Are we any nearer implementing systems concepts in business and government?

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ABSTRACT

The last century and the last decade in particular have seen the consolidation and development of a number of strands of systems thinking. The concepts and benefits of a systems approach are now well established and are infiltrating the language and culture of many disciplines and organisations. However the current reality is that systems based words are significantly greater than systems based actions. This is particularly true in business and government.

This paper takes a number of examples from recent business and government consultancy experience by the author concerning the application of system dynamics. Together these example constitute a participative, action research investigation, which casts light on the difficulties of implementing systemic concepts in business and underline the challenge which still exists in making holistic thinking an everyday activity.

It is suggested that there are two ways forward to embrace the systems concept in management. One is to recognise that a mixture of both reductionism and systemicity is necessary in any management dialogue and the second is that manages will listen more closely to the system argument if it is couched in terms of future financial value rather than purely systems terms.

INTRODUCTION

The merits of system thinking are becoming well established and there is much evidence that some of the concepts are emerging in everyday use in the language and understanding in organisations. However, when it comes to systemic based actions there is much less evidence of success. For example the British government and health service have made much of the terms 'joined-up thinking' and 'whole system' approach, but the reality remains far from this. This paper seeks to examine some of the barriers to systemic actions which seem to be capable of overriding the inherent logic of the approach.

It begins with a brief summary of the range of systemic methods currently available to business and government organisations and an overview of axioms of the systems concept. It then provides evidence from the business consultancy experiences of the author in a range of managerial and government settings of a reluctance by senior managers to really turn systems ideas into practice. These experiences are then categorised into groups that characterise some of the reasons for the apparent failures. The paper concludes with some suggestions for encouraging thinking which builds on existing semi-systemic business disciplines and a plea for business to understand better the balance required between systemic and reductionist thinking.

A BRIEF HISTORY OF SYSTEMIC THINKING IN BUSINESS

The discipline of systems thinking is very broad and of long standing, and it is beyond the purpose and scope of this text to present anything more than a cursory historical summary. However, it is important to make some points concerning the history of the systems movement in order to understanding some of the current barriers to its acceptability. It is certainly important to realise that it is only in the last 20 years that systems ideas have materialised into a set of strands related to business use which help with knowledge capture and issue structuring in complex situations.

Current systems thinking methods in business and government can be grouped into five broad categories.

The first is 'soft' operational research (SOR) (Rosenhead, 1989 and 1992; Wolstenholme et al, 1994), which, in a very general sense focuses on issue structuring and decision making in situations where numerous agencies have an interest in the outcome. The second is known as the 'fifth' discipline of organisational learning (Senge, 1990), which qualitatively builds on the insights arising from many different applications of system dynamics. The third is the growing field of chaos and complexity (Holden,1991) which provided a major break through in viewing the world and organisations as adaptive, non-linear, self-organising dynamic networks, where transition, continuous evolution and paradox are the norm (Capra, 1998). The forth is the area of cybernetics (Beer, 1996) which emphasises the very practical aspects of control and communication in organisations and the fifth the disciplines of Open Systems (Emery and Emery, 1976) which focuses on systems as derivatives of their environment.

The core method within soft OR is the Soft Systems Methodology (SSM) (Checkland, 1981; Checkland and Scholes, 1990; Wilson, 1990). This method of issue analysis and system redesign, which can be considered as the 'umbrella' framework for many strands of management systems work, arose out of the inability of hard system engineering concepts to deal with "human activity systems." The title of soft operational research is derived from this core move from 'hard' and rigid to' soft' and flexible analysis. The focus of SSM is on the people involved in change and it provides a flexible enquiring process for articulating, challenging, and comparing the meaning imparted by various people and agencies involved and their understanding of the problem situation. One of the major contributions of SSM is the idea of separating the 'real' and 'systems' worlds which builds on ideas from other applications of systems ideas to the management field (for example, Ackoff, 1976).

