
MULTI-METHODOLOGY: AN APPLICATION PERSPECTIVE

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Total Quality Management has been the primary focus of nearly every industry striving for competitive advantage, deploying extensive quality improvement methodologies in the process. Not all organisations have the capacity (time/ money/ resources/ skills/ specialised training/ change management) to implement such comprehensive methodologies. This paper introduces an alternative paradigm to meet these capacity issues. Furthermore, it is suggested to employ the concept 'Methodological Pluralism' (commonly known as a multi-methodology approach) aimed at a specific area or process requiring quality improvement within an organisation, as opposed to a single comprehensive methodology throughout the organisation.

Key phrases: methodological pluralism, multi-methodology, plurality of methods and techniques

INTRODUCTION

The orthodoxy within the systems approach and management science has clearly broken down, and a plethora of theories are to be found that vary from abstruse formulations deriving in part from philosophical considerations to more pragmatic varieties of analysis. This creates immediate complexity in determining which theory to use followed by a still more difficult problem of how to package that theory in the form of practical technique.

An interesting technique has been adopted by Hirschheim & Klein (1994:83-109). They use Burrell & Morgan's well-known classification that categorises social theory by its epistemological (way in which it produces knowledge), and ontological (its assumptions about reality) premises. In terms of this classification, the majority of current theorisation by implication, current practice is found in just one quadrant, labelled functionalism. The question however is that if a space is to be made to legitimate other social/organisational analysis, which one is to be chosen? The very essence of this 'second way of knowing – the world as a formula', of Mitroff & Linstead (1993:47) culminates in the analogy that:

"If we have to have precise definitions of complex problems before we can proceed, and if in order to obtain such precise definitions we need to base them on the adoption of a single scientific discipline or profession, then precision and clarity may lead us deeper into deception and not rescue us from it. By selecting a single scientific discipline or profession, we cut off innumerable other pathways that we could have chosen to explore the nature of our problem".

MULTI-METHODOLOGY DEFINED

The concept 'methodological pluralism', or 'multi-methodology' as the concept will be referred to in this paper, typically according to Tashakkori & Teddlie (1998:43) refers to both 'data collection techniques' and 'analysis' given that the type of data collected is so intertwined with the type of analysis that is used. In general, multi-methodology is referred to by Mingers (2000:679), as 'being the utilisation of a plurality of methods and techniques, both qualitative and quantitative within a real-world intervention'. In the simplest of terms, Mingers (1997:2) refers to multi-methodology as, 'the process of combining together more than one methodology (in whole or part) within a particular intervention'. The latest attempt by Mingers (2001:289) is to define the meaning of multi-methodology as 'employing more than one method or methodology in tackling some real-world problem'.

Based on the above, the approach in this paper will be to link together different parts from several methodologies, creating a design, specific to the particular elements or areas within an organisation requiring quality improvement.

ARGUMENTS SUPPORTING A MULTI-METHODOLOGY APPROACH

Arguments in favour of multi-methodology, according to Mingers (2000:679; 2001:289), are:

- real-world problem situations are inevitably multi-methodology
- an intervention is not a single discreet event, but it is a process that typically proceeds through a number of phases, and these phases pose different tasks and problems for the practitioner
- multi-methodology, a recent innovation, is being deployed in practice to modern post millennium technology solution requirements.

The analogy drawn from the above, according to the fact that while methodologies tend to be more useful in relation to some phases than others, the prospect of combining them has immediate appeal (Mingers 2001:289). Combining a range of approaches may well yield a better result. That combining different methodologies, even where they actually perform similar functions, can often provide a 'triangulation' on the situation generating new insights and providing more confidence in the results by validating each other.

In support of the views of Mingers cited above, Greene *et al.* (1989: 255-274), list the following five purposes of the concept multi-methodology:

- *triangulation* or seeking convergence of results; 'triangulation' within the context of this paper, can be defined as, 'seeking to validate data and results by combining a range of data sources, methods or analysts'
- *complementarity* or examining overlapping and different facets of a phenomenon
- *initiation* or discovering paradoxes, contradictions, fresh perspectives
- *development* or using the methods sequentially, such that results from the first method inform the use of the second method
- *expansion* or mixed methods adding breadth and scope to the project.

