresponds to the business system's special nature.

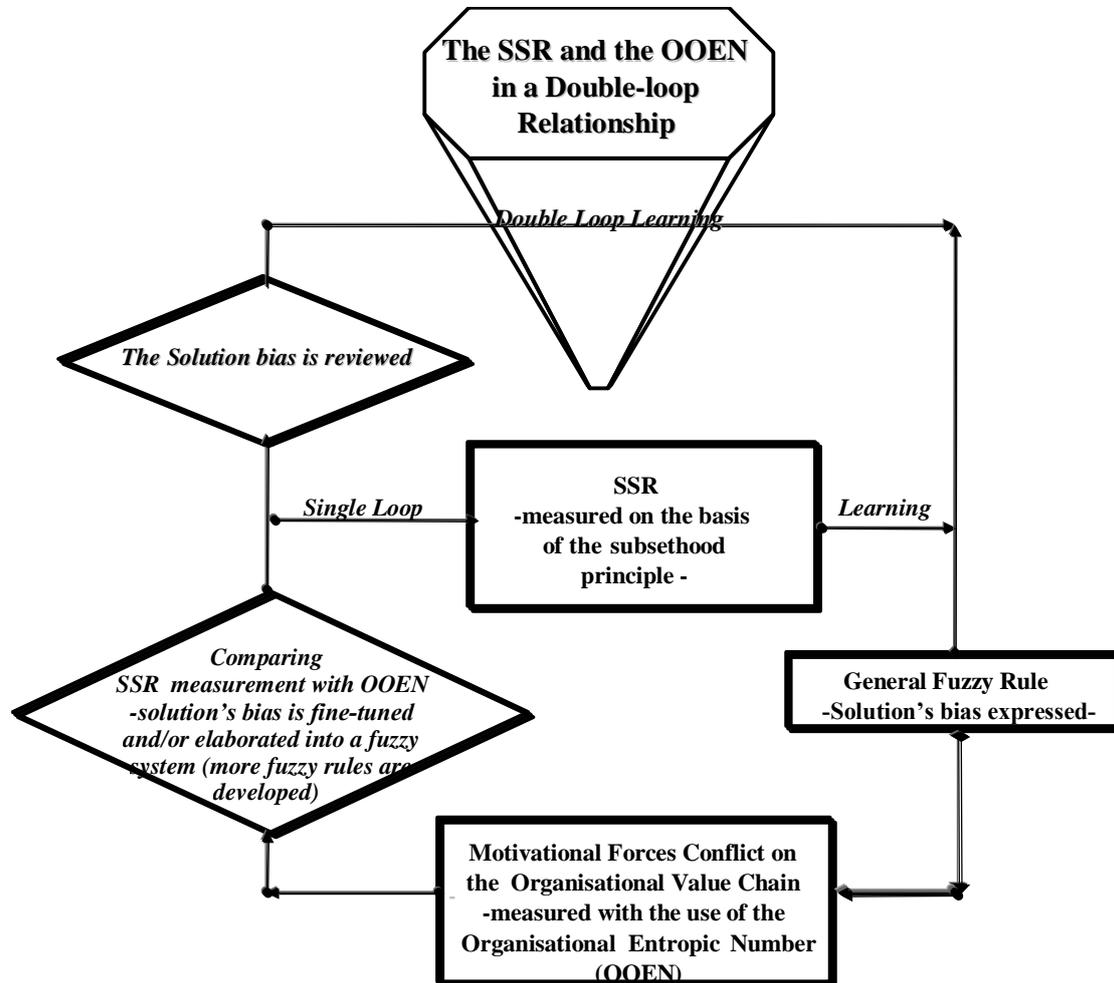


Figure 4

The business system should be analysed from the outside as a relatively objectified system, and from the inside as a HAS. The outside view should be systemic and functionalist in the sense that it should examine the organisational instrumental purpose(s), namely its commercial rationale, in the light of systemic integration, cohesiveness and synergy, and closure (viability and identity) in cybernetic terms. The basic concept for the development of an organisational information system to support and constantly monitor and evaluate that systemic integration is the SSR. The inside view should be emancipatory, aiming at facilitating the HAS content to define the

