

# **The Value of Information in Organisations: A Study of Information Use Situations as Contexts of Value**

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## **Abstract**

The notion that the value of information is significantly dependent on the context of use is widely accepted in information systems research. Context is however often conceived as given and exogenous to the use activity and hence beyond the control of the user.

This study takes a dynamic and holistic view of context in which the purposes, processes and effects of information use are seen as inextricable from the structural and environmental factors that mediate such use in organisations. The concept of Information Use Situation (IUS) is employed to represent this view of context. An IUS framework is developed and used as a guide to explore, describe, and interpret a number of information use situations in four organisations in the service sector. The study draws on several context studies in information systems, work motivation and self-interest theories in social psychology, and a number of philosophical propositions on the nature of information and value, in highlighting the key features of the situations studied.

The findings suggest that, in general, information use situations affect the value-in-use of information in at least three ways, by acting as filters, as mediators of use behaviour and as frames of reference for evaluating informational activities. The main contribution of this thesis to information systems research is in proposing and exploring the concept of information use situation as a more holistic view of context when studying the value of information in organisation.

The thesis concludes that organisations need to recognise the diversity of information use situations they feature and to appreciate that the value of information depends significantly on the nature of the situation in which it is used. This requires managers to pay as much attention to the processes by which employees experience and appropriate information as to the quality of the formal information used if they are to realise the optimum value of their information resources.



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# Chapter One

## The Research Question

### 1.1 Introduction

This research started with the objective of investigating the efficacy and effectiveness of contemporary information systems security audit theory and practice. The researcher's interest in this area arose from the feeling that current information systems audit principles and practices are borrowed largely from the accounting discipline and that these principles are not necessarily always effective in the information systems domain. A couple of months into the study, the researcher became increasingly convinced that information [systems] security is inevitably linked with information value. That is, in the ideal situation, the level and form of security applied to information systems in organisations should reflect the amount and type of value derived from them. Therefore to evaluate information systems security, one needs to understand and appreciate the kind and amount of value involved. This line of thinking redirected the focus of the research from information systems security audit to the value of information in organisation.

A survey of several definitions and characterisations of both information and value revealed that both concepts are not only ambiguous but also highly context dependent. This means that notions of information and value, and by extension the value of information, are only meaningful with reference to the context of application. Therefore to be able to identify and appreciate the value of information, we need to understand the context of its use. This study is an attempt to discern and describe that context from the perspective of the individual information user in order to have a better insight into the notion of value-in-use of information in organisation.

The rest of this chapter examines the need for information valuation in organisations today. It also highlights a number of different views on the

nature and manifestation of the value of information, and the role of context. The chapter concludes by stating the objective of the study, the main research questions, and the scope of the study.

## **1.2 The need for information valuation**

There are many claims (e.g. Machlup, 1962; Porat, 1977; Drucker, 1969) and counter claims (e.g. Webster, 1995) about whether we now live in an information society. While the arguments about the definition and reality of the information society are still unresolved, there is general agreement regarding the quantity of information evident in society today. "Almost everyone can recognise and acknowledge the extraordinary expansion of the informational content of modern life [as] contemporary culture is manifestly more heavily information laden than any of its predecessors" (Webster, 1995). Whether this evident quantitative increase in information, rather than its qualitative effect on society constitutes a credible indicator of an information society is not particularly relevant to this research. However, this explosion of informational activity and the corresponding increase in the cost of information, has focussed the attention of business organisations on the role, importance, and hence value of information.

The history of information technology (IT) development and utility in the past 3 - 4 decades is a relevant backdrop in justifying the current emphasis on the value of information. The much-heralded promise of IT that engendered massive investments in these technologies in the past did not materialise for many organisations. Yet organisations continue to spend vast amounts of money on information technologies. Thomas Davenport (1999) reports that "we spend over a trillion dollars a year on information technology, yet economists have found little correlation between companies' IT expenditure and financial performance". Furthermore, "company executives are confused by much of the advice they receive on how to manage and use their information systems and are often disappointed by the payback on their investment in these systems". Consequently, there is an ever-growing



demand in the current economic climate to determine the value of information in organisations. It is no longer acceptable to invest in IT or any information related project purely on the basis of unsubstantiated technological promises.

The desire to measure the value of information is not a new phenomenon but the upsurge in interest and practice over the past decade or so coincides with the increasing demand for efficiency in business operations and the general competitive tendencies which have characterised this period. In this climate, all investments including those on information related functions must be justified in economic terms. However, the economic value of any organisational process, activity or product seems to be defined exclusively in terms of the quantifiable contribution it makes towards corporate survival and profit, and especially to what is commonly referred to as the 'bottom line'. Many information valuation models, frameworks and approaches (e.g. Glazer, 1993; McPherson, 1994) reflect this quantitative view of the value of information. In this view, the value of information is largely seen as objective and quantifiable, and almost exclusively in terms of monetary value. This monetary value approach to information valuation is no longer restricted to the business sector. Even public and charity status organisations like local and national libraries that traditionally considered their services in terms of a public good are now attempting to evaluate the services they provide in monetary terms (see, for example, Griffiths, J and King, D.W. 1990, 1991).

The value of information is however normally manifested in forms that are both difficult to quantify and seemingly inappropriate to convert completely into objective monetary value. In spite of this, the three main reasons for evaluating the use of information in organisations today derive from economic demands, which are firmly focused on the monetary value of information. The need for cost justification, efficiency of business operations and the unrelenting quest for competitive advantage, which are all anchored in monetary measures of performance, figure among the principal reasons for

both the emphasis on information valuation and the drive towards quantitative measures. Other reasons include the need to market information as an economic commodity and the increasing call - at least in the USA and the UK - for the capitalisation of information as an intangible asset in accounting.

The difficulty with this quantitative view of the value of information arises from the absence of an objective means of identifying and quantifying such value. Many measurements of information value are largely subjective and only applicable in specific situations. Consequently, information markets and processes cannot be expected to reflect faithfully normal economic principles, such as demand and supply, for exchange purposes. Nonetheless, information is being traded increasingly either as a commodity, a product or as a service. Some of the amounts paid for such information constitute abstract quantitative representations of the value of information, which may not necessarily reflect the value-in-use. Such abstract notions of information (value) are "apt to mean little unless applied in specific contexts and for specific uses" (Sillince, 1995). This is why the concept of value of information in organisations needs a wider perspective, in which information is regarded as fundamentally intangible and very difficult to quantify into discrete units. In this perspective, the value of information depends considerably on the situational factors that determine and mediate its use since "criteria and values we apply to information vary from one context to another" (Badenoch et al 1994). Put another way, the social setting in which information is encountered determines its value (Chun Wei Choo, 1999).

Some researchers suggest that information without a definable purpose (Scarrott, 1994) or information that is not used (Badenoch et al, 1994) is not information at all. However individuals and organisations often pay large amounts of money for information even before they receive it and these amounts do not necessarily reflect the value realised from using the information. The value of information is therefore often regarded in two forms: exchange value and value-in-use.

In spite of this duality, the common business notion of information value concerns the potential or actual contribution of the information to outcomes associated with its use. This notion of value denotes an outcome-oriented view of the value of information as illustrated in Figure 1.

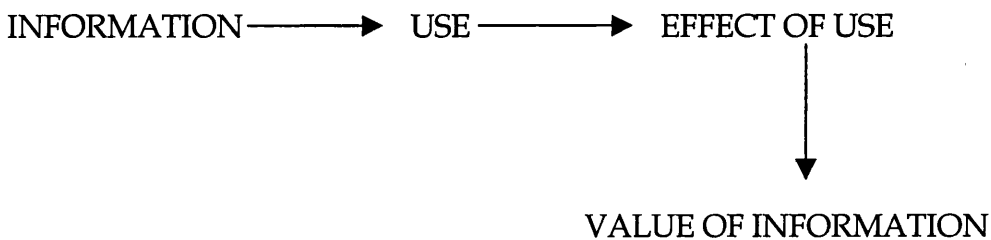


Figure 1: The value of Information: An Outcome-oriented View

### 1.3 A dynamic model of information value

While the outcome-oriented notion of information value is prevalent in the business environment, it is not the only form of value. The value of information can be manifested in other ways that may not be directly reflected in the observed or perceived outcome at a particular time. In order to account for such manifestations, we need to adopt broader notions of both the phenomena of information use and information value. Figure 2 presents a conceptual model of the information use process, which is based on a dynamic 'purpose-process-effect' view of the value-in-use of information.

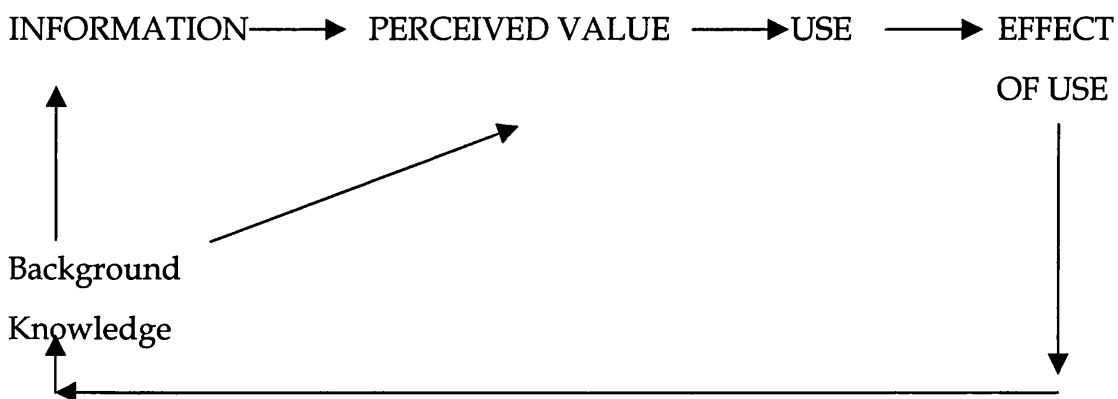


Figure 2 Information Use: The Dynamic Value Cycle

The above characterisation of the information use process stipulates that the value of information is manifested in all stages of the dynamic use cycle and that the perceived effect of use, at a particular time, accounts for only part of the value attributable to the information. To appreciate the various dimensions of this value, we need to understand the context in which the information is used.

#### **1.4 The role of context**

This research conceives of the context of information use in organisation in terms of the dynamic interaction of information with organisation, in which the purposes, processes, and outcomes of the interaction all become dynamic features of context. This notion of context is based on an interpretivist view of the information use process rather than the traditional rational and functional view, which denotes context as something exogenous or peripheral to the object of concern.

The main premise of the study is that the context of information use is a greater determinant of the value of information than the inherent attributes of either information or organisation. Klobas (1995) suggests that the quality of electronic information resources is only one of several influences on their use<sup>1</sup> and that use is better explained as a function of 'fitness for purpose'. Klobas defines fitness for purpose as the extent to which the information resource is of appropriate quality for the situation in which it is to be used. Hence use depends on the situation or context and for effective use, we need to understand the situations that characterise the use. By describing and interpreting the situations that characterise the use of information in organisations this research aims to gain useful insights into the complex processes of information use and evaluation in business organisations.

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<sup>1</sup> Here use is portrayed as an indicator of the value of the resource.

Figure<sup>2</sup> 3 is a conceptual, rather than an analytical, representation of the premise of this study.

