Instinct and Value in IT Investment Decisions

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Occasional Paper Series 1999

Number **OP001/99**

ISSN Number **ISSN 1464-1747**

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The Occasional Paper Series is edited by Kate Gilbert

Abstract

Although well over a thousand journal articles, conference papers, books, technical notes and theses, have been written on the subject of IT evaluation, only a relatively small subset of this literature has been concerned with core issues of what precisely is meant by the term 'value' and with the process of making (specifically) IT investment decisions. All too often, the problem and highly complex issue of value is either simplified, ignored or assumed away. Instead the focus of much of the research to date has been on evaluation methodologies and within this literature there are different strands of thought which can be classified as partisan, composite and meta approaches to evaluation. Research shows that a small number of partisan techniques are used by most decision makers with a minority using a single technique and a majority using a mixture of such techniques of whom a substantial minority use a formal composite approach. It is argued that in mapping the set of evaluation methodologies onto what is termed the investment opportunity space that there is a limit to what can be achieved by formal rational evaluation methods. This limit becomes evident when decision makers fall back on 'gut feel' and other non formal/rigorous ways of making decisions. It is suggested that understanding of these more complex processes and decision making, in IT as elsewhere, needs tools drawn from philosophy and psychology.

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Instinct and Value in IT Investment Decisions

Introduction

> *We are merely reminding ourselves that human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectations, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive or whim or sentiment or chance.*
>
> *Our knowledge of the factors which will govern the yield of an investment some years hence is usually very slight and often negligible. If we speak frankly, we have to admit that our basis of knowledge for estimating the yield ten years hence…….amounts to little and sometimes nothing.*
>
> John Maynard Keynes

Although well over a thousand journal articles, conference papers, books, technical notes and theses, have been written on the subject of IT evaluation, only a relatively small subset of this literature has been concerned with core issues of what precisely is meant by the term 'value' and with the process of making (specifically) IT investment decisions. All too often, the problem and highly complex issue of value is either simplifies, ignored or assumed away. The focus of much of the research to date has been on evaluation methodologies, and within this literature there are different strands of thought which can be classified as partisan, composite and meta approaches to evaluation. Research shows that a small number of partisan techniques are used by most decision makers with a minority using a single technique and a majority using a mixture of such techniques. Of these a substantial minority use a formal composite approach. It is argued that in mapping the set of evaluation methodologies onto what is termed the investment opportunity space, there is a limit to what can be achieved by formal rational evaluation methods. This limit becomes evident when decision makers fall back on 'gut feel' and other non-formal/rigorous ways of making decisions. It is suggested that understanding of these more complex processes of decision-making , in IT as elsewhere, needs tools drawn from philosophy and psychology.

1. A surfeit of methodologies?

There is little doubt that information systems evaluation is problematical (Smithson & Hirscheim, 1988) and has been so for quite some time (Keen, 1985; Smithson & Hirscheim,1988; Currie, 1989; Sherwood-Smith 1989; Scriven, 1991; House, 1993; Walsham 1993; Willcocks & Lester, 1993, Farbey *et al.* 1995; Remenyi *et al.* 1994, 1995, 1999; Strassman, 1985,1990, 1997).

In his keynote address to the ECIS conference in Aix-en-Provence in 1998, Peter Keen differentiated between what he described as perennial and transient issues in IS research. Amongst the former he included the problem of IT evaluation, arguably one of the most researched and written about topics in the IS literature. This literature is, to say the least, highly eclectic (Powell, 1992; Banker *et al.* 1993). In addition to traditional capital budgeting techniques such as net present value and cost-benefit analysis, researchers have developed a wide variety of other approaches to the evaluation of IT including productivity measures (Brynjolfsson & Hitt, 1994; Roach, 1997), return on management (Strassman, 1985, 1990, 1997) information economics (Parker & Benson, 1988), to mention only a few. Furthermore, various classifications or taxonomies of methods have been put forward by Irani (1999), Bacon (1994), Lucas (1993), Cronk and Fitzgerald (1998) and others.

