

THE INFORMATION SYSTEMS PROFESSIONAL AS A HERMIT: OF PLURAL RATIONALITIES, INFORMATION REJECTION AND COMPLEXITY

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Abstract

In this article, the contributions that Michael Thompson has made to the development of cultural theory are laid out. This is done by highlighting the ways in which Thompson has built upon the grid-group analysis of Mary Douglas. Thereafter, it is shown how cultural theory is compatible with, and can be strengthened by, the complexity theories that have been formulated within the natural sciences. The resulting theoretical framework is then applied to explain the persistent cultural gap between the business planning and the information systems-departments within companies. It will be argued and demonstrated that the information systems professional can usefully be understood as following the views and practices characteristic of the hermit, as defined in cultural theory.

Introduction

In 1986 Robert Galliers conducted a survey of information systems (IS) managers in 130 companies and found that there was a critical culture gap between business planning and information systems planning (Galliers & Somogyi 1987). This conclusion was confirmed by the Grindley survey of 100 companies in 1991 (Grindley 1991). Both surveys provided some contributing factors for the existence of the gap, but neither offered any theoretical propositions to explain the differences in perspective between the domains of business planning and information systems.

This article will attempt to develop an explanation for these differences in perspective, by trying to answer the following three questions: (a) why is there a 'culture gap' between the business and information systems domains; (b) why are there fundamental differences of perspective; and (c) why is communication between the two domains constrained? It will do so by examining two theoretical frameworks. The first theoretical framework is based on cultural theory, which arises from the work of anthropologists Mary Douglas and Michael Thompson. The second framework is based on the theories of complexity arising from biology, chemistry,

evolution, mathematics and physics. Employing cultural theory, it will be suggested that one of the major contributing factors for the differences in perspective between the two domains is lack of communication based on the notion of the rejection of information. Using theories of complexity (the term 'complexity' will be used for ease of reference), the article will explore some of the characteristics of organisations as complex evolving systems (Mitleton-Kelly 2003a) such as connectivity, interdependence, exploration-of-the-space-of-possibilities, emergence, far-from-equilibrium and co-evolution. Complexity complements cultural theory, and offers some deeper insights on the plurality of logics that it posits.

The article is based on research initiated by a field study in 85 organisations, in the United Kingdom (UK) and United States (US), across a broad cross-section of industries using a qualitative case-survey conducted in the late 1980s. By 'qualitative case-survey' is meant a method halfway between a survey and a case study. It combined the numbers usually involved in a survey, with the more extended access and depth of discussion of a case study. It was based on over 250 person-to-person semi-structured interviews using a list of topics, but the time spent on each topic was dictated by the role and interests of the interviewee. In most companies at least two individuals were interviewed: the business and information systems strategists (*i.e.*, individuals who either formulated or were influential in formulating the respective strategies). Whenever possible, those implementing or those affected by the implementation of the strategy were also interviewed. These individuals were interviewed for two main reasons: to ascertain the degree and effectiveness of communication of strategic intent within and between the strategy domains; and to provide richness of perspective.

The findings and patterns emerging from the qualitative case-survey supported the Galliers and Grindley surveys and confirmed the existence of a 'culture gap' between business planning and information systems planning. These findings were further reinforced by fuller case studies in the 1990s. The case studies differed from the survey in two key aspects. The cases involved many more individuals within each domain and thus provided greater replication and stronger validation; topics were discussed in greater depth; and processes were studied over time, which allowed observation of their development and evolution. Furthermore, the same individuals were interviewed over a period of several months. This developed a relationship of greater depth and trust between the interviewee and the researcher and enabled the latter to reach a better understanding of the issues, processes and context of each organisation.

The article will outline cultural theory, short for theory of socio-cultural viability, as developed by Thompson, Ellis and Wildavsky, (1990) and Thompson (1996) from the grid-group typology proposed by Mary Douglas (1982).¹ The article will develop the fifth archetype of autonomy within an organisational context and discuss the notion of information rejection. In parallel it will explain how some of the principles of complexity apply to cultural theory. In the process it will explore the reasons for the existence of a culture gap.

The Theory of Socio-Cultural Viability

According to Thompson, cultural theory is based on the premise that “there is no such thing as an organisation; there are only ways of organising and disorganising” (Thompson 1996: 46-47). This does not mean that organisations do not exist or that they are not organised, what this proposition means is that the persistence of an institution “cannot be accounted for in terms of a single organising principle” (*ibid.*). Consequently, more than one style or organising principle can be found in any one company or purposeful social grouping. If organisation is never singular, then *an organisation* is a contradiction in terms. And if this argument is accepted, then the classic definition of management within an organisation collapses, as it is founded on a fallacy of misplaced concreteness: the assumption that there really are such things as single organisations. The theory shifts attention away “from the non-existent organisations to what does exist, which are ways of organising and ways of disorganising” (*ibid.*).

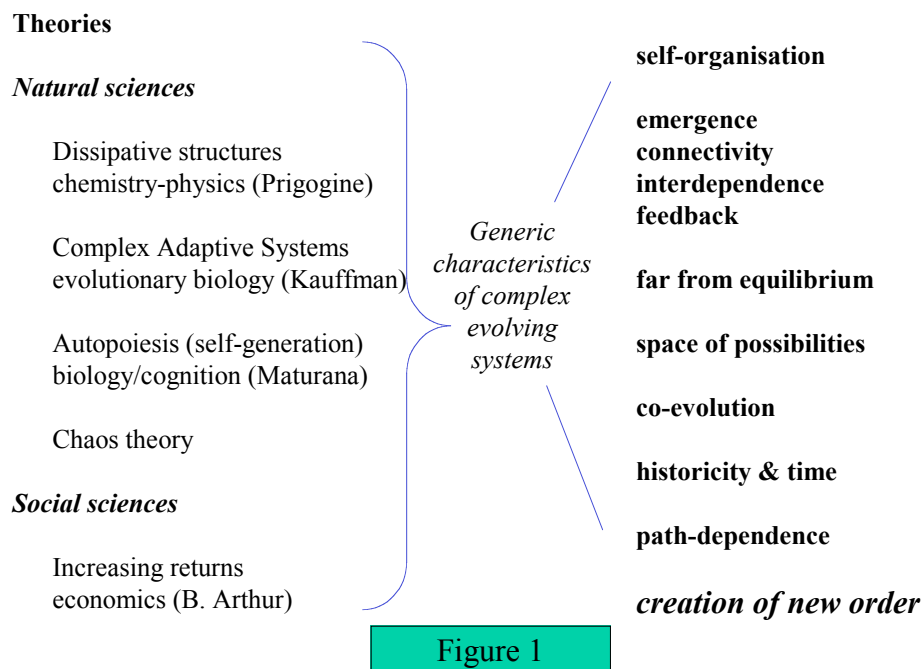
There are four different ways of organising, which at their extreme or archetypal state, are mutually irreconcilable as they are based on alternative rationalities or sets of convictions about how the world is (Thompson et al 1990). Socio-cultural viability theory, or cultural theory for ease of reference, is based on the assumption that the different ways of organising reflect incompatible world views, cosmologies or rationalities. The essential insight of the theory is that each archetypal position embodies a fundamentally different logic from the other extreme states. This inevitably leads the holder to totally different conclusions about the consequences of action and intervention.

This article will argue that organisations are made up of several ‘ways of organising’, which can be mapped onto, and explained in terms of, cultural theory. One way of organising and its associated behaviours, standards and shared values (which for ease of reference may be called a ‘culture’) may be dominant. An institution is usually identified with that single dominant culture, on the erroneous ontological assumption that only one unifying culture exists. This assumption may be at the root of the ‘culture gap’ between the business and information systems domains. The different rationalities held by each domain are so profoundly different that it would be more surprising, if a gap did not exist. One of the objectives of this article will be to explain why these differences exist. The argument will be based on the assumption of multiple rationalities, which become manifest in the way of organising of each archetype and on the way each uses information. The notion of the rejection of information will be introduced and offered as a contributing factor for the existence and persistence of the ‘gap’.

Complexity Theory

A complex world accommodates a multiplicity of different rationalities, *i.e.*, different ways of seeing and thinking about the world. Complexity theory focuses on the interaction of multiple perspectives. As the language of complexity needs to be interwoven with that of cultural theory, this may be an appropriate place to introduce a few terms describing the principles of complexity. A full description of ten generic principles of complex evolving systems may be found in Mitleton-Kelly 2003a. The following is a summary of several of those principles.

There is no single unified Theory of Complexity, but several theories arising from various natural sciences studying complex systems, such as biology, chemistry, computer simulation, evolution, mathematics, and physics. This includes the work undertaken over the past four decades by scientists associated with the Santa Fe Institute in New Mexico, USA, and particularly that of Stuart Kauffman (1993, 1995, 2000), John Holland (1995, 1998), Chris Langton (Waldrop 1992), and Murray Gell-Mann (1994) on complex adaptive systems (CAS), as well as the work of scientists based in Europe such as Peter Allen (1997) and Brian Goodwin (1995, Webster & Goodwin 1996); Axelrod on cooperation (1990, 1997; Axelrod & Cohen 2000); Casti (1997), Bonabeau *et. al.* (1999), Epstein & Axtel (1996) and Ferber (1999) on modelling and computer simulation; work by Ilya Prigogine (1990; Prigogine & Stengers 1985, Nicolis & Prigogine 1989), Isabelle Stengers (Prigogine & Stengers 1985), Gregoire Nicolis (Nicolis & Prigogine 1989, Nicolis 1994) on dissipative structures; work by Humberto Maturana and Francisco Varela (Varela & Maturana 1992) and Niklaus Luhman (1990) on autopoiesis (Mingers 1995); as well as the work on chaos theory (Gleick 1987) and that on economics and increasing returns by Brian Arthur (1990, 1995, 2002). All this work is summarised in Figure 1, which shows the five main areas of research that form the background to the ten generic principles of complexity identified by Mitleton-Kelly (2003a). Since these principles incorporate more than the work on complex adaptive systems, the term ‘complex evolving systems’ will be used.



By comparison with the natural sciences there was relatively little work on developing a theory of complex social systems despite the influx of books on complexity and its application to management in the past 7-8 years (an extensive review of such publications is given by Maguire & McKelvey 1999). The notable exceptions are the work of Luhman on autopoiesis, Arthur in economics, and the work on strategy by Lane & Maxfield (1997), Parker & Stacey (1994) and Stacey (1995, 1996, 2000, 2001).

The principles are generic, in the sense that they are common to all natural complex systems. However, human systems do differ in one important respect from all other complex systems. Humans are able to reflect and to change the way that they interact. Cultural theory shares this belief, which needs to be kept in mind during the following discussion on complexity.