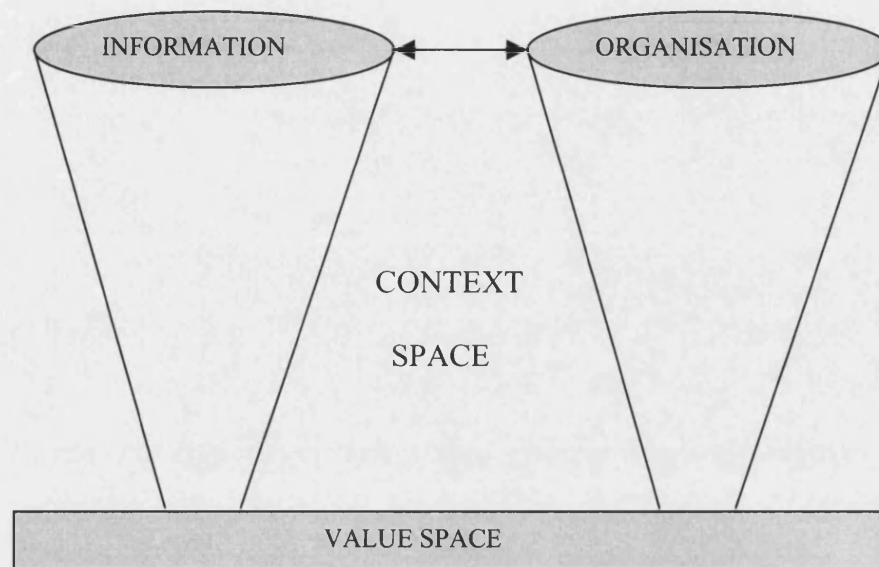


Figure 3 Context and the value of information

However, Badenoch et al (1994) have noted that:

- a) We cannot reliably identify the 'set of contexts' within which information may be used.
- b) We cannot reliably identify the set of criteria a person will apply within a given context.

These researchers however concede that in many situations, we can identify broad categories of users with fairly similar expectations and demands by which we can generalise the criteria or value systems they employ with respect to information use. Hence, if we can identify individual users or groups in organisations with the types and kinds of information they use, it should be possible, and desirable to describe various information use situations that could lead to a better understanding of the notion of information value.

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<sup>2</sup> The two cones representing information and organisation intercept only small portions of the value space, suggesting that the exclusive features of information and organisation do not, by themselves, deliver much value. Rather, the nature of the interaction between them – represented by context space – determines the bulk of the value realised.

Instead of seeking exclusive quantitative representations of information value, we should be able to describe information use situations (IUS) that would point to qualitative indicators of the value of information relevant to those situations.

It is understandable that ultimately, monetary value is normally more significant than other forms of value in business organisations since money signifies some form of objective value, which is easier to process. Money as a surrogate of value may however not always be the most realistic or representative of the value of information in organisations. For example, Oliver, Roos and Victor (1999) argue that organisations have value that does not appear on any balance sheet. They point out that when IBM bought Lotus, it paid seven times Lotus' published value because of considerations of the company's intangible assets or 'intellectual capital'. A good proportion of that capital relates to information in various forms. There are many other examples of take-overs and mergers where the money involved does not match balance sheet figures. While this research does not discount the usefulness of quantitative measures of the value of information, it argues that a thorough qualitative analysis of the value of information is both useful and necessary in today's business environment.

As the quantity and variety of information available to organisations continues to grow, it should become more apparent that certain manifestations of information value cannot be reliably quantified or converted into monetary value. Those aspects of the value that can be quantified will remain very useful and probably continue to be the accepted referents to the value of information in certain contexts, but even those need to be based on discernible qualitative indicators of value. There is need therefore to discern the value of information by matching its qualitative attributes with the situations of use.

## **1.5 The individual information user**

Although the attainment of formal organisational goals constitutes the ultimate objective of organisational activity, the satisfaction of end-user needs is recognised as an important element in the effective use of information systems and hence the realisation of the value of information. Accordingly, some researchers have suggested that "the value of an organisation's information systems is ultimately realised through the activities of single end-users or small workgroups" (Hemingway, 1998). The concept of information use situation (IUS), which focuses on the individual information user in a functional role in organisation, is based on this view.

Despite the focus on the individual, this study is not directed exclusively at the subjective experiences of people. Rather an information use situation includes the totality of formal and informal organisational features and occurrences as perceived and realised by individuals in their functional roles in organisation. This focus on the user accords well with the increasing realisation in information systems research that the human dimension constitutes the most important factor in the effective use of information (systems). Thomas Davenport (1999) argues that "regardless of the power of the technology, success above all depends on the human dimension ... after all it is humans who add the context, meaning and value that transforms data into information". Other researchers such as Chun Wei Choo (1999) posit that information does not reside in artefacts but in individual minds and that such information is created through individual thoughts, actions and feelings. The crucial role of the individual information user in the realisation of the value of information in organisation is hence widely recognised.

## **1.6 Objectives of the research**

The objective of this study is to investigate and describe the nature of information use situations in business organisations. By describing such situations the research hopes to provide some insight into how the complex dynamics of the information use process relates to individual user perceptions

and reactions to the value-in-use of information. To do this, an IUS framework is developed and used as a guide to explore, describe, categorise and interpret the situations. The situations are based on everyday work activities in various functional roles in four different organisations in the service sector. The focus on 'real everyday work activities' is meant to distinguish this study from those that regard information use almost exclusively in terms of decision making. This study takes the view that depending on the situation, information could be used to either take a decision, trigger an action, or very often a combination of the two. Information may also be used to simply clarify or reinforce some previously held views or suspicions, and sometimes it is used, correctly or incorrectly, to justify or defend predetermined decisions or actions. In certain cases, information may also be used for entirely symbolic purposes. In all of these situations some value could be associated with the information, whether it is negative or positive. The notion of information value is hence not necessarily limited to decision making.

### **1.7 The research question**

The main research question of the study is: How can we describe information use situations in organisations so as to gain useful insights into the notion of value-in-use of information?

This question could be decomposed into the following two interrelated sub-questions.

- 1) How do users in different situations conceive of the value of the information they use, i.e. what is the underlying essence of the value-in-use of information in organisation?
- 2) What major situational features affect information use in organisations and how do these features relate to notions of information value held by individual users?



The IUS framework is meant to facilitate the answering of the above questions, which are based on the following assumptions:

- a) The value of information in organisations is largely a function of the situations that occasion its use.
- b) Information use situations can be sufficiently described so as to discern those characteristics of the situations that enhance value-in-use.
- c) Because some aspects or dimensions of the value of information in organisations are difficult, if not impossible, to quantify and convert into monetary value; it is necessary to understand the qualitative dimension of the value of information in order to use it effectively.

## **1.8 Scope of the research**

The domain of this research is restricted to contemporary business organisations. This includes both profit and not for profit organisations in the public and private sectors. Owing to the very complex and fluid nature of the concept of information, this research will focus mainly on one form of information i.e. electronic information or computer-based information. This does not necessarily exclude the consideration of other forms of information (e.g. oral or mental and paper-based), since they are inter-convertible with the electronic form. The rationale for this restriction derives from the ever-increasing importance of electronic information in today's organisations as well as pragmatic considerations of the limitations of this research. Furthermore, the boundaries between electronic information and the other forms in the practical use situation are considerably blurred as pieces of information can easily, and often do exist in all three forms. The very pervasive and increasingly crucial role played by modern information

technologies, especially computers, in today's organisations however justifies the focus on electronic<sup>3</sup> information.

In this study, the term information refers principally to information as content. However, it is appreciated that certain forms of information, especially electronic information, are virtually inextricable from the technology through which they are processed, delivered and utilised. This means that very often, value objectives associated with such information are as much a function of the technology as they are of information as content. The value of such information therefore often reflects a combination of the functional capabilities and potential of the relevant information technologies, the context of use and the quality of information as content.

This chapter has outlined some of the reasons and rationale behind the current wave of interest in evaluating the role of information in organisation. It has also highlighted the output-oriented notion of value reflected in many information evaluation approaches, which do not address the full dimension of the value of information in organisation. To redress this anomaly, a dynamic model of the information use process, as a cognitive activity, is proposed. This model stipulates that the value of information is manifested at all stages of the purpose-process-effect cycle of information use and not just at the output stage. The chapter also discussed the role of context, in general and of the individual information user in particular, in the information use process. The objectives of the study, the research questions and the scope of the study were also outlined.

The next chapter examines the theoretical foundations of a number of fundamental concepts relevant to the research question. These concepts essentially define the research domain. By examining and relating them, chapter two aims to provide a comprehensive background and theoretical

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<sup>3</sup> For the purposes of this study, electronic information refers to information that is processed, stored, transmitted or mediated in any way by computer and telecommunication technologies.

support for the research approach, methodology, techniques and findings presented in the rest of the study.

# Chapter Two

## The Research Domain

In this chapter, the main theoretical and conceptual foundations of this study are presented. The chapter explores, examines and discusses four major concepts that bear directly on the research question. This includes the notions of information and value adopted in the study as conceptual tools for interpreting the situations studied. The four concepts examined in the chapter are:

- Value
- Information
- The value of information
- Organisation

### 2.1 Value

According to the Encyclopaedia Britannica, the term 'Value' originated in Economics. Originally, it meant the worth or exchange value of something, as held in the work of the 18th century political economist, Adam Smith. Both the term and concept of value have however been applied to a wider area of philosophical interest since the 19th century. This inevitably resulted in an extension of meaning as evidenced by the works of a number early 20th century thinkers and researchers including Rodolf Hermann Lotze, Friedrich Nietzsche, Eduard Von Hartmann, Wilbur Marshall Urban and Ralph Barton Perry. Perry, for example, theorised, in his book *General Theory of Value* (1926) that a value is "any object of any interest". He later explored eight realms of value: Morality, Religion, Art, Science, Economics, Politics, Law and Custom. This broadening of application area engendered as much interest in the philosophical analysis of value as confusion over what it really meant.

In the late 19th century, the political economist, John Armsden, commented on value as follows:

The ambiguity of the word 'value' contributes no small share to the confusion we see accompanying it in all its aspects; yet it is one of the most expressive of everyday use, while nearly all the energy of mankind is, consciously or unconsciously, directed towards the establishment of its equation.

This is one of the most salient articulations of both the fundamental importance and difficulty of pinning down value as a unique expressive socio-economic and political concept. More than half a century later, the philosopher Charles Morris remarked that the term value is one of the great words, and like other such words (Science, Religion, Morality, Philosophy), its meaning is multiple and complex. Morris did not give a generic definition of value but distinguished three ways in which the term is commonly employed. The three ways signify different manifestations of value, which he called *operative value*, *conceived value* and *object value*.

Morris defined operative value as "the tendency or disposition of living beings to prefer one kind of object<sup>4</sup> rather than another". He further suggested that reference to value in this sense "is simply a way of referring to the actual direction of preferential behaviour towards one kind of object rather than another". In contrast to operative value, conceived value restricts the concept of value to "those cases of preferential behaviour directed by an anticipation or foresight of the outcome of such behaviour". Conceived value thus refers to preference for a symbolically or conceptually indicated object. Morris concedes that the above two forms of value are not necessarily mutually exclusive as human beings hardly, if ever, adopt fully either or both types of value. Some interaction and some incompatibility between conceived and operative values is the common state (Morris, 1956). The third form of value i.e. object value, is concerned with what is preferable (or desirable) regardless of whether it is in fact preferred or conceived as preferable. The main indicator of object value is the property of the object, which may not

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<sup>4</sup> 'Object' in this definition refers to what ever can be preferred to something else, e.g., physical things, persons, colours, emotions, images, thoughts, symbols and even forms of physical activity.

necessarily coincide with personal preferences and judgements of individuals that interact with the object. Charles Morris' three forms of value all depend on the term *prefer* and could be summarised as *value as the preferred*, *value as a conception of the preferable*, and *value as the preferable*.

### **2.11 Objective versus subjective value**

According to Rokeach (1973), the value concept has been employed in two distinctly different ways in human discourse. One suggests that humans possess value and the other attributes value to objects as a function of their properties. Many researchers including Perry (1954), Lewis (1962), Katz and Scotland (1959), Hilliard (1950) and Campbell (1963) have approached the problem of value from the object side. To these writers, all objects are conceived as having a one-dimensional property of value ranging from positive to negative. More recently, the behaviourist, B.F. Skinner (1971) vigorously opposed the notion that humans possess value by arguing that "the reinforcing effects of things are the province of behavioural science, which to the extent that it is concerned with operand reinforcement, is a science of values" (Quoted in Rokeach, 1973, p.104).

On the other hand, writers like Kluckhohn (1951), Maslow (1954, 1964), Charles Morris (1956), Brewster Smith (1969) and Robin Williams (1968) have approached value analysis from the view that value manifestations are properties of humans, or of living organisms in general, as opposed to objects. Williams further suggests that a person's values serve as criteria, or standards in terms of which evaluations are made.