Amongst other strands of Soft OR are Strategic Options Development and Analysis (Eden, Jones and Sims, 1987,) based around cognitive mapping, the Strategic Choice Approach (Friend and Hickling, 1987), for assist communication about complex decisions and Critical Systems Heuristics (Flood,1996 and 1999), aimed at revealing the underlying value assumptions of issues.

Of the five strands of systems thinking listed, the focus in this paper will be on the 'Fifth' Discipline System Thinking. This variant of systems thinking, like SSM, arose out of system dynamics modelling (Forrester, 1994; Wolstenholme, 1990; 1993(1)) in response to a need to temper hard analysis with an understanding of the role of people and subjectivity in change. It achieved this by embedding systems thinking as a 'fifth' discipline of organisational learning to cement the human resource methods of visioning, team building, mental-model sharing and person mastery. This style of systems thinking bypassed, but retained the insights of quantitative modelling, by condensing many years of system dynamics modelling outcomes and insights into a set of generic patterns of structure and behaviour. These were named systems archetypes. The thinking was that archetypes would be easier to digest by a management audience than the content of simulation models. It should be remembered that this was at a time when system dynamics modelling was predominantly being used as a 'back room' modelling tool, rather than a 'front room', participative and learning aid to managers (Lane, 1994).

AXIOMS OF THE SYSTEMIC CONCEPT AND ITS USE IN BUSINESS AND GOVERNMENT

All strands of systems thinking have in common the idea of viewing the world and organisations as a web of interrelated systems with no one system being more fundamental than another. A systems view of the world embraces complexity and also provides improved rigour and understanding by providing a simple yet comprehensive systems language to help build pictures of whole organisations, both static and dynamic, from different perspectives. The major themes of the approach are to examine situations in context and to see how they are interconnected with one another.

The systems approach is best understood by its contrast with more traditional management approaches to change and problem solving, which tend to focus on developing understanding by taking systems apart through a process of reductionism and analysis. In contrast to systems thinking, which attempts to embrace and simplify complexity, reductionist thinking attempts to eliminate complexity. It tries to make the world more manageable and controllable by introducing artificial boundaries and compartments within which we work. Many boundaries are of course natural boundaries and are vital to the individuals and the organisation. However, many are artificially created to reinforce power and control.

In business thinking has been dominated by the reductionist approach. Since the middle of the 20th century, management thinkers have developed numerous analytical methods and tools to support decision-making. Wave after wave of methods and movements have emerged in a blaze of publicity -

and have mostly fallen away again as disillusion set in. In our own time we can recall (inter alia) organisation and methods, operational research, strategic planning, organisational design, total quality management, business process re-engineering and more. Ultimately, all these approaches were seen to be helpful but inadequate in themselves, because they either focused on single aspects of business, or were confined to strategic thinking or operational thinking but not both.

BARRIERS TO SYSTEMICITY – A CONCEPTUAL APPROACH USING SYSTEMS ARCHETYPES

Before describing some current examples of thinking in organisations, a conceptual framework for analysis of the examples will be developed using causal feedback maps and system archetypes. There are many types and variants of systems archetypes. For the purpose of creating a conceptual framework in this paper only two types will be considered. These are the 'limits to growth' and 'fixes that fail' archetypes. Further, these archetypes will be condensed and represented by a combination of just two loops, one reinforcing and one balancing.

Archetypal thinking suggests that any managerial change can be reduced to an action with well intended consequences, but one that creates by its existence an unintended consequence, referred to here as a side effect of the action. This interpretation of action is entirely consistent with the whole concept of recognising the world as a non-linear, self-adapting, feedback system. In such a world no action can become dominant. Whenever any strategy or policy does become dominant, adaptation by others will take place to eliminate the dominance by copying it or replacing it with another well-intended policy. Side effects are well recognised in some fields such as medicine, where the side effects of treatments can be worse than the disease they are intended to counter. In management the concept of side effects is much less well established, a fact that clearly contributes to a focus on reductionist thinking.

In the case of a managerial 'growth' initiative, the intended action is based around establishing a 'reinforcing' feedback strategy. Here the side effect is a 'balancing' feedback process that limits the growth. This combination of system structure and behaviour is referred to as 'limits to growth' pattern or archetype.