Connectivity, Interdependence and Multiple Rationalities

Complex behaviour arises from the inter-relationship, interaction, and inter-connectivity of elements within a system, and between a system and its environment. Murray Gell-Mann (1995) traces the meaning to the root of the word:

Plexus means braided or entwined, from which is derived *complexus* meaning braided together, and the English word 'complex' is derived from the Latin. Complex behaviour therefore arises from the *intricate inter-twining or inter-connectivity of elements within a system, and between a system and its environment.*

In a human system, connectivity and interdependence means that a decision or action by any individual (group, organisation, institution, or human system) may impact related individuals and systems. That impact will not be equal or uniform, and will vary with the 'state' of each related individual and system at the time. The 'state' of an individual or a system will include its history and its constitution, which in turn will include its organisation and structure. Connectivity applies to the inter-relatedness of individuals *within* a system, as well as to the relatedness *between* human social systems, which include systems of artefacts such as information technology systems and intellectual systems of ideas.

Complexity theory, however, does not argue for ever-increasing *interconnectivity*, for high connectivity implies a high degree of interdependence. This means that the greater the interdependence between related systems or entities, the wider the 'ripples' of perturbation or disturbance of a move or action by any one entity on all the other related entities. Such high degree of dependence may not always have beneficial effects throughout the ecosystem. When one entity tries to improve its fitness or position, this may result in a worsening condition for others. Each 'improvement' in one entity therefore may impose associated 'costs' on other entities, either within the same system or on other related systems.

Connectivity, or interdependence, represents one aspect of how complex behaviour arises. Another important and closely related aspect is that complex systems are *multidimensional*, with all the dimensions influencing each other. In a human context, the social, cultural, technical, economic and global dimensions may impinge upon and influence each other.

In addition, complex systems accommodate *multiple and contradictory rationalities* or ways of seeing the world. They interact and influence each other, in the way described by cultural theory.

But the distinguishing characteristic of a complex evolving system is that it is able to *adapt* and *evolve* and thus create *new order and coherence*. This creation of new order and coherence is one of the key defining features of complexity. Individuals acting 'at random' or with their own agendas nevertheless can work effectively as a group or an entire organisation – and may create coherence in the absence of any

grand design. They can also create new ways of working, new structures, and different relationships, where hierarchies may be reversed or ignored, as in integrated project teams² where a senior executive outside the team may not hold a leadership role within the team, while a more junior employee becomes team-leader because he/she has the correct qualifications for leading that particular integrated project team. Complex characteristics tend to be *scale-invariant* and could apply at all scales from an individual to a whole system as well as to systems at different scales (e.g. team, organisation, industry, economy, *etc.*).

Co-evolution

Connectivity applies not only to elements within a system, but also to related systems within an ecosystem. As entities and organisms interact and adapt within an *ecosystem* they alter “both the fitness and the fitness landscape of the other organisms” (Kauffman 1993: 242).³ The way each element influences and is in turn influenced by all other related elements in an ecosystem is part of the process of co-evolution, which Kauffman describes as “a process of coupled, deforming landscapes where the adaptive moves of each entity alter the landscapes of its neighbors” (Kauffman & Macready 1995).

Another way of describing co-evolution is that the evolution of one domain or entity is partially dependent on the evolution of other related domains or entities (Ehrlich & Raven 1964, Pianka 1994, Kauffman 1993 & 1995, McKelvey 1999a & b, Koza et al 1998); or that one domain or entity changes in the context of the other(s). The main point, however, to note is that co-evolution involves reciprocal influence and change within a co-evolving ecosystem. If influence and change are entirely in one direction, then that would be more accurately described as adaptation to a changing environment. However, short-term adaptation may result in long-term co-evolution, if the entities in due course influence and change each other.

A social ecosystem includes multiple dimensions such as the social, cultural, technical, geographic and economic dimensions and co-evolution may affect both the form of institutions and the relationships and interactions between the co-evolving entities (the term *entity* is used as a generic term which can apply to individuals, teams, organisations, industries, economies, *etc.*).

In a social co-evolving ecosystem, each organisation is a fully participating agent, which both influences and is influenced by the social ecosystem made up of all related businesses, consumers, and suppliers, as well as economic, cultural, and legal institutions. Strategies consequently cannot to be seen simply as a response to a changing environment, which is separate from the organisation, but as adaptive moves, which will affect both the initiator of the action and all others influenced by it. The notion of co-evolution is thus one of empowerment, as it suggests that all actions and decisions affect the social ecosystem. No individual or organisation is powerless – each entity’s actions reverberate through the intricate web of inter-relationships and affects the social ecosystem.

Dissipative Structures, Far-from-equilibrium

Another key concept in complexity is *dissipative structures*, which are ways in which open systems exchange energy, matter, or information with their environment and which when pushed *far-from-equilibrium* create new structures and order. In 1977,

Ilya Prigogine was awarded the Nobel Prize for chemistry for his work on dissipative structures and his contributions to nonequilibrium thermodynamics. Prigogine has reinterpreted the Second Law of Thermodynamics. Dissolution into entropy is not an absolute condition, but “under certain conditions, entropy itself becomes the progenitor of order” (Prigogine & Stengers 1985: xxi). To be more specific (*ibid.*):

... under non-equilibrium conditions, at least, entropy may produce, rather than degrade, order (and) organisation ... If this is so, then entropy, too, loses its either/or character. While certain systems run down, other systems simultaneously evolve and grow more coherent.

Complex systems are characterised by *symmetry breaking*, which means that the homogeneity of a current order is broken and new patterns emerge. Symmetry breaking may be understood as a generator of information, in the sense that when a pattern of homogeneous data is broken by differentiated patterns, the new patterns can be read as ‘information’. This phenomenon applies to and can be interpreted at different levels, from undifferentiated code (homogeneous data) to exception reporting, when different or unexpected patterns appear to deviate from the expected norms.

In dissipative structures the tendency to split into alternative solutions is called *bifurcation*, but the term is misleading in that it means a separation into two paths, when there may be several possible solutions. Before the system settles into one solution, several alternatives were possible.

Historicity

An observer could not predict which state will emerge (Nicolis & Prigogine, 1989: 72):

only chance will decide, through the dynamics of fluctuations. The system will in effect scan the territory and will make a few attempts, perhaps unsuccessful at first, to stabilize. Then a particular fluctuation will take over. By stabilizing it the system becomes a *historical object* in the sense that its subsequent evolution depends on this critical choice.

In a social context, it is the series of critical decisions each individual takes from several possible alternatives that may determine a particular life path for that individual. The alternatives available, however, are constrained by the person’s current state and the state of the landscape that the person occupies. Thus, the emergent behaviour of the person is not a matter of ‘chance’, but is the result of a person’s selection among a finite set of perceived choices, as well as past choices made in the past that have shaped that person’s life path. Once the decision is made, there is a historical dimension and subsequent evolution may depend on that critical choice. Yet before the decision is finalised, the alternatives are sources of *innovation* and *diversification*, since the opening up of possibilities endows the individual and the system with new solutions. When a social entity (individual, group, organisation, industry, economy, country, etc) is faced with a constraint, it finds new ways of operating, because away-from-equilibrium (established norms or patterns of work and behaviour) systems are forced to experiment and explore their *space of possibilities*,

and this exploration helps them discover and create new patterns of relationships and different structures.

Exploration-of-the-space-of- possibilities

Complexity suggests that to survive and thrive an entity needs to explore its space of possibilities and to generate variety. Complexity also suggests that the search for a single ‘optimum’ strategy may neither be possible nor desirable. Any strategy can only be optimum under certain conditions, and when those conditions change, the strategy may no longer be optimal. To survive an organisation needs to be constantly scanning the landscape and trying different strategies. An organisation may need to have in place several micro-strategies that are allowed to evolve before major resources are committed to a single strategy. This reduces the risk of backing a single strategy too early, which may turn out not to be the best one, and supports sensitive co-evolution with a changing ecosystem. In essence, unstable environments and rapidly changing markets require flexible approaches based on requisite variety (Ashby 1969).

Self-organisation, Emergence and the Creation of New Order

Self-organisation, emergence and the creation of new order are three of the key characteristics of complex systems. Kauffman in the *Origins of Order: Self-Organization and Selection* (1993) focuses on self-organisation and describes his argument in the title. He calls Darwinian natural selection a “single singular force” and argues that (Kauffman, 1993: xiii):

It is this single-force view which I believe to be inadequate, for it fails to notice, fails to stress, fails to incorporate the possibility that simple and complex systems exhibit order spontaneously.

That spontaneous order is *self-organisation*; he brings all three characteristics together when he refers to “the spontaneous emergence of order, the occurrence of self-organisation” (*ibid.*). Kauffman argues that natural selection is not the sole source of order in organisms and suggests that both natural selection and self-organisation are necessary for evolution. He then proceeds to expand evolutionary theory to incorporate both evolutionary forces.

Emergent properties, qualities, patterns, or structures, arise from the interaction of individual elements. They are the structures or patterns that appear at the next macro level as a result of interaction at a lower micro level. The relationship between the micro-events and macro-structures is iterative – it is a co-evolutionary process whereby the individual entities and the macro-structures they create through their interaction, influence each other in an ongoing iterative process. Emergence is the process that creates new order together with self-organisation.

Emergence in a human system tends to create irreversible structures or ideas, relationships and organisational forms, which become part of the history of individuals and institutions and in turn affect the evolution of those entities. *E.g.*, the generation of knowledge and of innovative ideas when a team is working together could be described as an emergent property, in the sense that it arises from the interaction of individuals and is not just the sum of existing ideas, but could well be something quite new and possibly unexpected. Once the ideas are articulated they form part of the history of each individual and part of the shared history of the team –

the process is not reversible– and these new ideas and new knowledge can be built upon to generate further new ideas and knowledge.

New knowledge needs to be shared, to generate further new learning and knowledge. There are many reasons why this process is severely limited in most organisations. One of those reasons may be that learning is often seen exclusively as the provision of individual training. Another may be that the generation and sharing of knowledge is identified with the capturing of data and information in a database. This is not what the current argument is about. It is about understanding connectivity, interdependence, emergence and self-organisation. It is about how these characteristics of a human organisation, seen as a complex evolving system, work together to create new order and coherence, to sustain the organisation and to ensure its survival, particularly when its environment or social ecosystem is changing fast. Another reason is the rejection of information. This argument was posited by Thompson and will be discussed later in the article.