DESIGN OF A MULTI-METHODOLOGY INTERVENTION

Mingers (1997:7) suggests different possibilities for combining different methodologies to ultimately culminate as a multi-methodology, namely:

- one/more methodologies
- one/more paradigms
- same/different intervention
- whole/part methodology
- imperialist or mixed

To assist in the design of a multi-methodology intervention in practice, Mingers (2001:292) cite Mingers & Brocklesby (1997), who identified four phases for this purpose, namely:

- **Appreciation:** Of the situation as experienced by the practitioner involved and expressed by any actors in the situation. This will involve an initial identification of the concerns to be addressed, conceptualisation and design of the study, and the production of basic data using such methods as observation, interviews, experiments, surveys, or qualitative approaches. Ormerod (1995:75) proposes that the type of multi-methodology to be used in an intervention should be negotiated with the end user or sponsor.
- **Analysis:** Of the information produced so as to be able to understand and explain the situation as it is. This would involve analytical methods appropriate to the goal(s) of the intervention and the information produced in the first stage. Explanations will be in terms of possible hypothetical mechanisms or structure that if they existed, would produce the phenomena that have been observed, measured, or experienced.
- **Assessment:** Of the postulated explanation(s) in terms of other predicted effects, alternative possible explanations, and consideration of ways in which the situation

could be other than it is. Interpretations of the results, and inference to other situations.

- **Action:** To bring about changes, if necessary or desired.

The phased approach in designing a multi-methodology intervention is supported by Ormerod (1997:56), who is of the opinion that the intervention will be easier to understand and manage if broken up in phases. Mingers (2001:292) suggests an approach to multi-methodology, whereby parts of methodologies are linked together, as opposed to combining whole methodologies. This would then require a detailed study of the different methodologies to determine where fruitful links can be created. An important observation is that the 'new formulated approach', should not be seen as a generic multi-methodology, but simply one that is suitable for a particular intervention. It is this specific approach which is suggested in this paper in dealing with a particular area or process within an organisation requiring quality improvement.

An example of a multi-methodology approach comes from Ormerod (2001:325), where the following methodologies were applied:

- The interactive planning approach to create a forward-looking dynamic, which is exciting and fun.
- The soft systems methodology to support the process analysis.
- Systems thinking as a stimulus for creative thought by the task force syndicates.
- The viable systems model to help the syndicates analyse the business processes.
- The strategic choice approach for the evaluation of the business process redesign opportunities and the shaping of the strategy.

The overriding maxim for the deployment of a multi-methodology approach is that it will necessitate the methodology, which will be applied reflecting the personal skills, experience values and personality of the practitioner. This observation is supported by Ormerod (1997:56-57), who is of the opinion that practitioners review their range of knowledge and skills and develop their methodological competence.

Some might argue objectivity requires that the nature of the task rather than the practitioner should determine the choice of the approach. From a multi-methodology perspective, according to Mingers (2001:303), to achieve this is impossible from a philosophical and practical perspective.

This view of Mingers is supported by Ackoff (1977:1-6), who gives the following rendition of the situation: 'Philosophically because objectivity can only be the result of many subjectivity's: it is value-full not value-free'. 'Practically, because individuals' skill and experience actually matter in their choices of method'. 'Everyone is not equally competent across a wide range of quantitative and qualitative approaches, and we all tend to have our own favourites with which we feel comfortable'.

MULTI-METHODOLOGY APPLIED IN PRACTICE

Mingers (2001:30) cite a recent survey of the operational research and systems practitioners undertaken by Munro & Mingers (2000), to discover the extent of multi-methodology use, and the particular combinations of method that worked well together. The results of the survey returned from 64 respondents, details of 163 different interventions, each employing a combination of methods.

Avison & Wood-Harper (1995:102) is of the opinion that a combination of approaches creates a theoretical framework which attempts:

- to account for the different viewpoints of all those involved in using a computer system
- to reconcile issue-based with task-related aspects.

The above requires closer scrutiny, and Avison & Wood-Harper (1995:109) provides insight into this framework by claiming that the multi-methodology approach comes from computer related questions and also matters relating to people and business functions, which is part issue-based and part task-related. The analogy follows that one cannot solve a problem until it is known what the problem is. Issue-related aspects are concerned with debating definitions of system requirements in the broadest sense, that is: What real-world problems is the system to solve? Conversely, task-related aspects work toward forming the system that has been defined, with appropriate complete technical and human views. The analogy is concluded with the observation that:

"The system, once created, is not just a computer system; it helps people do their jobs".