*Developing Intrinsically Motivated IS*  
*- A Critical Systems Approach -*

organisational purpose(s) free from coercion and false consciousness. The basic concept for the development of an organisational information system to support, constantly monitor and evaluate the definition of the business purpose itself in critical systems terms, in an emancipatory manner, is the OOEN. The joining of the two in a double-loop would provide the organisation with an intrinsically motivated organisational information system. An information system that will constantly report, monitor and support the compatibility, in critical systems terms, of the organisational strategic orientation, value system, standards (policies), major competencies, process and functions with the organisational purpose.

For example, consider a proposed implementation of an Enterprise Resource Planning (ERP) system, such as JD Edwards, SAP or Baan, which is championed by the CEO and the corporate level. As mentioned earlier, these systems tend by their very nature to be organisation-centred rather than human-centred (Kling & Star, 1998).

An ERP implementation has serious effects on: the organisation's competitive advantage and strategic positioning; its value system efficiency and effectiveness; its structure in terms of degree of centralisation; its systems in terms of the formal and informal procedures that make the organisation go, day by day and year by year (e.g. capital budgeting, cost accounting, training systems, reward systems, budgeting systems); its skills in terms of the organisation's crucial attributes such as Du Pont's research prowess or Procter and Gamble's category management. From the BSPA point of view, an ERP implementation and its associated tailoring (set-up) is not only subject to the organisational purposeful behaviour and power structure, but can also

seriously influence them, either by disturbing the organisational power structure and/or by its ability to support the organisation's purpose, commercial rationale, value system, policies and procedures. In other words an ERP system can be influenced by, but equally can influence, all the elements of organisational mission. Thus an ERP implementation becomes subject to critical systems thinking. The fact that an ERP is concerned with the SSR parts in terms of the organisation's purposefulness and power structure makes it subject to the SSR probing. The style element in terms of the management's symbolic behaviour, and the staff element in terms of the stakeholders' morale, attitude, motivation, and behaviour, namely the semantics and the pragmatics of the individual/organisational ideology, that an ERP can influence and be influenced by, are dealt in BSPA's inside view. This treats the organisation as the by-product of the organisational HAS's complex-coercive relationships in which the implementation of an ERP can serve either to emancipate or subject. A critical systems or rather a BSPA ERP implementation, in the context of the knowledge-based society and the needs of knowledge workers, 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.

Therefore, an ERP implementation should be subject to critical systems thinking in order to secure the development of an human-centred organisational information system instead of an organisation-centred one. To support this, the ERP pre-selection questionnaires can be tailored in terms of the SSR parts for MCI recording purposes. These tailored questionnaires that are filled by the management group will provide the

analyst with the scope of the implementation (the business units that the ERP will encompass) and the scope of the ERP functionality (which modules and sub-modules, e.g., finance, production, distribution, will be implemented). The identification and resolution (or not) of the stakeholder's overlap areas, in the inside view, will provide the analyst with the content of the ERP tailoring (set-up or customisation) especially in terms of procedures, accesses and privileges that mirror organisational physical and/or logical hierarchies and power structures. It will also provide the analyst with the range and type of the organisational restructuring, as well as with the semantic and the pragmatic flow of information in the light of the organisational purpose. Examples of areas of dispute in the organisational value chain (based on our experience) include: the marketing manager disputes the production manager's control over R&D; the cost accounting department disputes the production department's control over purchasing; the sales department disputes the distribution department's scheduling; the management disputes the development of decision support systems with the centralised and "hard-report" oriented mentality of the IS department; the management disputes with the business units in regard to their information systems development independency. These are all areas where the stakeholders' material and informational interest clash, and entropic forces develop that threaten to lead the ERP and even the organisation to fail. Many ERP implementations fail because of the hard systems thinking that it is implicit in organisation-centred systems, overlooking the organisation's special nature and taking for granted the organisational purpose, or because the ERP implementers try to impose the implicit generic business purpose that the ERP by definition is designed for in order to be useful to different organisations. The coupling of the ERP implementation SSR measurement (MCI) and the ERP implementation OOEN in a double loop learning, that can be implemented in