Grid-Group Analysis: The Work of Mary Douglas

Mary Douglas introduced grid-group analysis in a paper called ‘Cultural Bias’. Her premise is that individuals are constantly altering their particular social environment by negotiating with others about standards and values, about how life should be lived. In this transaction process, “units of culture” (Douglas 1982: 189) are used as the negotiating medium. People’s social contexts impose limits or bounds on the negotiability of culture. Any social context consists of at least two parts: (1) the deep accumulation of past actions and decisions providing a common social context; and (2) the specific context of present-day decisions. Each present decision is made within a fresh context of past actions – those which landscape an individual’s new choices. Thus, each individual is playing a part in transforming the social environment, but within bounds. What Douglas is describing is historicity and co-evolution within a changing landscape. The social context of individual people also reflects their beliefs and values, which form justifications for action. Douglas regards the latter as constituting “an implicit cosmology”. Having divided experience into *social context* and *cosmology*, she then derives a full array of possible social structures on the basis of two dimensions: *grid* and *group*.

Group refers to the extent to which an individual is incorporated into bounded units. The greater the incorporation, the more individual choice is subject to group determination, the tighter the control over admission into the group and the higher the boundaries separating members from non-members. The group is defined in terms of the (*ibid*: 191):

claims it makes over its constituent members, the boundary it draws around them, the rights it confers on them to use its name and other protections, and the levies and constraints it applies.

The group provides the social context, within which individuals interact with each other. But to capture the interactions that create most constraint upon individual behaviour, a second dimension is required, that of grid, which suggests the background of rules to which individuals are subject in the course of their interaction. Grid denotes the degree to which an individual's life is circumscribed by externally

imposed prescriptions. The higher the grid, the more individuals are kept apart by explicit institutionalised classification, which regulates individual interaction. The lower the grid, the more individuals are expected to negotiate their own relationships with others. The more binding and extensive the scope of the prescriptions is, the less of life that is open to individual negotiation.

Combining the two dimensions leads to the following picture:

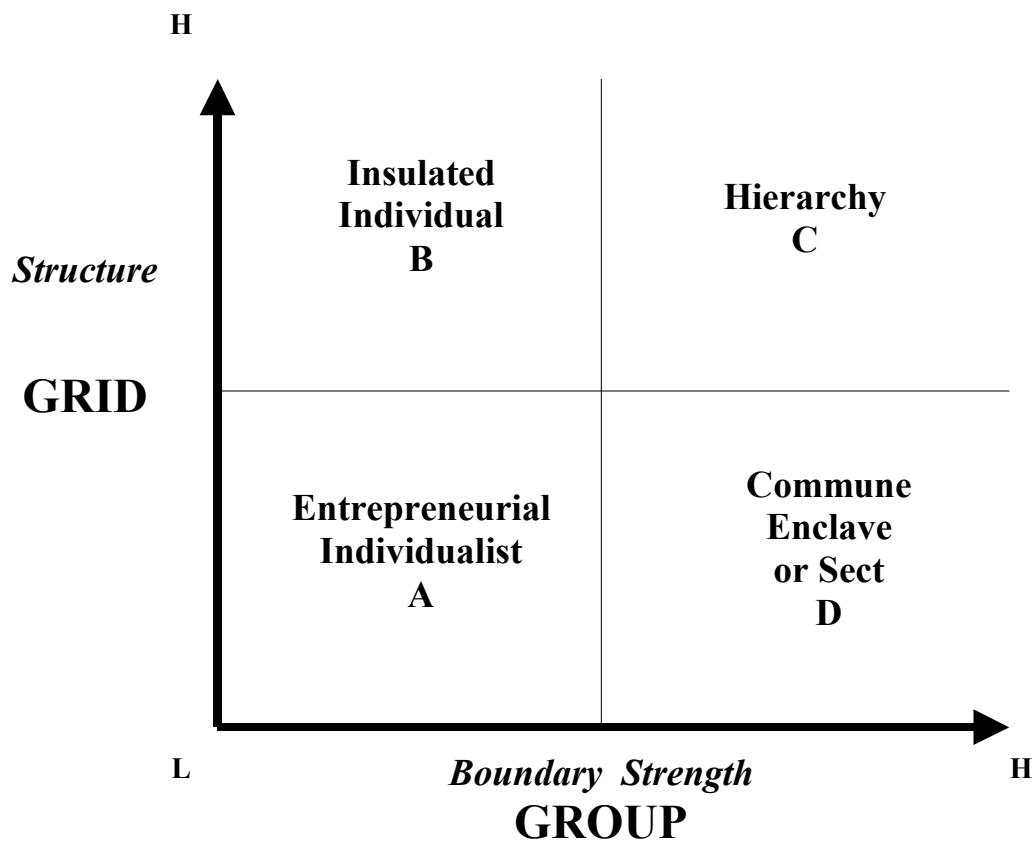


Figure 2
Four Types of Organisational Context

Position C, labelled hierarchy, is the kind of organisation which exhibits a high degree of structure and which prescribes the position of individuals within the group. This type of organisation has a deep hierarchical structure and strong group boundaries which incorporate the whole entity. By contrast, strong group D, on a low grid position, has minimum internal structure. The community at D may be called a commune, or enclave or a sect. It has a strong boundary, which provides a sharp distinction between members and non-members of the group, but within, there is no structure and everything is open to negotiation. The other two positions show persons isolated from others. The individualist at A has both weak boundary strength and weak structure, but is an entrepreneur and is able to negotiate with others. In this position, all boundaries are provisional and subject to negotiation. The insulated individual at B cannot negotiate, is subject to binding prescriptions, and is excluded

from group membership. Individual B feels controlled from outside and his sphere of individual autonomy is restricted, like that of the hierarchist.

The grid-group framework does not assume a predetermined classification of individuals or choices. The analysis “treats the experiencing subject as a subject choosing”. (Douglas 1982:198) The method allows for constant interaction between the individual and the environment, and assumes that both the individual and the environment can change, *i.e.*, can co-evolve. The individual may change position within the framework by choosing to do so, while the environment is not static but in flux, as it consists of all the other interacting individuals and their choices

The possibility of transformation for an individual starts by identifying choices. In this way, an individual is exploring the space of possibilities that may lead to innovation and the creation of new order. A group is not taken to be formed, solid, and existing independently of the volition of its constituent members. It is their commitment of time and energy which gives it its being and justifies its existence, and individual choice may be over-ridden and brought into line for the good of the group. On the other hand, the unique value ascribed to the individual person, may be the single cultural value, which justifies movement towards low grid. Shifts may not affect the community as a whole, but only individuals changing positions.

The grid-group approach cuts across the class structure. In the words of Douglas (1982: 199-200):

It is a method of identifying cultural bias, of finding an array of beliefs locked together into relational patterns. The beliefs must be treated as part of the action, and not separated from it as in so many theories of social action.

The argument allows scope for individual disagreements, for rebellion, and for mustering of support to change the whole context. The possibility of insurrection will be discussed later in this article. The argument allows for movement from one place on the map to another, which is expected to be more congenial.

Douglas’s approach is not anchored on any epistemological base, such as economics or psychology or technology, but “floats upon the shifting interaction of intelligent subjects” (Douglas 1982: 200). It is not individual positions that are claimed to be stable and determined, but the range of cosmological possibilities in which individuals can find themselves by choosing to deal with social problems in any particular way.

The framework provides structures of behaviour, which provide continuity from one social context and its supporting cosmology, to another. The typology only names four extreme cases for clarification in demonstrating the argument. Furthermore, classification into types allows generalisation. Grid-group is a polythetic method of classification: “it identifies classes by a combination of characteristics, not requiring any one of the defining features to be present in all members of a class” (Douglas 1982: 201). Each member of a class only needs to demonstrate a majority of the features in the class. The method’s scale ordering also avoids the problem of sharp dichotomies. We therefore only need to look for combinations of beliefs in all the possible social contexts in which the individual has to operate, which are limited and clarified by the grid-group axes. The level of analysis is that of justification and explanation of social action: why individuals behave as they do.

In 1992, at an LSE Strategy Seminar,⁴ Mary Douglas described a more refined typology, which applied to organisations rather than to individuals within a social environment. The horizontal group axis was defined as “boundary strength”, that is the strength of the boundary around the community. The vertical grid axis was called “structure” which defined the degree of prescription within an organisation, the degree of prescribed control on behaviour, and the degree of prescription complexity.

Cultural Theory: The Work of Michael Thompson

Douglas started with social environments and cultural bias and drew the distinctions from an anthropological perspective. Thompson (1996) has built on that perspective by superimposing two pairs of discriminators: equality and competition. Thus, he arrived at the four ways of organising shown in Figure 3.

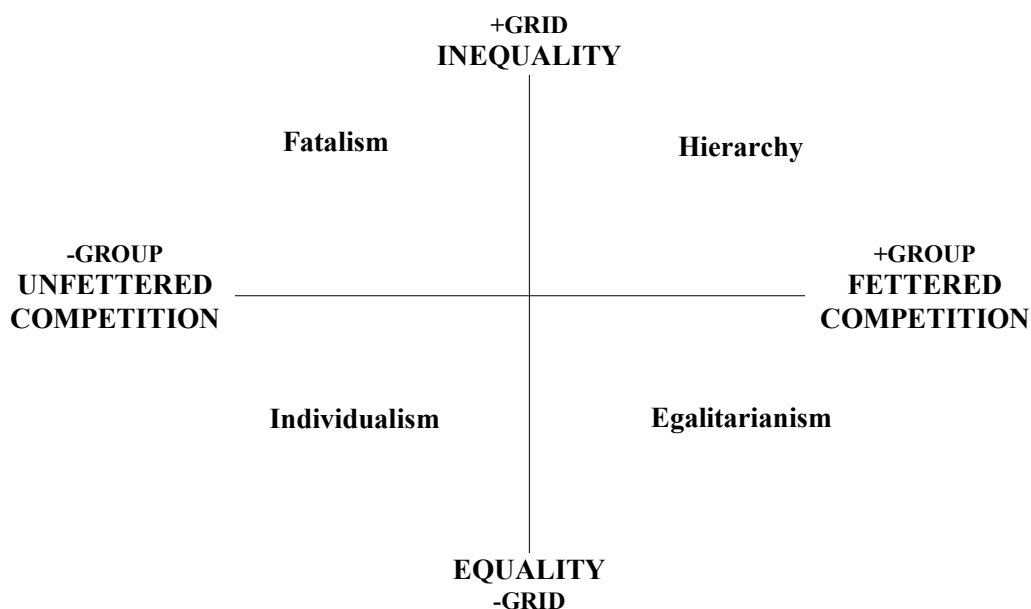


Figure 3
The Ways of Organising
(after Thompson 1996)

The four ways of organising are sustained by contradictory certitudes, four mutually irreconcilable sets of convictions about how the world is, which are *at the centre* of cultural theory. Yet, cultural theory is also referred to as “the theory of plural rationality”, as its fourfold typology provides four different frameworks for deciding what should count as rational and what should count as irrational. Thompson asserts that management science, organisation theory, decision theory and economic theory are built on the notion of rationality in the singular, which would be fine if organisation were singular. Since it is not, we need to be careful about relying on

theories and methods that depend upon single metrics, a single definition of the problem.

