

Facilitating Foresight: Where the foresight function is placed in organisations*

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Abstract

This paper will introduce the Viable Systems Model and in particular the Meta System component of that model, as a framework within which to consider how foresight can be facilitated in organisations. It will show how the System 4 function within the Meta-System is in a position to facilitate processes that will produce effectiveness and the development of overall system identity. It will also show how adopting another framework for understanding the paradigms or worldviews that operate in organisations can enhance the likelihood that these processes will be successful.

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1. Introduction

The difficulty faced by all organisations today is how to stay up to date with what is happening in their environment. The velocity of change that organisations face is increasing. The opportunities and threats that arise are dynamic and complex. What is the capability that can assist organisations manage this situation? Richard Slaughter says that the missing capability is foresight. *'Foresight is a deliberate process of expanding awareness and understanding through futures scanning and the clarification of emerging situations'*.¹ Where, then, is this foresight capability placed in an organisation and how is the process facilitated to achieve that outcome? It is the purpose of this paper to demonstrate to practitioners of foresight how environmental intelligence can be facilitated in an organisation to expand awareness and understanding. The principles behind this paper come from a theory of information management, which first came to prominence in the 1970s. Some of the language of that theory may seem difficult and dense to practitioners who encounter it for the first time. While the paper does try to reinterpret that theory to make it relevant to foresight practitioners today, it also wishes to maintain the rigour of the original theory. The benefit to the practitioner who makes the effort to understand the language used will be the acquisition of an expanded vocabulary of rich terminology which can be readily employed in many organisational interventions.

2. Stafford Beer and cybernetics

Stafford Beer sought a theory to understand how the overwhelming complexity in an environment could be managed. *'How are systems capable of independent existence or how are they viable in complex environments'?*² In his book *Brain of the Firm*, first published in 1972, Beer promoted his theory of *'the Managerial Cybernetics of Organisations'*. That theory proposed a neurocybernetic model of an organisation conceived as a viable system. Cybernetics, the science of control, had been theorised by a number of earlier researchers,³ but Beer was the one who first proposed it as the underlying basis for a theory of organisational design. Most famously the Chilean government under President Salvador Allende from 1971-1973 adopted Beer's approach. What was attempted there was the reconception of the entire Chilean economy as a viable system. The project was never completed. It was terminated when President Allende was assassinated in the military coup, which overthrew his government, however, the results the project was achieving before the coup did validate the theory.⁴

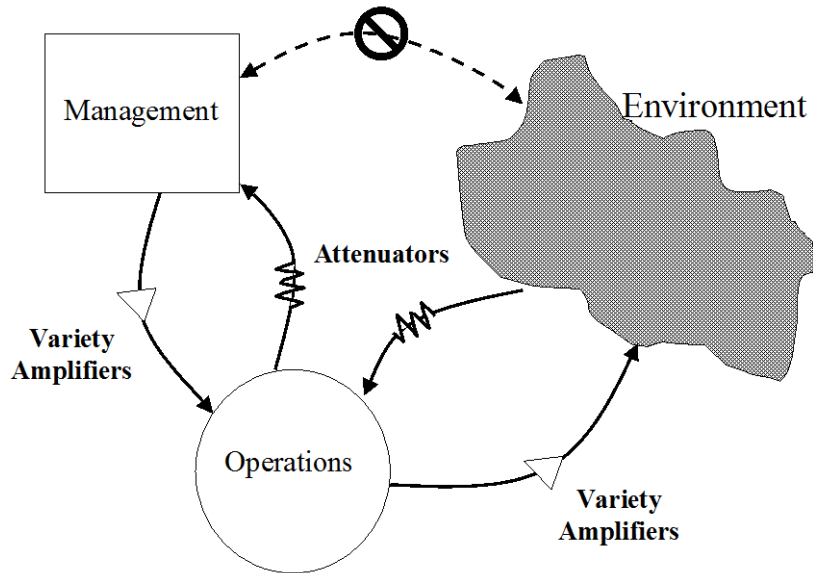


Figure 1: The simplified law of requisite variety. Adapted from Beer (1985)

The law that describes how complexity could operate to overwhelm a system of management is called the Law of Requisite Variety.⁵ Figure 1 is a simple representation of the Law of Requisite Variety. *Variety* is the term used in cybernetics to describe complexity. The figure demonstrates that there is infinite complexity in any environment which management wishes to do business with. If management, by itself, tried to deal with all the complexity in that environment then it would be overwhelmed. Instead an operational process is designed to interact with the environment, and management interacts with this operational process rather than with the environment itself. The operational process engineers the complexity it faces in the environment by reducing what is receives (*attenuating* complexity away) and by increasing the scope of its own interactions with it (*amplifying* the effect of what it does). The same process is repeated for the interactions between management and the operational process. The Law of Requisite Variety states that to control a complex system, the managing system must generate at least as much complexity as the system that it is trying to control. If either the managing system or the operational process lacks sufficient complexity then the complexity missed could cause the overall system to fail. In nature this could mean the death of the organism, in business it could mean the death of the organisation.

Operations, by necessity, will reduce complexity coming into the system through its interactions, and that complexity will be further reduced by the interactions with management. Reduction of complexity will occur, whether it is designed or not. "Ignorance" is a complexity reduction mechanism that does not take much effort to introduce into a system; however, it is usually not a wise choice in the long run! Increasing complexity (amplification) will not occur naturally but needs to be designed. The amplification processes shown in Figure 1 are trying to add complexity back to the outputs of first, management and then, operations. Complexity adds to the richness of the information and thus increases the value of the information. Clearly a low complexity piece of information going into a high complexity environment has a minimal chance of changing anything in that environment.

From his study of organic systems Beer found systems that were able to maintain independent existence despite the operations of the Law of Requisite Variety. He found that those systems exhibited the following properties:

- maintenance of identity (they had a purpose and organised the means to achieve it);
- able to self repair (they could repair themselves to continue existence);
- self awareness (they had awareness of themselves and what they comprised);
- were self organising (their organisational structure was environment and context specific);
- were self balancing (homeostasis applies);
- were open systems (they took adaptive information from their environment); and
- embodied recursivity (they existed within other viable systems).