a DSS tool, such as SAS or Cognos, can become an early warning system regarding the ERP's implementation success in mapping the system's dynamic and detail complexity. High negative MCI numbers (meaning disagreement between the management group) with high OOEN numbers at the set-up stages of ERP implementation imply limitless passive or active resistance in the live environment and high risks that the mapping of the organisation's operations in the implemented ERP would be unable to exhibit the requisite variety in order for the system to remain viable. In addition, the MCI-OOEN double loop learning at the ERP live stage can provide the stakeholders with knowledge about the sources of their motivation(s) and/or deception that led to a particular set-up as well as with the ability to be adaptive in regard to a continuous and ever-increasing or even chaotic rate of environmental changes within the constraints that the organisational ERP imposes on the business system's ability to reorganise in the face of environmental change. This is a business need that the ERP vendors themselves have realised, by trying to improve their designs with software tools that allow for quick ERP redesign in the light of an ever increasing rate of environmental change; environmental change whose perception by the business stakeholders is ideological, as the subsequent systemic adaptation will be also.

One of the major outputs of the inside view part of BSPA is the creation of a "profile" for every stakeholder identified. That profile includes the following information:

- 1) The stakeholders' ideology described on the basis of the steady states range vis-à-vis his/her description of the stakeholders' position on the organisational value chain

(perceived as well as official) and vis-à-vis the stakeholders' perception of the overall organisational purpose, strategy and structure and systems.

2) A description of the stakeholders' relationships with other inside and/or outside stakeholders vis-à-vis the conflict overlap areas that the stakeholders participates in.

3) A description of a particular stakeholder's socio-economic history.

Point (1) will enable the stakeholders to reflect on and thus inquire further about their purpose(s) by reflecting both on the sources of motivation and/or deception that are contained in their purpose(s) and also on the sources of collective motivation and/or deception that are contained in the business purpose(s) itself.

Point (2) will provide them with meaningful knowledge to the extent that it will enable them to reflect on their interactions with the other stakeholders in the light of their motivations and in relation to the constraints imposed by the instrumental design of the business system itself. Finally, point (3) will enable them to discern how their evolution in the organisation has influenced their present motivation and/or deception that are contained in their purpose in the light of the evolution of their material and informational interests as well as in the light of their interactions with other stakeholders in different time periods.

## **6. Conclusion**

The discussion in this paper leads us to conclude that the solution to the IS development problematic must look at purpose before developing IS, and must cope with the stakeholders' complex-coercive relationships and the phenomena of organisational power, coercion and false consciousness that characterise

contemporary business organisations. It must explicitly deal with organisational ideology and must take both an inside view (for emancipation) and an outside view (for systemic/functional integration). It must produce meaningful knowledge to the extent that it makes the stakeholders reflect on their ideological limits and inquire about their purpose(s) in relation to the business system and the other (perceived) stakeholders. In addition it must produce meaningful knowledge to the extent that it makes the stakeholders reflect on the sources of motivation and/or deception that are contained in their purpose(s) and the perceived business purpose(s) itself. Overall it must produce meaningful knowledge regarding the organisation's domain of problematic and solution, incipient instability arising from organisational conflict and the organisation's ability to adapt or influence its environment by achieving a steady-state at a particular point in time. This will ultimately produce an intrinsically motivated information system that is the result of theoretical and methodological complementarity.

For this purpose we have developed a Critical Systems Methodology, Business Systems Purpose Analysis (BSPA), as outlined above, which covers the whole range from the business systems systemic purpose definition to the very development of the corresponding organisational intrinsically motivated information system. Fuller details may be found in Panagiotidis (1998).

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