

## CLAY FEET OF MARKETING DECISION SCIENCES

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*This paper draws attention to the development of modern decision making processes in terms of the two periods from which their principles may be argued to have sprung: the mass production hiatus of the World War II period of the early 1940s and the late eighteenth century Enlightenment that saw the ascendancy of value free, scientific approaches as the preferred and ultimately mandatory pre-requisite for sequential, neutral decision making. The paper seeks to put the scientific model of decision making into its historical context, then argue for a re-appraisal of its tenets in light of some emerging counter examples.*

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### INTRODUCTION

The purpose of this paper is to argue for a re-appraisal of the conventional notion of decision making. In so doing, the authors refer to a particularly well-documented element of marketing teaching, the new product development process. Its step-wise nature is universally accepted (McCarthy and Perrault 1990; Urban and Hauser 1993; Crawford 1996; Kotler 1997; Zikmund and d'Amico 1999). This makes it a good exemplar of marketing-as-decision-making, strongly characterized as it is by a sequential approach. We would like to debate the merits of sequentiality in marketing decision making by introducing some counter examples from quite different fields. This allows us at once to both step outside the nomenclature of marketing and compare and contrast it with the nomenclatures and styles of other disciplines. In such a way we hope to be able to avoid the pitfalls associated with critical review of an aspect of a discipline -- in this case, marketing -- if undertaken from within the bounds and accepted discourses and protocols of that discipline.

Before proceeding to a closer discussion of marketing's new product development process, it is appropriate to examine the nature and origins of the

processes that fall under that umbrella term of "decision sciences". It is from decision sciences that the concept of marketing-as-science, as extolled in its texts, has emerged.<sup>1</sup>

The essential character of the decision sciences process is embedded in its genesis. The origins of the decision sciences approach can be initially discerned in the philosophy of the systems approach, so assiduously applied during the hiatus of the production of military materiel during World War II. Then, the logistics of large scale operations proved too complicated to be managed by a single management group. Rather, the production issue -- or problem -- was broken down into sub-problems, and the sub-problems were worked on by separate and independent teams who were provided a set of boundary specifications in order to avoid unnecessary duplication of effort. At the same time, such a specification of the boundaries allowed the solutions to be linked to each other (Blue 1976).<sup>2</sup>

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<sup>1</sup> All of the cited marketing texts allude or directly refer to marketing as a science. Especially see Kotler (1997). The cited texts (Crawford 1996; Kotler 1997; McCarthy and Perrault 1990; Urban and Hauser 1993; Zikmund and d'Amico 1999) are full of decision making models for everything from market segmentation to market research.

<sup>2</sup> The development of systems approaches was a pre-requisite for the American approach to the meeting of war time production requirements. It seems to have had a widespread application for all manner of resources, be it food, personnel recruitment for active service or military production. Take for example the production complexities for one American aircraft, the B-24 long range heavy bomber. In his analysis of the development of this aircraft, Allan G. Blue (1976) uncovers an incredibly complex trail of major developments in concurrent sub-

Was this the start of decision science? It has been argued that the foundation for such approaches had sprung from a much earlier and more fundamental shift in how decisions were arrived at, validated and propagated. The methodology for such a development was borrowed from the emerging field of the natural sciences of the late eighteenth century. Here, general rules were sought to facilitate the mathematical formulation of problems. These rules were deemed attractive if they were independent of the decision maker. In such a way was the externalization of the decision-making process stressed as a prerequisite for any subsequent acceptance of the decision by peers and perhaps the wider community.

In the process of this externalization, there developed the use of mathematics as the ascendant language of representation. Now, the decision process could be made a divisible one, even for the same decision maker, as in the case of Utility Theory. The attractiveness of the mathematical -- rapidly becoming a scientific -- model to decision makers lay in its inherent capacity to be externalized. Put another way, the decision maker has, since the Enlightenment, been able to draw from a relatively indisputable and widely sanctioned modeling approach that was developed by another party, or, to use the indisputable model themselves in their own decision processes. It is this externalization of the process that appears to have made "science" so attractive a field for the analysis of decision processes themselves, to the point of virtually guaranteeing its indispensability. It became what Appelby *et al.* (1996) have called the "heroic model of science"<sup>3</sup> As stated by them:

