

# DEALING WITH COMPLEX SOCIETAL ISSUES: HELPING ACTORS TO DETERMINE A WAY AHEAD

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7th version

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01 February 1999

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## *Abstract*

A method is suggested for helping actors in organization and society to decide how to proceed when researching complex issues. Its structure arises from the distinctions that the mind draws when trying to adjust to changing situations. These are based on dichotomous answers to simple questions: What should be done?, Where?, and Which Way or which type of approach should be used? These lead to the creation of four general types of approach and eight particular approaches. This structure can be used to help determine which approach or methodological orientation should be used in a research context. The alternative orientations correspond to those in Brugha's structure of adjustment decision-making within Nomology, to Schwaninger's polarities framework within Integrative Systems Methodology and to Bowen's Eight Faces of Research. The selection of orientation depends on the answer to three questions regarding the subject being researched. Is it more about Planning, or is it more about Putting plans into effect? Has it more to do with People, or is more to do with the Place of the decision, i.e. systems and structures? Does it rely more on a Personal approach to problem solving, or do the decision-makers rely more on using their Position, i.e. their power or authority in the situation? The authors propose this as a holistic meta-methodology that uses a dichotomous structure to help identify and choose between genuine complementarities. The method is then tested in the context of some cases.

Key Words: Systems, Methodology, Research, Nomology, Philosophy

## *1 Introduction*

The purpose of this article is to give actors in organisations a heuristic for ascertaining how to proceed in a given situation, i.e. to determine what is the priority for action, where they should primarily direct their efforts, and the best methodology or research approach to use.

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It reflects the coming together of three streams of research, “Nomology”, "Integrative Systems Methodology" (ISM), and "Eight Faces of Research”.

Our interest in Nomology arose in the early 1970s out of a procedure that was built to help diagnose answers of senior executives responsible for aspects of the administration of transportation operations and facilities in the Dublin area. This was and is a large-scale societal problem that was too complex to solve using any mathematical or computer model. The basic intuition was that the executives who were full-time concerned with improving transportation particularly for commuters in the Dublin area were excellently positioned to give advice on the most important improvements for resolving the problems. Since the time of that survey and analysis the theory that underpins the analysis has been built and extended into a generic theory which in principle is applicable to any complex situation (for details, see Brugha 1998a, b, c, d; 1974).

Integrative Systems Methodology (ISM) was developed to help actors in organisations (and whole organisations or groups of individuals as actors) to achieve requisite variety when dealing with complex issues or problems. In other words it is intended to help them enhance their action potential. ISM builds on leveraging the complementarities of the positivistic and the phenomenological-hermeneutic approaches, the objectivistic and the subjectivistic perspectives, and quantitative as well as qualitative methods (for details, see Schwaninger 1996, 1997a, b).

The “Eight Faces of Research” framework corresponds to a classification of types of (operational) researchers. It is easily generalised to types of management style or to different approaches to research. It was developed to better understand why researchers chose different approaches, and could be used to select the organisational style likely to be appropriate in a particular situation. This research grew out of ongoing research into the context of operational research projects (for details, see Bowen 1990; Eilon, 1974; Agrell, 1983, 1989).

### *2 The Commonality between Nomology, ISM and the Eight Faces of Research*

Nomology is the science of the laws of the mind<sup>1</sup> (originated by Hamilton, 1877). The foundation of nomological theory is the structure of qualitative decision making (Brugha, 1998a) which has two

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<sup>1</sup> Nomology derives from the Greek, 'nomos' - law, convention, observance, and 'logos', word, speech, account, argument, reason, and explanation.

branches: adjustment and development. The method described in this article is based on the theory of adjustment decision making (Brugha, 1998b).

The basic nomological idea is that decision making processes, in general, are invariant and cope with complexity by combining simple heuristic "building blocks" in the form of successive questions and choices. In any culture, there should be a natural language that incorporates the concepts of a nomological system. Furthermore, the way people make decisions should be expected to follow certain simple axioms regardless of culture or situation. Thus when people have a complex and ill-structured management problem that cannot be solved using standard quantitative techniques they try to analyse it by breaking it down into dimensions with which they are familiar by means of asking simple questions. The natural way that problem-solvers structure their answers to such questions is in terms of dichotomies, i.e. questions with either/or answers. Inherent in the process of breaking judgements into dichotomies is that every such system involving qualitative decision-making will have an inbuilt tendency to try to redress imbalances within each dichotomy. This happens systemically so that each dichotomy is transformed into a genuine complementarity. As people think and act "interpretively" they iteratively transform "either/or" choices into an "as well as" approach.

The first such dichotomy to be considered relates to the question "what should be done?". If we are relatively unclear about what should be done then we will focus more on the planning aspects. If, on balance, we feel relatively clear about the direction that should be taken we will focus more on putting solutions and plans into effect. The difference between planning and putting lies with the approach of the decision-maker who, in turn, is affected by the general level of uncertainty associated with the problem or system in question. If uncertainty seems to be high he or she will emphasise developing suitable proposals and getting clearer perceptions. If uncertainty seems to be low he or she will emphasise getting people's agreement about plans and putting improved systems and better methods in place.

The second dichotomy relates to the question "where should it be done?". Should we be doing something in a particular place, for instance in some part of the company or organisation, such as spending some money on a project or restructuring an institution? Or should we be focusing more on the people involved, agreeing what should be done or motivating the participants?