Throughout the literature there is a worrying leitmotif which can be described as the 'gut feeling' phenomenon . Many researchers who have investigated the practice of IT investment decision-making have found that, when it comes to very complex decisions, managers often rely on methods that do not fall within the traditional boundaries of so-called rational decision-making. It seems that managers sometimes base decisions on 'acts of faith' - a phrase that (in various forms) crops up consistently in the literature (Farbey *et al.* 1993; Deitz & Renkema, 1995), 'blind faith' (Weill, 1990) or 'gut instinct' (Powell, 1992; Katz, 1993)[1]. To add to the problems, when managers are not relying on their intuition or instincts, studies of *decision* practice indicate that managers frequently fall back on a relatively small repertoire of techniques involving some variety of relatively simplistic cost-benefit analysis (Willcocks & Lester, 1994; Ballantime & Stray, 1998).

For both theorists and advocates of rational decision-making, these are worrying phenomena. After all, there is no shortage of innovative IT evaluation techniques. Berghout and Renkama (1994) list 60, while Katz (1993) cites Wilson as having identified over 160! In the light of such a plethora of techniques we can only conclude either that theory has completely lost touch with reality, that theoreticians have failed to get their message across to practitioners or that the body of theory is still very immature and in all probability far from complete. It is this latter possibility that will be explored in this paper.

We argue that a weakness in much of the current research is the fact that the definition of value is usually unclear, frequently inadequate, often partisan and sometimes completely absent from the discussion. Until there is a better understanding in the IT community of what value is and how managers attempt to optimise it, current IT evaluation methods for complex decision-making purposes will often be neither credible nor effective. Secondly it is argued that the way decision-makers evaluate complex IT investments is subtle and that current methodologies are at best crude approximations to the reality of this process. In order to understand the nature of these complex decisions we need a different approach to understanding the situation, i.e. a better model.

2. A question of perspective

Considering the breath and depth of research on IT evaluation, the volume of research into the subject of IT value *per se* is remarkably small. Many papers on IT evaluation either take value for granted and assume that there is a common understanding of the concept, or define it in a narrow sense to serve a specific purpose. Thus, for example, Brynjolfsson states "Productivity is *the* fundamental economic measure of a technology's contribution" (Brynjolfsson, 1993, p.76 emphasis added). This narrow perspective is (perhaps deliberately) limited in its understanding of the nature of IT value. When the banker/economist Stephen Roach describes the productivity gains of the computer age as "just a myth" (Financial Times 13th August 1997) he is reflecting not only a purely economic (or even accounting) viewpoint, but a particular sub-set of monetary values. As the list of value-adding goods and services not measured by conventional accounting and economics is legendary, the IT industry probably ought not to be unduly concerned about Roach's view of IT investment performance. On the other hand, if management actually believes that conventional productivity is the only IT benefit issue and that using conventional accounting metrics is the only way of understanding this, Roach's assertion probably has some degree of validity.

A similar observation is made by Loveman (1992) who stated "despite years of technological improvements and investment there is not yet any evidence that information technology is improving productivity or any other measures of business performance on a large scale - or, more importantly, significantly enhancing US economic performance".

Observation suggest that there has to be something profoundly wrong with Brynjolfsson, Roach and Loveman's diagnoses. Over the past 30 years, the computer industry has grown to vast proportions with IDC recently reporting an estimated annual global expenditure of over $1.8 trillion on IT in 1997. If Roach is correct, then the entire global managerial cadre must be responsible for a colossal

and collective act of enormous folly. Organisations would not have made IT investments on this scale if it were as irrational as some economists claim. The real reason here may well be that pronouncements by accountants and economists on IT value tell us more about the inadequacies of accounting and economics that about the inadequacies of IT investment (Quinn & Baily, 1994).

The severe criticism in the professional and business press of IT value (Lincoln, 1990, Earl, 1992) has, not surprisingly, provoked the IS community into trying to respond in order to demonstrate how worthwhile their endeavours actually are. However, although there are those who support the notion of the value of IT such as Davis and Davidson (1993) when they said "by 2020, 80% of business profits and market value will come from a part of the enterprise that is built around info-businesses", there are also those whose research makes it clear that IS are not valued. For example Lacity and Hirschheim, (1995), looking at the development of IT outsourcing reported that "senior management in the participating companies do not value information systems in the way they account for the function. In eleven of the thirteen companies, the IS departments are set up as overhead accounts. As an overhead account, the IS function is viewed as a necessary cost, but one that does not add value directly to the company".