"Pure, elegant, simple and clear when summarized by its laws, natural science with its experimental method came in the eighteenth century to be seen as

the measure of all human truth. Imitate mechanical science, follow its methods, seek laws for everything from human biology to the art of governing -- that was the advice bequeathed to the Western world by the Enlightenment... the heroic model equated science with reason: disinterested, impartial, and, if followed closely, a guarantee of progress." (Appelby *et al.* 1996, p.15)

A number of reviews of the various models and theories developed by the students of individual and organizational decision making are available in the literature (Hammond *et al.* 1977; Polister 1981; Zeleny 1982). These identify two distinct approaches to the study of decision process; those based on mathematico-deductive methods and those based on empirico-inductive methods (Bass 1983). These include attribution theory (Heider 1958), information integration theory (Anderson 1974), social judgment theory (Hammond *et al.* 1975), decision theory and multiple attribute utility theory (Keeney and Raiffa 1976), psychological decision theory (Kahneman and Tversky 1979), behavioral decision theory (Einhorn and Hogarth 1981), and analytical hierarchy processes (Saaty 1982), among others.

Most of these contributions date from the late 1970s through to the 1980s and have their epistemological bases in the previously noted decision making springboards of the Enlightenment and the 1940s wartime production periods. Both the mathematico-deductive and empirico-inductive methods have been criticized as being limited in their range of applicability. It is appropriate now to examine some of these limitations.

### LIMITATIONS OF DECISION ANALYSIS

Much of the research into the individual decision-making process has drawn from the decision analysis literature. This is especially the case for studies in clinical judgment and medical decision making (Polister 1981). This literature presents normative approaches to clinical decision making using judgmental probabilities and subjectively assessed utility functions (Weinstein *et al.* 1980; Zeleny 1982). The decision analytic methods have, however, generated considerable controversy (Polister 1981;

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assembly production at as many as five separate plants for the same componentry. Whilst this clearly is a case of concurrency of production, the purpose of it remained essentially sequential: to bring the componentry to the next stage of a more advanced assembly.

<sup>3</sup> Appleby *et al.* provide a penetrating treatise on the role of scientific method in the shaping of western cultural approaches to such diverse fields as the natural and physical sciences, sociology and history, see Appleby *et al.* (1996). The issue of what the Enlightenment bequeathed us is also extensively covered in Saul (1993).

Zeleny 1982). The central question is what constitutes rational decision making and whether this is better achieved through intuitive or mathematical techniques. Questions remain unanswered about the validity and applicability of multiple attribute utility theory. These include: what procedures should be used for the assessment of utilities and their functions; whether weights should be assigned through direct elicitation or inferred indirectly through observations; when and where can the theory be applied, and how to validate the theory. Significant departures from behavior predicted by expected utility maximization have been reported (Kahneman and Tversky 1979). The critics of decision analytic methods suggest that such methods may lead to oversimplification, cause errors and introduce biases of their own. For instance, these assume that objectives are fixed and constant, that a problem is somehow independent of time, that pay-offs are readily measurable and that a problem can be described as a closed system. In fact, not only do utilities scales differ from person to person, they also vary with experience and time. For a complete analysis of a decision, the problem needs to be broken down into component elements. The risk is that in doing so, some relevant variables may not be identified and the interrelationships overlooked. This risk can be considerable as, for instance, in the case of medical decisions. Emerging medical technologies offer unique, complex and previously unencountered situations which do not always lend themselves to decision analytic methods. It may be difficult to construct a decision tree to obtain meaningful probabilities for possible outcomes (Climo 1984; Hamm *et al.* 1984).

#### LIMITATIONS OF HUMAN JUDGMENT

Few would argue against the important role played by human judgment in management decision making. However, the main argument in favor of decision analytic methods is that the intuitive decision making capabilities of individuals are limited. Studies have demonstrated that, unaided, decision makers have difficulty in using all the information available to them. Memory is also cited as a limitation. It should be acknowledged here that intuitive judgments are not always inferior to the predictions of formal analytical

methods. Predictions based on a consensus among a group of decision makers can do as well as, if not better than predictions of analysis. Polister (1981) wonders whether "the essence of clinical expertise is distilled in consensus judgments and eliminates individual consistency".