The above seemingly diametrically opposite positions on the nature of value poses some fundamental philosophical questions about the nature of value and value judgements. For example:

- 1) Is an object valuable because it exhibits certain real properties in itself or because we (living organisms) confer value on it by our attitudes towards it?

- 2) Is an object of value because it is desired (subjectivist) or is it desired because it has value (objectivist)?
- 3) Are there other ways of defining value without refuting the validity of claims made by either of the two camps?

### **2.12 Value as a relational phenomenon**

Despite the objective/subjective divide on the nature of value, both sides agree that value judgements have a cognitive status. While the objectivist hold, in their general epistemology, that things exist independently of our thinking, they accept that whatever value things have is validated through the cognition of living beings. In other words there is objective being, but no absolute objective value.

In an attempt to reconcile the opposing views on value, Hilliard (1950), proposed the following definition of value, which emphasises not so much the properties or characteristics of the object or organism, but the affectivity that results from the interaction between them in a specific context.

Value is affectivity occurring in the relational contexture determined by the reaction of an organism<sup>5</sup> to a stimulus object.

Like Charles Morris, Hilliard defined object in the widest possible sense to include: "a thing, situation, action, occurrence, symbol, even symbol of non-existent objects, figment of the imagination - in fact any stimulus or stimuli whatsoever that we find convenient to delimit and call an object". Hilliard maintains that there is no question of inherent affectivity present in an organism other than by a reaction (response) to an object; if there is, it does not constitute value. Every affectivity therefore signifies some reaction to some stimulus and positive, indifferent and negative affectivities exhaust the affective possibilities of all reactions. Hence indifference to a stimulus (object) by an organism constitutes a reaction to the object rather than inaction. The reaction of an organism to an object therefore constitutes the necessary and sufficient condition for value to occur. Hilliard rejects the common linguistic

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<sup>5</sup> To Hilliard, an organism is any living thing, from the simplest one-cell creature up to the state or society or beyond.

notion that equates *objective* with good or correct and *subjective* with bad or wrong. He proposes that objective and subjective values can each be positive or negative depending on the context. Nonetheless, Hilliard accepts that some values refer to relatively stable features and experiences, common to a number of organisms and hence fairly predictable in given contexts (objective?), while others relate to more random and varied occurrences that are highly unpredictable (subjective?).

In stressing the importance of the relational context rather than the discrete properties of either the object or subject in determining value, Hilliard postulates that:

- a) Value occurs or is capable of occurring in every case where an organism *is able* to respond, directly or indirectly, to an object (my emphasis).
- b) In general, two or more organisms can never experience an identical relational context, for if they did, they would no longer be two organisms but the same one.

An object-subject interaction therefore constitutes both the antecedent and manifestation of value and that value is in essence an individual experience.

Hilliard's propositions set out the necessary and sufficient conditions for value to occur but they do not tell us how and why humans appropriate notions of value. We therefore need to examine further the nature of values and how they relate to human needs.

### **2.13 The nature of values**

Rokeach (1973) has suggested that any conception of human value should clearly distinguish the value concept from other concepts with which it might be confused. He cites concepts such as attitudes, social norms and needs which are somehow related to value but not synonymous with it. Rokeach defines value as follows:

A value is an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence.



He further defines a value system as:

An enduring organisation of beliefs concerning preferable modes of conduct or end-states of existence along a continuum of relative importance.

Deconstructing the above definitions leads us to the following observations on the nature of values:

- a) A value is enduring: this implies that values are neither completely stable nor completely unstable. Rokeach argues that "if they were, neither change, individual and social, nor continuity of human personality and society would be possible". Values are thus both enduring and changing in character.
- b) A value is a belief: A value is a belief of the prescriptive or proscriptive type, i.e. a belief wherein some means or ends of action is judged to be desirable or undesirable. Like all beliefs, Rokeach maintains that values have cognitive, affective and behavioural components. On the cognitive component he suggests that a value is cognition about the desirable, equivalent to what Charles Morris (1956) called conceived value and to what Kluckhohn (1951) termed "a conception of the desirable". In respect of affectivity, value is affective in so far as one can feel emotional about it and approve or disapprove of positive or negative instances of it respectively. In terms of the Charles Morris typology, this is operative value. Finally the behavioural component of value constitutes an intervening variable that leads to action when activated<sup>6</sup>
- c) A value refers to a mode of conduct or end-state of existence: Beliefs concerning modes of conduct or desirable end-states of existence have long been identified as value in one form or another. To some researchers, (e.g. Kluckhohn, 1951; Lovejoy, 1950; Hilliard, 1950; English & English, 1958) value exhibited through means should be distinguished from value realised as an end. These two kinds of value are commonly referred to as instrumental and terminal values respectively.

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<sup>6</sup> The problem is that the behavioural component cannot always be reliably linked with the cognitive and/or affective manifestations of value, owing to the ability of humans to pretend.

Further classification of the two kinds of value postulated by Rokeach include two kinds of terminal values: personal and social, and two kinds of instrumental values: moral and competence values. The classification of value as instrumental or terminal is just one of many dimensions of the value concept.

According to Hilliard, value as a generic concept can be classified according to four bipolar criteria, each being exhaustive of all possible cases in that category. Nine adjectives are offered as qualifiers of the term to represent the four sets of criteria as given below:

Actual	Direct	Positive	Terminal
		Indifference	
Potential	Indirect	Negative	Instrumental

Thus depending on the circumstances that determine or mediate its occurrence, value could be actual or potential; direct or indirect; positive, indifferent or negative, and terminal or instrumental.

The nine adjectives represent four independent criteria for classifying value and are together exhaustive of all occurrences of value. These could be variously combined to describe a maximum of twenty-four discrete modes of value actualisation. This array of value manifestation ranges from 'actual-direct-positive-terminal value' at one end to 'potential-indirect-negative-instrumental value' at the other. The diversity of modes of value in this array gives an indication of the complexity of the value concept. Nonetheless, the above characterisations could be used as a basis for understanding aspects of human value systems and how they relate to human needs and wants.

#### **2.14 Values, value systems and needs**

One way of establishing the relationship between values, value-systems and needs is to focus on the functions of values. Rokeach suggests that values

could be thought of as standards that guide human activities, and that value systems are general plans employed to resolve conflicts and to make decisions. Values could also be thought of as giving expression to human needs, although we must be cautious in how we infer needs from values since values are not isomorphic with needs. Nonetheless it is reasonable to propose that values are cognitive representations of individual human needs bounded by institutional and wider societal demands. These demands arise from a variety of factors, including sociological and psychological forces acting upon the individual. Therefore the cognitive representation of needs as values relates as much to societal demands as to individual needs (Rokeach, 1973). In the context of business organisations, this suggests that the notion of value must not refer exclusively to formal organisational objectives since these are not necessarily always incompatible with individual or subjective notions of value. However the prevailing notion of value in business organisations tends to focus on the formal organisational view of value, commonly referred to as economic value.

### **2.15 Economic value**

Before proceeding to examine the nature of economic value, it is necessary to first define the closely related concept of utility, and to distinguish between the two. Economists generally define utility as the satisfaction of human wants or desire. This definition is too general to be useful in valuation studies. However the concept of utility so defined is so close to the general notion of value that some writers treat them as synonymous. Sinden and Worrel (1979) for example, suggest that utility as defined above is "virtually synonymous with a capacity to make a favourable difference to someone's life" which, according to Baier (1969), is the means to the ultimate desideratum: a worthwhile life. People therefore value things that have the capacity to make favourable differences to their lives, or from the point of view of economists, which have utility. Thus utility is synonymous with

value in this respect but not equivalent to it. Sinden & Worrell illustrate this relationship in the following equation:

$$\text{Value} = f(\text{Utility, environmental conditions, circumstance of evaluator at time of valuation}).$$

Value is hence a function of utility mediated by environmental, circumstantial and temporal variables with respect to an evaluator.

According to Hilliard, the main differences between utility and value are:

- a) Unlike value, utility does not imply affectivity.
- b) Utility and value have no necessary relation to one another; i.e. an object may have utility and not be valued, or not valued in the way of its utility. Conversely, an object may be valued but not have utility or utility corresponding to the value.

The difference between terminal and instrumental value is of particular importance in considering the concept of economic value. Hilliard observes that "if aesthetic value is roughly coextensive with terminal value, then economic value is correspondingly so with instrumental value". That is to say, economic value is concerned with instrumental value since "no object is considered to possess economic value unless it is believed to serve some purpose, to be useful in realising some end; to further some human satisfaction - in short, to have utility" (Hilliard, 1950).

Economic value is further defined within the broader field of instrumental value by characterising it as pertaining to "those values that have to do with objects and actions in so far as they affect the production, distribution, or exchange of wealth<sup>7</sup>". Thus economic value is principally concerned with the means to an end rather than an end in itself. Two important activities in the economic process are thus choice and exchange. The concept of value plays a central and crucial role in these two activities. First values as indicators of relative importance are used as guides in making choices between alternatives and second, value systems are employed as standards on which economic exchange activities are based.

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<sup>7</sup> Wealth is defined as the class of all those objects that are actual or potential means to value.

In modern societies, the most important feature of such exchanges is the use of money as a universal medium of exchange. The amount of money paid for an item is taken to indicate the comparative value of that item as seen by the people involved in the exchange. This amount of money is commonly referred to as the price of the item, which by and large, is a compromise between the valuations of the seller and buyer. Economists have employed various theories to explain the behaviour of the two parties in market exchanges. Using these theories, they hold market price to represent the value of the particular item exchanged as well as all other items similar to it. This value is also supposed to hold for other people who were not involved in the exchange. But Sinden & Worrell argue that "neither of these extrapolations of value may be valid. The only sure value information conveyed by a market price is for the specific transaction in which it was involved, and even then it may only represent value to one party under peculiar circumstances". Market value may therefore not be as objective as economists would like us to believe. As such money might be a very convenient and useful medium of exchange but not necessarily a guarantor of objectivity.

### **2.18 Money as a surrogate of value**

Humans exchange goods and services for other items of value to satisfy needs and wants. The nature of values however makes it very difficult for certain types of values to be directly compared with each other. This makes direct exchange of items between people rather problematic. Money as a universally accepted medium of exchange alleviates this problem by serving as a surrogate for various types and levels of value. It enables people to exchange items of similar and dissimilar value types. However certain types of value in certain situations, may not be exchanged for money, irrespective of the amount. This means that in spite of its universality, money cannot be used as a measure for all kinds of value in all situations. Exchange value, though important and useful, should therefore be seen in the context of the

above limitations of the medium of money. This is especially important in the valuation of intangibles, like information.

The key points in the foregoing characterisation of value could be summarised as follows:

- Values are both personal and social.
- Values are both enduring and changing.
- Values refer to modes of conduct as well as states of existence.
- The antecedents of human values can be traced to culture, society and its institutions and personalities.
- Economic value, especially monetary value, is important and very useful in contemporary human interactions but it has limitations in representing certain aspects and forms of value. This is particularly relevant to value associated with intangible elements such as information.
- Value derives from the interaction between a subject and an object, and that value is a function of the nature of the interaction rather than the discrete properties of the subject or the object. The next sub-section examines the nature of information.

## **2.2 Information**

What do we mean by information or what do we call information? Is it a universally shared concept, a physical artefact, a subjective construct or a combination of these and other forms? This subsection examines a number of characterisations of information, in the IS literature and related fields, which attempt to answer some of the questions posed above. These characterisations are important in understanding the practical notions of information value that prevail in organisations. For example, when information is conceived as a physical artefact or a thing, the corresponding notion of value tends to focus principally on the quality of the 'thing'. When we regard information in terms of shared concepts, then value often depends on and is reflected in inter-subjective agreements. Likewise characterising information as a subjective construct suggests that its value depend significantly on the

characteristics of the user. It is hence important to examine various notions of information and to see how they influence practical notions of information value in organisations.