As the key questions asked are independent of each other so the answers should find their own balance independently of the others. The activities based on recursive combinations of dichotomies of different dimensions have meaning and importance in the practice of decision-making. A planning

activity within place is described as a proposition. Planning amongst people corresponds to developing a perception. Putting a solution into effect amongst people is a pull activity. And push describes the activity of putting the remaining aspects of the solution into place. Planning starts first in place and then moves to people; putting starts amongst the people and then moves back into place (Figure 1).

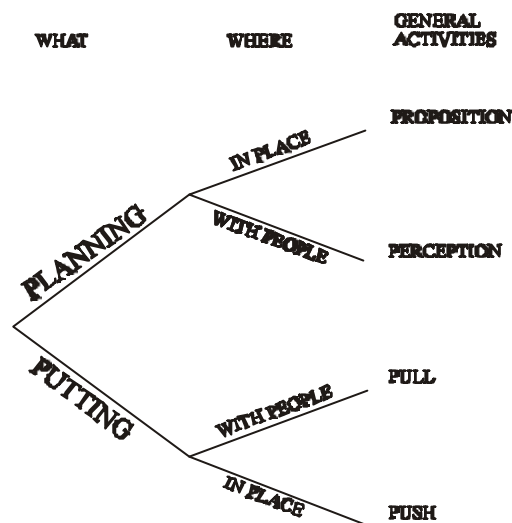


Figure 1. The four general kinds of activity

The set of general decision-making activities proposition-perception-pull-push virtually covers all kind of situations. Writers in different fields have developed many versions of the above generic set. Examples from philosophy are attention-intention-desire-detachment and energy-equanimity-effort-effectiveness. From religion there are body-mind-soul-spirit and reform-conform-confirm-transform. Adjusting as part of a grieving process involves numbness-yearning-disorganisation & despair-reorganised behaviour. In management there are direction-mission-vision-synergy and capacity-capability-community-contribution. See Brugha (1995a) for further examples.

Recent approaches to dealing with complexity in management (Schwaninger, 1997; Espejo, 1993; Espejo et al, 1996) have distinguished between a content loop and a context loop. The content loop relates to the subject-matter of a process or activity of coping with a problem. The context loop refers to the structural and cultural texture in which that process is embedded.

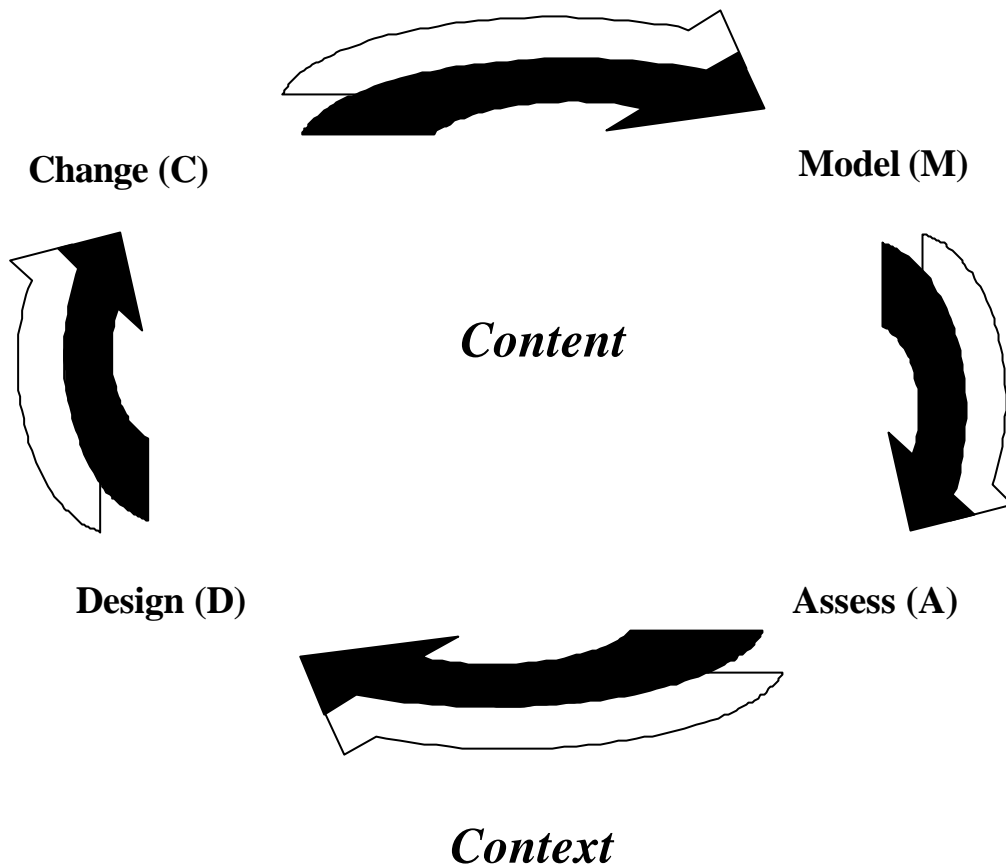


Figure 2: Integrative Systems Methodology (overview). Source: Schwaninger (1997a)

The context loop would match the four adjustment phases. Thus "model" would correspond to a proposition activity, "assess" to a perception activity, "design" more to a pull activity, and "change" rather to a push activity. ISM differs from Nomology in that it is more specifically focused on the research approach or methodology to use. This is clear from the terms and also from the polarities underpinning ISM.