In the IS research world, this debate has developed into what Farbey *et al.* (1993) call the 'great benefits hunt'. There have been two primary lines of counterattack. The first, exemplified by Brynjolfsson, Loveman, Hitt and others, might be loosley termed econometric and tries to find relationships in Input/Output data (Loveman, 1991; Brynjolfsson, 1993, Brynjolfsson & Hitt, 1994; Hitt & Brynjolfsson, 1996). This approach takes on the economists on their own ground and using their own weapons - a questionable tactic that has led to much confusion with successive announcements of the productivity paradox regained. An alternative approach, but one which still uses essentially the same weaponary, is the process view developed by Barua *et al* (1995), Mooney *et al* (1995) and others. Soh and Markus (1995) have reviewed and endeavoured to synthesise a number of such methods. While this approach looks at value creation as a process, the value concepts used, though much more refined and wide ranging than simple productivity (e.g. 'improved organisational effectiveness'), are still essentially economic.

The results of all these econometric approaches are not very satisfactory. The data is problematic, the appropriateness of the methodology debatable, the theoretical models open to challenge and the conclusions either weak, contradictory and/or intuitively suspect. The problems with the type of numbers produced by this approach was well expressed by Bernstein (1996) who said:

> *Our lives teem with number, but we sometimes forget that numbers are only tools. They have no soul; they may indeed become fetishes. Many of our most critical decisions are made by computers, contradictions that devour numbers like voracious monsters and insist on being nourished with ever-greater quantities of digits to crunch, digest, and spew back.*

Despite this, the work of these authors has received widespread publicity. The press thrives on bad news and, on the other side, the IT industry for its part is only too happy to seize on any bit of good news, no matter how doubtful its provenance. Meanwhile the overwhelming important question persists: if the return on IT investments is so uncertain, why is the IT industry still growing at double-digit percentage rates per annum?

One obvious answer is that managers and executives know intuitively that IT returns value, and that the business and human concept of value is deeper and wider than the narrow rationalism that these economic and accounting models are able to identify. Glazer (1993) pointed this out when he said "…managers themselves are the best judges of the value of the variables with which they work". If this management insight or intuition is right, then the approaches described in the preceding paragraphs are simply not looking in the right place. In fact Oscar Wilde's classic definition of a cynic come to mind when describing the work of Roach and others: people who appear to know "the price of everything and the value of nothing".

But if not with the business input out put variables, then where and how should the benefits and the value be sought?

The alternative, exemplified by Walsham, Farbey, Symons and others, is broadly sociological and/or organisational and uses a wider definition of benefits. They place value in a broader context than accounting and economics, taking into account both hard and so-called soft or intangible benefits (Symons, 1990; Symons & Walshman, 1991; Remenyi & Money, 1994; Symons, 1994; Peters, 1994). Symons uses the term 'multiple perspectives' to emphasise the location of IS evaluation in social/organisation contexts. This clash of perspectives reflects different approaches, implicit or explicit to value. To understand this different approach to IT evaluation, we need to consider the nature of value itself and we now turn to this debate.

3. Some aspects of value

Loveman states that: "First and foremost, what ultimately matters is value - to the firm, individuals, or society" (Loveman, 1992 p. 101). But what is 'value'? In most of the literature on IT evaluation, the concept of value is taken to be self-evident or axiomatic - so axiomatic that it need not even be formally denied. Absence as a clear conception of value can, unsurprisingly, lead to some serious misconceptions about the usefulness of metrics designed to measure it. Business value can be deceptive. For example, Cross (1997) shows how increases in market share and capacity utilisation, both frequently cited 'benefits', can in the wrong circumstances be accompanied by a drop in both absolute profit and/or profitability. Keen (1991) and Strassmann (1997) have also highlighted the ambiguities in and contradictions between traditional measures of value. Where value is formally defined there is a broad range of definition used. For example, speaking of value as perceived by customers, De Rose (1991) defines value as: "…the satisfaction of purchase requirements at the lowest total cost in use". The concept of value is clearly complex since it may be regarded as a measure of the organisation's effectiveness. Accountants use the concept of 'monetary measurement' (Sidebottom, 1970) which, in crude terms may be stated as 'everything has a price'. Sidebottom states that for the accountant: "In general, value means historic cost to the accounting units". One would expect that if an unambiguous definition of value was to be found anywhere it would be in accountancy. However the presence of the words 'in general' in Sidebotham's definition show that even accountants cannot be unambivalent about the concept.