In the case of a managerial 'control' initiative, the intended action is based around establishing a 'balancing' feedback strategy to meet defined target objectives. Here, the side effect is a 'reinforcing' feedback process that will act to undermine the control or cause it to escalate out of control. This combination of system structure and behaviour is referred to as a 'fix that fails' pattern or archetype. This pattern is particularly instructive to identify where the 'controllers' are actually well aware of the side effect, or of a fundamental solution they might use rather than the 'fix', but choose to ignore it.

CURRENT REALITY IN SYSTEMS PRACTICE

The above simple conceptual framework will be used to categorise examples of two groups of situations recently encountered in management consultancy practice. First, a group of situations will be presented where the side effects or known fundamental solutions of well-intended control actions have largely been ignored. Second, a group of situations will be presented where the side effects or limits of well intended growth strategies have also largely been ignored. In each case the archetypal thinking will be used to examine why reductionist, rather than systemic thinking prevailed.

Group 1 examples - Not tackling fundamental solutions:

Table 1 shows a number of issues, control actions used to address the issue, the intended results, the actual results (which compounded the issue) and a suggested holistic solution which might have worked better .

Issue	Control Action	Intended result	Actual result	Suggested Holistic Solution
Profit warning	Cut expenses/ downsize	Reduced costs	Low moral/ reduced revenue/ reduced profit	Revenue initiatives
Falling Demand	Centralise/ Globalise/ Merge	Wider market/ Reduced costs	High marketing costs/ Poor product penetration	Understand local market better
Excessive Demand	Increase productivity/ technology	Increased work throughput	Stress/ Leaving	Balanced supply investment
High Hospital Waiting Lists	Pay consultants overtime/ increase bed stock	Reduced waiting lists	Increased waiting lists	Address consultant contacts/ discharge patients more efficiently
Rising Crime	Increase police recruitment	Reduced crime	Increased Crime	Address societal factors and courts/prison capacity
Road congestion	Build more roads	Reduced congestion	More congestion	Public transport investment

Table 1. Not Tackling Fundamental Solutions

Group 2 examples - Not recognising the limits of well-intended actions:

Table 2 shows a number of objectives, growth initiative used to achieve the objective, the intended results, the actual results (which undermined the initiative) and a suggested holistic solution which might have worked better.

Objective	Growth Initiative	Intended result	Actual result	Suggested Holistic Solution
Narrow Product Range /Poor product take-up	Launch new Product/ Promote product	Customer Growth	Poor Customer Service and Customer Loss	Gear up customer service and supply chain
New Channels to Market	.Com development	Increased sales	Increased Crime	Gear up customer service and supply chain
Poor speed of products to market	Reduce research and development time	More products at market/ Improved revenue	Poorer quality/ Shorter product life cycle	Balance time to market against late life benefits
Tendering Opportunity	Sound business strategy and plan	Business growth	Lack of senior management time on existing core business	Balanced existing and future business
Too few people in higher education	Increase places in higher education	Improved job opportunities	High class size/ poor staff moral/Reduced quality of qualifications	Increase teaching capacity in line with student growth
National Prestige	New facilities/events	Improved Image	Worse Image	Balance facilities development with infrastructure development

Table 2. Not Recognising the limits of well intended actions

DEVELOPING THE CONCEPTUAL FRAMEWORK TO UNDERSTAND THE EXAMPLES

In each example emphasis is clearly placed on localised, short-term, reductionist solutions and aimed largely at the symptoms of the issue rather than the issue itself. In each case the applied solution actually made the matter worse in the medium term.

So why did the organisations involved not behave systemically in the cases described? Did they not see the possible side effects of their actions, or were there mitigating circumstances for them seeing but being unable or unwilling to account for the wider picture. To some extent all of these answers are relevant and can be better understood in the context of an extended appreciation of the conceptual framework introduced earlier.

There are three characteristics of systems archetypes, which are important to understanding the difficulties of systemic thinking and which help clarify why systemic thinking is much easier in hindsight than in real time.