An effectively facilitated foresight process in an organisation would be fundamental to the establishment of many of those properties, especially identity, self-awareness and openness. The task of Foresight is to enable entities to take purposeful action in regard to the future and, as such, it operates to manage the complexity inherent in any consideration of the future. Purposeful action is necessary if any system is to remain viable in a complex environment. Beer had discovered the properties that produced viability. What he then proceeded to do was develop how those properties could be designed into a system.

3. The Viable Systems Model

Beer's Viable System Model (VSM) is the organisational framework that creates the conditions from which the properties of a viable system will arise. The model outlines a number of management functions and specific interrelationships between those functions. What should be understood is that this model is an abstract concept. If actual systems in the world, were they individuals, teams, organisations or nations, are observed then these functions and relationships will not be noted. Instead it is the totality of these functions and relationships, when operating effectively, that produce the properties of a viable system. What this model gives to the practitioner is an orientating diagnostic framework with which to interrogate an organisation. Armed with the VSM as a diagnostic the practitioner will note a wide range of organisational dysfunctions and discover their correlate in ineffective or non-existent functions and relationships. From this diagnosis the practitioner can craft the necessary intervention. Some of these interventions would be the facilitation of a foresight process.

This paper will examine those VSM functions and interrelationships that are necessary for the facilitation of foresight processes in an organisation in significant detail. In the service of brevity, however, this paper will not cover the totality of the model to that same depth. Nevertheless to ensure that a practitioner has a working knowledge of the entire VSM what follows is a brief overview of the complete model. Figure 2 is an example of the VSM. This example comprises two operating systems, which primarily interact with the external environment and the five attendant systems, which together with the specific interrelationships, produce the properties of viability.

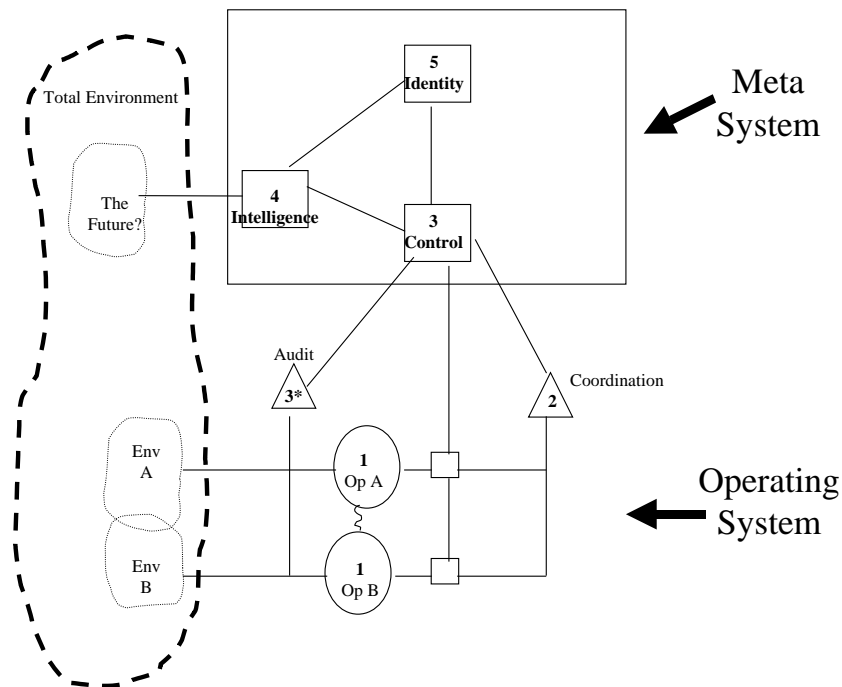


Figure 2: The Viable System

System 5 represents the *identity* of the system. From this identity comes the total system *purpose* and the measures of its success. System 5 passes down to System 3 the policies and authority necessary to govern the overall system outcomes. System 5 balances present and future as well as external and internal perspectives. It also moderates the relationship between System 3 and System 4.

System 3, charged with the necessary authority and policies, ‘bargains’ with each of the operational systems (System 1 Operations and each System 1 Management function). In this example we will call them ‘A’ and ‘B’. This bargaining process establishes the agreed environmental territory of each operational system as well as the outcomes and performance standards expected from each. System 3 and each System 1 also agree to a monitoring process (System 3*) which will sample a number of the interactions between each operational system and the external environment. This *audit* process gives System 3 sufficient confidence that the ‘bargain’ is being met. This takes complexity away from the 1-3 communication channel that gives it the capacity to handle more complexity. The System 1’s also agree, between themselves, how they will coordinate their actions both inside the system (eg. resource sharing) and outside the system (eg. shared client management) and these agreements are managed by System 2. This system also removes complexity from System 3 that also frees up additional complexity capacity in System 3.

Finally System 4 examines the external environment to gain *intelligence* about both its totality and its future. Environmental intelligence that can be managed within existing policies is passed directly to System 3. Environmental intelligence, which requires a re-examination of the entire system’s identity, is passed to System 5. If the total system identity has to be adapted then new policies by System 5 and are then passed to System 3 and the process is repeated.

What has just described may make the operation of a viable system sound much like a traditional organisational planning process, from the top to the bottom. This is not the case at all but was merely done to give a quick overview of the method. In reality any of the six systems operate with authority to commence a cybernetic intervention at any point in time. In this way it is a self-controlling system.