Parker and Benson (1988) take a different view of IT value based on Porter's value chain (Porter, 1985). Value, in their definition, may be summarised as the ability of IT to enhance the business performance of the enterprise. Wiseman (1992), building on Parker and Benson's definition, clearly differentiates between value and benefits, asserting that value is both larger and more important than benefits. Foe example, users will develop a strong attachment to an old system. It aquires a sort of value, despite the fact that it may be out of date and inefficient. Berghout and Renkema (1997) define value as the outcome of financial and non-financial consequences of the IT investment - definatley a more flexible definition.

Further definitional problems arise when one considers the value of information *per se*. Information is a non-material good. Its value may be subjective, time sensitive and even negative (Englebert, 1991). It may also be a latent or 'hidden property good'. For example, the value of information input to s decision may not be visible until the impact of that decision is known, an event which may be many years in the future. Englebert (1991 p. 37) states that "[information] acquires value (worth) only at the point when it meets its user". The value of information depends on the user's skill in understanding and using that information so "…worth (value) is almost a subjective property: it may exist for an individual, a team or for society as a whole" (1991 p.38). In another approach, Dier (1992) uses a dictionary definition of value as a measure of equivalence between items (goods, services or whatever).

The challenge has been put succinctly by Keen (1991 p.162) "many a scholar, consultant and practitioner has tried to devise a reliable approach to measuring the business value of IT at the level of the firm, none has succeeded". Keen argues that IT does not create benefits as such any more than does R&D. Like R&D benefits, IT benefits are the result of complex lagged effects (a point of view endorsed by Nowak (1991), although Nowak argues that there are well-established techniques for R&D evaluation which can be applied to MIS evaluation).

This subject is also plagued by conflicting evidence. For example Huff (1990 p.43) states that "while the findings have not been totally consistent, generally market leaders have been shown to have invested heavily in IT as a percentage of sales, than have average performers". However, the Kobler unit (1987) based at Imperial College, albeit looking only at the UK market, and using a small sample, found that there is *no* difference in IT spend between market leaders and laggers.

Contributions to this debate have also been made in a series of papers by Cronk and Fitzgerald (1997a, 1997b, 1998). They discuss the concept of IT business value in some depth. The problem with IT business value, they assert, is that it has never been adequately defined. Cronk and Fitzgerald's solution is to try to establish an IT business value construct by introducing a different idea, that od dimensions of value. They define three basic dimensions: system dependent, user dependent and business dependent dimensions which they claim are uncorrelated, and a moderating contextual dimension. While Cronk and Fitzgerald have added new insights, there are still problems with their model, not least the assumption that their basic dimensions are uncorrelated, a precept that seems intuitively suspect.

It is clear from the above brief that the definition of value is far from universally agreed especially among information systems academics and consultants. The word 'value' is, as Veryard (1991 p.3) puts it "nicely ambiguous"[2]. Given this, it is not surprising that, in searching for value or benefits, a variety of routes have been tried and the findings are sometimes contradictory and the subject of fierce debate.

4. A taxonomy of techniques

Investment decisions are based on perceived value, however measured. An understanding of how value translates to decisions can be aided by classifying approaches to evaluating IT decisions into three basic techniques that can be used in two different ways.

The first level consists of the basic approaches to evaluation, which can be termed *Fundamental, Composite* and *Meta* methods.