Many researchers on information (e.g. Fox, 1983; Stonier, 1991; Badenoch et al, 1994; Metcalfe & Powell, 1995; etc) have noted with concern that there is no unique or universally accepted definition of information. This does not necessarily make the study and analysis of information undesirable, only perhaps more difficult. The logical starting point for one to study any aspect of information therefore is to establish and articulate clearly one's conception of what constitutes information.

The information systems literature is full of various definitions of the term 'information'. Many of these definitions are either contradictory or non-complementary with each other. The suggestion that there is a commonly held view on the nature of information (Metcalfe & Powell, 1995), which states that the debate on [the nature of] information is somehow closed may be true within certain narrowly defined information-related disciplines but not necessarily across disciplines. It is not very difficult to see, for example, that a communication engineer's notion of information is radically different from that of a systems analyst's and even more different from a linguist's. Information as represented in electromagnetic signals for transmission has very little in common, if anything at all, with data definition diagrams and data dictionaries or with patterns of natural language structures in printed text. Within the information systems discipline, which is itself not easy to define or demarcate, the debate on what constitutes information is still far from closed despite the tendencies towards certain dominant conceptual themes or metaphors. Thus the relative dearth of research in this area may not be entirely due to lack of recognition that the nature of information is not fully established (Metcalfe & Powell, 1995). Instead, it seems that contemporary research in information systems proceeds on the basis of intuitive working definitions or notions of information which are amenable to

the research tools, concepts and techniques in use and to the overriding business and technical paradigms which pervade current research thinking.

The business and telecommunications domains have in the past 2-3 decades been largely dominated by information technology application research. It is thus not surprising that "though human and organisational issues are at the forefront of current IS research, the focus is more on the systems rather than on the information" (Metcalf & Powell, 1995). Notions of the character of information compatible with the systems concept have thus inadvertently dominated the IS and IT research literature.

In order to appreciate the extent of the variety of characterisations of information, even within the IS discipline, - in spite of the prominence of the systems view and its associated metaphors - a review of a number of characterisations from several research interests is undertaken below.

One of the earlier and much quoted definitions of information came from Shannon (1948) and Shannon & Weaver (1949). In his famous book, *the mathematical theory of communication*, Shannon defined information in terms of the difficulty in transmitting sequences from an information source. The principal object of Shannon's work was not to describe the nature of information but to establish theories governing the transmission of signs and signals as carriers of messages. Nonetheless, the somewhat machine-oriented metaphor - depicting information as something that flows from one point to another - that emerged from this work has influenced many aspects of information studies for many years. This notion of information has not been without criticism however. One of the main criticisms is that this characterisation of information is content (meaning) free. The mathematical probability of transmitting certain signs from one location to another may be accurately determined in Shannon's theory but how those signs relate to humans sending and receiving messages with meaning is not accounted for. The absence of consideration of the part played by humans is thus the principal criticism against information being characterised in terms of the probability associated with sign transmission. In spite of this criticism it is



widely recognised that Shannon's theory is an important contribution to the development of human communication in the last five decades.

A closely related characterisation of information to the Shannon & Weaver model is given by Stonier (1991). In his proposal for a new theory of information, Stonier postulates a mathematical, albeit non-linear, relationship between entropy and information. His theory is based on two fundamental assumptions on the character of information. These are:

- Information, like matter and energy, is a basic property of the universe<sup>8</sup>.
- Any system that exhibits organisation contains information.

Based on the above assumptions, Stonier derived a number of propositions as further insights into the nature of information. These include:

- 1) In spite of the ability of humans to create and transmit information, information has existed since long before the appearance of human beings.
- 2) Like energy, information may exist in a variety of forms, may be transmitted from one system to another and may undergo a series of transformations.
- 3) The more intricately organised a system is, the more information has accumulated within that system.

Stonier's postulates as presented above share the same criticism as that levelled against Shannon's; i.e. that no account of the human role and hence meaning is considered. But Stonier maintains that information can and does exist without meaning. Information, he argues, "is an intrinsic property of various systems (in fact the universe itself) which exists irrespective of whether any human or other forms of intelligence perceive or utilise it". Meaning on the other hand is a function of perception with respect to context.

This is a revolutionary, if not radical, characterisation of information that has not found much favour in contemporary research. Some researchers have

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<sup>8</sup> This is similar to Otten & Debon's (1970) suggestion that information, like energy, can be viewed as a fundamental phenomenon.

criticised it as content free (e.g. Glazer, 1993) or entirely systemic (e.g. Banocho et al, 1994).

Gordon Scarrott (1989) proposed a similar, albeit limiting characterisation of information. Scarrott's characterisation of information is based on the proposition that the essential function of information in nature is to control and operate the recursive organisation of life at all levels; from micro organisms to international and multinational human organisations. Scarrott argues that information exists in order to co-ordinate the physical activities of the components of the organisation "so that their collective behaviour is organised for a purpose - ultimately the survival either of the individual, or of a group, or the species".

Scarrott emphasises that control and purposefulness are the core requirements for defining information. A purposeful organised system is implied to be active due to its recursive nature. This is the limiting condition of Scarrott's definition on Stonier's. While Stonier propose that any system that exhibits organisation contains information, Scarrott suggests that no inanimate natural system satisfies the definition (of an organised system and hence information), since inanimate systems do not incorporate a control feature or exhibit a purpose. Inanimate artificial systems, like computer systems, are however covered by Scarrott's definition since they exhibit control features and they relate to human purposes. The emphasis on purposefulness and control in this characterisation of information suggests a functional perspective rather than an ontological characterisation as proffered by Stonier.

Like Scarrott, many other researchers have approached the definition of information from a functional perspective. Often these definitions relate knowledge and uncertainty with information and are generally problem oriented. This approach to defining information has also been criticised by a number of researchers. Banocho et al (1994) for example, suggest that Arrow's (1984) definition of information as 'that which reduces uncertainty' is

neither a necessary nor a sufficient identifier of information for the following reasons:

- a) It relies on the definition of uncertainty, which can be a subjective experience or a probabilistic measure.
- b) Other things, which are not information, may reduce uncertainty (e.g. emotional support).
- c) Things, which we usually refer to, as information may have no human certainty or uncertainty associated with them.
- d) Information may in fact increase uncertainty (which is not necessarily always bad).

A common element in most definitions of information with a functional perspective is the prominence of knowledge. Many such definitions depict information as either a form or surrogate of knowledge (Farradane, 1976); or something which develops knowledge (Burch, 1974; Deeson, 1991) or something created by knowledge (Farradane, 1976). One difficulty in defining information in terms of knowledge is the problem of distinguishing what Badenoch et al (1994) have termed 'ontogenic' and 'exogenic' knowledge; i.e. knowledge as an internal mental state and knowledge as an external representation of human cognition or thought, respectively. These two forms of knowledge are quite different and correspondingly relate to two quite different conceptions of information. Badenoch et al called information associated or derived from these forms of knowledge epistemic<sup>9</sup> and systemic<sup>10</sup> information respectively.

The distinction between information considered in the context of human cognition and that viewed in the context of a particular means of physical representation is not unique. A Parallel distinction is cited in Machlup's (1979) dichotomy of process and content.

Research in the last three decades has produced several other perspectives on the character of information. Some have characterised information as a

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<sup>9</sup> Information dominated by the content element.

<sup>10</sup> Information that has much of its content embedded in certain dominant forms and processes.

process that occurs in the mind (Wersig & Nevelling, 1975), others conceive of information as an event (Pratt, 1977), and still others are happy to identify information in the structure of text (Belkin & Robertson, 1976). These characterisations have variously been criticised, principally by Fox (1983), for confusing information with its various common usage synonyms. For example, Fox argues that information is not a process. Rather, the process is data generation and diffusion (Metcalf & Powell, 1995). Fox maintains that the failure to distinguish the process of information and information contained in a message leads to confusion. This is evident in Pratt's characterisation of information as a "class of events..." which Fox suggests, is confusing information with an "informational event".

The above, relatively recent attempts at clarifying the nature of information have one common feature. They have tended to focus on the epistemic aspect of information. This is probably an overdue attempt to search for new perspectives and metaphors for analysing, and hence understanding the nature of information. With the realisation that "information science lacks an accepted characterisation of the nature of information", (Fox, 1983) and that "our understanding of information technology has continued to outstrip our understanding of information" (Galliers, 1987), it is not surprising that a search for alternative perspectives on the nature of information would ensue.

The perceiver-concerns perspective is one such perspective proposed by Metcalfe & Powell (1995). Unlike those conceptions of information that ignore or deem irrelevant the need to include people in defining information (e.g. Shannon, 1948; Stonier, 1991; Scarrott, 1989), this perspective is based on the proposition that a concerned perceiver must be present for information to exist. Metcalfe & Powell thus echo Boland's (1987) call for the need to include people in any characterisation of information, and Cleveland's (1982) assertion that there is information only through human observation. These researchers contend that recognising the centrality of the perceiver presents a

different social construct of information that would complement the transmission metaphor and not necessarily replace it.

The rationale for the perceiver-concerns perspective is the proposition that information is a function of the recipient; and that the perceiver's concerns determine the informational content that they give to messages. This implies that several kinds of meaning conveying or meaning associated information may be contained in the same message. Indeed Metcalfe & Powell intimate that "the idea that informational content varies as the perceiver's concerns change over time is fundamental to the perceiver-concerns approach". The notion of information as an objective construct, natural or artificial, is therefore not a viable proposition in this perspective. The minimum necessary condition for information to exist in this conception is the presence of at least one person (mind) to perceive phenomena in the world. The difference between communication and information is stressed, in that communication requires at least two minds. This, according to Fox, implies that information can exist without communication.

The principal reason for the call to include people in every characterisation of information is the concept of meaning. The perceiver concerns perspective approaches the concept of meaning by first emphasising the difference between information and meaning. It echoes Fox's assertion that information is not meaning and that the two are not interchangeable, even though "information is determined by and is relative to meaning in a sentence" (Fox, 1983). The concept of 'sense meaning', as different from 'referent meaning' is also introduced. Sense meaning is defined as the "sense or connotation that a word evokes different from referent meaning" (O'Shaughnessy, 1992). Meaning in general is defined in the perceiver concerns perspective as "the informational content that the perceiver assumes someone else gave to a message". Since the perceiver's concerns determine the informational content of a message, it follows that meaning as portrayed above depends on the perceiver. This suggests that meaning is an entirely subjective experience of individuals. However, Metcalfe & Powell point out that: (a) most of one

person's concerns are also the concerns of others (b) it is often possible to predict the concerns of others and (c) people are able to guess what information another person will extract from a message. Hence meaning is not exclusively subjective or personal.

The foregoing characterisations have approached the concept of information in a number of unitary dimensions. While some definitions depict the ontological features of information, others focus on the functional, transmission, or meaning-conveying features of information. Hence none of these in themselves portray adequately the multidimensional and complex nature of information.

A more holistic approach to information and its role in human communication is given by Semiotics, the study of signs. Semiotics as a unified theory of signs can be traced back to the work of the Logician C.S. Peirce (1839-1914). More recent works in this area include the contributions of Charles Morris (1956) - from a behavioural standpoint - and Ronald Stamper (1973), in the business information systems domain. Stamper defined Semiotics as a theory concerned with "the properties of things in their capacity as signs". In particular, the theory is concerned with those properties "we are accustomed to lump together under the title *information*".

John Minger's (1995) analysis of the concept of meaning from a semiotic perspective is another insightful contribution to this debate. Mingers identifies four main types of signifiers (of information): events, signs and signals, symbols and utterances. Of these, the bulk of human communication takes place through utterances. He describes utterances as "some combination of signs or symbols produced at a particular time with some intent", although he concedes "utterances may also have unintentional aspects". An utterance is characterised as having four components. The first two, intent and connotation, which could be seen as the input components, contribute in the production of the utterance. The utterance, as an element of communication results in two outputs component, signification and import. Each of these components contributes to the notion of meaning. By

examining these components we can establish links between the context, use behaviour, meaning, and value of information.