4. The Meta System - “The Brain of the Firm”

Beer referred to the System 5-4-3 inter-relationship as comprising the *Metasystem*.⁶ By describing it as such he was not granting it seniority or power but instead was referring its responsibility to determine the identity and direction of the overall system. The inter-relationship of the System 3-3*-2-1 was called the *Operating System* (see Figure 2). It is the Metasystem that is the realm of Foresight and it is here that the function of each of the systems and the nature of the interrelationships between them will be expanded. Those functions and interrelationships are:

- System 5 - The “Reflection and Representation” function
- System 4 - The “Outside and Then” function
- System 3 - The “Inside and Now” function
- Systems 4/3 - The “Translation” Interrelationship
- Systems 4/5 - The “Transformation” Interrelationship

Facilitating foresight in an organisation would involve ensuring that each of the 5-4-3 systems was functioning correctly and that the interrelationships were healthy and effective.

4.1 System 5 - “The Reflection and Representation function”

System 5 represents the identity of the *system-in-focus*;⁷ its vision or its niche. To do this System 5 should reflect the essential qualities of the whole system. It is also responsible for representing these qualities to the wider system of which it is merely a recursive element. Thus its primary purposes are reflection and representation. By representing the system-in-focus to the wider system it gains a clearer understanding of how it ‘fits’ within the greater part. It can then reflect on whether its current identity is consistent with that wider system. In making that reflection, however, System 5 has a special responsibility, to prevent ‘*pathological autopoiesis*’.⁸

The Operating System is directed towards self-maintenance and optimisation. Left alone the interrelationship of the 3-3*-2-1 becomes a very powerful force in the overall system-in-focus. It produces system viability in the short-term. When System 5 makes changes to the identity of the system-in-focus then the Operating System has to be recalibrated to take into account the new policies that have arisen. This takes time and energy and for a period of time it sub-optimises the short-term effectiveness of the Operating System. But this is not dangerous for the health of the overall system. What is dangerous is organisational behaviour that results in ‘the self-maintenance or self-production of a system despite, over the long-term, a consequently negative balance on the larger whole’.⁹ A viable system with total focus on its own self-production and self-maintenance in the short-term could sub-optimize the greater system of which it is just a lower recursive level. Another possibility is survival without growth, which is entropy. It is System 5’s responsibility to make sure that pathological autopoiesis is not occurring and this will be a task that Foresight can assist in through the 5-4 interrelationship.

4.2 System 4 “The Outside and Then function”

System 4 contains the environmental scanning capability of the system-in-focus, which is employed to produce an ‘outside and then’ view. ‘Outside’ because it looks at the totality of the external environment that the system-in-focus operates within and ‘then’ because its view is

prospective or future focussed. When this view is combined with System 3's internal viewpoint, the strategic decision-making environment of the system-in-focus is created. System 4 is also in an ideal position to diagnose the overall system-in-focus's compliance with the VSM and so it can also facilitate the development of the management processes and interrelationships. This paper will not go into the hows of environmental scanning. The paper by Voros describes a methodology for doing Environmental Scanning at the broad macro-environmental level.¹⁰

Beer often found that the System 4 function was the weakest point in the organisations that he studied. In such case he worked with the executive group of a Canadian Insurance company that wished to reorganise themselves based upon cybernetic principles. The original project brief stated that the company 'lacked a capability for systemically sensing and reacting to the changes that were building up in the environment'.¹¹ It should therefore not have been a surprise that Beer found that System 4 was missing from the four highest levels of recursion of the company. After more than *ten years* with the executive group, however, they were unable to establish an effective System 4 function at the highest level of recursion of the organisation. The possible reasons cited for this were many but what it boiled down to was that the senior managers on one hand did not want to surrender their 'power base' in the organisation to take up the System 4 role but at the same time they opposed ceding sufficient influence to the function because they saw a properly functioning System 4 as a possible 'threat'.¹²

The System 4 function can be quite challenging for traditional organisations because of its 'outside and then' paradigm that flies in the face of the traditional 12-month business-planning paradigm which is often premised on a projection of the present into the future. System 4 also has to manage two quite distinct relationships, the 4-5 and 3-4, as we will soon see. Re-considering the System 4 function within the framework of facilitating foresight, however, can provide an opportunity to give the System 4 function greater organisational sustainability. The following discussion on the other functions and interrelationships will more fully illustrates the System 4 predicament.

4.3 System 3 'The Inside and Now function'

System 3 is the system-in-focus *control* function concerned with the Operating System's governance with the policies established by System 5. However such control does not come at the expense of operating process autonomy as to do otherwise would see the control function become hopelessly compromised by complexity overload (requisite variety will always defeat any attempt to assume complete operational control). Rather, governance is ensured through the monitoring process of System 3*, the cooperation of the System 2 coordination process and by receiving the *algedonic*¹³ 'exception' reports from the autonomous System 1s. From this position System 3 produces a 'inside and now' view of the system-in-focus directed towards optimising the synergies between the operational System 1 processes. It should not be surprising that System 3 would prefer incremental change to large-scale change as incremental change does not de-optimize system performance to the degree that large-scale change does. System 3, therefore, can be naturally quite antagonistic towards the System 4 function that can suggest that large-scale change is required. Further System 3 controls the resource allocation function that can be exercised as a position of considerable directional power in an organisation (which is tantamount to System 3 operating as System 5). Thus it is quite easy to imagine how a 'powerful' System 3 process that is antagonistic to the 'outside and then' paradigm of System 4 could act to suppress the influence of System 4. This is what Stafford Beer found in his Canadian Insurance company case study.¹⁴ Such suppression would, of course, reduce the viability of the whole system-in-focus over time. The process of facilitating foresight must be very sensitive to this tension and it must employ skilful framing techniques to ensure that the relationship is healthy.

As it has been described System 3 tends to see the world from a polar opposite viewpoint to that of System 4. Before the intricacy of this interrelationship is considered it is necessary to gain a deeper understanding of how System 3 tends to 'see' the world. System 3 has usually come from an empiricist viewpoint that all data can be objectively measured in the here and now and is data

grounded in direct experience. System 3 is a control function that operates governance and regulation processes and because of this it has a need, and a preference, to work with known facts. It would like to see itself as scientific in its approach. However as much as System 3 would like to think that it is dealing with the 'hard' facts of what is really going on the Operations System it should be clear that this is not the case.