1. *Fundamental* measures are metrics which attempt to assign parameters to some characteristic or closely related set of characteristics of the investment down to a single measure. Fundamental measures very from capital budgeting techniques such as return on investment and internal rate of return to non-financial performance metrics such as anchor values (e.g. cases processed per employee) and user satisfaction ratings. The defining characteristic of such methods is that they provide a single score or statistic by which to assess the investment. Return on investment being required to pass a hurdle rate is a classic example. Measures of this type are not confined to the purely financial, although financial measures are the most common.[3]

2. *Composite* approaches combine several fundamental measures to get a 'balanced' overall picture of value/investment return. Composite measures include Information Economics of Parker and Benson (1988), portfolio methods, the Balanced Scorecard of Kaplan and Norton (1996), BSC (Ward, 1994) and SMART (Goodwin & Wright, 1998). Some composite approaches (like the Balanced Scorecard) are highly structured and standardised in order to provide some sort of industry comparison or benchmarking capability. Composite measures may also be ad hoc in conventional weighted ranking. Even where the structure is pre-determined, as in Information

Economics, different weighting and scoring schemes may be used to alter the balance of the factors affecting the decision. The ultimate output of these methods may be yet another single number score. In this sense, they might be considered super-composites, ie. a composite made up of other composites (it is an interesting question whether incorporating such items as return on investment or strategic match into such a super-composite risks an element of recursion). There are few organisations that would try to evaluate their information systems activity today without using some variant of the composite approach.[3]

3. *Meta* approaches (e.g. Farbey *et al* 1993; Peters, 1994) attempt to select the optimum set of measures for a context or set of circumstances. This meta orientation is not ususally structured and there is no question of the organisation wishing to use this approach for any sort of benchmarking other than for internal comparison between different projects and or over time when the same meta approach is being applied.

Although these evaluation methods may be, and in practice often are, used separately as single evaluation techniques they may be also used in combination.

These three approaches may be applied in two different ways:

1. *Positivist* where the decision-maker allows the methodology to make the decision. In this approach the investment with the highest return (say) or with the best overall score in some ranking is chosen. The decision-maker establishes a series of mechanical operations which reduce the decision to a single score, either by using a preferred basic method, combining several such methods with a composite technique or using a meta approach to select a single method. The latter two can be combined, ie. using a meta method to select an optimum set of techniques to be used and an ad hoc composite method to combine them.

2. *Hermeneutic*[4] here defined as methods of interpretation of data which use non-structured approaches to both understanding and decision-making. Here the decision-maker takes on board several different metrics directly and combines them in his or her mind in a manner that cannot be formally stated. Various techniques are used to provide a level of visual support to this process: spider charts and cognitive maps being two of the best known. It is in this area that instinct and intuition plays the biggest role. It is sometimes argued that this is the most important aspect of decision-making.

This concept is illustrated in Figure 1.

In reviewing the literature, it is clear that much of the current research into IT evaluation is focused on the former at the expense of the latter which to us is the more interesting, but much more difficult to confront. We argue, however, that hermeneutics is pervasive and that there are strict limits to the purely positivist approach. The number of evaluation methodologies and approached is distinctly finite. On the other hand, there is an infinite number of possible IT investment/expenditure situations. The latter might be termed the investment opportunity space and, loosely speaking, it can be considered as a continuum of possible decision-making situations. It follows that there is an infinite number of possible mappings from the set of evaluation techniques onto the investment opportunity space and vice versa. Clearly some subset of the investment opportunity space can be meaningfully evaluated using an appropriate single basic measure of value. However, once one steps outside of this subset, an immediate tension between positivism and hermeneutics arises. This can be seen in what the composite and meta methods try to achieve:

- Composite (and, to a lesser extent, meta) approaches try to model how some sort of ideal decision-maker should (or would want to) make the evaluation. This is nothing more nor less that an attempt to map the mind of the decision-maker; an attempt, by weighting and scoring, to externalise the interior process of decision-making. Formalised composite methods, such as

Information Economics, are, therefore, tantamount to a semi-prescriptive statement that this is the way an IT investment decision *should* be made. Given that we have an infinite number of decision-making situations, this seems to us to be highly presumptive. The very linearity of Information Economics implies that the mind works in similar straight lines, something that is manifestly not true. At most, therefore, composite methods provide a substitute for hermeneutics and an implicit recognition of the need for interpretation.