In Nomology the first dichotomy corresponds to planning / putting and relates to the degree of uncertainty associated with the problem. In ISM where there is high uncertainty the research approach must emphasise the exploratory aspect, i.e. model and assess, and where there is less uncertainty the primary challenge lies in leveraging confirmatory investigations, i.e. design and change creatively. In the "Eight Faces of Research" the dichotomies divide into a strong desire or not to make certain statements. The first dichotomy is based on the "desire to make statements about the adequacy of 'the system' (as it is 'theoretically' assumed for some purpose)" (Bowen, 1990). The

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meeting point for the three streams is firstly the question of uncertainty about the research approach to take. If there is a lot of uncertainty about how to proceed then 'the system' will be open to question and the approach will be more exploratory.

As far as the methodological perspectives in dealing with complexity (Schwaninger, 1997a and b) are concerned, the people / place dichotomy would be associated with the systemic<sup>2</sup> / non-systemic modes. The corresponding "Eight Faces" dichotomy is based on the "desire to make statements about the adequacy of the beliefs of a 'decision-maker' as to what the system is and can do (doubting the 'theory' and the basis for particular decisions)" (Bowen, 1990). A strong desire to challenge existing beliefs corresponds to emphasising the people aspect.

The content loop of ISM is largely to do with development (at a substantive level). Although this article confines itself to the adjustment aspect it is worth noting with regard to the commonality between ISM and Nomology that both recognise the differences between adjustment and development, and deal with each in similar ways.

In the next two sections we show how both adjustment frameworks extend to eight aspects.

### *3 The principal adjustment activities of Nomology*

The four general kinds of activity break down into eight principal activities on the basis of a further question, "which way should be used?" (Figure 3). Whenever an organisation is challenged or threatened by some new situation the first response is to propose some solution. Those who are in place in the organisation, who have control over the resources, usually will first try some solution that does not involve too many other people. The combination of a **proposition** activity that is done using one's **position** (i.e. the control one has over resources, people or influence) is described as **pounce**, a sudden shift in direction of resources or emphasis that has not been widely discussed or agreed.

The other extreme on the dimension of which way to solve a problem is by focus on the **person** instead of on one's **position**. If a pounce solution is inadequate then go "in person" to those who are in place in the organisation and see how the problem affects the work that they do. So, a

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<sup>2</sup> ISM's systemic mode and the "Eight Faces" use of 'the system' are not aligned with each other. One aim of this article is to find the commonality between the concepts. Essentially this is structural and arises from the combinations of positions on the nomological dichotomies.

**proposition** activity that is centred on the activities of each **person** involved would be directed at improving the **procedure** whereby the problem is usually solved. There should be a procedure for handling every eventuality and, where a new or different type of situation arises, the procedures should be changed accordingly.

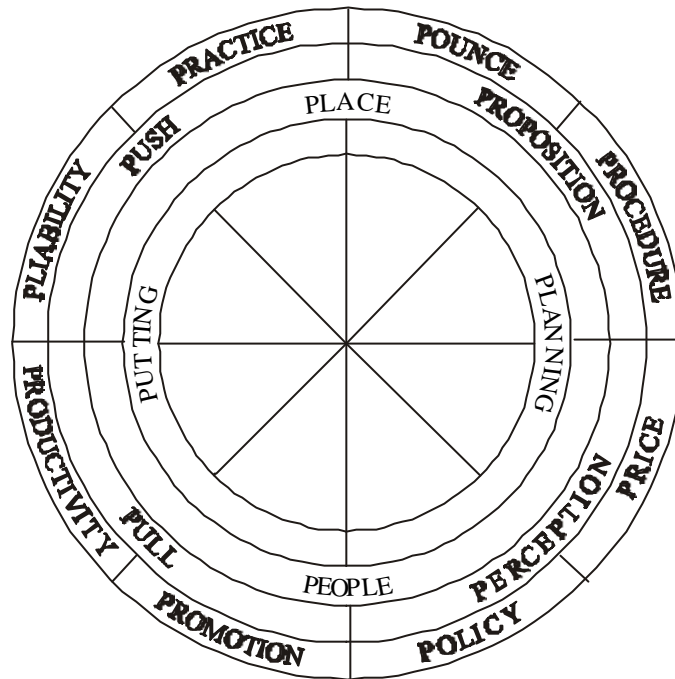


Figure 3: The cycle of principal activities

If revising the procedures that are used to sort out new problems has not succeeded in dealing with a situation, presumably because it is bigger, or newer or more complex than can be handled by proposing some solution, it will be necessary to develop a better **perception** of what is going on. The initial preference is to use some objective measure of what people think. The kind of question that is asked is "How does this affect our position?" "This" might mean a currency crisis, a new product from the competitor, a technology change. It relates to one's standing as measured by using some objective guideline. "What would people be prepared to pay to ensure the continuation of this activity?" The combination of a **perception** activity that is found through examining one's **position** (i.e. in some market or competition for resources) is described as the **price** that people are willing to pay.

The other extreme within the perception activity is to focus on the person instead of on one's position. There is a capacity within the person to internalise all the information that has been accrued from pounce, procedure and price activities, and synthesise them into some new direction for the

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organisation. Each person can be asked to make proposals and, through some group process, a combined view can be formulated. Thus, a **perception** activity that encapsulates the wisdom of each **person** involved could lead to the development of a new **policy**. There are many situations where there are no clearly spelt-out rules, particularly in uncertain or changing environments. Broader statements of intention, or policies, can provide clear direction without over-constraining the person's behaviour.

The formation of policy is the summit of the planning activities. Once the policy for dealing with the problem has been decided upon then the balance moves from favouring planning to favouring putting. This is the point that is furthest away from the centre of control within the organisation. Here the location of activity is among people and the approach used is based on the person.