Myths of Nature

Contradictory certitudes about how the world is are not random, there is a pattern to their different responses, and their decisions can be rendered rational in terms of four myths of nature. Thompson has drawn upon a typology of myths of nature derived from ecology that is compatible with the four ways of organising. These myths of nature are sets of assumptions about stability and change in the natural world. Myths, according to ecologists, are not falsehoods, but rather partial truths – each myth captures in simple and elegant form some essence of experience and wisdom. Each particular myth can be represented by a picture of a ball in a landscape. The four myths of nature, shown in Figure 4 will first be described and then be superimposed on the four ways of organising.

Nature benign is represented as a ball in a basin, which in turn represents global equilibrium. This is a forgiving world, capable of absorbing all kinds of disturbance: whatever knocks the ball is dealt, it will always return to the centre. As a consequence, the managing institutions can take a *laissez-faire* attitude. Classical economics has bequeathed us the equilibrium model, which is now being challenged by complexity theories. The *laissez-faire* attitude that it engenders is only sustainable when there is little turbulence or change in the environment. But in a constantly changing environment, an organisation that does not acknowledge the changes surrounding it is unlikely to survive. Those that survive understand that a single optimum solution (at equilibrium) is only viable for a limited time. They realize that they need to explore their space of possibilities and create new order or new ways of organising so that they are continually co-evolving with their changing environment.

Nature ephemeral posits the exact opposite and is represented as a ball on an upturned basin. It views the world as an unforgiving place in which the least jolt may cause catastrophic collapse. Thus, the managing institutions and everyone else must tread lightly on the earth and observe a very strict precautionary principle.

Nature perverse/tolerant is represented by a ball in a valley between two hills. It is forgiving of most events but is vulnerable to the occasional knocking of the ball over the rim. Consequently, the managing institutions have to develop the expertise to determine the precise position (or boundary) of the rim and to ensure that everyone stays on the right side of that rim. This model leads to statutory regulation and the acceptance of tolerable risk.

Nature capricious is a world which operates without rhyme or reason. It is portrayed as a ball on a plane. Institutions subscribing to this myth neither manage nor learn. They cope as best they can with erratic and unpredictable events. Their motto: ‘why bother, whatever one does is not going to make any difference’.

The four myths of nature are *contradictory* in that they cannot all be true at the same time and place. The behaviour which each of these myths justifies, appears irrational, if not criminally irresponsible, to those who cling to one of the other myths. But if each myth is seen as encapsulating a fundamentally different world view, then each actor is perfectly rational given his or her conviction about how the world is. There is always enough uncertainty to enable individual actors to take up any one of

the four positions on policy. The situation is one of plural, but not infinite and not arbitrary rationality.

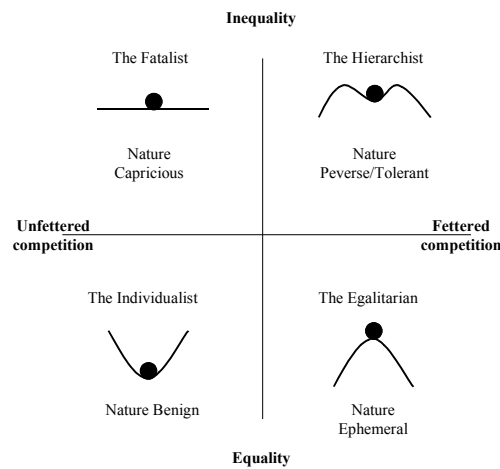


Figure 4
Four Myths of Nature (after Thompson et al., 1990)

Each actor is given his or her convictions through the institutions – the various patterns of relationships which people both build for themselves and find themselves built into. These patterns of relationships are the various ways of organising and disorganising that constitute the cultural theory diagram. Each myth is only supportive of one way of organising and undermines the others. Ways of organising cannot be mixed and matched with beliefs and values, There is a mutual functionality within each pairing. All four pairings will be found in various patterns of contention within what is habitually called an organisation. It is necessary to refer to the resulting policy preferences to see how each myth is supportive of just one of the ways of organising. If it were held by those who were organised in any of the other three ways, then it would inevitably lead to its collapse. For instance, if a hierarchist who believed in statutory regulation and was occupied with limiting competition, regulating and setting safe standards, were to come to believe in nature benign and start acting as an entrepreneur, he would find it very difficult to operate within a tightly regulated hierarchical organisation. Such a social environment would find entrepreneurial behaviour alien and would seek to expel it.

Fourfold cultural pluralism is essential; the three active rationalities –the hierarchical, the individualistic and the egalitarian ones– structure the world in different and, in the right circumstances, complementary ways. Fatalists are essentially passive. Each of the three active rationalities seeks to advance its cause by mobilising the fatalists behind it. Fatalists are an undifferentiated resource, which each of the other ways of life can draw on to strengthen and renew itself and if the fatalists were not there the endless renewal would not go on.

Requisite variety is always present. According to cultural theory, all ways of organising are present, but may not be manifest at the crucial decision making levels. Thompson (1996) suggests that an organisation can legitimate the individualistic and egalitarian certitudes, which tend to be squeezed out in a large and predominantly

hierarchical organisation, and can ensure that proposals are exposed to these certitudes as well as to those that blossom naturally within the culture. This can be done informally through role-playing, or formally through techniques such as scenario planning. Organisations also need to be aware of established methods and procedures, which deny plurality and rely on single metrics.

When companies and institutions attempt to create a single unifying culture or way of organising, they are denying that other ways of organising can co-exist within the same entity. The attempt shows that the dominant culture wishes to impose its set of values, as each way of organising is coupled or paired with a set of beliefs and values. Yet companies and institutions are in practice made up of a plurality of rationalities and ways of organising. *The culture gap arises not so much because the differences exist but as a consequence of denying that plurality.* The business domain can only see and accept methods of planning and ways of developing strategy, which are known and accepted by that domain. Radically different approaches are not admitted as legitimate. This denies the possibility of legitimate plurality, which is an intrinsic aspect of a complex world.

A Fifth Way of Life: The Hermit or Recluse

The focal point of grid-group analysis is social control. Individuals are manipulated and try to manipulate others. The difference between them is the form of power. When Mary Douglas introduced grid-group analysis, she concentrated on four archetypes that are involved in some form of control and power, and avoided the possibility of the rejection of power and control. She did not deal with rejection, as it meant the negation of social interaction and a withdrawal from society. Douglas admitted that her diagram “does not deal with the possibility of voluntary withdrawal from society” (Douglas 1982: 204) and proceeded to explain that however withdrawal was defined, it could not be accommodated within the typology. She therefore decided “to take total withdrawal, however defined, right off the map” (*ibid.*: 204). The above discussion has also restricted itself to four ways of organising. There is a fifth possible way of life, that of the hermit or recluse “who escapes social control by refusing to control others or to be controlled by others” (Thompson *et. al.* 1990: 7). (The term ‘hermit’ and its associated way of life of ‘autonomy’ are used by Thompson, and the terms ‘recluse’ and ‘withdrawal’ are used by Douglas.) Although Douglas refuses to put the recluse on the social map, Thompson (1982) has introduced the hermit, and has positioned him in the centre of the grid-group framework.

Although the hermit is often not included in cultural theory discussions, he cannot be ignored. His very rejection of power and control brings each of the other four archetypes into sharper focus, refines the analysis and completes the range of possibilities. The hermit represents autonomy as a way of life. Although autonomy shares certain characteristics with all of the other ways of organising, its distinctive characteristic is its bias towards isolation and the rejection of competition and control. The reason for introducing the hermit is that a full analysis of the five archetypes shows that the information systems professional exhibits many of the hermit characteristics. If that proposition is accepted, then the reasons for the existence of the ‘culture gap’ between the business and information systems domains become clear.

Below, some of the characteristics of the hermit will be introduced. They will be compared and contrasted with each of the four engaged archetypes. The development of the argument should show whether the proposition ‘hermit = IS professional’ is sound. For the purposes of this analysis, the hermit archetype will be applied to the IS professional within the social environment of a company information systems department.⁵

The Hermit’s Myth

The hermit’s distinctive myth is that of Nature Resilient. The hermit sees the other four myths as dualistic: they all assume the clear separation of ball from landscape, while in his view “the movement of the ball actually alters the shape of the landscape through which it moves.” (Thompson et al 1990: 30) This characterisation is very similar to the concept of the deforming fitness landscape of complex systems described by Kauffman as “a process of coupled, deforming landscapes where the adaptive moves of each entity alter the landscapes of its neighbors” (Kauffman & Macready, 1995). The way that a fitness landscape resembles the hermit’s myth of nature is in the way that an entity (a ball) is part of its own landscape or ecosystem, and both affects and is affected by that ecosystem. In other words, it co-evolves with its changing ecosystem. Figure 5 shows a fitness landscape; another way of visualising it is to imagine a children’s ‘bouncy castle’, which changes with each move that each child makes on its surface. It illustrates how each decision or action influences and alters the landscape.

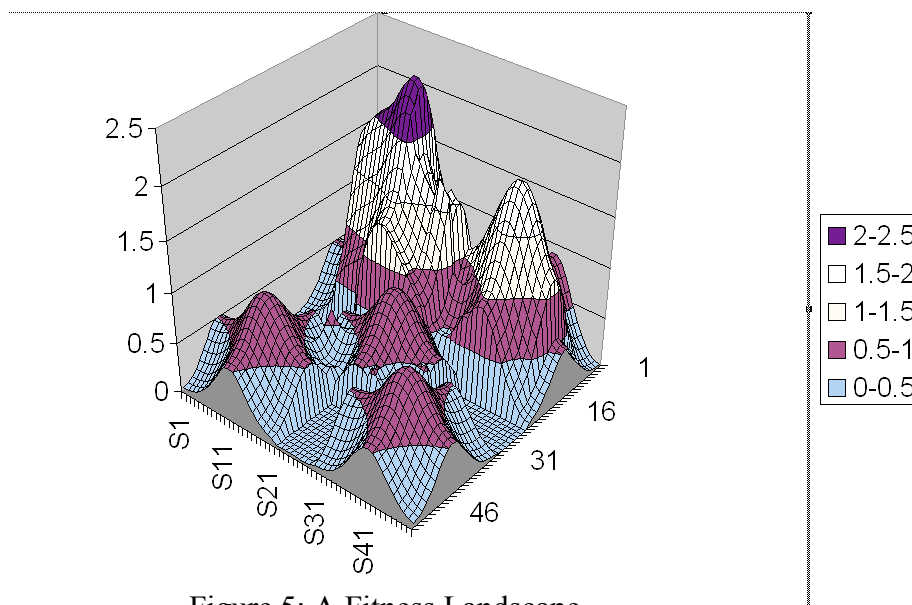


Figure 5: A Fitness Landscape

To illustrate the concept of the transformation of the ‘landscape’ by the movement of the ball, Thompson cites studies of fisheries and of farming systems in Canada, showing how (1995: 30-31):

policies that are based on the myth of Nature Perverse/Tolerant start well but end up increasing the ‘brittleness’ (and, hence, the unmanageability) of those systems.