The human judgment process is reported to have three fundamental characteristics (Hammond *et al.* 1975). First, it is covert; second, it is inaccurately reported; and third, it is inconsistent. It is seldom possible for individuals to describe their judgment processes accurately. Introspection and guessing are usually the only means of actually explaining or "uncovering" judgments. Such explanations are often held by rationalists to be incomplete and misleading. Identical circumstances do not always lead to identical judgments. When judgments are made by an individual, an observer might conclude that the individual making that judgment is either incompetent or harbors hidden motives. These presumed characteristics may not completely describe the judgment process, but they do indicate that the perceived limitations of that process offer substantial potential for mistrust and conflict.

The decision-making process in a new product development scenario may be portrayed in a similar view. A synthesis of the steps is shown below in Figure 1. These sequential steps are drawn from standard specialist and generalist textual references (McCarthy and Perrault 1990; Urban and Hauser 1993; Crawford 1996; Kotler 1997; Zikmund and d'Amico 1999) and have been employed in recent field research into marketing orientation and new product development processes (Enright 1996; Enright and McDonald 1997). These studies, conducted within a specific geographic of Melbourne, Australia, made a qualitative examination of the extent of market orientation and the presence of formalized new product development procedures in two high growth sectors: the garden nursery and mountain bike industries. The result was a rich picture of the way these business people made marketing decisions.

**TABLE 1**  
**A Sequential Synthesis of the Steps**  
**in the New Product Development Process**

A sequential synthesis of the steps involved in the new product development process follows:

- Strategic planning/marketing planning
- Opportunity identification
- Concept generation/idea generation
- Business analysis
- Concept/idea evaluation
- Product development
- Test marketing
- Financial evaluation
- Commercialization/introduction/launch
- Post-launch follow-up/management/maintenance

There was an almost complete lack of formalized marketing knowledge held within these industries. The respondents were unfamiliar with the theories, terms and concepts which business decision-makers commonly use. Significantly though, many of these firms exhibited characteristics we would find in marketing-oriented firms. For new product development, formal planning was replaced in part by intuition and market experience. Respondents conducted their marketing outside the formal approaches and *lingua franca* of marketing. All respondents nevertheless firmly believed they were market oriented. In terms of their service levels, understanding of total product offerings, and preparedness to view customers as the focus of their business activities, they clearly were. What was lacking was the formality of planning protocols and the familiarity with marketing terminology that encodes conventional views of market orientation. It is noteworthy that earlier, in their comprehensive review of approaches to new product development, Craig and Hart (1992) concluded that no absolutely-preferred method exists.

It is what this recent research (Enright 1996; Enright and McDonald 1997) showed that brings the efficacy of such models into question. General and specialist marketing texts present the new product development model -- albeit with minor variations -- as a universally applicable and logical decision making sequence that is very much in the style of the scientific approach. Whilst for some industries, the

model may well be eminently applicable, it clearly was not for two retail based industries in Melbourne, Australia, that formed the basis for the two field surveys of the garden nursery industry and the mountain bike industry. Neither industry displayed an appreciation or use of such a model. The respondents in these industries were so embedded in the marketing of their products as to consider such a model to be beyond their capacity to apply or adhere to. To this extent, the respondents in these two field surveys either saw their new product development processes as a jumble of events and actions or, at best, much more a concurrency of events and decisions than a neat sequence.

Perhaps what these respondents were alluding to was something in the nature of the previously mentioned "limitations of human judgment". Do cases of decisions-gone-awry or decisions pre-empted by external exigencies exist elsewhere?

### THE COUNTER EXAMPLES DISCUSSED

Much of what has been discussed here is in concert with another organizational field, the military. In *On the Psychology of Military Incompetence*, Dixon (1976) points to the omnipresence of a military decision making model that essentially codes anxieties in combat into response protocols: the more anxious a combat situation becomes, the more "militaristic" the decision process becomes. The more the situation is shaped by external agencies, such as the opposition, logistical inadequacies, the weather, even hysteria amongst absent superiors, then the more the military decision making model becomes a ritual of response.