The Law of Requisite Variety will determine that System 3 can only absorb as much complexity as it possesses in itself. We also know that there will be a greater amount of complexity in the Operations Systems than System 3 will possess. So attenuation of information will occur, whether planned or not. This being so, the 'inside and now' picture that System 3 will build up arises from four sources. System 3 will get 'routine' data from the Audit process, it will 'hear' information from System 2 about the resources and processes that the System 1s are sharing, it will 'detect' some information from the management cells of each System 1 operational process and it may 'receive' some algedonic signals from lower recursive systems. From these four sources the task of System 3 is to build up a 'picture' of what is going on. System 3 cannot directly experience what is going on, the Law of Requisite Variety makes that impossible. Instead it has to interpret what other systems are informing it that they experiencing and while doing this System 3 will continue to believe that it is dealing with facts. It is able to do this seemingly remarkable thing by employing paradigms through which it interprets what it is experiencing.

5. The Paradigms of 'Systems'

Management functions are not human and therefore do not actually have experiences. It is the people who work in those functions who interpret the world and it is those people who possess paradigms. Those paradigms develop from the dynamic interplay of biological, psychological and sociological factors with their environments that occur throughout a person's life. Put simply, we adopt a paradigm that works for us, that gives us a sense of congruence with our environment. If the paradigm works then we keep using it, if it stops being effective then we develop a new paradigm. Organisations are another socialisation factor that creates distinctive workplace paradigms. Thus it is said that workplaces have their own distinct culture which is another term for a workplace paradigm. These workplace paradigms fulfil the same purpose of providing congruence with the environment. Once again, if the paradigm works then it is sustained. Such a culture develops and is transmitted to all employees invisibly and quickly. If a person wishes to maintain their continuing existence within that organisation, they learn to share the workplace paradigm, notwithstanding their own personal preferences. If this is too difficult for the person, they move on; if it is a good fit, they will stay and often flourish. By this process then management functions can develop and maintain their own distinctive paradigms. The work of Don Beck and Chris Cowan in their book, 'Spiral Dynamics - mastering values, leadership and change' introduces a framework that gives insight into the paradigms that could be operating in the different functions of an organisation. This is not the only framework that could be used, it just one that is generally fastest to understand. That framework will be used to explore the different paradigms that could be operating in System 3. The assumption in this paper is that the organisations practitioners are facilitating foresight into are reasonably complex and have a degree of self-awareness. We would not, therefore, be looking at organisations that exhibit much of the first three of existential states of Spiral Dynamics (SD). This is not to say that there will not be individuals working in those organisations who exhibit some of these states, just that the workplace paradigms in most reasonably complex organisations would be based around the BLUE, ORANGE and GREEN existential states. This should hardly be surprising given that these are the paradigms most associated with the phase of human consciousness referred to as 'modern' that is the stage in history most propitious for the emergence of complex organisations.

6. The Spiral Dynamic structures in detail

For completeness the eight main existential states will be outlined in the SD method, however, greatest emphasis will be placed on the BLUE, ORANGE and GREEN states.¹⁵

1. BEIGE - *archaic-instinctual*. The basic state of instinctual survival. The 'self' is barely awakened. An individual state that would not be displayed by many individuals operating in organisations.
2. PURPLE - *magical-animistic*. The first collective phase where individualism is sacrificed for the good of the 'tribe'. The thinking involves animism and magic, the processes are circular. The motivation is safety and to honour the 'ancestors'. There would certainly be 'tribal' teams in organisations but overall this would not be a state found to be predominant in most reasonably complex organisations.
3. RED - *impulsive-egotistical*. The strong emergence of distinct self which leaves the bonds of the tribe behind. The thinking is egotistical; the processes are combative or exploitive. The motivation is to win against the odds, to explore new territory. Behaviour is governed by 'codes'. While this state has much in common with forms of entrepreneurship and is a very energetic and passionate one it would be very difficult for an organisation to remain viable in it for long. RED will be found in organisations but rarely at the surface level.
4. BLUE - *mythic-purposeful*. The first really large-scale organisational state. Driven by the need to find purpose, direction and meaning in life. Thinking is absolutist; the processes are authoritarian. Pyramidal hierarchies are found in BLUE organisations. The motivation is to sacrifice individual behaviour, to follow rightful authority, in order to achieve future reward. A significant state in most large bureaucracies.
5. ORANGE - *rational-achiever*. Centred on individual achievement. Driven by the need to succeed and prosper. Thinking is strategic, rational and multiplistic. Processes are scientific and experiential. Structures tend to delegate strategic space to individuals within which they are encouraged to be successful. Motivation is to express self in order to achieve independence and material gain within the boundaries of what is considered lawful. The predominant state of commerce, although lasting ORANGE is usually built upon a solid BLUE base.
6. GREEN - *pluralistic-communitarian*. Seeks inner and communal satisfaction. Driven by the need to relate and find affiliation. Thinking is relativistic and egalitarian. Processes are consensual. Structures are heterarchical producing social networks. Motivation is to sacrifice self in order that 'others' may prosper and thus to affiliate with the greatest number. Once the predominant state of community groups, GREEN is an emerging state found in many large organisations.
7. YELLOW - *systemic-integrative*. Sees the world as a chaotic organism that is navigated by its own 'map' of the system. Driven by the need to discover more knowledge of the system in order to improve its 'map'. Thinking is systemic. Processes are integrative and open to negotiation. Structures are flexible and adaptive to their environment. Motivation is to express self without doing harm to others or the environment. There are certainly YELLOW thinkers in many organisations, however, true YELLOW organisations are thin on the ground.
8. TURQUOISE - *globalist-holistic*. Sees the world as a series of interlocking forces that are delicately balanced. Everything is connected to everything else. Driven by the need to promote universal order of spirit/self/other. Thinking is holistic. Processes are ecological. Structures are global. Motivation is to sacrifice self in order for species/planet survival. We do not see many TURQUOISE organisations.