Keeping the ball away from the boundary works and goes on working until that unsuspected moment when the bowl, which has been getting steadily shallower, ceases to be a bowl and becomes a bump instead. All is then lost; the tolerant pocket, which was the key to the management of the system, has disappeared and nature is suddenly everywhere perverse (a situation that is made sense of by the myth of Nature Ephemeral). Mathematicians refer to these sudden and discontinuous changes as ‘nonlinearities’. ... On a more local level, there is growing concern that economic management is relying on a linear model to manage a nonlinear economy.

By transcending the duality of ball and landscape, the myth of Nature Resilient, captures the transformational properties of the world, which the other four myths ignore and as such is essential in completing the range of possibilities. Because of its transformational nature, it is very difficult to depict this myth. Thompson describes it thus (*ibid*: 31):

The easiest way to visualize Nature Resilient is to consider what would happen to both ball and landscape if the ball sucked up the landscape as it moved through it. If we start off with a bowl-shaped landscape, we find that it changes first to a depression on a mesa, then to a flat surface, and then to an up-turned bowl. In the last situation, the ball will roll off, coming to rest only when it finds its way into another depression [see Figure 6]. This completes the transformational cycle, and the next one starts off from this new hollow. In this way the cycle –the myth of Nature Resilient– repeats itself but history does not. We come, not full cycle but full spiral.

It is interesting to note that the myth of Nature Resilient is the one that most closely describes a complex, co-evolving world and the idea of the spiral is the most apt description.

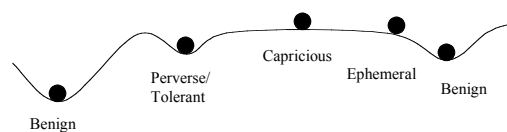


Figure 6
Nature Resilient: Transformational Properties of Ball and Landscape

Figure 6 is the graphical representation of the myth of Nature Resilient. It passes through all the other four myths of nature from Nature Benign, through Nature Perverse/Tolerant, and then Nature Capricious, to Nature Ephemeral and captures the transformational properties of all the other myths. The hermit's myth shows that change is inevitable and paradoxically also comes the closest to describing a complex world. This myth says that "to act in the world on the conviction that it is one particular way, ... is sooner or later to change the world to some other way" (1995: 32). Although the above has concentrated on the bias of each particular archetype, this dualism of stability versus change is not valid (1995: 33):

Without change there could be no stability. Like the ball and the landscape through which it moves, each is a part of the other. In much the same manner, our myths of physical nature and our concepts of human nature reinforce and enter into each other.

Patterns of Relationships

Cultural theory is not about personality types. It is an institutional, a contextual, an organisational theory. Different ways of seeing the world and behaving in the world go with different patterns, ways of being caught up in social relations. The five ways of organising are based on the formation (or absence) of social relations, which form patterns of relationships. These patterns can be seen in terms of groups and networks. If relationships are organised in a *group* pattern, then a mapping of that pattern will show the same set of relationships irrespective of the starting point. In other words, the mapping can start with any one individual and "will end up with the same pattern of relationships linking the same set of individuals (and separating them from all the other individuals who are not members of that group)". (Thompson *et. al.* 1990: 11) But if *networks* were to be mapped, then the pattern would turn out to be unique to each individual.

This distinction has been interpreted in social science as one of pattern and non-pattern. It is clear that groups do form patterns, but networks have been interpreted as the breakdown of pattern because they have no boundary and because (Thompson *et. al.* 1990: 12):

They are as numerous as the individuals who build them. ... The dimensions of grid and group ultimately derive from the recognition, first, that both groups and networks are patterns and second, that they can intersect with one another to create networks of groups (hierarchies) and groups of networks (markets).

Seen from a network perspective, individualists are network centralists, while fatalists are network peripheralists. Seen from a group perspective, egalitarians practice institutionalised equality, by connecting every individual to all other individuals within the group, while keeping their group separate from all other groups. And hierarchists practice institutionalised inequality by arranging their group, not themselves, into orderly and ranked relationship with other groups.

The four 'engaged' archetypes are distinguished by the pattern of relationships, which they favour and each tries to maximise its social involvement through that favoured pattern. The hermit archetype by contrast prefers to withdraw from social transactions and is an individual who deliberately withdraws from the coercive social involvement in which the other four social beings are involved. This

detachment is only meaningful, if there is a world to be detached from. The hermit's autonomous way of life becomes viable only in relation to the other four ways of organising, by choosing to withdraw from each and all the other patterns of relationship. In the words of Thompson *et.al.* (1990: 29):

Whereas the viability of each of the four engaged ways of life depends on the presence of the other three... the hermit's viability depends on the presence of all four. The hermit's bias is against the entire system that is sustained by the interdependencies of the other four biases.

This distinction is a key element in understanding the problems of attempting to integrate into a hierarchical organisation a collection of individuals, the IS professionals, who belong to neither group nor network. Patterns of relationships may also be seen as types of solidarity. The solidarity distinguishing individualists is ego-focused networks; that of hierarchists is ranked and bounded groups; and that of the egalitarian is bounded but unranked groups. While the fatalist is *excluded* from organised patterns, the autonomous, hermit archetype *shuns* human relations and prefers to be free of relationships. A significant proportion of the IS professionals interviewed, felt happier working with a machine than with other humans. (There were of course exceptions, but the incidence of hermit-type characteristics was of significant frequency.)

The Research Findings: The IS Professional as a Hermit

The following comments reflect the findings of the field research in 85 companies conducted in the late 1980s and early 1990s. As academic IS departments were not included in the field research, the findings are not extrapolated to apply to the academic IS community.

Hierarchy

A hierarchical organisational environment is characterised by adherence to rules and regulations. The hierarchist assumes control through the authority bestowed by tradition, and encapsulated by the explicit and implicit rules, which govern the behaviour of the institution. Planning and strategy approaches are based on the assumption that control of resources, actions and consequences is desirable and possible. Since the hierarchist believes that nature is tolerant within certain bounds, but perverse if the boundary is crossed, he will create rules and regulations, which limit and constrain behaviour within the acceptable boundary. The corollary of this is that the boundary must be clear and well-defined, and the managing institution has to develop the expertise to determine the exact position of the boundary and to create the rules that will keep everyone within it. That does not mean that a hierarchical organisation is totally averse to risk. It prides itself that it is far-sighted enough to take risks, but the risks taken must be within tolerable, predictable and thus acceptable limits.

The rationality, which underpins the hierarchical organisation, is bound with the belief that the institution, its environment and the world as a whole, are based on

structures which are subject to rules or laws. Behaviour at both micro and macro levels, ranging from the behaviour of the individual to the laws governing the universe, is seen as rule-governed and deterministic, as conforming to statistical probability and the law of averages and therefore as predictable. Once the laws are discovered and understood, then everything, including the future, can be manipulated and controlled. The hierarchical institution will therefore feel quite at ease with long term planning, based on careful, intricate and precise calculations predicting specific outcomes. This is the traditional method of planning favoured by the majority of companies, which participated in the field research during the late 1980s and early 1990s. The pattern repeated over and over again was the production of a three-year plan (a few organisations extended this period to five years) with an annual rolling financial plan. At 3, 4 or 6 monthly reviews, the actual outcomes were compared with the predicted outcomes and action was taken accordingly. If the actual results (usually expressed in precise financial terms) had not achieved the predicted figures, then the appropriate 'adjustment mechanism' would be put into effect.

Both the thinking and the language used, reflect the assumptions underlying the hierarchist's rationality. The world is like a machine, which can be adjusted – all that is required is to understand the principles by which the machine operates and then to use the right tools to achieve the desired end-result. When a stable, slowly changing environment seems to operate according to certain rules and when experience shows that certain actions tend to lead to particular consequences, the hierarchist's beliefs about the world are reinforced. The kind of planning approaches that are favoured rely on meticulous detail, based on 'accurate' measurement and detailed prediction. A hierarchy has a long history and has built up a tradition of how 'things are done'. This is reflected in its planning and strategy approach, which is based on extrapolation from the past into the future and in its expectation that the future will repeat the patterns of the past. It assumes sufficient stability for predictions to be accurate most of the time.

The hierarchical organisational environment is also characterised by ranked and bounded groups. Their 'tidy' multilayered structure and the strong sense of 'boundary' awareness are again expressions of control and are evident in the organisational structure, in the pattern of reporting, and in the assumption of responsibility and accountability. The pattern of relationships is institutionalised inequality and that characterisation captures the essential value system of a hierarchy through differentiation in rank, status and associated privileges. Examples of institutions with a dominant hierarchical organisational environment include many Civil Service Departments, and companies in the banking and manufacturing sectors.

The IS professional does not fit easily into the hierarchical organisational environment. He⁶ feels out of place in a tight multilayered structure with strict rules and regulations implying control. He neither wishes to be controlled by others nor to control. Although he operates within a mental universe of order and logic, he shuns the overt controlling of his actions. He reluctantly appears to accept imposed time and cost constraints, and then proceeds to ignore them. (This hypothesis may partially explain why IT projects are often not delivered on time or on budget. The IS professional's value system assigns such constraints to the periphery - they are not of central importance.) In terms of relationships and the circumscription of duties and responsibilities, he prefers the fuzzy to the clear cut and favours either an unspecified range of roles or a very narrow specialisation, which distances him from all others.

The aversion to boundaries also applies to his membership of groups. Although he belongs to a department or a function, he does not relish being seen as a member of any group. He is an individual within a loose alliance. The alliance is forced upon him by economic circumstances, but he will do everything within his power to preserve his autonomy. Even the language he uses, which often creates an impenetrable boundary, is not seen as creating a group boundary but as disassociating him from the rest of his 'colleagues'. He feels much more comfortable relating to a machine. He can understand it and predict its behaviour, while he can apply neither skill to other humans. In his affinity to the machine, the IS professional resembles the hierarchist but the similarity is limited. The hierarchist's view of the world as a machine is related to power over, and control of, others. The IS person does not seek power or control over others. The hierarchist uses the machine as a metaphor for the way the world is, whereas the IS person has a direct relationship with the technology. It is an association with something he has an affinity with, in terms of logic, structure, predictability and in its total lack of emotional involvement.

The approach to planning and strategy development of the IS professional reflects these characteristics. He prefers emergent to explicit strategy formulation and will restrict 'planning' to the short term and to specific practical projects. He will restrict himself to what can be achieved each day. This way he insulates and distances himself from the urgent demands of others.