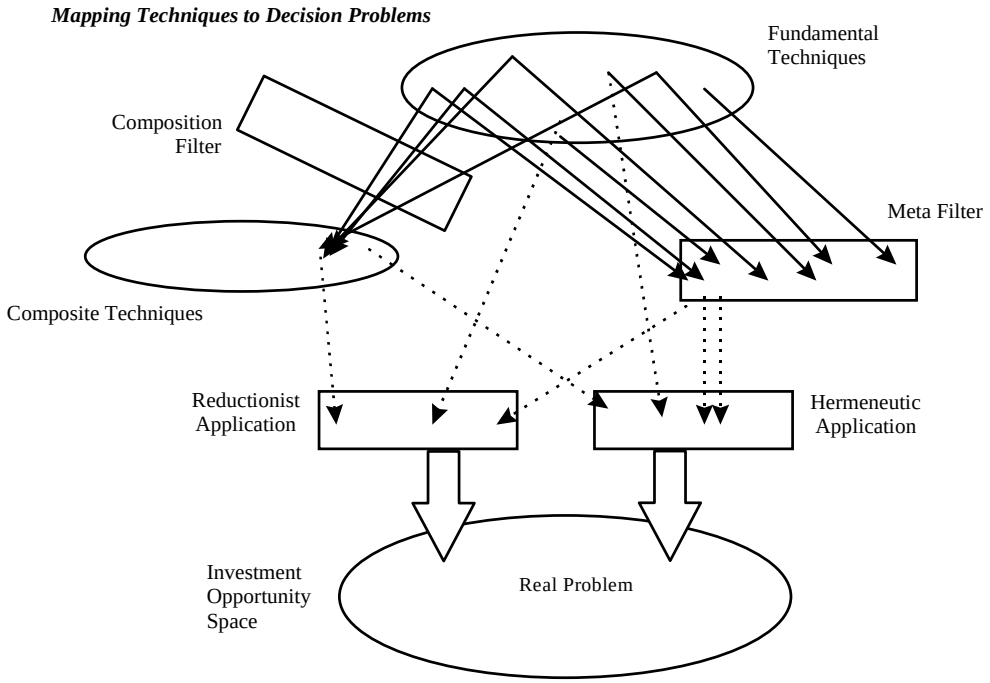

Figure 1. Three techniques and two approaches to IT evaluation

- The meta approach[5] attempts to match decision to technique. Meta methodologies may be useful in helping to identify the most appropriate evaluation technique, ie. given this decision problem, this is the best technique or type of technique to use. The shortcoming of the meta approach is the necessity to try to derive general rules for a continuum of decision-making situations from a finite set of tools. Inevitably, the conclusion of this process will often be tantamount to saying 'there is no perfect tool, but here is something which may be the next best thing'. But, meta techniques are themselves in part hermeneutic - the user is invited to use interpretative techniques to arrive at a Positivist method of evaluation. This runs the risk of spurious rationality.

All formal methodologies and combinations of methodologies bump up against the limits of physical representation by numbers, two-dimensional diagrams and the boundaries of modelling human reason using such tools. It may be that the closest we can get to actual workings of the managerial mind in complex situations is to use such tools as Likert scales, cognitive maps and spider charts (see Remenyi *et al* 1995, for an interesting compilation of such techniques). They may be two-dimensional, but at least they are not trapped in the linear world of many other evaluation models.

5. An understanding of complex decision-making

The focus here is instinct, which occurs as a subset of the evaluation techniques or approaches that employ hermeneutic methods and which *cannot* be easily handled by the traditional approaches. Such situations probably constitute a significant proportion of decisions, but they are often the largest, most strategic and hence most critical decisions.

Irrespective of whether a composite approach or a meta approach has been taken to the IT investment analysis, eventually a decision has to be made and this means some form of hermeneutic assessment.

No matter how quantitative the analysis has been some person will sooner or later have to make a judgement, as this is the most difficult part to comprehend (Collins, 1994).

In order to move towards an understanding of this process we need to look to other fields of complex decision-making. How do individuals arrive at their options on such complex issues as suicide, human cloning, or for that matter what constitutes great art or what makes a good teacher? Anybody who has witnessed or participated in an argument on suicide for example, will be aware many people, faced with such a complex issue, one which has moral, religious, social, medical, political. This sort of decision-making or judgement making is not irrational or al least it need and economic overtones arrive at a stance that says something like 'suicide is wrong, but there are circumstances where it can be justified', but when asked to justify this stance, cannot do so in logical terms.

This sort of decision-making or judgement making is not irrational or at least it need not be. But it is often made without going through the apparent rational step by step processes which management decision-makers are expected to follow. That is where instinct or intuition comes into play.