These paradigms exist in a series of overlapping waves where an existing paradigm is overlapped by a newer or older one. Thus the paradigmatic states in SD are referred to as *Entering* (emergence of new thinking on top of existing old), *Peak* (apparent congruence around a dominant paradigm) and *Exiting* (dissonance from existing paradigm and a search for a new one). When a distinction needs to be made between the states the dominant state is designated with capitals and the minor state in lowercase. Thus the likely paradigmatic states that are most likely to exist in a complex organisation are:

- BLUE (Nodal Blue)
- BLUE/orange (Exiting BLUE)
- blue/ORANGE (Entering ORANGE)
- ORANGE (Peak ORANGE)
- ORANGE/green (Exiting ORANGE)
- orange/GREEN (Entering GREEN)
- GREEN (Peak GREEN)

While other states are possible, these seven paradigmatic states will encompass the majority of states that a foresight practitioner would encounter. To demonstrate the differences in each state, it will be shown how System 3 would 'interpret' the world and hence its role depending on which paradigm was operating at the time.

7. Facilitating Foresight through the Meta System (continued)

Facilitating Foresight

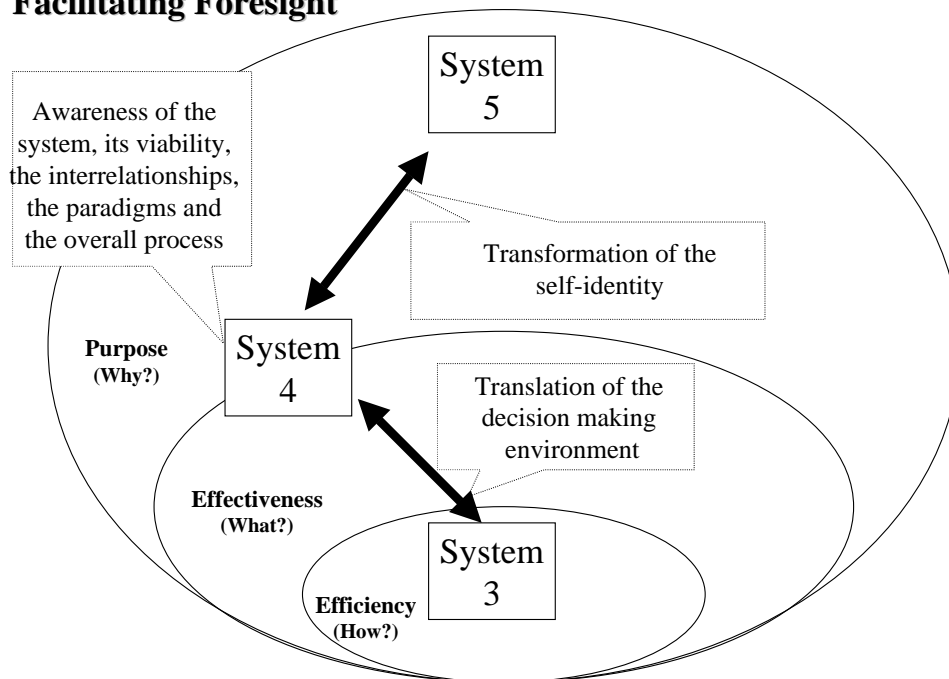


Figure 3: The VSM as a design framework for facilitating foresight

Figure 3 is a pictorial representation of how foresight is facilitated through the Meta System. The three systems have been outlined. Also shown are the recursive levels of organisational objectives. *Efficiency* (doing things right, the realm of 'how' questions) is the lowest level objective. Efficiency is encompassed within *effectiveness* (doing the right things, the realm of 'what' questions) which is in turn encompassed by *purpose* (the realm of the 'why' questions.)

It has already been explained how System 3 operates as a control on the Operational System in order for that system to become *efficient* (do things right). Figure 3 shows System 3 situated totally

within the efficiency recursion. Left alone System 3 will produce greater efficiencies from the Operational systems as the 3-3*-2-1 processes are continually improved which amplifies variety and hence maximise the ability to deal with complexity. While efficiency is a useful organisational objective, as a single focus it can result in the wrong things being done very well. Hence the need to place the efficiency recursion within the higher recursion of effectiveness.

System 4 straddles both the effectiveness and purpose recursions. Effectiveness focuses upon the right things being done. Purpose is focussed upon the self-identity of the organisation, what it contains that is unique and distinctive. The 4-3 interrelationship creates the strategic decision making environment for the organisation. This is the realm of organisational strategy, where organisational capacity is aligned with its external environment. 'What' is done is consistent with purpose, capability and environment. The 5-4 interrelationship permits the organisation to transform itself when changes in the external environment make this necessary. System 4, the foresight function, is pivotal in both these interrelationships, as will be shown in the following.

7.1 The System 4-3 Interrelationship - "Translation of the decision making environment"

Bringing together the 'inside and now' viewpoint of System 3 and the 'outside and then' view of System 4 creates the strategic decision making environment of the organisation. Strategy is a commonly used term in an organisation's lexicon but is also a term which is often misunderstood. Cybernetic system theory incorporates three distinct forms of strategy. The first is '*intended*'¹⁶ strategy, the strategy role of System 5. This is strategy with the purpose of achieving identity. Next is '*emergent*'¹⁷ strategy, the strategy role of System 4. This is strategy as adaptation to changes in the environment. Finally is '*realised*'¹⁸ strategy, the strategy role of System 3. This is the product of intended strategy mediated by emergent strategy.

The 'inside and now' view of System 3 is focussed towards an alignment of internal capability (3-3*-2-1) to intended strategy (System 5). It makes perfect sense to align capability with intention, there is not much point having an intended strategy which outreaches capability. This would be very dangerous to overall system viability. This view, however, has an attenuated view of the business environment because its perspective is from inside the system looking out. This is not a fault of the design, just a fact. The 'outside and then' view of System 4 is focussed towards the alignment of intended strategy to the business environment. Once again, it makes perfect sense to align intended strategy with the business environment. This view, however, has an attenuated view of internal capability because its perspective is outside the system looking in. When the two views are combined, a three-dimensional perspective combining strategy, capability and environment is created, and this is the strategic decision making environment of the organisation (see Figure 4).