From the perspective of the receiver, an utterance is represented by the two components: signification and import. In human communications, these are contingent upon some awareness of the existence and nature of the intent and connotation components. More specifically, Mingers posits that "the amount of information available to a particular person depends on ... their prior knowledge of the possible states of the source" (p. 290). Signification refers to the information carried by the utterance and import is the specific meaning the receiver gains from the utterance. The distinction between signification and import suggests that often, the meaning gained by the receiver in a communication act is not necessarily the same as the information associated with the act by the sender or by other observers. It is argued in this study that this difference is due to differences in the information use situations of the parties involved in the communication act. Mingers suggests that signification (i.e. information) is always objective and true, and that it is thus not affected by context. His definition of information as "the propositional content of a sign" implies that for every occurrence of a sign, including utterances, there is a unique 'reality' associated with it. In what he describes as a realist<sup>11</sup> ontological stance, he refers to this reality as "what must be the case given that the sign or event has occurred". However that signification or information is only available to humans through context and the nature of that context inevitably transforms the signification into import for the receiver. One important aspect of that context is the meaning system or connotation that exists in the organisation, which is an intersubjective feature.

The semiotic approach stipulates that signs are the fundamental components of information and communication and that the properties of signs could be analysed along the following four dimensions: pragmatics,

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<sup>11</sup> This characterisation is based on an ontological position depicting a physical world consisting of structures and events that are related in a causal way so that the occurrence of every sign is seen to have a cause i.e. its signification.

semantics, syntactics and empirics. A detailed exposition of the semiotic theory is not intended here but the above dimensions provide a multi-faceted view of human communication, which can help us understand the nature of information. By directing our attention to the different features of information as they relate to the various dimensions of the communication process, semiotics enables us to conceptualise information in a more holistic manner. The four dimensions together constitute a comprehensive framework for analysing human communication and hence the nature of information.

Many other researchers, including Belkin (1978), Farradane (1976), Rueben (1992) and Thow-Yick (1994) have contributed to the debate on the nature of information and its definition. It is neither practically feasible nor desirable to undertake an exhaustive exploration of definitions and conceptions of information in this work. It would be more useful to derive from the various approaches, perspectives and characterisations, a clearly focused notion of information by synthesising those contributions that are considered relevant to this study.

### **2.21 Synthesis of notions of information**

One of the most significant contributions to the debate on the nature of information is that of Shannon (1948) and Shannon & Weaver (1949). Despite the recent wave of criticisms, it is generally acknowledged that defining information in terms of probability associated with entropy or uncertainty is at least useful in modelling the physical aspects of communicating information. Shannon's communication theory therefore contributes significantly to our understanding of the character and value of information. In semiotics, both the presence and absence of a sign or symbol in a message can denote meaning. In so far as Shannon's theory accounts for the probability that some or all of the intended signs transmitted arrive at the receiving end, it contributes to the discourse of meaningful communication, albeit indirectly, since the process of communication affects meaning.



Tom Stonier's proposition that information, like matter and energy, has physical reality and is manifested in any system that exhibits organisation is radically different from the common intuitive conceptions of the term, which generally carry implied purposefulness with respect to humans. A major difficulty with this definition is the proposition that information can exist without meaning, which calls into question the usefulness of information to humans. Despite the difficulty, Stonier's characterisation of information presents a useful ontological perspective on the nature of information.

The next characterisation of information, which was proposed by Gordon Scarrott, is not significantly different from Stonier's. Scarrott sees information in terms of anthropology and biology (purpose and control) and maintains that there is no place for inanimate natural systems in considering the phenomenon of information. By focusing on the functional aspect of information through purpose and control, this definition captures the most basic and fundamental essence of every organisation, i.e. survival. It is therefore especially useful in studying information use in organisations.

The most vital element of any human organisation is people. The purpose and control of such organisation often reflect the characteristics of the people who make up the organisation. The concerns and interests of people hence mediate the nature and types of information used in organisations. This is the basis of the perceiver concerns perspective on information proposed by Metcalfe & Powell. The core requirement that at least one perceiver (mind) should be present for information to exist signifies the importance of the human factor.

The perceiver concerns perspective adopts a cognitive approach in characterising information but doubts a direct rational relationship between people's concerns and externalisation of those concerns through actions such as seeking and using information. Since there is no guarantee that people will always respond by physical action to a message that directly addresses their concerns, it could be argued that studying the concerns of people could only be a partial approach to determining the value of information. This

perspective is however useful as part of a holistic conceptual frame in which it highlights and directs attention to crucial pragmatic considerations in information processing, distribution and use.

The semiotic approach affords us such a holistic frame. If the foregoing perspectives and characterisations of information are roughly mapped on to the semiotic frame, it could be argued that Shannon & Weaver have mainly addressed the empirics aspect of communication. Stonier and Scarrott's characterisations can be related to syntactics, and Metcalfe & Powell's perceiver concerns perspective is directed at semantic-pragmatic issues. These notions of information are therefore complementary to each other in some respects and also consistent with the semiotic view.

In the practical world, information could be considered in terms of both its intangible nature and the physical forms and mediums through which it is represented, processed and utilised. In particular, in view of the pervasive role of information technologies in modern organisations, it is reasonable to assume that any conception of the nature and value of information that does not sufficiently recognise the mediating role of the technologies would be both inadequate and misleading. Likewise, if the properties and demands of the technology direct the course and nature of solutions without due regard to the 'concerns' of humans, such solutions will at best offer only limited impact and at worse lead to much more serious problems. Information therefore "needs to be defined in terms of the full process by which humans communicate and not restricted to either the limited sub-process of signal transmission or the perceived motivations of humans involved in the process" (Ritchie, 1991).

The foregoing discussion suggests that both the concepts of value and information have diverse, confusing, and sometimes contradictory characterisations. This diversity makes it difficult to come up with a unique definition or notion of the concept of the value of information. The next subsection examines the notion of value of information from a number of

perspectives and describes some approaches and tools employed to measure such value.

## **2.3 The value of information**

It was established in sections 2.1 and 2.2 respectively, that 'value' and 'information' are both extremely difficult to define. As a result there are various conceptions and definitions of each term. Similarly, the concept of the value of information is ambiguous and hence lacks a unique definition. In this subsection, a number of approaches to measuring the value of information from the IS literature are presented. These approaches feature various notions of information value, which provide important theoretical insights into the perceived role of information in organisation. Two specific methodologies for assessing the value of information are examined in order to illustrate the differences in practical notions of information value and approaches to measuring such value.

### **2.31 Pragmatic contexts of information valuation**

The value of information is a question of great concern to many information-related disciplines. Management scientists, information service providers including librarians, economists and sociologists all need to have an indication of the value of the information they create, process and utilise in their respective disciplines. It was suggested in section 2.15 that value could be seen as a way of giving expression to human needs. This implies that a variety of values could be derived from various types of human needs. In so far as different disciplines of human knowledge and enterprise can be construed as having different immediate objectives and needs, it is not illogical to expect different conceptions and approaches to value. Apart from differences in the concepts of information in the various disciplines, the criteria used in establishing the value of information in many cases are different too. Consequently the metaphors and themes that pervade the literature on the value of information often reflect the nature, use and value of information as perceived in the different disciplines.

Badenoch et al (1994) identified four broad themes in the literature on the value of information, which reflect the different backgrounds of the academics and practitioners in this area. The researchers however note that these themes are not necessarily mutually exclusive since some overlaps in interest areas can be discerned.

The four themes are:

- Economic and econometric perspectives
- Organisational and resource management perspectives
- Costing, pricing and evaluation of information services
- Social value of information services.

This study is mainly concerned with the second theme, i.e. the organisational and resource management perspective of information value. However much of the earlier information valuation approaches focus on the first theme and the third has become increasingly popular in recent times. The rest of this sub-section will be limited to the first two themes with the understanding that they do overlap with each other and with the other two.

#### *Economic approaches to information valuation*

The notion of value applied to information in economics centres around the consideration of information as a 'commodity', which reduces uncertainty. This commodity could be bought and sold, and mathematical models depicting real-world scenarios could represent its value. Like other commodities, information is viewed as something that can be traded in units. However, due to its peculiar characteristics with reference to appropriability, value considerations can sometimes depend on the exclusiveness of the information. In general, economic approaches to information depend on the following four critical assumptions:

1. Information reduces uncertainty.
2. This uncertainty applies to knowledge about the outcomes of future events (risks).

3. Outcomes of events can be identified using probability.
4. Discrete economic value can be attributed to specific outcomes (Badenoch et al, 1994).

Two types of information and corresponding value manifestations are identifiable from the above criteria. The first is information depicting the actual outcome of future events and second is information about the variables that influence those outcomes. The mathematical models employed by economists attempt to depict and clarify the latter in order to determine the former. Models that reflect this conception of information are however criticised for being based on the notion of 'perfect information'. That is, they assume that all the information about the variables that influence predicted outcomes is perfectly knowable. From this perspective, the value of information represents the difference between knowing the behaviour of the variables that could influence future outcomes and not knowing anything at all about those variables. Accordingly, the value of information is defined as "the probable difference in profits with and without a particular unit of information" (Isaac, 1987). Since profit is normally measured in money, this suggests that the value of information is fully convertible into monetary value.

#### *Organisational perspective on information value*

The increasing realisation that information plays a fundamental role in today's organisation and as such it must be managed, like any other resource, is the basis of a variety of new ways of looking at information and its value in organisation. These new approaches, under the name of information resource management (IRM) emanated from the work of Marchand and Horton (1986). Marchand and Horton did not only contribute significantly to the idea of information resource management but also highlighted the potential value of information in a variety of wholly new dimensions. IRM is now viewed as a management tool or activity that is meant to link corporate information resources with organisational goals and objectives. The IRM perspective on the

nature and role of information in organisation is quite different from the traditional economic view. As a resource, information is not only considered as something of fundamental value, but also one with measurable characteristics. Critics of the IRM model however point out that information is very difficult to measure in any form and the fact that information is largely intangible and often subjective makes it a different kind of resource.

A variety of criteria have been suggested for assessing the value of information in organisation. Some of these focus on the attributes of information while others are based on the effect of use. A few others consider both attributes and effects of use. For example, Badenoch et al proposed to consider the value of information under five major headings: quality, utility, impact on productivity, impact on effectiveness and impact on financial position. Burke and Horton (1988) proposed three: effectiveness, strategic importance to activities the information is intended to support, and the strategic importance to the organisation. Clarke and Augustine (1990) considered accuracy, timeliness, reliability and relevance as parameters for evaluating 'information worth' in a manufacturing company. Time saving, according to Abell (1994), could also be seen as a measure of information value.

A popular and more formal technique for valuing information in organisations is cost-benefit analysis, but this technique has been criticised for a number of shortcomings. These include the following observations by Badenoch et al (1994):

- a) Costs and benefits do not appear at a comparable time.
- b) Benefits are highly dependent upon subjective judgements, and their conversion into monetary terms is suspect, while costs are clearly converted into monetary values.

The above approaches to the value of information generally fail to address the main criticism that they lack objectivity in assessing both the quantitative and qualitative aspects of information value. Part of the reason for this lack of objectivity is the multidimensional nature of the concept of information, which includes the duality of the value of information.

### **2.32 The dual nature of the value of information**

In spite of the difficulty in determining an objective value of information, it is now commonplace to exchange information, in various forms, for money. This suggests that some form of 'objective' valuation is possible. The amount of money paid for a discrete set or piece of information may thus be construed as a measure of the value of that piece of information. This value may not however be necessarily equivalent to the benefits derived from that piece of information by the buyer. Thus two kinds of value are discernible here. The former is normally referred to as 'exchange value' and the latter as 'value-in-use'. In the ideal economic sense, these two values should be commensurate with each other but this is often hardly the case. Hence neither the relatively objective and quantifiable exchange value nor the more subjective value-in-use can by itself faithfully represent the value of information. This is the basis for the dual approach to the value of information, which has its origin in the work of Adam Smith. Smith commented on the ambiguity of the word value, which in one sense signifies usefulness, and in another, power of purchasing. He called these notions of value, value-in-use and value in exchange, respectively.