The process of internal digestion and conclusion which is fed by instinct and intuition has been discussed by many philosophers starting with Aristotle who differentiated between what he termed *techne* and *phronesis,* what might today be called technical and practical reasoning (Dunne, 1993). The process of practical reasoning was described vividly by Newman who called it the 'Illative Sense' (Newman, 1889). Other more recent defenders of phronesis include the German philosophers Gadamer (1989) and Habermas (1984).

Although one can normally differentiate between the value of an IT investment to an organisation and to the decision-makers, in practice, in the mind of the decision-makers, both are confounded. It is simply not part of human nature to make totally detached decisions about anything, never mind about choices which will affect them personally. We will bring what Gadamar calls our own prejudiced to the decision. Our decisions are influenced not only by the clinical analysis of numbers and costs, but by cultural, political, personal and a host of other subliminal factors; what Dunne calls the sub-soil of the psyche. This is more than a mere acknowledgement of human bias as widely discussed in the decision theory literature. This part conscious, part subconscious digestion of a mass of information, prejudices, personal values, experience, sense of duty as well as internal and external pressures is what decision-makers often go through when making complex decisions about IT investments. They could not easily rationalise this process even if they tried. Instead they call it 'gut instinct', faith, intuition etc.

Instinct is not therefore necessarily something to be condemned - abandonment by the decision-maker of reason. Rather it is often a different and subtler kind of reasoning - a taking into account of how the world really is rather than simply what the spreadsheets say. Instinct, intuition or gut feeling is not, *per se,* non-rational or irrational. They are perhaps best regarded as super-rational which effectively means that they incorporate the processes of reasoning but at a much higher level than is taken when a problem is worked out step by step. A model of this decision-making process is shown in Figure 2.

Any decision is influenced by a range of factors, some rational, some non-rational, some explicit others implicit. These factors clearly carry different weights in the mind of each decision-maker. Each is derived from external information of various types which in itself may come through various filters such as subordinates, consultants, journalists and salespeople. We may term these external filters.

This information then goes through a further interior filter of personal experience and psychological make-up, before being assimilated and weighed up to make a decision. A large component of the interior filter is the decision-maker's perception of value. The role played by rational decision-making technique needs to be understood in this context. Finally, it should be noted that even this relatively

complex model simplifies various aspects of decision-making, in part by ignoring the issue of process. In practice decisions emerge over time. There is a point at which the decision is made, but there may be a prolonged gestation period, even after the sources of external information have ceased supplying new data.

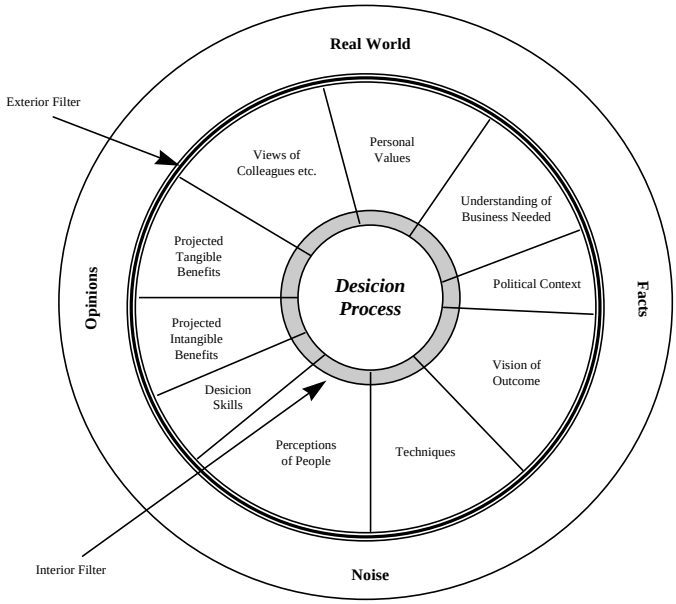

Figure 2. Decision Process Model

6. Summary and conclusion

Sound management decision-making requires a combination of different talents. Rational thinking processes alone are not good enough. Thurber (1939) powerfully proclaimed the inadequacy of reason alone when he said: "man, with his power of reason, has reduced economics to the level ofa farce which is at once funnier and more tragic than Tobacco Road".

To be successful management decision-making required at least rationality plus instinct.