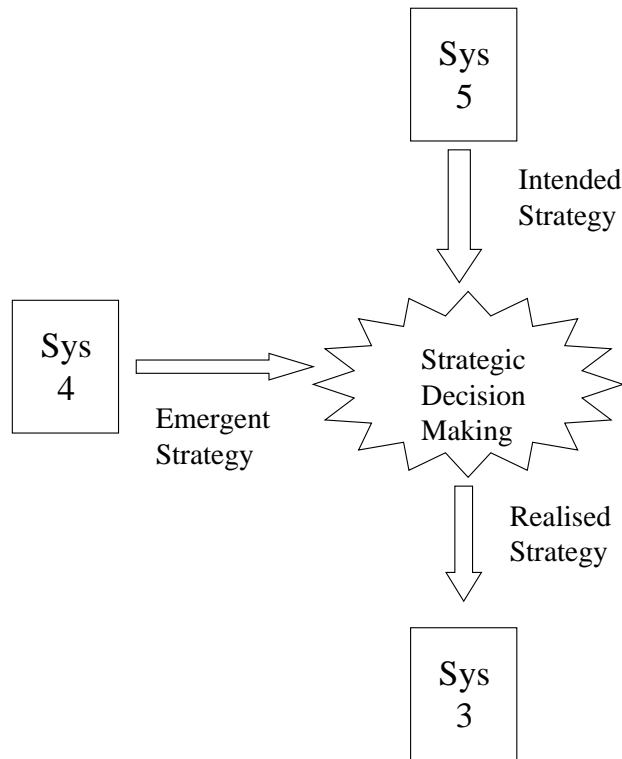


Figure 4: Creating the strategic decision making environment

Thus the 4-3 translation encompasses the effectiveness realm of the business and also refreshes intended strategy with emergent strategy arising from System 4's outside the system perspective. System 4 is in the best position to diagnose the entire system-in-focus in order to see if it is meeting the conditions for viability. It can recommend remedial action to any part of the system-in-focus if it detects the failure of any of the viable system functions. It is also in a position to diagnose the paradigmatic state that System 3 is operating from in order for it to modify the foresight method employed and communication style adopted to facilitate the interrelationship. System 4 can then ensure that the strategic decisions do result in changes to the Operational System.

To demonstrate how the different paradigmatic states would affect the 4-3 interrelationship it will be shown how perceptions of authority and thinking/data frameworks would differ. When System 3 operates as a control on the Operational System it applies the policies developed by System 5 and it also interprets and acts upon to the data it receives from other sub-systems, including System 4. System 3 thus has to adopt an interpretational stance to what it accepts as 'valid' authority and another stance to the validity of data and thought processes

In the BLUE state System 3 would accept prescription and demonstrate absolute obedience to the policies of System 5. It would expect that the policies be clearly written, be non-discretionary, and should be followed *to the letter*. The validity of information being received would be gauged from the extent to which it is compliant with the basis upon which the policies were originally developed. The prevailing thinking process is absolutist. This System 3 would struggle with the concept of autonomy in the other systems and it could tend to try to directly control the System 1s. Requisite variety would probably flood this System 3 and it could be 'too busy' to listen to the 'outside and then' messages from System 4. If it was listening, then trend extrapolation could be its

preferred mode of discussing the future because the attraction of historically based contemporary evidence.

In the BLUE/orange state System 3 would still believe in the correctness of higher authority but some change would now be possible. While different ways of doing things are possible there would still be a 'best' way of doing things. The focus is to *improve* the present, not to *change* the present. Acceptable information comes via the process of the 'right thinking mind.' What is rejected by System 3 is not authority but error. Thinking here is still absolutist but with some flexibility. This System 3 would be more relaxed with autonomy in the other systems if it could be shown that this was the best way of doing things. This should mean that System 3 would have some variety available for System 4 to work with provided the 'outside and then' message could be shown as reducing error and making present improvement. Forecasting could be its preferred mode of discussing the future because while forecasts still draw heavily upon what has passed they also create a 'choice' space within which the 'right thinking mind' can seek perfection.

In the blue/ORANGE state System 3 would accept that diversity is present but that it should be eradicated. Risk exists but is to be managed. Credibility comes from 'tried and true experience'. The right way is learned from careful testing and observation. Authority is seen as a power giver and boundary establisher. Multiplistic thinking is employed by System 3 to determine risk and probability. Autonomy amongst the systems should be increasing so System 3 should be increasing its capacity for variety. It would be interested in System 4 presenting data based upon modelling and simulation, which in turn is based upon experience. It would also be interested in analysis that made assessments of likelihood, consequence and risk mitigation.

In the ORANGE phase data is king. Potential risk is now an opportunity space. Confidence in System 3's own abilities are high. Timeliness is now a critical factor. Generated choice is a preferred decision making process after careful consideration of all the data. The system will be pressing for greater autonomy and it will recognise the authority of the most competent. System 5 and System 4 will have to demonstrate their competence to keep System 3 satisfied that the Meta-System is functioning correctly. The language here is strategy and tactics. System 4 would do well to keep its reports to the point and brimming with opportunities for exploitation. Delphi surveys would be well received due to the emphasis on 'experts'.

In the ORANGE/green phase a tension is occurring between categorical certainty, which is weakening, and relativistic thinking which is increasing. System 3 now may be bumping into gender and culture issues, things that were never a problem in the good old BLUE days. Certainty has been shaken but appearances must be maintained. System 5 would demonstrate its authority is partially derived from inclusiveness and the consideration of others. Autonomy is still important and so System 3 will look to System 4 to explain why some of these changes are occurring. System 3 will be very sensitive to its own doubts but System 4 must not publicly acknowledge them. Scenario writing could be useful here as taboo topics could be safely raised but the use of the STEEP¹⁹ factors would still be used to keep the emphasis on business matters.