First, it must be appreciated that any management change action is a complicated process, requiring considerable focus of attention and intense communication and it is often difficult to keep the side effects in primary consciousness. Second, the side effects usually transcend the local environment of the change makers and are often 'hidden' from their view across impermeable internal or external boundaries. Third, there is usually a considerable time delay between implementation of a change initiative and the appearance of the side effect. After implementation the initiatives can appear to be successful for a time but then be overtaken by the side effect. Depending on the strength of the side effect, relative to the initiative, the initiative can be reduced or negated. When the negation does take place it is cloudy by other events and actions which have taken place in the meantime. Often little connection is made between the poverty of the action and the later deterioration in performance, particularly as the latter then require intense fire-fighting and a focus on event-based management.

APPLICATION OF THE CONCEPTUAL FRAME TO THE EXAMPLES

In each of the examples given discussion took place as to why the managers involved chose to have reductionist thinking dominate the change agenda and ten categories have been defined representing the different reasons given. These will be discussed in turn with reference to the examples.

1.   The Case of the totally Blind

For some people the totality and complexity of the change process would seem to reduce the chances of seeing and investigating the side effect. This is particularly true when the objective set is a make or break activity for the organisation, or the individual leader. It such cases there is a belief that the longer term will not even exist if the short term objective is not met. Such thinking has been encountered in start-up companies, particularly dot com companies, but it has also been encountered in more traditional companies launching new products. Any new growth initiative such as customer gain seems to totally outweigh thinking about customer retention and service.

2.   The Partially Sighted

There are many people who are not totally blind to the side effects of their actions but who only pay lip service to them. Here traditional solutions dominate thinking as in police recruitment to reduce crime. It may be acknowledged that this will mean more arrests, but the thinking stops at getting potential offenders off the streets. It is then up to other agencies in the rest of the criminal justice system to make sure they have the capacity to cope with the increased demands on them. There is little understanding or interest that what happens in the police sector will have consequences beyond that boundary. Particularly, whether or not the actions might lead to more cases of plea bargaining, shorter prison sentences more bail and more ex-offenders released requiring more police recruitment later.

3.   Seeing but choosing not to see (the Nelson syndrome)

In many cases the side effects are well known, but the attitude is that it they have to be accepted and lived with. This situation has been encountered in numerous growth initiative situations where it is expected that fewer and fewer people will be able to cope with more and more business.   The assumption is that longer working hours will not be detrimental to the performance of the individual or the organisation. In reality individuals either increase productivity at the expense of quality by scanning, skipping and destroying work or burn themselves out. Whole new industries such as stress management thrive on the results. Sometimes whole organisations legitimise throwing away work to

ease backlogs when demands are too great. For example, when the demand to scrutinising such items as insurance claims and tax returns vastly outweighs the capacity to supply.

4. Seeing, but afraid to act

Particularly in the case of profit warnings or cost escalation, the power of the short-term accounting regime in organisations dominates and it is more important to show good end of year returns than to demonstrate long term sustainability. In these situations to even raise the concept of side effects is tantamount to blasphemy and cynicism and can be career threatening.

5. Seeing but do not believing

In some cases there is evidence that the side effects are acknowledged, but perceived to be 'soft' feedback links of uncertain or low probability. For example, Ministers in the department of health have consistently refused to acknowledge that there is any significance in the relationship between high elective surgery waiting lists and slow discharges of elderly people from hospital into community and continuing care. Hence, they would choose to address high waiting lists by increasing bed capacity in the acute NHS hospitals rather than by increasing bed capacity in Social Services controlled community care. The fact that there is an accounting boundary here is very relevant.

6. Seeing but unprepared to take risks.

Many companies know that there is a good chance that their growth initiatives will generate customers but are never willing to risk capacity and supply investments to match their expectations. This reason for reductionist thinking has been encountered in situations as diverse as chocolate bar and pesticide manufacture.