If Douglas' assertion is accepted that the grid-group framework is a polythetic method of classification in that "it identifies classes by a combination of characteristics, not requiring any one of the defining features to be present in all members of a class" (Douglas 1982: 201), then the IS individual exhibits many of the hermit's characteristics and as such does not fit into the hierarchy quadrant.

Looking at the hierarchist and the hermit from a complexity perspective, it is not surprising that there is a culture gap between them. The hierarchist needs and wants to control everything and everyone around him. His view of the world as a machine reinforces his belief that control and predictability are possible. A complexity perspective with an emphasis on emergence, self-organisations, co-evolution, *etc.* is threatening and consequently unacceptable to a hierarchist. So when his long-term plans are not fulfilled he intervenes time and again believing that if only he can identify the right solution, all will be well – and not understanding that his very behaviour is compounding the problem.

The hermit shuns control. He does not wish to control others or to be controlled. He is averse to boundaries and tight structures. He prefers fuzzy to clear cut relationships, duties and responsibilities. He prefers emergent short-term strategy to long-term plans. All the above are significant differences, but what both misunderstand is the impact of complexity on their actions. The hierarchist cannot accept that the world is not a set of averages with predictable behaviour, and that heterogeneous agents interacting, create unpredictable outcomes. While the hermit, in the guise of the IS professional, is constantly surprised when an upgrade or adjustment to a large, highly connected IT system with multiple interdependent modules generates unpredictable effects in other parts of the system. Experience should have taught him that this happens with a relatively high degree of frequency, yet he still believes that he can understand and predict the system's behaviour.

Individualism

The opposite quadrant of individualism exhibits low group involvement and is subject to a minimum of externally imposed restrictions. The pattern of relationships favoured by the individualist is the network or web with the individualist at its centre. This person exercises control and power through personal relationships, by admission to the network and by consignment of a position within the network. Those favoured are near the centre of the web, while those less favoured are at the periphery. These positions are not permanent, as relationships are in constant flux. Rarely is an existing network member rejected outright. If they have fallen from favour they are consigned to the outer periphery, until they can become useful again. The 'network' is not however a single inter-related entity, but is made up of clusters of networks. The individualist is the common element, providing the link between the various clusters.

The individualist believes in the myth of nature benign and is thus able to take risks, to innovate and to break rules, as nothing will permanently upset this world. Nature, according to this worldview, is forgiving – it will absorb all shocks and disturbances and retain its global equilibrium. The strategy style of the individualist is therefore exploratory and opportunistic. The range of options and possibilities is constantly explored, and no option is permanently closed or rejected. They are all juggled and kept up in the air. If the individualist is a member of an institution, she may be the product or project champion, or the bright spark with the innovative or entrepreneurial ideas. If she finds herself within a hierarchical institution, she will only be tolerated if the entrepreneurial activity is of some benefit to the institution.

The individualist shares with the hermit a strong sense of autonomy and individuality. They both feel uncomfortable as members of a group. One major difference between them is in the exercise of control. The individualist imposes a type of control through inclusion in the network, while the hermit shuns all forms of control. The individualist also exhibits strong entrepreneurial bias. There are some IS professionals who share a number of the individualist's characteristics, including the entrepreneurial skills. These are the IT innovators and some hybrid managers, who fit comfortably between organisational environments. But the 'typical' IS professionals who are the mainstay of the corporate information systems department (and took part in the field research) cannot be described as 'individualists', within the grid/group framework. Despite their strong individualistic bias, they are not prepared to take the risks which the entrepreneur has to take, and are not happy to establish the strong personal relationships necessary to sustain an extensive network. They prefer to work alone with minimum interference from and contact with others. That is their strongest hermit type characteristic.

Individualism is the one rationality which feels most comfortable with, and understands how to operate in, a complex world. An individualist focuses on personal relationships and on networks, which are at the heart of complexity. She innovates, breaks rules, takes risks and explores her space of possibilities, constantly searching for the new. She is an entrepreneur who can 'see' new patterns as they emerge and can take advantage of them, as few others have seen them. With a strong sense of autonomy she can self-organise and attract others to her team and her vision. The hermit on the other hand is not prepared to take risks, is not comfortable with the new, and is not prepared to invest on strong relationships. The two rationalities are diametrically opposed, even though they both value autonomy and freedom from control. Different reasons are involved: the individualist uses her autonomy to create

the new and to build her network, while the hermit uses his autonomy to distance himself from others and to create space around himself, free from interference.

Fatalism

In the strong grid/weak group quadrant of fatalism, the individual finds himself exploited and manipulated. The fatalist is excluded from organised patterns and does not belong to groups, but may find himself on the periphery of an individualist's network. The fatalist subscribes to the myth of nature capricious and believes that he is at the mercy of events, which he has neither the power nor influence to shape. He is thus controlled by the other three archetypes and never assumes control. Fatalists do not plan long term, as any plan is bound to fail. They live within the short term like the hermit, and accept whatever comes their way. However, the hermit lives from day to day because he does not wish others to control his actions, not because he accepts everything.

IS professionals are not fatalists and do not find themselves in a strongly prescribed environment, which they are powerless to affect. Individuals may at times feel that they are just coping with the demands of the environment, but as a rule IS professionals tend to have a significant influence on the working practices of the firm. They share with fatalists their aversion to assume control, but IS professionals also reject attempts to control them.

The fatalist sees little pattern and order in the universe. His world is that of disorder and random chance. He intuitively understands about emergence and unpredictability, but not why or how they happen. So he has to accept them without question in order to survive. He cannot go against the trend or innovate or self-organise – he sees them all as useless. He does not believe in reciprocal influence and co-evolution, only in one-way influence (on him) and adaptation (by him) to changes imposed by others. The hermit on the other hand, and the IS professional in particular, does believe in order and pattern. The IT systems he works with are ordered systems displaying repeating patterns. He does acknowledge his power to influence others, but he shares the fatalist's aversion to going against the trend.

Egalitarianism

Egalitarianism favours bounded but unranked groups, and exerts control through admission to the group. The strong boundary excludes the rest of the world, but within it there is professed institutional equality. It does not however follow that there is equality in everything and that there is harmony and cohesion within the group. There is often dissension and non-articulated competition, under the guise of differences in principles or ideals.

Egalitarianism is characterised by strong idealism. The myth that underlies the egalitarian worldview is nature ephemeral. The world is seen as an unforgiving place and the least disturbance may cause catastrophic collapse. The myth of nature ephemeral only fits in partially in a historical complexity perspective. There are extinctions of species as there have been major catastrophic events in the history of the earth. But the world as a whole has continued. There are bifurcations and the old 'order' may be destroyed, but dissipative structures do renew themselves and complex systems do create order out of chaos.

With regard to the IS professional, he may appear to fit best within the egalitarian quadrant, in the sense that the boundary of the group is strongly delineated while the social context is not highly regulated (weak grid). But there are significant differences between the egalitarian archetype and the members of an information systems department. Although the boundary of an information systems department may be clear and entry conditions may be high, the internal cohesion of the group is weak. Furthermore, although the information systems department may appear to reject the outside world, it does not do so on the basis of criticism of the world's inequality and coerciveness, like the egalitarian. The IS person rejects the rest of the world because he is uncomfortable with human contact. He will, however, overcome his hermit bias and swap full autonomy for the loose group of a corporate information systems department, because that position affords survival and protection from the environment.

Autonomy

The closest resemblance of the IS professional, therefore, is to the hermit, who seeks isolation and autonomy, avoids relationships and prefers neither to be controlled nor to control. Individuals will form themselves into the loose group of a department, which tends to stand quite separate from the rest of the organisation, but internal cohesion of the group is weak. The hermit archetype shares certain marginal characteristics with all four of the other archetypes. But the strongest classifying characteristic is one of isolation and autonomy. The IS department seems to be made up of individuals with a strong hermit bias, who can only come together as a loosely formed group.

An Exception

There is occasionally a bifurcation of the way of organising, from the hermit in the centre into one of two possible quadrants: hierarchy or individualism. Such a person is able to form an extensive network like the entrepreneur and to communicate freely with non-members of the information systems group, thus exhibiting entrepreneurial characteristics; or to accommodate the highly regulated and prescribed structure of the company's business hierarchy and function comfortably within such an environment. This exception to the above classification is the so-called hybrid IS manager. Very few were encountered during the period of the field research. They were usually the IS manager or director and had developed a career in information systems after experience in another domain, which required inter-personal skills. They also had extensive knowledge and experience of the business domain. They were able to move into information systems by overcoming the barrier of technology in both skills and language. The hybrid manager is therefore not a hermit, but either an entrepreneurial individualist or a hierarchist.

Information Rejection

By information rejection, Thompson (1996: 38) means something:

much stronger than Herbert Simon's notion of bounded rationality: the idea that people, when taking a decision, don't take everything into account.

Nor does he (*ibid.*) equate information rejection with:

Cyert and Marsh's observation that our rationality is bounded by the limits that our physiological equipment (our neurological circuits and so on) place on our information-processing abilities. The trouble with both these approaches is that they still leave us with *rationality in the singular*.

Thompson's argument is that people deliberately stop short of these physiological limits and that they do not all stop at the same place. To stop short of where others are stopping one needs to do something much stronger than simply not acquire some information that is available. The potential recipient needs to (*ibid.*) "actively reject information, which others are trying to force on that recipient." What Thompson is trying to show is that there is no single delineation between information and noise. There are (Thompson 1996: 38):

always several mutually contradictory drawings of the line between information and noise. Information rejection, therefore, is the turning into noise of something that is already information to someone else.

Information rejection can be described in terms of four information-rejecting styles, which can be mapped on the fourfold typology of cultural theory. The four archetypes are not isolated, extreme, static states but are interrelated and provide twelve possible transitions. The grid is therefore not a sterile and limiting model, but a dynamic model of interchange. The four ways of organising can also be interpreted as information cultures; *i.e.*, ways of defining information, sharing it and defending it, incorporating the four information rejecting styles. The starting point is provided by "questioning the prevalent assumption ... that people want information" (Thompson, 1996: 38). The four information rejecting styles (Figure 7) are: *networking* adopted by the individualist, *paradigm protection* favoured by the hierarchist, *expulsion* used by the egalitarian, *risk absorption* practised by the fatalist. In each case the kind of information which is rejected, and the way in which it is being rejected, are different. Identification of the distinct information rejecting styles in turn indicates different ways of organising. More than one style can be found in any one company or purposeful social grouping.

It is important to emphasise that each of the four cultural styles is a reasonable response to different social contexts. Since each response is reasonable, Figure 7 is a typology of rationalities. It is a description of the different contexts, which define what may count as rational. It is not rejecting the theory of rational choice but is providing a theory of rationality-conferring contexts.