In the orange/GREEN phase relativistic thinking processes are becoming dominant. The process employed is now just as important and the outcome of the process. In fact the demonstration of thought processes is now more significant than the data used to make decisions. The frame of reference is starting to become worldcentric. System 3 will be changing its focus from 'hard' quantitative data to 'soft' qualitative data in how it controls the Operating System. It would be expecting a similar change in the style and method of authority demonstrated by System 5, which would be more inclusive of others in and outside the system-in-focus. The opportunity for System 4 here is to demonstrate multivariate analysis methods. Causal Layered Analysis²⁰ would be useful here, as would scenario writing, but more value from the scenarios will probably come from the group processes and less the output of the written work itself.

In the GREEN phase, which would be very rare in commercial organisations, we would be starting to touch post-modern thinking processes. Relativistic and situationalistic thinking are dominant. One wonders how any work would get done with the perpetual processing of decisions. Certainly feelings and emotions would be turned on now and they would be the basis of most significant decisions, notwithstanding the intellectual basis that would be made explicit. System 3 would be struggling with its role as a control system and it might be questioning whether its

authority is appropriate. System 5 would be expected to be truly representative of the whole system. System 4 might find that employing organic system metaphors (chaos theory, soft-systems theory) for change and the future will be well received by System 3 as explaining the forces operating in the environment.

The foregoing has demonstrated why the 4-3 interrelationship is referred to as 'translation of the decision making environment'. In practice, the paradigm of System 3 would not move dramatically, unless the life conditions of the system-in-focus were to fundamentally change. System 4 would be able to fine-tune the methods it uses and the information it passes onto System 3. In the interests of the longer-term viability of the system-in-focus, however, System 4 should also try to 'lead' System 3 to the higher levels of conceptual thought that occur through the movement of BLUE through to GREEN. Higher levels increase the conceptual space for decision making, which is tantamount to increasing requisite variety in System 3. This process cannot proceed too quickly otherwise the System 3 will reject it. System 4 could safely lead from a position of one phase higher than the System 3, provided this was carefully monitored. Still the main role here is translation, with growth a secondary goal. If growth is necessary for the system-in-focus then chances are it will be a change lead from the 4-5 interrelationship.

7.2 The System 4-5 relationship - "Transformation of self-identity"

It has been shown how the Meta System of Beer's Viable System Model achieves efficiency through the System 3 interaction with the Operating System and how it achieves effectiveness through the 4-3 interrelationship. Further, the 4-3 translation relationship creates the strategic decision making environment, by mediating intended strategy with emergent strategy to achieve realised strategy. It has also been shown how System 4 can best facilitate that process through understanding the likely System 3 paradigm and how it can translate its 'outside and future' focussed information. By doing this, the system-in-focus largely achieves five of the necessary properties of a viable system:

- self-awareness;
- openness;
- self repair;
- self-organisation; and
- self-balancing.

The sixth property is self-identity and this is the responsibility of System 5. But what is the process that examines the self-identity of the system-in-focus? It is the transformational interrelationship of System 4 and 5.

E. F. Schumaker in his book, 'A Guide for the Perplexed',²¹ identified two distinct types of problems that an entity needs to find methods of resolving, if it is to continue existence. One type of problem is what he called 'convergent' problems. The more intelligently you study these types of problem, the more information you gather, the more research and observation you do and the answers tend to converge. The current level of thinking can find a way to solve these types of problems given enough time, money, people etc. For a system-in-focus these are the problems that are solved through the 4-3 interrelationship. Solve these problems and the system-in-focus becomes more effective (within its current identity). For an organisation these are the typical decisions around products, markets, strategies, goals and outcomes. The problems will converge if System 3 and 4 get their thinking processes and information aligned so that the 'inside and now' and 'outside and then' view coalesce into the strategic decision making framework of the system - in-focus.

Schumaker identified another type of problem. A problem that when two intelligent people looked at then what they concluded tended to contradict one another. The problem did not converge. *'On the contrary, the more they are clarified and logically developed, the more they diverge, until some appear to be absolute opposites of the others'*.²² Take the concepts of equality

and freedom. Are we all the same or are we all free to be whatever we want? What of maximising shareholder value or taking care of employees? Or minimising tax liability or making a fair contribution to maintaining the place where income is earned? Or economic growth to create the most wealth to share or minimising growth so that future generations may have existence? These type of problems offend the logical mind which has a preference for making a choice, finding the truth, going with the best/safest/profitable option or the one which will help/save the most people/my people/most deserving people. But it should be clear that if you make one of these choices then there would still be other people who can prove that you have made the wrong decision and therefore the problem is unlikely to go away. If the system-in-focus encounters these types of problems then the 4-3 interrelationship cannot deal with it because it is not convergent. It is only through transformation arising from the 4-5 interrelationship that these problems can be addressed.

Transformation of the self-identity of the system-in-focus is expansion of the conceptual decision-making space to encompass the points raised by each side of the divergent problem such that they are transcended and cease to be opposites. The historic example of this cited by Schumaker was the catch-cry of the French Revolution. *Liberté* and *Egalité* is equality verse freedom and is irreconcilable in ordinary logic, a classic divergent problem. The third word, *Fraternité* or brotherliness transforms the other two words as it gives them the context within which liberty and equality can be defined. In the VSM Meta System process this is how it would have been played out.

The previous self-identity of the system-in-focus of 'what it means to be French' might have had as its self-identity (from System 5) '*we are all equal*'. System 3 would then have taken the equality policy and used it to govern the Operating System to produce efficient equality. System 4, in its scanning of the 'outside' then detected a new emerging force, an idea of personal freedom, in the writings of various scholars. The 4-3 interrelationship would try to make the equality policy more effective. System 4 was very sensitive to the BLUE/orange paradigm that System 3 was operating from in this Enlightenment worldview but even with this insight the problem seemed unsolvable between the two perspectives. Fortunately System 4 had the foresight to diagnose the problem as divergent and not convergent and therefore the matter was taken up between the 4-5 interrelationship. That process resulted in a transformation of the self-identity of the system-in-focus to 'we are all brothers' and so a new brotherliness policy was passed down to System 3 to implement efficient brotherliness in the Operating System. The earlier policy of equality and new policy of freedom now became sub-policies of the brotherliness policy.