It is clear that instinct is a central part of all decision-making processes and especially the management decision-making process. Without an understanding of instinct we would have a very incomplete understanding of management. The issue of instinct is sometimes associated with subjectivity and the importance of this is clearly expressed by Wheatley (1992):

> *We inhabit a world that is always subjective and shaped by our interactions with it. Our world is impossible to pin down, constantly and infinitely, more interesting than we eve rimagined.*

Human decision-makers, even working in groups within larger organisations, are rarely as logically rational as many commentators, including themselves, would like to believe. Philosophers dating back as far as Aristotle have pointed out that the technical model of reason has strict limitations. Many IT investment decisions are made, or apparently made, and rightly so, on purely technical rational grounds. Such decisions may be made using the same type of formal structure that might be used to buy a factory, develop a new product, build a house or play bridge. But much of the time, the process of evaluating IT is the application of *phronesis*, a praxis, the application and the absorption of a range input information. the information can include data, evaluation techniques, personal experience, personal knowledge, corporate or departmental politics, personal desires and intuition; a process of filtration and distillation of frequency very complex data, information and knowledge to levels manageable to the human mind.

Whether the incorporation of all of these factors is conscious or unconscious, they are always present. Models which try to provide surrogates for such 'irrational' facotrs may be employed, but should they conflict with the inner conviction of the decision-maker(s), they may be rejected. The technical rationalist may describe such a rejection as 'irrational', but this view is based on the premise that the decision-maker shares the same values and has access to exactly the same knowledge as the observer. On practice, this will very rarely be the case. The uncomfortable fact remains that good business decisions are sometimes taken in the teeth of the 'evidence'. It is this ability to make intuitive leaps that often distinguishes the great manager from the competent functionary.

This decision-making process is often known as or expresses itself in the term of instinct, 'gut feel', 'intuition' and other equivalent terms. In order to influence and improve IT investment decisions, it would be very useful to have a deeper understanding of this interior practice or functioning of the managerial mind. Hitt and Brynjolfsson have identified this challenge succinctly when they observed that "the problem of IT value is far from settled". In fact according to Lacity and Hirschheim (1995) "the problem is that meaningful measures of departmental efficiency do not exist for IS….much of the knowledge required to make efficient economic decisions (related to information systems) cannot be expressed as statistical aggregates, but is highly idiosyncratic in nature".

This internalised, subjective and idiosyncratic knowledge and knowledge processing, referred to in this paper as instinct, is an essential part of the decision-making approach and should not be in any way disregarded or denigrated. In fact it is the authors' suggestion that this instinct should not only be defended but it should actually be celebrated as part of not only that which differentiates man from machine but separates mediocre and top flight management.

After all value, like beauty and the contact lens, remains in the eye of the beholder and the eye of the beholder in business and management situations needs to be cultivated. Were it any other way, there would be far fewer poor or bad business decisions - whether IT-related or not.

Notes

1. These expressions such as 'acts of faith', 'blind faith' or 'gut instinct' are sometimes euphemistically replaced by the term 'strategic insight' which really means the same thing.
2. Classical economics states that there are two types of value. There is value in exchange and value in use. Accounting is based on value in exchange where the amount of money for which a product changes hands is its value. Although only of limited use this notion has the great advantage of being clear and simple to understand and apply. Value in use is more complex to understand and has considerable problems in being quantified. The problem which arises in the IS evaluation setting that value in exchange is not of much help in assessing the success on an investment as there is no exchange. Therefore we are forced to come to terms with the quantification of the value in use concept and this is loaded with problems.
3. Many of these methods are themselves composite in nature. For example, even a net present value is derived from net cash flows, which in turn are derived from a range of other factors and computations. Cost benefit analysis is also based on using money as a metric for combining many factors, some of which are distinctly non-monetary in origin. This repertoire of techniques has evolved into a shopping list of methods that are applied in day to day IT investment evaluation. A brief scan of the literature will reveal numerous cases where these methods are cited or where researchers have endeavoured to find out which of these methods are used in practice.
4. Hermeneutics is defined as the science and methodology of interpretation.
5. The meta approach is essentially interpretist or hermeneutic in character in as far as the selection of the techniques is concerned, although some of the techniques may themselves be quite positivist.

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