In recent times, a number of researchers (e.g. Repo, 1986, 1989; Badenoch et al, 1994) have tried to explicate the relationship between these two forms of value. Repo, for example, argued that classical economic models and techniques may be useful in determining the exchange value of information but not value-in-use. To evaluate value-in-use, Repo advocates a cognitive approach, which takes account of the context of use of the information and the effects of such use. Such context must include both individual and organisational objectives and tasks for which the information is required. The conceptual and methodological approach taken in this research is significantly informed by this proposition since it allows for studying the use and value of information in organisation from both individual user and organisational perspectives.

A number of difficulties arise in determining the value-in-use of information. Just defining the 'use' of information can be problematic. Several

questions need to be addressed. For example, does information use always result in noticeable change? What is the nature of that change? Is it, cognitive, emotional or physical? Is there a definable period of use? Can we categorically establish causal relationships between processes and outcome with discrete units of information? These and many other questions make it extremely difficult to assess the value-in-use of information.

Despite the recent emphasis on the cognitive perspective in information valuation, the mere receipt, physical or mental, of information may not automatically be construed as use. A recent case against a police officer, who checked car registration details on a police computer on behalf of a friend, illustrates this point. In the case, the House of Lords ruled that "the term 'use' in the 1984 data protection act could not apply simply to accessing information and reading it" (Financial Times; February 9, 1996). This seems to imply, at least from the legal point of view, that information use must include a cognitive activity and a practical dimension.

In business organisations, information is normally expected to trigger and/or direct decisions and actions that contribute towards organisational goals. These contributions are often taken as indicators of the value of the information used. The problem though is how to quantify and measure such value. Even when information is used for very specific tasks, the value may still be situation dependent. For example, both the type of user and the environment of use might affect the performance of the task. A generic and objective information valuation framework for organisations is therefore almost infeasible.

### **2.33 Some information valuation methods**

The underlying object of valuing information in organisation is normally twofold. First, there is the need to discern and identify the ways in which value is manifested or realised. Second there is the desire to quantify such value in monetary terms. Apart from the difficulty in articulating clearly the various forms of such value, there is the added problem of converting subjective



perceptions of value into objective measures. With the advent and accelerated development of computer technology, a number of software programs have been employed to aid the process of information valuation. However it must be recognised that the data input into these programs are still dependent on the subjective judgements of the evaluators who use the programs.

In order to highlight the limitations of some of the contemporary information valuation techniques and tools, two recent methodologies proposed for the valuation of information in organisation are summarised below. Both methodologies propose the use of software programs as described above. The efficacy of the programs themselves is of little interest in this work but the conceptual and theoretical foundations of the methodologies need examining. Inevitably, each methodology emerges from a theoretical and conceptual base that reflects the author's perspective on both the nature and value of information. The accounts presented below will therefore highlight the following three aspects: the conceptual perspective on the nature and value of information, the tools and techniques employed for identifying the value indicators and the mechanisms used for quantifying and measuring the value. The object is to show that in spite of their usefulness in enhancing information value awareness and use behaviour in organisations, the theoretical foundations of the tools used to quantify the value of information are often inadequate and sometimes simply presumptuous. The presumption is usually in the passing of subjective judgements of value as objective truths.

#### *Valuing transaction based information*

Glazer (1993) proposed the following methodology for valuing the information acquired by organisations while transacting everyday business. The methodology was apparently inspired by the marketing research interest of the author. Essentially, the methodology is meant to help organisations discern and articulate the ways in which information that is already available to them can manifest value.

The main premise of the methodology is that information, rather than information technology, is the real carrier of value and source of competitive advantage in organisation. Glazer's notion of information tends towards the cognitive model which advocates a "focus on meaning" approach. The emphasis on meaning derives from the assertion that "the meaning of a piece of information is clearly related to the measure of its value". For Glazer, the value of information in business organisations derives from an information value chain in which data is transformed through information and knowledge into decision. Data therefore becomes increasingly useful to organisations as it goes through the value chain as indicated below.

Data → Information → Knowledge → Decision

Glazer argues that unlike the typical economic good, which displays the general properties of divisibility, appropriability, scarcity and decreasing returns to use, information as a commodity is different because of a number of peculiar attributes.

These include:

- Information is not easily appropriated or divided
- It is not inherently scarce although often perishable
- It may not exhibit decreasing returns to use, but often in fact increases in value with use
- It is self-regenerative or feeds on itself.

The methodology is only concerned with information that is created through transactions. A transaction is defined as the exchange between a firm and the consumer of goods and services for money. For every transaction, there is an exchange of information along with the exchange of goods and money. This information, which may be a record about the transaction itself or about the customer or the conditions under which the exchange took place, could be of value in facilitating future transactions. The various ways such information may be of value to the organisation are identified and these are referred to as

Components Of Value (COVs). For a typical transaction between a firm and customer, three general components of value are identified:

- Increase in revenue on future transactions due to increase in the number of future transactions as a direct result of the effective use of information.
- Lower cost of subsequent transactions due to, for example, more effective communication with customers.
- Sale of information to other firms.

These COVs may derive from the following three types of transactions.

- i) Exchange between the firm and its customers (downstream)
- ii) Exchange between the firm and its suppliers (upstream)
- iii) Exchanges within the firm.

The total value of the firm's transaction information is the sum of the values of information associated with the three types of transaction above.

Glazer admits that the methodology is purely conceptual and that the implementation of the proposed measures may be problematic. But he maintains that "the exercise is in principle no different from many others involving forecast of the response functions - i.e. changes in the states of outputs as a function of inputs - associated with other managerially relevant variables". An interactive computer program based on a modified decision calculus approach is used to help managers estimate the value of transaction-based information associated with their business. The value of information as it is currently used and the potential value that could be derived in future use are both estimated.

As a strategic planning tool, Glazer suggests that the process of going through an information valuation process is sometimes as important as the output itself. In addition to helping managers uncover the tacit and intuitive knowledge they possess about the business, it also indicates whether a firm is fully using its information assets.

### *A methodology for capitalising information*

This methodology was proposed by McPherson (1994), as a tool for converting intangible benefits in organisations into money value. McPherson starts with a manufacturing metaphor to describe information as "the raw material of cognitive activity". This suggests that he holds the 'information creates knowledge' notion of information.

According to McPherson, the main object of the methodology is to develop "an accounting framework that can bring many value dimensions, monetary, tangible and intangible, into a unified value space that ... makes sense in conventional accounting terms". Towards this, the author attempts to propose what he calls "an information accounting system that is at par with money accounting". A number of models for defining and measuring the value of information are presented. The author suggests that the current economic evaluation tools and methods in organisations are purely money-focused and hence they generally fail to highlight the contributions of information. He describes value as a multidimensional construct of which money is only one dimension. Therefore a valuation model that clearly articulates the role and contribution of information towards the total value in organisation is needed.

McPherson employs three models to define the contribution of information processing to organisations:

- 1) The cognitive model: This describes how information gives rise to enhanced knowledge, which in turn leads to action towards organisational goals.
- 2) The corporate information process (CIS) model: This portrays a twin track structure of business strategy comprising product strategy on one track and information strategy on the other. This model attempts to elevate the information strategy, and hence the information function, from the traditional support role to a level at par with the other operational and production functions.
- 3) The conventional value added model: McPherson suggests that this is the traditional economic value-added representation in which the

information function is accounted for only in cost and not benefit. He attributes this to the fact that overall corporate objectives normally fail to highlight the intangible objectives towards which information mainly contributes. To correct this, McPherson proposes that corporate objectives should be broken down into three streams: financial, strategic, and organisational so that "a new value dimension is introduced which can be placed on equal terms alongside money value". The strategic and organisational objectives together contribute to what he termed 'corporate benefit', which represents the total output from 'informational activity'.

An Integrated Value Methodology (IVM) that uses a special computer software program is presented as a tool for information accounting. The software is an interactive program, which utilises a multidimensional combination calculus in order to combine monetary and intangible value measures. Inputs to this complex system however come from estimates and preferences based on the subjective perceptions of individual senior managers. The methodology is based on a hierarchy of information value that desegregates value into fundamental components. These are then broken down into components of information value and again reassembled as the final indicators of value.

#### *Comments on the two methodologies*

The two information valuation methodologies described above were developed for very different objectives. While one is aimed at assisting managers to utilise their information resources more effectively - by creating a better awareness of the potential value of such resources - the other is principally geared towards developing an information value quantifier. In addition, the foci of application of the two methodologies are quite different. Glazer's work is situation specific in the sense that it focuses on transaction based information only while McPherson's methodology addresses the

generic use of information in organisation. Nonetheless the two approaches share a number of underlying assumptions. These include:

- a) That the value of information is quantifiable.
- b) Within organisations, the value of information is mainly concerned with formal organisational objectives and that such value is convertible into monetary value.
- c) The process of valuation depends largely on subjective estimates but the result could be seen as an objective measurement.

In addition to the above assumptions, the two methodologies seem to equate information with knowledge. With the emphasis on meaning as the carrier of value, it is not surprising that little or no effort is made to distinguish between information and knowledge. For example, Glazer states that the total of a firm's information assets is "the sum total of what it knows". A vexing problem with the cognitive model of information in the valuation exercise is the inability of the valuer to specify whether value derived from an information activity is significantly due to the receipt of new information or whether in fact the value is largely due to previous background knowledge. This makes it difficult to determine whether the value realised derives from new information or existing knowledge or both. It seems most likely that whatever the measure of value, it derives from both background knowledge and new information. It is therefore difficult to determine the actual contribution of new information to the calculated value. There is also a time problem here. The transaction based methodology defines the 'information gap' of an organisation as the difference between the potential value of its information ( $V_p$ ) and the current value ( $V_c$ ). Both of these values depend on the 'useful life' of the piece of information, which is a time variable. Over what time, for instance, can the potential value be meaningfully projected? The methodology stipulates a one-year period but offers no justification for that choice apart from perhaps the normal accounting year reporting requirement.

McPherson's model measures among other things strategic, organisational and operational effectiveness but it is not clear whether the methodology is implying that these measures are exclusively attributable to the value of information or whether other variables such as motivation, drive and entrepreneurship contribute. If they do, then the methodology seems to measure the value of intangible assets in an organisation in general and not exclusively information.

The models in McPherson's framework are useful in articulating the role of information in achieving organisational objectives, but interpreted literally they run the risk of implying that information only contributes towards intangible benefits or outcomes. In practice, information also contributes towards the production of tangible end products. The net product of intangible assets cannot therefore be characterised exclusively as intangible benefits.

The two methodologies described above indicate the need and desire in the business sector to quantify the value of information. They also demonstrate the great difficulty in modelling an objective valuation tool for information. The approach adopted in this research therefore reflects the view that unless enough is known about the context of use of information; organisations may not gain much from the use of generic information valuation tools or methodologies. It is therefore important to investigate and describe the context of use of information in organisation. But first we need to examine the notion of organisation.

## **2.4 The organisation**

With the ever-increasing pace of change in the contemporary business environment, one of the central aims of research on the organisation is to understand how the context of organisational activities affect outcomes. A nagging problem, though, is that the concept of organisation is both abstract and varied, and hence difficult to describe in generic terms. Without a clear notion of what constitutes an organisation, it is difficult to discern the myriad variables that together constitute the context of activity in organisation. Researchers often use a number of instruments in the form of theories, models

and metaphors to represent their conception of organisation. These instruments are meant to cast light on the nature of organisations by relating abstract concepts to reality.

This study is especially interested in those instruments that relate to organisational change. This is because the value of information is manifested in the changes effected in individuals and organisations as a result of its use. A brief survey of some of these instruments is necessary, if only to highlight the diversity and richness of the various perceptions of organisation and to inform the development of the IUS framework. The following models and metaphors articulate a number of conceptual views on the current wave of change in organisations.

#### **2.41 Models and theories of organisational change**

##### *Weisbord's radar Screen Model*

Burke (1992) remark that a "model is useful when it helps to visualise reality". One of the simplest models of organisation that meets this criterion is Weisbord's radar screen model (see Burke, 1992). This model is based on the open-system notion of the organisation. This notion stipulates that organisations exist in a dynamically constraining environment so that what happens in the organisation is mediated by environmental influences. Weisbord depicts the organisation as similar to a radar screen that 'blips' to tell about organisational highlights, good or bad, that needs attention.