The next step entails the first of the **putting** activities. As with policy this is also based on people and the focus is also on the person, so the demands of the change are not excessive. Having developed the policy and got it agreed, now it is necessary to **pull** the people into line.

Initially the focus is on the person instead of on one's position. It is about motivation, leadership, persuading people to implement the policy. Each person needs to be persuaded individually, or as part of a team, to focus on a target. Thus, a **pull** activity that emphasises primarily the involvement of each individual **person** corresponds to **promotion**. As promotion is the first step of the putting activities, all issues to do with it should be raised and discussed amongst the people.

If the benefits of using promotion are beginning to diminish, it is necessary to go to the other extreme on the issue of how to carry out the pull activity, i.e. on the dimension between person versus position. The focus changes to using an objective measure of the contribution to the agreed goal. The combination of a **pull** activity that is found through examining one's **position** (i.e. in some market or competition for resources) is described as the **productivity** of the people or departments in the organisation. In the diagram (Figure 3) of the activities, using the planning / putting axis, just as promotion is a mirror image of policy, so is productivity a mirror image of price. The kinds of questions that are asked under productivity are similar to those asked under price: "How does this or that contribution improve our position?"

The nature of the **putting** activity then changes from a **pull** to a **push** activity aimed at the structures and practices of the organisation that require changing. Being the first of the place activities the power of those "in place" is at its least. If the pull activities, with all their emphasis on getting people to work for the common goal, have shown up some faults or weaknesses in the institutional structures and methods, then now is the best opportunity to impose or push through any changes. So, the first focus is on the **person** instead of on one's **position**. Through examining each person's informal relationships within the organisation it may be possible to define a better formal structure that



reflects the new directions and targets. Correspondingly, a **push** activity that re-orientates the place or system to make it fit better the needs of each **person** involved is dependent on the **pliability** of the organisation and its structures. A lack of pliability, which is often typical of state structures, of large organisations, and of institutions with a long tradition, can be a significant stumbling block to progress in an organisation. Fitting the structures to the current needs leads to greater focus and a clarification of any difficulties with putting plans into effect.

Once the structures are in place it is important to not continue adapting them. At the other extreme on the position / person axis, the combination of a **push** activity that is done using one's **position** is described as **practice**, the ongoing administration of the work of the organisation in a regular way. The emphasis is on using one's position to put usual solutions in place. In contrast to **pounce** those who have control over resources will try the most appropriate solution that experience and the regulations indicate and which does not involve too many other people, and this should usually succeed in solving the problem.

This completes a cycle of activities; just as policy represented the summit of planning, practice represents it for the putting side. Planning starts in the place of the organisation with various propositions and moves to the people looking for perceptions of what to do. Putting starts with the people by trying to pull them together and towards some goal and finishes back in place trying to push through the various plans. If the practitioners fail to achieve the objective the cycle starts again.

#### *4 The polarities framework of ISM*

The first ISM dichotomy corresponds to (planning / putting) the degree of uncertainty associated with the problem and whether the research should be more exploratory or confirmatory. The second ISM dichotomy corresponds to (people / place) and the question of whether the research should focus more on systemic or non-systemic mode.

The extension of the adjustment framework in Nomology from four general to eight principal activities arose because of the question of which way to solve the problem, either by focussing on using personal approaches or instead on one's position. As far as the methodological perspectives in dealing with complexity (Schwaninger, 1997a and b) are concerned, a positivist stance would imply emphasising a position-based approach, while a more personal approach would be associated with methods that have variously been described as phenomenological, interpretivist, and hermeneutic. The common “personal” aspect arises as follows. “Phenomenological” is used in the sense given by Kelly (1955) where the views of the decision-makers are treated as phenomena that should be taken

seriously in their own right. The “interpretivist” approach would focus on understanding the intentions in the mind of the decision-maker. The “hermeneutic” approach is similar to the interpretivist and is often associated with the use of linguistics. Its use is not confined to linguistics.