It sounds quite straightforward but in reality transformation of the self-identity of the system-in-focus is probably the most difficult, but ultimately, most important role of facilitating foresight. System 4 will be operating with the paradigm issue again in its dealings with System 5. But unlike the System 3 interrelationship where all System 4 had to do was mirror or maybe slightly lead the paradigm that System 3 was operating from, in this situation System 4 has to *awaken new paradigmatic states* in System 5. Beck and Cowan found that six conditions must be met before a higher paradigmatic state can be accessed. These conditions are: ²³

1. The potential for the individuals or collective are open to, capable of or prepared for change. They can be OPEN to change (easiest to work with), ARRESTED (which can limit the potential for change) or CLOSED (don't even bother). System 4 can work with OPEN, can try and work with ARRESTED and should walk away from CLOSED.
2. Current convergent problems have or will be addressed. Movement from present conditions can only occur if there are no serious problems in existence. There is no point planning a new self-identity for an organisation if there is not enough money to pay next week's salaries.
3. Sufficient dissonance about the current conditions exist for the 'status quo' to not be an option. System 4 must have a strong case for change.
4. Insight into how these circumstances came about. The present self-identity was thought to be appropriate in the past. Does System 5 know how it thought then and what has changed since? Were earlier assumptions based upon premises that no longer exist? System 4 here

has to take System 5 through a depth analysis so that it can understand how it once thought and why it thought that way.

5. The barriers to change are identified and managed. While physical barriers need to be identified and managed an insightful depth analysis should show how many barriers are the property of how thinking is constructed. Still real barriers need to be dealt with.
6. Support for consolidation during transition is needed. A new self-identity will mean new policies for System 3 to implement. The Operating System will be sub-optimised for a period of time. Expectations have to reflect this. System 2 will need to be resourced to support the efforts of the System 1s to coordinate themselves and not to leave them on their own. The Meta System must also be very sensitive to any algedonic signals of pain emerging from the system-in-focus and react quickly to them to help and not punish.

Facilitating Foresight is clearly more than finding the divergent problems for the system-in-focus to deal with. It includes facilitating the whole process of transformation with System 5. If the six conditions for transformation do not exist then it is negligent to commence a transformational process, as all that will happen is that the system-in-focus will be damaged and its viability compromised.

8. Wrapping Up

What this paper has tried to demonstrate is how consideration of the VSM as a design framework could outline the functions and processes that would enable the facilitation of foresight in organisations. System 4 is the realm of foresight for the system-in-focus. An effective System 4 would amplify the variety of information coming into the organisation. In conjunction with the System 3 function it would create the strategic decision making space of the organisation. This space is focussed on organisational effectiveness by aligning internal capability to business niche. System 4 would also facilitate the mechanism by which the identity of the organisation adapts to changes in the external environment.

Foresight, however, is more than an intelligence gathering process. It is critical that an understanding of how individuals and groups 'see the world' is brought to the process as well. When this is done, the process 'respects' where people are and tries to work with how they see the world. Miscommunication is minimised and the likelihood of the intelligence being acted upon is maximised.

Finally, there is the belief that personal mastery is enhanced when people and organisations improve their 'thinking capabilities'. They receive greater knowledge from their environment and can use that knowledge to ensure long-term viability. How is thinking changed? *'If you want to change how people think, give them a tool, the use of which, will lead them to think differently'*.²⁴ The VSM and Spiral Dynamics employed to facilitate foresight is such a tool.

Endnotes

¹ Slaughter (1995) pxvii

² Espejo & Harnden (1989) p21

³ Those people who Beer regards as the 'grandfathers of cybernetics are Norbert Weiner, Warren McCulloch and Ross Ashby

⁴ For more on Beer's Chilean experience, the reader should read Part Four of Brain of the Firm.

⁵ Ashby (1964) 'Only variety can destroy (i.e. absorb) variety'. p206

⁶ Beer (1972) p402

⁷ System-in-focus means the scope and boundary of the specific system under examination. Beer suggested that the mapping of the system-in-focus should begin with the basic operations of the

enterprise. It is usually quite clear which are the processes that deal with clients and add value. The system-in-focus must contain all functions of viability. If all viable functions are identified then the totality is a system-in-focus, e.g. these particular operations interacting with this specific portion of the external environment with the operations governed by these five specific functions. Higher levels of the system will exist and they should also be parts of a new system-in-focus at a higher level of recursion.

⁸A viable system will be autopoietic. It will produce itself. However when this autopoietic process becomes an end in itself, ie it becomes the purpose of the system, then it is pathological. The system has 'lost' its purpose and it is System 5's task to ensure that this does not happen Beer (1979) p410

⁹ Espejo & Harnden (1989) p419

¹⁰ Voros (2001)

¹¹ Espejo & Harnden (1989) p215

¹² Espejo & Harnden (1989) p269

¹³ Beer (1972) p401

¹⁴ Espejo & Harnden (1989) p249

¹⁵This detail is largely drawn from the book, *Spiral Dynamics*, by Don Beck and Chris Cowan, Beck & Cowan (1996) - see also Voros (2001)

¹⁶ Mintzberg (1994) p24

¹⁷ Mintzberg (1994) p25

¹⁸ Mintzberg (1994) p24

¹⁹Social, Technological, Economic, Environmental, Political

²⁰For discussion on the uses of layered analysis in foresight approaches see Inayatullah (1998)

²¹ Schumaker (1990) p82

²² Schumaker (1990) p64

²³ Beck & Cowan (1996) p75

²⁴ Fuller (1976) p101

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