The general need for a multi-methodology approach can be found in the summary of the work of De Bono (1986:182), when he claims:

"There is a vacuum. There is a gap. There is a need. We simply do not have the structures necessary for the resolution of conflicts. This is not

through any ill will or incompetence. It is simply that structures designed for a specific purpose may be inadequate for other purposes.

It was Hamel & Prahalad (1989:70) who captured the crux underpinning the need for a multi-methodology approach very succinctly with the following:

“It is not very comforting to think that the essence of Western strategic thought can be reduced to eight rules of excellence, seven S’s, five competitive forces, four product lifecycles, three generic strategies, and innumerable two-by-two metrics.”

Hamel & Prahalad (1989:70) argued that to revitalise corporate performance, there is a need for a whole new model of strategy. This approach is supported by Watson (2002:36), who proposed an approach to drive software breakthroughs by integrating the Capability Maturity Model and Six Sigma methodology to improve software quality performance. This requirement to do an analysis of the methodologies to be used in the multi-methodology approach, is supported by Skyrme (1995:237) who is of the opinion that, ‘methodologies need to be decomposed into their basic units’... ‘Thus each methodology would be a seamless toolkit that allows dipping and diving into appropriate techniques to support a multi-methodology’.

Examples of the use of the concept ‘multi-methodology’ in practice are provided by Mingers (2000:677). The following serves as examples:

- accounting information systems, where the Soft Systems Methodology was used
- information systems strategy, where the Viable Systems Model was used
- capturing process knowledge, where the Soft Systems Methodology + Process Model was used
- development information systems strategy, where Interactive Planning + Soft Systems Methodology + the Viable Systems Model was used.

In the view of the author of this paper, there is another significant motivation for using a multi-methodology approach as opposed to a single methodology for the purpose of a specific customised process intervention. For instance, to implement a full blown Six Sigma methodology, a Capability Maturity Model or a Balanced Scorecard methodology into an organisation, would require extra-ordinary demands on human resources, time, money, training and change management, to mention but a few. This opinion is based on the fact that the combined expenditure of US companies on management consulting and training in 1997 was over USD 100 billion, and a

sizeable fraction towards efforts to develop operational capabilities matching those of the best firms in the business.

Furthermore, despite the vast expenditure and notwithstanding dramatic successes in a few companies, few efforts to implement such programs actually produced significant results (Repenning & Sterman 2001:64).

Alternatively, according to Pryor & McGuire (1997:621), organisations wishing to use any of the extensive process improvement methodologies mentioned above for small non-mission critical initiatives may not be able to justify the cost (Hollenbach *et al.* 1997:44), and time associated with using the full end-to-end processes of these methodologies.

Furthermore, specifically referring to the Six Sigma methodology and the Capability Maturity Model, Watson (2002:36-37) makes out a strong argument to use a multi-methodology approach, when he states:

“Both perspectives have a unique contribution to defining ‘goodness’ in software, and both of these perspectives are necessary in order to have ‘world class’ levels of quality performance. It is equally important to note that neither viewpoint is sufficient by itself, to achieve the highest levels of software quality”.

According to Watson (2002:40), the following benefits can be gleaned by forging a link between the Six Sigma methodology and the Capability Maturity Model, namely:

- establish a common language between hardware and software developers
- define a shared objective for product design performance improvement
- build a set of processes that applies the systems approach to product design
- provide a consistent framework for assessing project performance
- assume the integration of product development and business strategy.

CLOSURE

Against the above background, it seems most appropriate to heed to the warning of Brooks (1987), cited by Herbsleb *et al.* (1997:30) ‘that there was not likely to be a single silver bullet solution to the essential difficulties of developing software’. In view of the authors of this paper, this statement by Brooks is a powerful motivation for the requirement for a multi-methodology approach. In conclusion the wisdom of Gammack (1995:160-161), who dictates that ‘notwithstanding philosophical theories

of everything in the information systems world, (where the proof of thinking is generally constrained by a requirement to be applied in physically located practice), there are to date few explicit attempts to reconcile the ontologies that different systems approaches span'. The motivation contained in this paragraph clearly demonstrates that a multi-methodology approach can be used effectively to structure paradigm shifts introduced into an organisation and furthermore demonstrates that the approach can contribute to overall quality improvement.

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