7. Seeing but the time scale for the side effect is too long to be considered important

The magnitude of the perceived time delay in a side effect is sometimes an important consideration in the attitude to systemic thinking. This situation is encountered often in the area of branded pharmaceutical and agrochemical products. Here there is a tendency to try to be first to market rather than to spend more time on research and development. However, in such circumstances the long term view can be vital. Product sales toward the end of the product life cycle might be well into the future but are determined by the product quality created in the research and development process. This is particularly true of the viability of branded products when they reach the stage of having to compete with generic products.

8. Seeing but choosing to ignore for political reasons

One important reason why side effects of actions are ignored is that there could be a secondary and perhaps even stronger side effect than the obvious one, but on quite a different agenda. This is often the political rather than economic imperative. For example, to acknowledge that a cut back on roads is necessary to reduce congestion by forcing people away from cars has the bad side effect of being a vote looser. There is an interesting time delay in such situations before it becomes politically acceptable to acknowledge the existence of side effects without loosing votes. This is usually well beyond the point at which the side effect is obvious and inevitable to the majority of people. The point at which it was politically respectable to acknowledge the side effects of smoking on cancer and car exhaust pollution on asthma are other examples.

9. Seeing, ignoring on the assumption that no one will challenge the side effect

It is sometimes in no one's interest to acknowledge a side effect. A deterioration in educational standards as a result of increasing student numbers without increasing staff numbers is a case in point. It is certainly not in the institutions, students or parents interest to openly recognise a fall in quality and if it happens in every institution it is more difficult to perceive the absolute decline.

10. Seeing and acting

It is undoubtedly true that some organisations both embrace and act systemically and this category although not embraced in the examples used in this paper must be included for completeness. An interesting irony is that those who do act on systems ideas do not like to it widely known for the reason that it could be a significant competitive advantage.

THE WAY FORWARD

The above examples and analysis suggest that the big picture can be hard to embrace. Time, effort, barriers, culture, politics and survivability seem to get in the way. In order to over come some of these barriers it is suggested on the experiences used in this research that there are two ways of improving the take-up of systemic thinking.

One is to challenge the premise often put forward by systems practitioners that the big picture (the systems view) is the only picture. It is suggested here that systemic thinking should not be seen as an alternative to the reductionist thinking, but that both should have a place in the world.

The second is that to move people a little further towards the big picture there needs to be a way of giving them some more meaningful incentive to embrace systemic thinking.

Both of these ways forward will be explored here.

The paradox of perspective

It is important to recognise that a 'systems perspective' and a 'reductionist perspective' are at the extreme ends of a spectrum of perspectives and that most people to make sense of the world and to make decisions and change have to position themselves in a comfort zone along this perspective. The important point here is that the systems view and the reduction view should complement rather than, rather than replace one another.

It would be foolish to deny that many reductionist tendencies are vital to business. For example, the single-minded drive and initiative of numerous individual entrepreneurs has been vital in helping the business world evolve into the powerful wealth creating activity it is today.

It is suggested that, rather than reject either, both the systems and the reductionist views should be held in mind at any time and that this paradox, like many others in life, should be embraced as a contribution to increasing our awareness of situations. Seeing the world as a web of interconnected systems makes this possible.

For example, in health care, if our focus of interest is on a blockage of the digestive system then we clearly want the specific skills of a gastro-entologist to go down to the detail of our digestive system to restore us to health. However, we also perhaps want to look up to see the spatial and time context of any required operation. Everyday experience, as a patient or customer, tells us that we want and respond better if we do not become the 'colonic obstruction' in hospital ward 9 that is part of a dynamic pattern over time which prevents others being admitted for treatment. Such a perspective would also resonate with the hospital management responsible for capacity planning to keep waiting lists low.

In systems terms, the digestive system is part of the body itself and, for a short time, the body is part of the hospital system. The digestive system also contains more detailed parts, which may or may not be relevant to the situation. Further, the hospital is part of the National Health Service, a fact that might also play a part in the situation.

In any situation we want effective care to be delivered, but in a holistic framework that puts our illness in the context of our own life and the lives of others. In general we want to respect the detail, but to acknowledge the higher purpose.