Complexity also rejects the notion of a single rationality. Not only does it argue for multiple interacting rationalities, but it also explains the inter-action between them, as part of the process of the exploration of new possibilities.

Information Rejection Styles

Networking: The individualist attempts to deal with the problem of too much data by using a large personal network as a filtering system for information. Only information that the individualist considers absolutely vital is retained; all other information is either rejected or referred back to others on the network. The network is therefore used to sift data and to bring to the individualist's attention only that information which he regards as valuable. Thompson points out that the analysis of the implementation of information technology has uncovered the individualist's "seemingly perverse preference for shifting the really vital discussions away from the formalized information-handling systems and onto the informal old boy net" (Thompson 1996: 41). Thompson characterises this strategy as *individualist manipulative*.

Paradigm protection: Strongly hierarchical organisational forms tend to reject information, which threatens their hierarchical structure or questions their operating paradigm. In such organisations, information moves along specified channels; if it tries to spill out of the proper channels or to shortcut correct procedures, it tends to be rejected. As Thompson puts it (1996: 42):

Such information rejection is often diffused and depersonalised - the unseen discards from the agendas of committee meetings, and the sifting by shared (but unvoiced) assumptions that goes on in smoke-filled rooms. When it is forced out into the open, it is usually swathed in an aura of altruistic self-sacrifice ("for the sake of the regiment", "in the national interest" and so on).

Thompson illustrates this behaviour by the adverse reaction and the closing of ranks of the scientific community against Professor Ohm when he first attempted to publish Ohm's Law, as it questioned an accepted paradigm. This strategy is characterised as *collectivist manipulative*. Most cases of resistance to change when new information technology is being introduced which threatens established ways of working may also be considered as examples of the collectivist manipulative strategy.

Expulsion: In contrast to the hierarchical establishment an egalitarian group has no internal differentiation and deals with threatening information in a much more uncompromising way. Without an internal hierarchy it has to (Thompson 1996: 42):

concentrate all its defences at its boundary, protecting the soft vulnerable 'us' from the nasty predatory 'them' by a total rejection of threatening information. Since such egalitarian bounded groups do not negotiate and refuse to compromise with the wider society, they cannot manipulate anyone except their own members (who, of course, do not see this as manipulation, since it is what they voluntarily joined the group to do). So the members of this sort of grouping sustain themselves with a *collectivist survival* strategy.

Risk absorption: The fatalist accepts a world, which has power over him while he has no power to affect or influence the world. The way of coping within this social context is in terms of *individualist survival*, by accepting all the risks, which the individual is powerless to deflect.

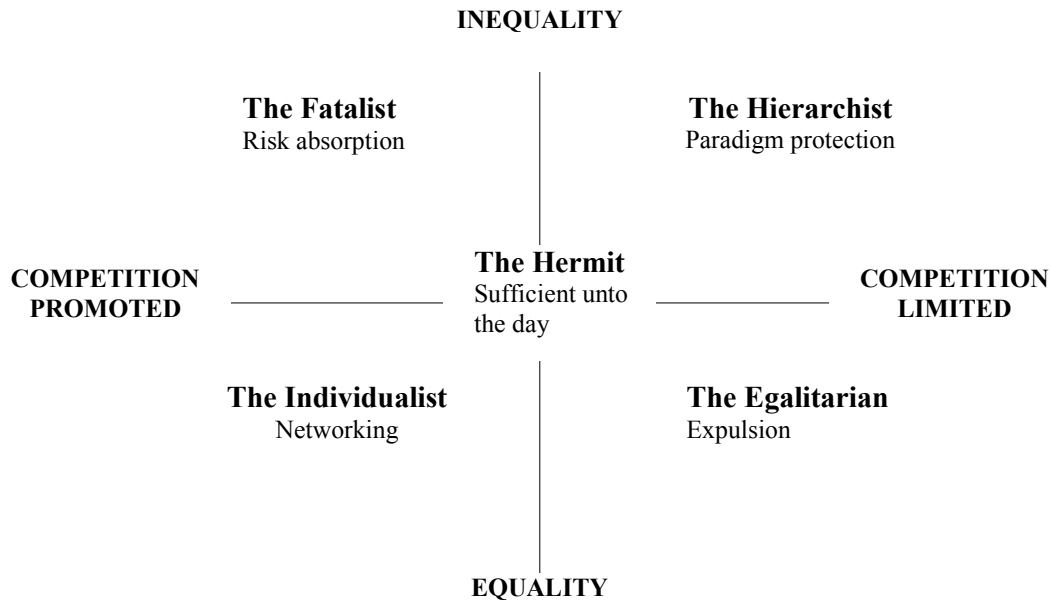


Figure 7
Information Rejecting Styles (after Thompson 1996)

The Hermit's Information Rejection Style

The above four information rejection styles have been discussed and published (Thompson & Wildavsky 1986; Thompson 1996), but the fifth style of the hermit is not included in those published works. The following analysis and interpretation arises from conversations with Dr Michael Thompson.

The motto encapsulating the hermit's approach is 'Sufficient unto the Day'. The hermit tends to reject information, which has any long-term implications. He simplifies, focuses on what is essential for to-day and puts little value on memory. Neither the past in the form of tradition or precedence, nor the future in terms of plans and long-term strategies, are of importance.

The hermit's information rejection style shares some of the elements of the other four styles, but also differs in certain fundamental characteristics. The following analysis first sets out the hermit's style of information rejection, and then proceeds to apply those general characteristics to the IS professional. The comments which follow may appear somewhat extreme and may seem to draw a caricature of the IS professional, but they are based entirely on the picture presented to the author-researcher throughout the field research. That picture is of course open to interpretation and the researcher may be accused of interpretative bias. As she started the research without any strong preconceptions, however, the interpretation may be allowed as that emerging from repeated evidence throughout a broad cross-section of industries, size of company and geographical location. Another aspect, which needs to be noted, is that specific individuals, particularly those who attain a senior position within the information systems department or function of an organisation, may not share those characteristics. The IS manager often needs to be distinguished from the

members of the information systems department. The following analysis concentrates on those 'members' (the term is in quotation marks to indicate the essential separateness of the hermit, who will only reluctantly associate with others).

The hermit shares with the individualist the characteristic of only retaining information that is strictly relevant and vital to his activities. Applying this to the IS professional, he tends to concentrate on the technological aspects of information systems and to pay relatively little attention to the broader picture of the business and its concerns. This tendency was one of the key elements in exacerbating the 'gap'. There was a general lack of interest in the affairs of the company and the rest of the world outside the information systems department. This characteristic is shared with many scholars and scientists and is perhaps the distinguishing characteristic of the hermit. Furthermore, most IS people prefer to tackle immediate and esoteric problems. When applications backlogs were a serious problem in the late 1980s and early 1990s, they were seen by the information systems department as a 'business' problem. The information systems department carried the burden, but somehow not the responsibility. There were always good reasons for the existence of any backlog, and most of these reasons were associated with the lack of support from the business. For example the information systems department was not given adequate money or staff or other facilities, which would enable it to reduce the backlog. Responsibility for the existence and reduction of the backlog was rarely acknowledged by the IS professionals as resting with the information systems department. By contrast, they would happily spend time and immense effort in solving any problems associated with technology, but would shy away from those areas which required extensive contact with members of the company outside the information systems department. They also seemed to work on a different time scale from the rest of the organisation and priorities were rarely shared.

Although the hermit and the individualist share a narrow focus on retaining information that is directly relevant to their activities, they differ in an important aspect. The focus of the individualist may expand to encompass any information that is relevant to the 'bottom line' and the individualist is prepared to invest in a long-term venture that seems potentially profitable. These matters are of no interest to the hermit. This tendency is again reflected by the field research. IS professionals preferred not to be concerned with the details of budgets and long-term plans. When they were forced to do so they complied reluctantly and pushed all such responsibility to the IS manager.

Like the hierarchist, the hermit tends to favour paradigm protection. When a new operating system, or programming language or a new type of database became available, most IS people in information systems departments would convince themselves that they were far too busy to learn a new language or incorporate a new system. Superficially this appears to be a paradox: it is IS individuals who invent or develop the new systems or languages, yet their fellows reject the new 'paradigms' as they threaten the existing and the familiar way of working. But the hermit does not acknowledge others as 'fellows'. Everyone is an 'other', and as such, outside the boundary of the individual being. Unlike the hierarchist, the hermit does not work for the benefit of the group as a whole in protecting it from the new ways of working. The hermit only considers his own interest and will always find personal reasons for not using what he admits to be an admirable and useful new artefact. Another fundamental difference with the hierarchist is the hermit's refusal to depend on precedence or past experience to guide present or future actions. Also unlike the

hierarchist, the long continuum from the past to the future does not signify anything for the hermit. To the latter, only the present matters. The hermit's lack of interest in both the past and the future may be another key element in explaining the distaste and lack of interest in the planning process. The traditional planning process depends upon and extrapolates from the past into the future. By its very nature, planning is also determining the activities of the present to achieve a future outcome. The hermit rejects all such information and the activities it engenders. If the IS professional fits into the hermit archetype, then his reluctance to conform to the planning process dictated by the business may be explained, and may thus offer another element in building up an explanation for the existence of the 'culture gap'.

In common with the egalitarian, the hermit will protect boundaries by the total rejection of threatening information. But for the hermit the boundary around the individual is of greater significance than the boundary around the group. By his very nature the hermit does not fit happily into any group and the IS individual only accepts group inclusion for protection and survival, provided that the 'group' is loose and unstructured. The conjunction of the rejection of all information that may be or may appear threatening, with a preference for aloneness, renders the hermit an unlikely candidate for co-operative work. Planning is essentially a co-operative exercise, across disciplines or domains. To participate fully in the planning exercise, the IS professional would need to accept and understand information about the business, which he finds puzzling and obscure. In a sense that information is 'threatening' because if accepted and assimilated it will change the worldview of the hermit. It therefore must be rejected.

The hermit, finally, accepts risk absorption like the *fatalist*, but in a fundamentally different way. The hermit does not believe that he is powerless to influence the world. He knows that he can do so, if indirectly and passively. But when things go wrong he neither accepts responsibility for them going wrong nor absorbs the adversity like the fatalist, without doing anything about it. He just shrugs his shoulders and concentrates on what he can do to-day to solve the problem. Tomorrow will have to wait.