Six boxes on the screen correspond to six functional elements of the organisation: purpose, structure, rewards, helpful mechanisms, relationships and leadership. Each element (box) is viewed in terms of both the formal and informal systems of the organisation in order to account for the inadvertent gap between the formal dimensions of the organisation and its informal policies and practices. The larger this gap, the more likely it is that the organisation is not functioning effectively. Weisbord's model presents an uncomplicated systemic view of organisation. The six elements of



organisation in the model all feature in some form in the IUS framework developed in chapter four.

#### *The Nadler & Tushman Congruence Model*

A comparatively more complicated model that also subscribes to the systems view of organisation is given by Nadler and Tushman (1978). The Nadler and Tushman congruence model is based on the assumption that an organisation is an open system that is influenced by its environment via inputs, and that it also helps shape that environment through its output. Thus the organisation can be conceived as a transformation entity that converts inputs into outputs.

Input to the system comprises four elements: the environment, the resources, the organisation's history and strategies. These elements define and constrain behaviour in the organisation, including opportunities for action.

The elements and activities in the transformation process are what people normally regard as the organisation. This process is represented by four interactive elements: Task, individual, organisational arrangements, and the informal organisation.

Output of the system comes in four categories.

- 1) System functioning: This refers mainly to the attainment of tangible deliverables by the entire system working as a unit.
- 2) Group behaviour: This is an assessment of how well groups within organisations function as cohesive units.
- 3) Inter-group relations: This refers to the nature and extent of inter-group communication, collaboration and conflict resolution.
- 4) Individual behaviour and effect: This covers such individual behaviours as job performance, absenteeism and turnover, which are all perceived as outputs of the system.

The model depicts the organisation as a dynamic entity so that the relationships between the components of the systems are vital in explaining

phenomena associated with organisational change. The hypothesis is that the effectiveness of the organisation is reflected in the measure of fit between the components and the better the fit the more congruence there is in the organisation.

A major problem with this model is that it offers no standard means of identifying congruence or what levels of congruence are desirable. Also, as the authors have admitted in a later comment on the model, "the fact that congruence seems to be related to effectiveness and performance, implying that it is a desirable state, at least in the short term, makes it a double-edged sword" (Nadler & Tushman, 1989). This is because high congruence in the short term can result in a resistant to change mentality, which may render the organisation unable to respond to new situations. The main contribution of this model to the IUS framework is the identification of the four interactive elements of the transformation process, all of which feature in the framework.

#### *The Tichy TPC framework*

Tichy's (1983) organisational framework on the management of change is similar in some respects to the Nadler and Tushman model. Tichy views the components of a systems in terms of nine organisational change levers: external interface, mission, strategy, managing organisational mission/strategy process, task change, prescribed networks, organisational processes, people and emergent networks. Most, if not all, of these elements are subsumed into the Nadler Tushman systems variables. The Tichy framework however goes further to map the above variables across the technical, political and cultural systems, which together constitute the organisational systems. The author argues that these three sub-systems are individually guided by three dominant and fairly distinct traditions. For example, the technical view is held as rational, empirical and based on scientism. In the political view, there is the realisation that organisations have dominant groups and that change is primarily brought about by bargaining. The cultural view portrays the organisation's culture - which ties people

together - as a set of shared symbols, values and cognitive schemes. Instead of congruence, Tichy employs a matrix that maps the nine levers across the three systems to perform an analysis of alignments. His hypothesis is that "organisational effectiveness (or output) is a function of the components of the model, as well as a function of how the components interrelate and align into a functioning system" (Tichy, 1983; quoted in Burke, 1992, p.108).

This model is useful in this study for two reasons. First, as Burke rightly remarks, the model includes many, if not most of the critical variables important to understanding organisations. This understanding is the key to discerning the nature of situations in which information is used and valued in organisation. Second, Tichy identifies what he considers as the primary organisational levers that are pulled or pushed to effect change. The type and amount of such change may depend on how those levers relate to information in the organisation. One aspect of Tichy's framework that has been criticised is that the human component tends to ignore individual issues in favour of general political and cultural considerations (Burke, 1992). Furthermore, like congruence in the previous model, too much alignment may become a potential basis for resistance to change.

The foregoing models and framework are diagnostic tools employed for constructive intervention in organisations. Their point of appeal in this work is that they are meant to be practical tools, which makes them available for empirical application. They are however generic but contingent models, implying that they prescribe no standard best way or configuration for effecting organisational change.

#### **2.42 Other conceptions of organisation**

Organisations often constitute different things to different people. As such, both researchers and practitioners hold a number of different views on the internal dynamics of organisations. For example, the business enterprise, according to Child (1969, p.12) is variously seen as:

- 1) A functionally integrated and normally harmonious system, which is directed towards the attainment of a set of goals that all its members hold in common.
- 2) A somewhat uneasy coalition of economic convenience in which the pursuit of conflicting sectional interests is balanced against the mutual benefits of co-operation.
- 3) A potentially unstable arrangement whereby the property-less and oppressed many are exploited for the private gain of a privileged controlling elite.

Similarly, the normative theorist R. Likert (1967) categorised the management of organisations as systems in the following ways:

System 1: Autocratic, top-down, exploitative management.

System 2: Benevolent autocracy (still top-down but not as exploitative).

System 3: Consultative (employees are consulted about problems and decisions but management still makes the final decisions).

System 4: Participative management (key policy decisions are taken in groups and by consensus).

In spite of the various, and seemingly disparate approaches to organisational analysis, Lammers (1989) suggests that all models of organisations as coherent entities can be reduced to two basic views. These are: organisations as social systems, sustained by the roles allocated to their participants, and organisations as associations of self-interested parties sustained by the rewards the participants derive from their association with the organisation. Aldrich, (1992) notes that the two models can be used to explain different aspects of organisational change and that they are not logically mutually exclusive. This means that both notions of organisation could be adopted simultaneously.

The main implication of the foregoing characterisations of organisation for this study is that they prepare the researcher to expect differences in the nature and types of value parameters associated with information in the

organisations studied. As such, generic notions of business objectives and efficiency may not necessarily provide a good basis for the evaluation of business processes and outcomes and hence the part played by information towards those outcomes. Nonetheless, since organisations operate in an interdependent and competitive world, individual businesses cannot be immune to changes around them. For example, the effect of new information technologies is felt by every business organisation today. The crucial and pervasive role of information and the associated technology has engendered certain generic approaches to the management of businesses in general including changes in business thinking and strategy. These changes have resulted in new organisational structures and processes, which have been described and analysed by many researchers (See, for example, Peters, 1989 and Burke, 1992). To understand these changes, we need to examine the role of information systems in organisations today.

#### **2.43 Information systems in organisations today**

Ever since the 1960's when spending on information technology was just beginning to grow, organisations have tried to harness, control and utilise the power of the technology through the 'rational' concept of information systems. The nature, scope and role of information systems have inevitably evolved with changes in both the technological and business environment. Similarly the objectives of information systems have altered with time. For example, during the early days of transaction/data processing, when the systems were mainly employed in such functions as customer billing, products shipment and salary payment; the objectives of information systems were defined by productivity measures such as system throughput (number of transactions processed per day) and the percentage of up-time for the computer (Sprague & McNurlin, 1993). When the focus of the systems shifted to producing reports for management in the management information systems (MIS) era, there was a corresponding shift in objective to the now

classic IS objective of 'getting the right information to the right people at the right time'.

Today, even such a desirable objective is deemed inadequate because it tends to focus on a means rather than an end. The competitive nature of the current business environment demands "an outcome or result goal instead of a go-through-the-steps process goal" (Sprague & McNurlin, 1993).

Using information systems to perform prescribed organisational processes faithfully is no longer enough unless those processes are discernibly linked to value oriented outcomes. This means that much grander objectives, albeit sometimes ill defined, are now associated with information systems in organisation. Sprague & McNurlin, for example, describe the mission of IS in organisation as: "to improve the performance of people in organisations through the use of information technology". The rather broad and non-specific nature of the above mission is an indication of the ever-widening scope and pervasive role of information systems in the modern organisation. In fact information systems have become a basic infrastructure of the modern business organisation (Yasin and Quigley, 1995).

However, despite the increasing pervasiveness of information systems, many organisations still find it difficult to meet the objectives of their information systems. Furthermore, because these systems are employed to achieve a wide range of objectives in different organisations it is inevitable that success rates will be different even when the promised outcomes and methods of use are similar. One way to explain these differences is to examine the methods of IS evaluation employed.

#### **2.44 IS evaluation in organisation**

Hirschheim and Smithson (1987) in arguing that "evaluation is endemic to man's existence" suggest that "evaluation is undertaken as a matter of course in the attempt to gauge how well something meets a particular expectation, objective or need". However, one of the main problems in information evaluation is the difficulty in understanding and articulating clearly the

relationships between expectations, objectives and needs. The value associated with information systems in organisations is sometimes as much a function of the characteristics of the systems as it is of ideas held about the systems by stakeholders. These ideas may be directly or indirectly influenced by the user's expectations, desires or perceived needs, which in turn may be as much influenced by formal organisational requirements or individual personal dispositions or both. Two fundamental questions in IS evaluation are therefore: a) can we clearly define what is being evaluated and b) do we clearly know why it is being evaluated? In theory, these questions appear to be quite reasonable and straightforward but in practice, they often highlight the tensions and contradictions between the formal and informal aspects of IS applications in organisation. Hirschheim and Smithson suggest that while formal evaluation is largely based on overt technical considerations and covert political tendencies, informal evaluation normally sway with intra-group social pressures. Formal and informal evaluations may however be seen as complementary although they serve different functions and in practice they may result in conflicting answers (Hirschheim and Smithson, 1987). It is therefore important that the value of information in organisation is perceived in terms of both formal and informal dimensions of use.

The major criticism against many IS evaluation tools and techniques is that they often assume that information systems are objective and rational and hence they should be evaluated according to the dictates of rational tools and techniques. This analytical and technical approach to IS evaluation neglects the often subtle but equally important social dimensions of IS use. As suggested by Ahituv & Neumann, (1982) the value of information "is related to who uses it, when it is used, and in what situation it is used".

Examining the conditions that mediate the use and evaluation of computer-based information from the perspective of the individual user in organisation is thus an important contribution to information systems research.

## 2.5 Summary

This chapter has defined the research domain of this study by examining the key concepts and terms associated with information use in organisation. The main objectives were to contextualise the research questions and also provide theoretical support for the research approach, methodology, and eventual findings. Because of the ambiguity of the concepts and terms examined above, this study will adopt the following specific positions and definitions that will apply through out the study.

*Value:* Drawing on Hilliard (1950), value is conceived of as a phenomenon that results from the interaction between a subject and an object. This value is manifested in at least three forms described by Charles Morris as operative value, conceived value and object value. Practical illustrations of the above typology of value with respect to information would be as follows:

- Operative value: If I prefer some information rather than another for whatever reason, then the extent of that preference represents the operative value of the information. For example, an end-of-year financial statement that reports X percent profit in an organisation may have a higher operative value for most members of staff if it provides for staff bonuses than if it does not. This may imply that operative value is largely a matter of self-interest but that is not necessarily always the case. Operative value can be equally manifested through objective rationalisation on the one hand and idiosyncratic and irrational dispositions on the other. For example, some employees may prefer information that reports poor performance of their organisation in certain situations while others would be proud of the good reputation of their organisation even if it does not translate into personal tangible benefit for them. Operative value is hence not necessarily always rational or objective.