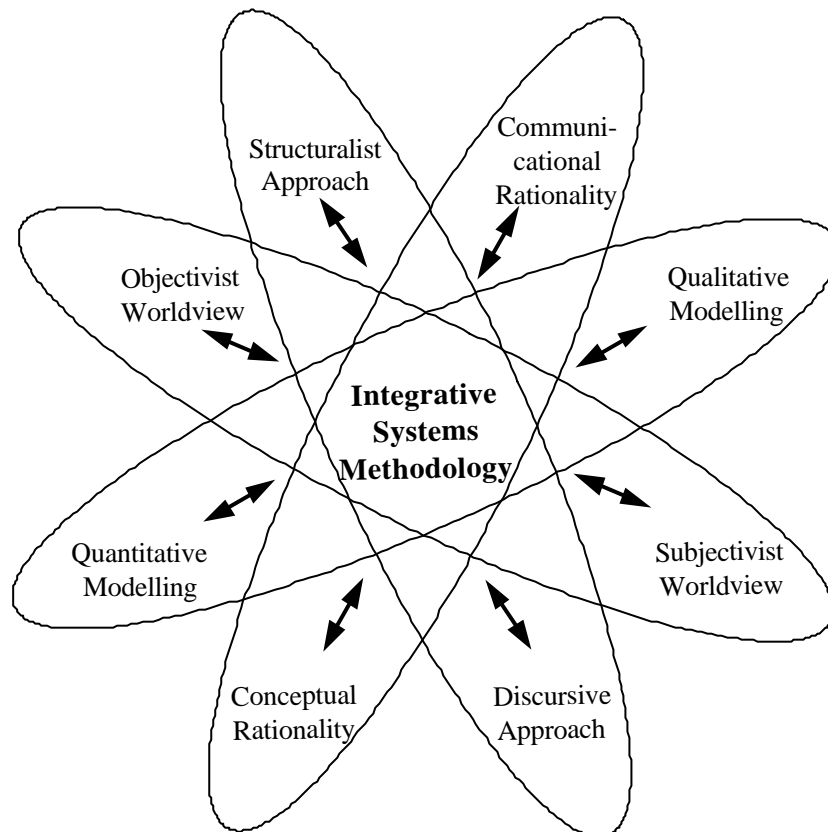


Figure 4: Polarities Framework (source: Schwaninger, 1997b)

In ISM the proposition or **model** activity is exploratory and non-systemic. This divides into two, a positivist and a phenomenological-hermeneutic approach, corresponding to the nomological activities of pounce and procedure. In the context of Schwaninger's (1997b) polarities framework **pounce** would be related to **instrumental-conceptual rationality**. The conceptual type orientation is very similar to pounce in that the decision-maker may have a sense that the solution to the problem at hand will be some conceptual break-through or insight. Corresponding to **procedure** is the use of a **subjectivist approach**. It is an interpretive or hermeneutic methodology; i.e. it uses more personal interactions as part of the exploration.

Once the model phase is complete the process moves into perception to **assess** the ideas that have emerged. This is a move from the non-systemic to the systemic, i.e. to relating the ideas to people and their systems. The initial preference is to use some “objective” or positivist measure of what people think. This is akin to **price** and, in the context of Schwaninger's (1997b) polarities framework, would correspond to the use of a **structuralist approach**. It is positivist in the sense that it submits the stronger and more valued ideas that emerge in a discussion to rigorous scrutiny and formal validation using a structured approach to building confidence into a model gradually. The other side of this positivist / hermeneutic polarity corresponds to the use of a **qualitative approach**. This is hermeneutic in the sense that the focus is on using a more personal approach to include everyone's ideas. It links to policy in that the emphasis should be on synthesising all the relevant views and opinions before endeavouring to put the plans into effect.

The other four are the putting or confirmatory activities. These start with the two other systemic approaches that correspond to design, or the pull activity in Nomology. The first of these is hermeneutic and corresponds to **promotion**. In the context of Schwaninger's (1997b) polarities framework this is the **communicative approach**. The other of these is positivist and corresponds to an **objectivist approach**. This parallels with **productivity** in the sense that the most productive solution to a problem should be measured in some objective way.

The last pair are confirmatory and non-systemic and correspond to ISM's push or **change** activity. The first of these is hermeneutic and, in the context of Schwaninger's (1997b) polarities framework would correspond to the use of a **discursive approach**. This emphasises the inclusion of all members of the system in a discourse on the identity and plans of the organisation. Pliability, the nomological corollary, then is about flexibly allowing for changes in structure that are grounded in the commitment of all members of the organisation. As in Nomology, once the structures are in place one should focus on a more positivist process and develop good **practice** at solving the problems. In the context of Schwaninger's (1997b) ISM polarities framework the use of a **quantitative approach** corresponds to a confirmatory, non-systemic, positivist methodology.

This completes the polarities framework. As with the nomological set (Figure 3) the polarities framework (Figure 4) brings out the emphasis on balance between opposites. Obviously each approach has its own merit as a problem-solving or research methodology. As a set they balance one another, and the exclusion of some of them will inevitably lead to an imbalance in the problem-

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solving activity of an organisation whether it be tightly managed like certain companies or loosely managed such as most communities.

### *5 The Eight Faces of Research*

The "Eight Faces of Research" reflect different points of view that a researcher may have depending on the situation. Bowen (1990) sees these as arising from the desire by the researcher to make three kinds of statement in the course of some research: statements about 'the system' at hand, statements about the beliefs of the decision-makers, and statements about their behaviour. These statements have the same structure as those discussed above with regard to Nomology and ISM.

The suggestion that 'the system' is not adequate corresponds to planning in Nomology and to an exploratory approach in ISM. If the system is not adequate then there is uncertainty about what it should be and, consequently, new approaches should be explored.

Correspondingly, questioning the decision-maker's beliefs is a people-emphasising or systemic approach. Bowen sees these statements as challenges; focusing on the people aspect of a problem corresponds in his terms to challenging their beliefs.

In Nomology the extension to eight principal activities arose because of the question of whether to use a more personal or more positional approach to carry out some activity in a particular place. In ISM this corresponded to taking either a phenomenological-hermeneutic or a positivist approach. With the "Eight Faces" the extension occurs with respect to the "desire to make statements about the adequacy of behaviour that controls the system (the same theoretical system, for the same purpose)" (Bowen, 1990). Suggesting that the behaviour of the decision-maker may not be adequate corresponds to a more personal or hermeneutic approach. The opposite corresponds to a positional or positivist approach.