Cultural Theory and The Consequences of Information Rejection

If the above analysis is accepted, then the three questions raised at the beginning of this article have partly been answered. The questions were: (a) why is there a 'culture gap' between the business and information systems domains; (b) why are there fundamental differences of perspective; and (c) why is communication between the two domains constrained? The irreconcilable world views of the five archetypes posited by cultural theory answer the first two questions, and explain why there is a culture gap between the two domains and why there are fundamental differences in perspective. Given the irreconcilable perspectives of the hermit and the three active worldviews, it would be more surprising if there were no culture gap. The third question is addressed by the concept of the rejection of information. Not only does each archetype see the world from a different perspective, but it also accepts different information about it. This of course is not a linear or causal process. The differences in perspective are inextricably bound with the selection and rejection of information, and each aspect reinforces and supports the other.

If each archetype sees the same world from a different perspective and bases that perspective on different information, communication is likely to be difficult. This statement is based on the assumption that in order to communicate, individuals need to share not only a 'language' but also similar conceptual schemata. Language used in this context has a much more restricted meaning than a natural language such as English or French, *etc.* It refers to the shared language within a specific context or domain, and is culturally determined and dependent. For example, each organisation shares a 'language' or the use of terms and expressions, which may be unique to, and will reflect the culture of, that organisation. But if the thesis of cultural theory is accepted then there is no such thing as a single culture or organisation, but different ways of organising leading to different 'cultures'. Each company will consequently be made up of a collection of different ways of organising and their respective social environments. If some of those environments have significant differences in language and conceptual schemata, then communication between them will suffer. But why should that be the case? It may be argued that humans are adaptive, flexible and learning creatures, which can overcome such relatively minor obstacles to communication. Yet the empirical research indicates otherwise and shows that cultural differences exist and persist.

Subversion

Once the typology has been outlined, Thompson concludes, "we have the essential framework for a theory of organising", but then he adds (Thompson 1992: 18):

in which *subversion is inevitable*. Any theories that ignore subversion, or insist that it can be got rid of, will be worse than useless. Good management, therefore, must be concerned with encouraging the constructive interplay of subversions and discouraging the destructive ones.

He illustrates the point that subversion is inevitable with the example of the 1975 expedition to the South West Face of Everest. When Chris Bonington decided that the expedition should walk to Base Camp in two parties, one travelling one day behind the other, so that they did not place an intolerable burden upon the Nepalese countryside, he named them Team A and Team B. Although Bonington did not intend the A Team as the leaders and summiteers, his decision was initially interpreted in that way. But this gave way to another interpretation that the A Team included "the chaps", while the B Team was made up of "the lads". This assumption was based on Bonington's choice of travelling companions, which included the Base Camp Manager, the Equipment Officer, the Senior Doctor and the media. During the two-week walk, the division was emphasised, and the B Team developed "that impenetrable bloody-mindedness born of the I-only-work-here mentality of the shop-floor" (Thompson 1996: 30-31). They therefore came to represent the Underground Leadership while the A Team represented the Overground Leadership, although at that early stage there was little evidence of leadership and limited scope for subversion by the B Team. As the climb progressed and the expedition became strung out over a number of camps, however, communications became strained. The Underground was able to "influence the course of events by withholding information" (1996: 31). The Overground still made all the decisions, but on the basis of grossly

inadequate information, which meant that the Overground, without realising it, simply followed the wishes of the Underground. There were now two leaderships, each operating “by its own logic, without displacing the other” (Thompson 1996: 32), but also interacting with one another. The expedition had developed organisational plurality and a tendency for subversion. But then something interesting happened. When the expedition was getting close to the summit and final success, the Overground and the Underground “merged into a single upward-thrusting force” (*ibid.*) and achieved the summit.

This story illustrates some interesting and subtle dynamics at work, which (Thompson 1996: 33):

have some serious implications for theories of leadership and organisation. Perhaps the most important message ... is that subversion is inevitable. That is, if there is an Overground then there will be at least one Underground. The viability of the whole depends on the contradiction of the parts.

This insight that the viability of the whole depends on the contradiction of the parts is almost shocking, as it challenges accepted assumptions of organisation. Companies strive to encourage harmony between different sections or parts of their organisation – assuming that there is a common unifying culture or ethos, when there are conflicting cultures that tacitly or explicitly endeavour to undermine one another. The clearest example of this behaviour encountered repeatedly during the field research was between the information systems and the business strategy domains. There was quite clearly more than one leader-defining strategy.

Another point made by the Everest expedition story is the emergence of organisation plurality, not as static classification but as a dynamic process. At Camp 6, before the summit was climbed, the predominant behaviour was that of a network of individualists “willingly cooperating to achieve something that to their great regret, no one of them (could) achieve unaided.” (Thompson 1996: 34). But these were the same people who, as hierarchists, had meticulously planned the expedition, and established the procedures, which ensured that the expedition took place and kept going. They included Bonington the leader and his executives of Team A, but also the Underground Team B, which made “the crucial transition from fatalism to individualism by way of egalitarianism.” (Thompson 1996: 36) There is in other words, the possibility of movement in any direction but the precise movement cannot be predicted.

Coherence that Accommodates Diversity

A complex organisation is able to accommodate conflicting agendas and strategies within a coherent whole. This was illustrated quite strikingly in a recent project (2003-4) working with a global engineering company. The company had acquired a set of firms in Scandinavia with distinct cultural and business models. These differences were not only apparent between the UK and Scandinavia but also between Norway, Sweden and Finland, as well as the UK and the USA. Each saw the world differently. The Nordic firms were small entrepreneurial, innovative organisations with many customers, whom they knew personally. They were able to react quickly to

changes in requirements. In addition, each of the Nordic firms also had significant national and cultural differences, which were apparent in the way that each related to its customers, the way they communicated and the way they used and rejected information.

The UK organisation had few very large customers, long-term horizons and a long-established hierarchical form of organisation. Because of their specific product, they had quality and safety measures appropriate to that product, but totally inappropriate to the Nordic firms and their products. When the procedures and the organisational structure of the parent company were imposed on the acquired firms, they created confusion and a great deal of tension. Yet despite all these problems and the deep conflict between them, the organisation as a whole grew and became quite successful. The point made here is that conflicting agendas do exist and can be accommodated within a complex organisation. In a vain attempt to impose homogeneity, the parent exacerbated the problem. When in due course it appreciated that diversity was not a problem but a strength to be built upon, it changed its strategy and focussed on providing an enabling environment that accommodated diversity.

What happened was that the Nordic and UK parts of the organisation co-evolved. They learnt how to live with each other through reciprocal influence and change. They did not become clones of each other, but retained their individual identity while at the same time changing to a 'new order'. They found a new way of organising that took into account their history and national culture, while at the same time adjusting to being part of a larger global organisation. In the process the identity of the whole also changed as a result of that internal co-evolution, as well as co-evolving with a changing market.

A Model of Transition

According to Thompson *et. al.* (1990: 75) there are 12 possible transitions from one of the four archetypes to another. Adding the hermit increases the possible transitions to 20 and this is shown in Figure 8.

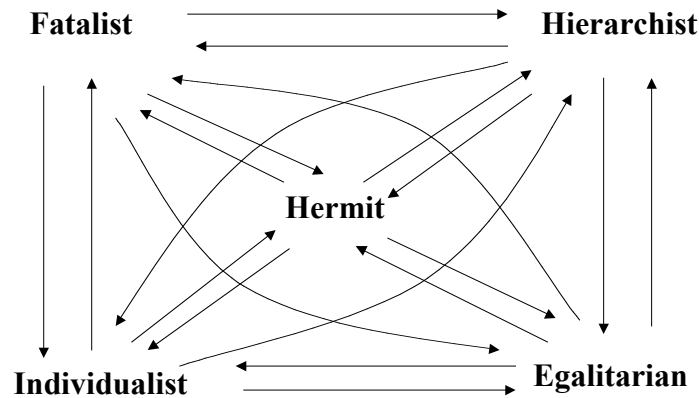


Figure 8
A Model of Change

A possible description of such a model would go as follows: starting from any archetype, as that archetype interacts with others it begins to co-evolve. It is doing so by exploring alternative strategies until at a critical point it ‘flips’ and transforms into another archetype. In the model shown, it has four alternatives to choose from. The actual number of alternatives is not material. What is important according to cultural theory is that there are not an infinite number of possibilities. Using the image of Nature Resilient in Figure 6 we can move to Figure 9 and show that at each point of bifurcation there are at least three alternatives.

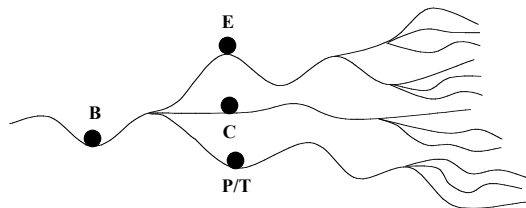


Figure 9
Creation of new order

Using the logic of complexity a slightly different proposition can be put forward: each time a transition takes place something new is created. The archetypes self-organise and co-evolve – but each emergent form is new. It may have characteristics from the original archetypes it arose from, but the new form has its own identity. It is a kind of co-evolutionary transition, which creates a new form. This brings us back to Thompson's idea of a spiral that moves through the different myths of nature but ends up in a new place. To that image, the idea of multiple strands needs to be added, making it a *multi-stranded spiral* with the strands interacting and changing through that interaction (the strands do not remain separate and isolated). Although the actual direction, at each transition point, cannot be predicted, movement itself is inevitable. If the archetypes interact, then their connectivity and interdependence will inevitably bring about co-evolution and the creation of new order.

This does not mean that there will be homogeneity, as the dance will continue to generate diversity. Co-evolution does not necessarily mean that archetypes move closer to each other, it could also mean that they move further apart and become more extreme. In other words as long as there are different rationalities interacting in a complex world, the culture gap will continue.

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¹ The paper by Professor Mary Douglas entitled "Cultural Bias" in her collection *In the Active Voice* was first published as Occasional Paper 35 in 1978, by the Royal Anthropological Institute.

² Integrated project/product teams (IPTs) are often used in the Aerospace and other industries to bring together representatives from different organisations or functions with the knowledge and skills necessary to design a new project or product.

³ Kauffman (1993, p33) borrows the hill-climbing framework with minor modifications, directly from Wright (1931, 1932) who introduced the concept of a space of possible genotypes. Each genotype has a 'fitness', and the distribution of fitness values over the space of genotypes constitutes a *fitness landscape*. Depending upon the distribution of the fitness values, the fitness landscape can be more or less mountainous.

⁴ The LSE Strategy Seminar was held on the 11th March 1992, and Professor Douglas's presentation was entitled "How Institutions Think". A paper had not been prepared for the Seminar. The material used in the article is based on a tape recording.

⁵ The analysis is based on over 150 interviews conducted during the field research with IS directors/managers and other members of the information systems department in 85 organisations. The total number of interviews conducted in the late 1980s and early 1990s, however, was over 250 and included business strategists. When the case studies were added in the mid-1990s that figure rose to well over 350.

⁶ The male gender is used because 99% of all interviewees were male.