Perhaps this is what the new product development model is to some -- a ritual process that is more rigidly observed as a marketer's capacity to make unimpeded decisions is diminished by external forces. Although by no means broad enough studies to provide conclusive evidence for all other industries and organizations, the Melbourne research (Enright 1996; Enright and McDonald 1997) suggests that this thesis might warrant further examination. This issue has been addressed in recent research (Enright 1997) that suggests the field of marketing in

particular is employing a scientific -- perhaps pseudo-scientific -- approach to marketing decision making in order to posit the discipline's claimed indispensability in advance of its proven worth.

Literature is still being produced that purports to be able to facilitate the decision making process through the borrowing of another field's accumulated sagacity. The process had its roots in the 1970s, possibly commencing with the use of PERT charts and the employment, by Ansoff in particular, of decision tree-style decision making using an outcome matrices approach (Ansoff 1965). These are very good approaches for building nuclear-powered submarines but is the built-in finesse supple enough for business -- especially marketing decision making? A very recent addition to the field of decision methods borrowing is McNeilly's *Sun Tzu and the Art of Business* (McNeilly 1996). McNeilly attempts to take ancient principles of war developed by the Chinese strategist Sun Tzu in *The Art of War* and, as stated in the preface of McNeilly's work, "crystallize the concepts and ideas put forth ... into six strategic principles that can be easily understood and applied in the world of business".

This may well be the case, but thinkers such as Dixon, might disagree. So too might that merciless American, Ambrose Bierce (1993), who, in his version of things described the word "decide" as, "to succumb to the preponderance of one set of influences over another set." By the use of literary models as a potential alternative to conventional scientific approach, it has been illustrated that alternative processes are at hand in decision making (Dhir 1986).

### CONCLUSION

"Judgment" is fraught with problems when it is applied to "decision". It becomes even more a matter of contention, if not complication, when the conventional wisdom of such a universal model for new product development comes face to face with the highly intuitive -- and frequently employed -- thinking approaches revealed in the medical profession, and in the responses of such disparate fields as those

revealed in the two recent Melbourne field studies (Enright 1996; Enright and McDonald 1997).

Perhaps there is a need for a marriage, or at least, a co-existence between the scientific and the intuitive. It would be interesting to see if the two could become recognized for what they are and what potentially they could do -- both jointly and alone -- rather than being seen as diametrically opposed schools of thought.

Since the eighteenth century, science has posited that only its models are effective conduits for decision and discourse (Appleby *et al.* 1996; Enright 1997). Science is deemed to be the basis for models of rational thought because of its capacity to expose, if not externalize, the processes involved. It is seen as the only way by which "proof" can be "positive" and hence, applicable and acceptable. Science, since Voltaire, has dispensed with such elements as intuition, imagination, judgments based on reflection, and suchlike, because these are decisions whose seemingly vaguer processes invite emotional response, simply because they have no external validation reference point.

The dominance of the scientific model has its conception and its continued existence in the need for findings to be highly translatable through that most essential common denominator of the modelled decision making process. Far from becoming an aid to decision making, the scientific hero has become more of a tyrant, locking out and dispossessing the qualitative other side of a decision making process. Intuition, judgment and any emotive element of decision making that influence a meaning assigned to a concept have tended to be neglected by the approach to decision-by-science because they do not lend themselves to easy measurement.

Further, this presumed failure to be "easily measured" means that such non-scientific approaches lie in dispossession, unable to gain entry into or acceptance by scholarly and management discourse. What sorts of models might an alternative approach to decision making yield? To such scientific elementals as function, constraint, uncertainty, probability and opportunity cost we might also deal

with, if not willingly include, the elementals of emotion, action, meaning, consequence and accountability. Then, we might develop a wider base of decision making: one that confronts the missing part of scientific, neutral decision making -- its drama.

The very act of creating a model, or adhering to one, allows a person to maintain credibility in their profession, even their culture. The very act of such modeling may yet prove to be counterproductive to modern thinking if at the same time it disenfranchises the decision maker from making that decision based on all and everything they have felt and experienced in the disorderly and entirely natural humanist approach of reaching a decision.

Without the inclusion of the denied elements of the drama of decision making, there may be a risk that our Western frameworked, post-eighteenth century, rational, science-as-hero accultured decision processes will lay a path that leads to decisions that erect straw men rather than decisions that may well profit from being seen to be more independent of the expectation that a goal has to be realized. Only then can the added responsibility -- and value -- of duty in decision making be included within its discourse.

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