The Eight Faces of Research are presented in combination with the other two systems in Figure 5 and are described in detail below with the descriptions in quotations coming from Bowen (1990). The aim is to describe a generic set of research methodologies from which an appropriate one could be selected for any situation, for instance using the priority pinpointing procedure. Having a set of alternatives begs a fundamental question: why not use your own favourite methodology? The reason is that a research methodology goes beyond simply "finding something out"; it is part of the change process. Whether in nuclear physics or in management the "observer" influences what goes on. Further than that, Nomology shows that planning and putting (plans into effect) are not discrete

activities. They form a spectrum from the highly speculative Pounce to the minimally changing Practice. A research methodology is an instrument for change. The question therefore should be which methodology best matches the perceived need for change at this point? To be most general we should take out the word research, and talk about appropriate methodologies. This fits the generic concept in Nomology of answering adjustment questions in the following order: what? where? and which way? The validity of this has been tested by Brugha (1998e) in the context of checking people's approach to adjusting to life, both current and long-term, by asking them to select their favourite colour. Most people can select a first favourite corresponding to what adjustments they are currently making, for example. Some can select a second and third colour corresponding to where they are focused and which approach they are using. Experience with the colour test indicates that the selection of second and third colours corresponds to a fine-tuning of the previous choice. The same reasoning suggests that the approach described in this article would only apply to complex societal problems, because these would demand a significant depth of response from the respondent that could bring them to answer at this third level.

This sequence of levels occurs in two ways. The senior one is the sequence of questions about what should be done, where it should be done, and by which (way) methodology, the focus of this article. Within the latter the alternative methodologies are differentiated depending on what system is used, where are the beliefs of the decision-makers, and which form of behaviour are they employing. The behaviour is embedded in the beliefs, which are, in turn, embedded in the system. The "home-base" methodology is that of the **Chronicler** who "has no aim other than to describe what is: he passes no judgements (in his role as Chronicler)". The assumption is that there is no need for change other than the occasional fine-tuning. Gathering quantitative data (ISM) would be a good idea so as to "keep an eye on things". The systems seem to work well in practice (Nomology) so there should be minimal interference or none at all.

If something does go wrong this comes as a surprise. It does not justify challenging the beliefs of decision-makers, or their behaviour. The question is why was the system not adequate? This is answered by the **Puzzle Solver** who "accepts the 'theoretical' problem as stated by the decision-maker". It is a conceptual problem (ISM) which is resolved by pouncing on some good idea (Nomology) without any obvious rationale or justification. With this and successive methodologies, if it works to resolve the problem then well and good, but if it does not then a deeper and broader approach must be taken. In this case, if the puzzle cannot be solved within the confines of the system, then the search must be widened to include the behaviour of the decision-makers. The

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**Empiricist** observes the "effect of changes to the system and of changes in the decision-maker's behaviour, and will suggest, implicitly, improvements to both". This is a subjectivist approach (ISM) in which the advisor follows some well-tried and accepted procedure (Nomology) to evaluate what is happening. It differs from the Puzzle Solver's approach in that there is some interaction with decision-makers, but it questions only their behaviour, not their beliefs.

The next phase challenges both the system and the beliefs of the decision-makers. The initial preference is to not challenge the behaviour of the decision-makers. Here the **Dialectician** doubts the "data about the adequacy of the system because these are coloured by the decision-maker's beliefs. The decision-maker will have to change the system, or his beliefs, or, most probably, both if he is to meet the Dialectician's argument". Dialectics is a method of formal dialogue. In it, aspects of the system and the beliefs that have been challenged are scrutinised with a view to keeping some and jettisoning others. The analysis is rigorous and follows a strict structure (ISM). This is a sort of pricing activity (Nomology) in which the worth or value of various aspects is assessed, particularly in view of the problem that has created the need to apply some methodology. If this fails to resolve the problem, then all the aspects: the system, the beliefs, and the behaviour of the decision-makers are opened to challenge. In this case the **Change-Agent** "will look at the whole and make appropriate comments". Correspondingly, the most open methodology is the qualitative approach (ISM). Having all aspects open to change opens the way for the formation of a new policy (Nomology) that can deal with the new situation as well as the older ones.

At this point it is assumed that changes to the system have been identified, i.e. a plan has been formed, but that changes to beliefs and behaviour will be needed in order to implement the changes. Thus the remaining four methodologies assume that the system is adequate. They are confirmatory (ISM) or putting activities (Nomology) and so may not seem like "research": hence the need to use the broader concept of "methodologies". The first two concern the changing of beliefs and correspond to a design (ISM) or pull activity (Nomology). The very first of these requires an **Iconoclast** who will "challenge beliefs and behaviour, accepting, for the time being, that the system is as it is (or as it is proposed)". While the Iconoclast uses a communicational approach (ISM) and promotes the new system (Nomology) it is not true to suggest that research is not being carried out, or that the system is not open to new plans. The active promotion of the changed system itself is an investigative methodology that helps to determine how to implement the system, particularly what kinds of beliefs and behaviour are appropriate. Having tried to change both beliefs and behaviour the next approach is to focus only on changing beliefs. This is done by the **Classifier** who tries to

"organise the information, and to influence the ideas, as to what the system is and can, or will, do under certain impulses". The idea here is to take a more objectivist (ISM) approach to what ideas will work well in the new context. Holding on to some outmoded ideas would be counter-productive (Nomology) in the light of the changes to the system, which were brought in to take account of some real problems. The Classifier identifies and groups the beliefs that have become "unacceptable" and does so with a view to using the weight of general opinion to marginalise them.