System archetypes have the potential to assist with the move towards a balanced systems perspective. Whenever any managerial action is undertaken, dialogue should take place around the language of system archetypes to identify and challenge, in a non-career threatening way, why unintended consequences are not being explored or are being ignored. This can be quite revealing because, as indicated, some of the reasons relate to the functional and personal power bases and culture of organisations.

If consequences are explored and identified, then systems thinking approach further suggests that steps should be taken in parallel with the growth or control initiatives, to unblock the side effects and hence improve the chances of the intended growth or control being achieved.

SEEING ENOUGH OF THE SYSTEMS WORLD TO ENRICH REDUCTIONISTIC DECISION DIALOGUE

It is clear from the examples given in this paper that there is a tendency to weigh decisions in business towards the reductionist end of the spectrum and that there is a need for a better balance.

It is of interest to note here that although many organisations are reluctant to embrace a systemic viewpoint, there is strong evidence of management disciplines however emerging in every day use in business that are embracing a wider systems view.

The ideas of the value chain (Porter, 1998), value based management (PriceWaterhouse, 1997), performance measurement (particularly the balanced score card) (Kaplan and Norton, 1996), knowledge management (Polipopolis, 1998) and some strands of strategic thinking (in particular, resource based strategy) (Wernerfelt, 1984), and Organisational Learning (Senge,1990) all represent a move towards systemic thinking. These methods can be described as semi-systemic since they all widen out conventional thinking and are concerned, for example, with looking at performance measurement across organisations, looking at the future rather than past, and focusing on value, people, teams, intangibles and intellectual capital as key business drivers.

The Value Chain - The value chain contributes the idea of thinking at an intermediate level in organisations, where strategy and operations come together and where value is created and destroyed.

Balanced Scorecards - Balanced scorecards contribute the idea of balanced performance measurement across the organisation, including internal processes, customers, finance and learning/growth.

Resourced-based strategy - the resource based view of strategy contributes the idea that sustainable competitive advantage depends on the nature and type of resources a company has, both tangible and intangible, and how they are deployed.

Value-based Management -Value-based management contributes the idea that companies and business strategies should be judged by the future economic value they create for shareholders, i.e. the net present value of future free cash flows, discounted over a future period of competitive advantage.

Knowledge Management - knowledge contributes the idea that gathering, sharing and developing both tacit and explicit knowledge and using this to accelerate future deployment of resources and learning is a key to success.

Organisational Learning - organisational learning contributes the idea of learning residing within teams and organisations rather than the individual and the need for organisations to undertake activities which lead to the sharing and embedding of mental models and knowledge.

The value chain in particular focuses attention on the softer people issues associated with working across organisational boundaries of responsibility within the chain. Because each functional sector of the chain is a business in its own, there exists a tendency within any function area of the value chain, to look down and to see solutions in the detail. This is simply because it is the priority view dictated by job descriptions, performance measures, defined responsibilities and accountability.

The value chain perspective encourages us to accept important boundaries around our functional activities and to see what we are part of, in addition to what is part of us. It may not be appropriate to pull down barriers, but we might at least think about not building them or at least making them as transparent as possible.

A key word in most of these approaches is value and the future financial value concept is a powerful way of assisting people to be more systemic. Purely 'reductionist thinking' can be translated to mean 'value destruction', whereas 'holistic thinking' can be translated to mean 'value creating' thinking.

CONCLUSIONS

This paper has suggested that, despite the rhetoric, business and government have a long way to go in embracing a more systemic view of the world. Managers in different levels of organisations often recognise the insights, which a systems view brings, but they often feel powerless to communicate and implement them. All too often organisations are locked into existing structures and sectors of responsibility where vested interests, short time horizons, historical momentum and impermeable boundaries dictate events. The paper has stressed the importance of balancing systemic thinking with reductionist thinking and the need to use value concept and semi-systemic management disciplines to assist business in having a greater appreciation of the importance and benefits of greater systemic awareness.

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