Eilon (1974) developed much of the understanding of these archetypes. Bowen (1990) discovered the "Eighth Face" which he considered in the context of completing a 2 by 2 by 2 matrix that reflects dichotomies in three dimensions. Agrell (1989) has also considered these three dimensions. The type of operational researcher identified by Bowen is in the fourth quadrant in which neither the system nor the decision-maker's beliefs are challenged. Here is the **Decision-Theorist** who is "solely concerned with whether behaviour (decision) is matched to what the system *should* do". This is a discursive approach (ISM) which challenges the decision-makers in their behaviour to be sufficiently flexible or pliable (Nomology) to adopt whatever systems and belief changes that have been decided upon. As in Nomology, once the last modifications to behaviour have been done there is no need for judgements of any sort whether about the system, beliefs or behaviour; the Chronicler then takes over responsibility for monitoring.

This completes the integration of the "Eight Faces" into the nomological set and the polarities framework. A few points should be re-iterated. The eight methodological approaches or orientations do have a sequence from the most uncertain conceptual approach to the least changing quantitative approach. The methodologies are based on a balance between opposites, but less as conflicting opposites than as complementarities. They should be viewed holistically as an integrated system. They reflect three important dichotomous decisions that the researcher may be able to make, leading to a possible focusing of the direction of the research approach. The next section considers case experience of using the system to help select appropriate methodological research approaches.

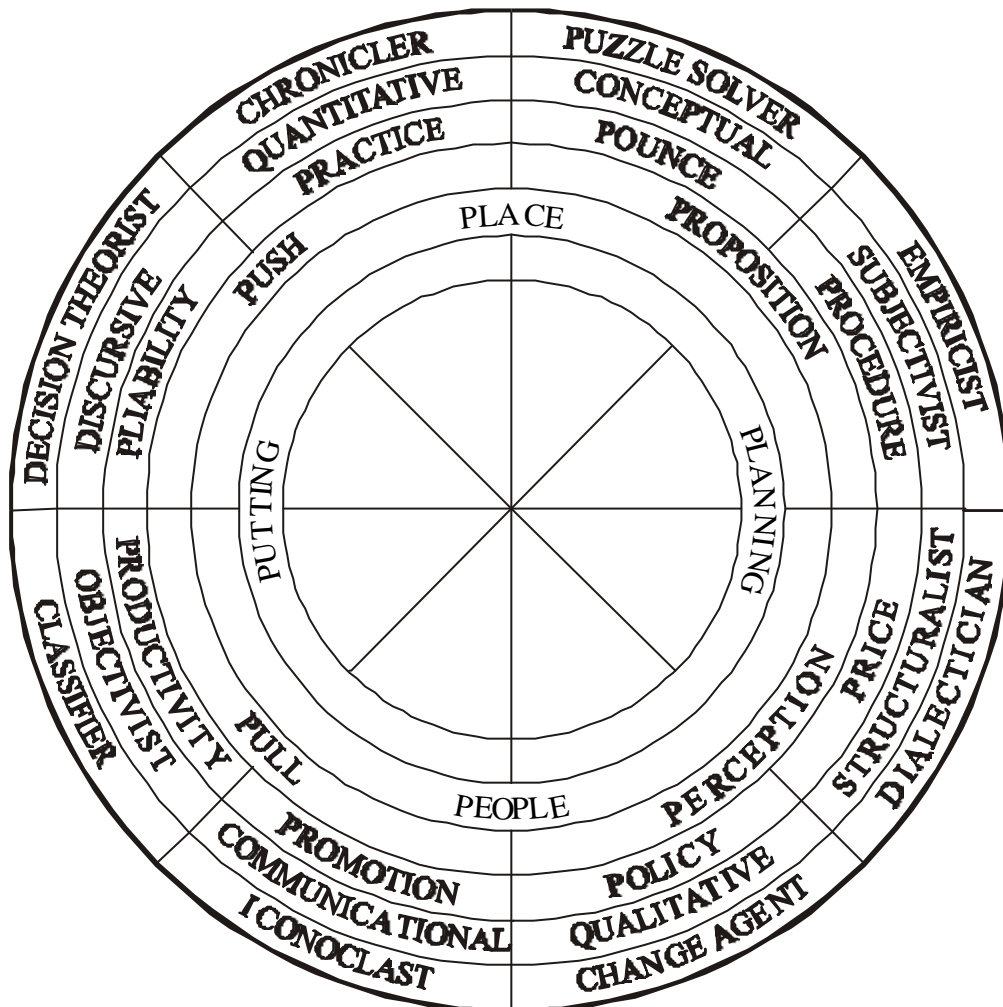


Figure 5: Combined Framework

*6 Application: Finding Methodological Directions for Research*

The intention is to apply the method to helping to find or confirm methodological directions for research, using a simple questioning process and the framework described above. Early experience with this is presented here in two cases based on the research of Peter Keenan and John Mangan who are in the final stages of their PhDs in University College Dublin’s Faculty of Commerce. Peter Keenan is a member of the Department of Management Information Systems and John Mangan was with the Department of Business Administration before moving to the Irish Management Institute; both departments are in the Commerce Faculty.



Both were made acquainted with the system described in this article. They were asked firstly to describe the main issue or question that was the focus of their research. Then they were asked to answer three questions based on the dichotomies described above, and give reasons for their answers.

The first case is that of Peter Keenan whose research is into Spatial Decision Support Systems for Vehicle Routing (Keenan, 1998). The quotations are from his responses.

**1.** What is the main issue or question or problem that you are dealing with in your research?

*"The issue is to see how a decision support system can be enhanced to support the vehicle routing decision."*

The second question was introduced as having three parts and seeking to determine what type of decision-making activity was being studied. These questions were designed to be answered by selecting within a dichotomy, using a balance approach.

**2A:** Would you say that the decision-makers are more carrying out a planning-type activity, or are they more putting plans into effect? In other words, would you say that they are more unsure or sure in their approach to their decisions?

*"The decision-makers are assumed to be experienced and, for this group, the requirements of the decision are well known. Therefore the choice phase of the situation is low in uncertainty and so can be better regarded as Putting rather than Planning."*

**2B:** Is it more putting in place or amongst people?

*"It is not much related to people issues; it has to do with computer systems and data."*

**2C:** Does it have more to do with personal activities of decision makers, or does it relate more to positional activities, i.e. decisions that can be made using one's own position, e.g. one's own authority, power or resources?

*"It is related to positional activities in that it is concerned with refinement of the operational planning of the organisation. On the decision wheel it can be seen as reflecting a primarily quantitative approach."*

The second case is that of John Mangan whose research is into the routing decisions made by those responsible for delivering Irish produced goods for export. It developed out of research into Irish ports (Mangan & Furlong, 1998). The quotations are from his responses.

**1.** What is the main issue or question or problem that you are dealing with in your research?

*"The issue is to investigate how originators (i.e. manufacturers) and carriers (i.e. hauliers / freight forwarders / third parties) go about deciding which port and roll-on / roll-off ferry service to use from a choice of over twenty in both the Republic of Ireland and Northern Ireland."*

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**2A:** Would you say that the decision-makers are more carrying out a planning-type activity, or are they more putting plans into effect? In other words, would you say that they are more unsure or sure in their approach to their decisions?

*"The decision makers under consideration here are making decisions where there is a considerable amount of variety and uncertainty. Usually, there is no optimum or best route. Practically every shipment is different (e.g. in terms of routing, commodity carried, customer requirements, drivers' preferences, etc.) They cannot thus just 'put' a plan into effect - they have to constantly review and amend their decisions in accordance with the heterogeneity and uncertainty which surrounds them. They are thus clearly in a 'planning' and not a 'putting' mode. They are constantly revisiting and altering their decisions (i.e. planning alternative courses of action)."*

**2B:** Is it more planning in place or amongst people?

*"Clearly their decision is not in the abstract. It is all to do with people related issues. They constantly need to talk with the drivers, manufacturers, shipping people, customers at the other end etc. They cannot make decisions by reference only to some non-human benchmark."*

*"Thus, for these decision-makers, it is "planning amongst people", i.e. they are concerned with getting a clear perception."*

**2C:** Does it have more to do with personal activities of decision makers, or does it relate more to positional activities, i.e. decisions that can be made using one's own position, e.g. one's own authority, power or resources?

*"Positional sounds too rigorous, as if the decision and the decision-makers fitted neatly into some part of a superstructure. This is not the case with these decision-makers. They are interpersonal networkers who adopt a very broad holistic outlook on the decision. I thus go for personal activities and thus end in policy (not the price activity)."*

Further comments: In the context of the Combined Framework (Figure 5) policy corresponds to qualitative. *"Qualitative research has been proven (by gaps in the quantitative research) to be most applicable in the context of my research. Similarly the decision-makers can best be seen as change agents, as described by Bowen when he looks at the whole (holistic approach mentioned above)."*

In carrying out this questioning in these cases we drew on experience that was developed using the colour test (Brugha, 1998e). Where a respondent has difficulty with an answer it is usually easier for them to exclude the less appropriate alternative. With Keenan, for example, his work was not focussed on planning, was not about people-related issues, and was not about a personal response.

This approach can be used with the combined framework (Figure 5) by covering the half of the diagram that has been excluded by the answer. Thus the first question excludes four alternative research directions, the second two, and the third question reduces it to one. Using this method helps to emphasise that the answer does not justify the use of some *particular* methodology; it simply points towards one of eight possible directions.

Generally the questions are taken in the order presented by the structure: "what?", "where?" and "which way?". Where a respondent has difficulties with one of the questions it helps to move onto the other questions. Keenan had some difficulty in deciding had work by a decision-maker in Spatial Decision Support Systems had more to do with planning or not. By reducing the eight alternative sectors to two: Practice and Pounce, it became easier for him to select which it was. Also, the three descriptions in each sector helped to clarify the differences between them.

Generally both Mangan and Keenan accepted the implications of the conclusions about their research directions, and found the process helpful in clarifying their research intentions.

## 7 Conclusion

In this article the authors have drawn together three independent streams of research. They suggest that there exists a commonality at a meta-modelling level that reveals an inherent structure within methodological approaches to complex problem solving in society. If true, this would imply that finding an appropriate approach to solving a new problem could be simplified through viewing the problem in the context of some kind of generic framework. They suggest such a framework and, out of this framework, suggest a procedure for applying it. They have tested the procedure on two cases that, on the surface, appear to have much in common. Both refer to research into routing-type problems in Ireland. In fact, in the context of the combined framework, the two problems are totally different. One focuses more on planning, is concerned more with the activities of people, and emphasises personal activities. Together these suggest that the appropriate direction for the research should be qualitative. The other focuses more on putting plans into better effect, is concerned more with systems, and emphasises the type of activity that a manager could carry out without much inter-personal activity. In this case the appropriate direction for the research should be quantitative.

The approach suggested in this article leads to the indication of a *direction* for research as described on a wheel (Figure 5). It does not try to confine or limit the research in any way. It takes account of the existence of both dichotomies and complementarities within which certain choices are preferable to others. Thus it should contribute to the efficiency and effectiveness of the research process by helping determine a focus for the research that fits its intentions.

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