- **Conceived value:** The extent to which I believe that the use of certain information will result in a positive or negative outcome indicates the conceived value of that information. A business model that indicates high profit will have a conceived value in the form of the user's perception of the potential for achieving such profit. However the model may have very different operative values for different users. For example, if the model includes the requirement for compulsory staff redundancies, it may have a lower operative value for trade union officials than market oriented managers even though the conceived values may be similar.
- **Object value:** The extent to which some information almost invariably leads to an outcome that is publicly acclaimed indicates the object value of the information. For example, a timely smoke alarm that helps prevent a fire disaster has object value even if the alarm is not preferred or conceived as preferable by say, an arsonist. Information that has object value is thus consistently associated with specific outcomes and beliefs. A feedback system that consistently prevents disaster or enhances the performance of an automated system thus manifests object value. However the use of information by humans is not an automatic process which can guarantee specific outcomes consistently. Hence it is extremely difficult to establish the object value of information. Value judgements based on the quality or attributes of information therefore tend to represent conceived and operative value rather than object value. Nonetheless, it may be possible to discern object value in the performance of very structured tasks in very specific situations, where outcomes could be consistently associated with particular forms of information use. Examples of such situations would include very structured data and transaction processing tasks.
- **Information:** A semiotic approach to the notion of information is adopted in this study. This means that signs and symbols constitute the fundamental basis of information and of human communication.

Although the researcher accepts the proposition that information as an organised system of signs can exist independent of humans (Dretske, 1981; Stonier, 1991) the study is only interested in that aspect of information that relates to humans. The term 'information' in this study does not therefore coincide with Dretske's notion of absolutely true and objective information (signification), which is not accessible to humans because they already live in an inescapable meaning system. The position of this study is that information must always be associated with meaning, albeit not necessarily a unique meaning. This non-uniqueness of meaning suggests that information is not synonymous with meaning although the amount of information derived from a message, i.e. a system of signs, is a function of its meaning.

Information is also not the same as knowledge. However, information can create and be created by knowledge, which could be described as an internal mental state. Furthermore, knowledge cannot be construed as comprising units of information since mental states are by nature dynamic and changing and since such changes indicate states of knowledge, which cannot be attributed exclusively to particular units of information.

- *Value of information:* An instrumental perspective on the value of information is adopted here, i.e. the use and value of information in organisation is always related to a purpose. The value is therefore assessed in terms of the extent to which the information helps towards achieving such purpose. For both individuals and organisations, purpose may not however be always unique, stable or clearly predefined and sometimes it changes during the process of information use. Hence the use of information and the realisation of its value is conceptualised in terms of a dynamic purpose-process-effect cycle rather than a linear purpose-outcome operation. The practical manifestations of the value of information may thus take many forms. Examples of such manifestation may include the enhancement of decision-making, time and cost saving,

improved productivity and improvement in the quality and ease of work processes. Other value indicators may include the enhancement of user knowledge and skills, motivation and commitment to organisational goals, and personal satisfaction with the process or result of use.

- **Organisation:** Two views of the organisation as a coherent entity are adopted in the study since they are not necessarily mutually exclusive. These are: organisations as social systems, sustained by the roles allocated to their participants, and organisations as associations of self-interested parties sustained by the rewards the participants derive from their association with the organisation (Lammers, 1989). Organisations may also be described in terms of both conceptual and physical boundaries such as the organisations line of business, type of products and services, management structure and style, geographical location, ownership and customers served. The boundaries of the organisations studied in this research are however more conceptual than physical. The features of the situations described in the study will therefore reflect mainly conceptual rather than physical locations. For example, an organisation located in the UK may have customers in several countries or some employees in that organisation may work on projects physically situated in another country. Hence the domain of activity and the environment of such organisation may not be easily defined in terms of physical or geographical boundaries.

The above positions emphasise the following points with regards to the four concepts discussed in this chapter.

- a) The relative nature of the notion of value and the need for a subject-object interaction as the necessary and sufficient condition for value to occur.
- b) The multi-dimensional nature of information and the importance of the concept of meaning as the link between information and human communication.

- c) The crucial roles played by purpose and the concerns of individuals in establishing and appropriating meaning.
- d) The intangible nature of information in general and the great difficulty in quantifying its value satisfactorily.
- e) The dependence of both the notion of meaning and the value of information on the context of use of information.
- f) Differences in notions of organisational dynamics and their effects on approaches to information use and evaluation.
- g) The pervasive but changing roles of information technologies as rational tools for exploiting information and their effect on perceptions of information value in organisations today.
- h) The problems of evaluating information in organisation such as the tensions between formal organisational objectives and informal realities.
- i) The need to approach the value-in-use of information from a qualitative, situation-specific, perceiver-concerns perspective in order to accommodate the foregoing features when studying information use in organisation.

These propositions link the research question with the approach, methodology and tools used in this study. For example, the emphasis on meaning as a crucial feature of information is consistent with the focus on information-as-content. The relational, subjective and intersubjective nature of the concept of value suggests an interpretivist approach to studying human information behaviour rather than rational methods of inquiry. Furthermore, the pervasive roles of information technologies and their effect on contemporary organisational structure and dynamics makes it difficult to consider the notion of information in business organisations independent of these technologies. Hence the focus on computer-based information systems. The next chapter presents the research methodology of the study.

# Chapter Three

## Research Methodology

This chapter presents a full account of the research design of this study. Creswell (1998) drawing on (Bogdan & Taylor, 1975) refers to a research design as the "entire process of research from conceptualising a problem to writing the narrative, not simply the methods, such as data collection, analysis, and report writing". This is consistent with Yin's (1989) characterisation of design as the logical sequence that connects the empirical data to initial research questions and ultimately to conclusions. In accordance with the above notions, this account will address the entire set of issues, techniques and processes related to this study, ranging from the philosophical and theoretical positions adopted to the constraints and limitations of the conduct of the study.

Although there is no universally fixed number of steps or stages in conducting and reporting a research study, certain prominent stages are usually common. These include:

- a) Deciding a research topic, its purpose and scope.
- b) Adopting some philosophical and theoretical positions on the nature of knowledge and reality, and the appropriateness of certain research techniques and methods.
- c) Identifying the research strategy, which is usually based on the adopted philosophical and theoretical stance.
- d) Choosing research techniques that are consistent with the strategy.

The steps above are complemented by the more obvious stages of identifying and gaining access to theoretical and empirical data, collecting and storing such data, and analysing and reporting on the research findings. For good research, the process should be guided by an awareness of the need for, and actions towards, maintaining the quality and verifiability of the study.

This chapter addresses all the above elements in the following order: First the philosophical and theoretical positions adopted in the research are defined and discussed. Then a number of specific theories and proposals that are relevant and useful in the study are presented. This is followed by a rationalisation of the choice of the research strategy, including the reasons for choosing the various sources of empirical data. The research techniques employed are then presented and discussed in terms of how they fit in with the theoretical framework. More details on how the empirical process was conducted are given in chapter five, which presents an account of the first phase of the empirical study.

### **3.1 Philosophical position**

This study is based on qualitative inquiry and in particular the interpretive paradigm in information systems research. This means that beliefs and assumptions that guide the inquiry include:

- a) The notion of subjective epistemology in which "facts and values are intertwined and hard to disentangle" (Walsham, 1995).
- b) The ontological belief that reality is not absolute, instead it is socially constructed by individuals and groups in the research domain. Reality is thus either subjective or inter-subjective.

A social interactionist perspective on organisational reality is adopted, since social interactions are considered crucial in shaping the manner of information use in organisation. The evaluation of such use requires understanding dynamic organisational, social and political processes as they occur over time (Kaplan, 1998). Accordingly, this study involves considering the interactions between systems characteristics, individual user characteristics and organisational characteristics. The study focuses as much on the purposes and processes of information use as on the outcomes in accordance with the purpose-process-effect cycle model of information use proposed in chapter one.

### **3.11 The interpretive paradigm**

While it is relatively easy to distinguish the positivist paradigm from the interpretivist mode of research, it is not that easy, if at all possible, to describe a definitive and precise philosophical stance that characterises all interpretive research. This is because there are different types of interpretive approaches with different philosophical positions or foci. Mingers (1984) suggests that there are at least four substantively different strands of thought in interpretivism. These are phenomenology, ethnomethodology, the philosophy of language, and hermeneutics. Of particular relevance to this work are the phenomenology and hermeneutics strands. Apart from the fact that interpretivism as an approach to inquiry in social science is grounded in classical hermeneutics and phenomenology (Silva Sical, L 1997), these propositions for inquiry are particularly relevant to this research for two reasons. First, the nature of the information use process, especially cognitive use, as portrayed in the dynamic value cycle (Figure 2) is akin to the concept of the hermeneutic circle. Second, the idea of an underlying structure to the concept of value-in-use of information as experienced by individuals in functional roles is very much a phenomenological issue. It is therefore necessary to discuss these two propositions as useful instruments within the interpretive paradigm in some detail. This research also utilises a number of more specific social science theories, which are briefly outlined below. Even though they do not particularly relate to interpretivism, these theories share the interpretive feature of emphasising the centrality of individual reality in explaining human behaviour.

The following section expounds the philosophical and conceptual characterisations of phenomenology and the hermeneutic process of inquiry and their relevance to this study.

### **3.12 Phenomenology**

Phenomenology is the name associated with a broad philosophical movement, with many different perspectives, which can be traced back to the

work of the German mathematician and philosopher Edmund Husserl. Despite the differences in perspectives, all phenomenologists share the common principal objective of direct investigation and description of phenomena based on the experiences of individuals and without theories about their causal explanation. Thus loosely, phenomenology can be defined as the study of the lived experiences of people. At the core of phenomenology is the belief that individuals can and do construct their own meanings from their own experiences. As such, there is in effect no objective reality. What appears to be objectively defined reality is merely a widely agreed interpretation of an event; and many interpretations of events are highly individual and not widely agreed (Arnold, Cooper & Robertson, 1995). Phenomenologists therefore focus on the individual as the source of knowledge about human experience, behaviour and action. They believe that there is an essential, invariant structure or a central underlying meaning of every experience, which is related to the intentionality<sup>12</sup> of consciousness. Hence the reality of an object is inextricably related to one's consciousness of it (Creswell, 1998). This reality cannot be divided into subject and object. That is, an object does not exist independently and outside a subject, which can observe and interpret it. The act of observation (experience) is in itself the creation of the object for the subject.

This notion of reality, as opposed to the subject-object divide of the objectivist philosophy associated with the natural sciences, is the root of Heidegger's hermeneutic phenomenology. For Heidegger, what the objectivists call the subject does not gain meaning or understanding by processing some internal representation of reality since the 'subject' is itself an integral part of that reality. Heidegger refers to this concept as 'Dasein' (being-in-the-world). This philosophical notion of reality has been supported by the work of the biologist Huberto Maturana. Maturana used the concepts of autopoiesis and structural coupling to explain the essence of a living

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<sup>12</sup> The idea of intentionality of consciousness refers to the proposition that consciousness is always directed at an object.



system. An autopoietic system is a closed, evolving collection of components, which grows, evolves, adapts, and eventually dies through the process of structural coupling with the environment (Devlin, 1995). The significance of Maturana's contribution is in the proposition that behaviour is not caused through the process of consciously representing an 'outside' object internally and then responding to that representation. Rather behaviour is due to, and actualised in the excitation of the nervous system as a closed system.

Both Heidegger's philosophical concept of Dasein and Maturana's biological proposition of autopoiesis have contributed to the study of human experience through cognition. Such study has mainly focused on interpretation and understanding, which is in essence the purpose of hermeneutics. In the field of information systems, especially management information, one of the main advocates for the application of hermeneutics is the researcher Richard Boland. His rationale for advocating a phenomenological approach to information systems research through hermeneutics is given as follows:

- a) Information systems comprise data, which become information in consciousness.
- b) These information systems are part of organisations and are socially constructed through language and acts of communication.
- c) Both organisation and information systems are thus constructed by information acts, which require an interpretive approach to research.
- d) An information system should in theory be considered as a text that needs to be interpreted.

The above arguments imply that there is no objective truth 'contained' in an information system. Rather what confronts users is a form of objective reality, which has to be interpreted by individual users. This reality is usually in the form of output from the information system, which has to be rendered meaningful to users before being incorporated into decisions and action. The process of interpreting and giving meaning to this output is hence the link

between information systems and the interpretive approach anchored in hermeneutics. In spite of this link, there is little evidence that hermeneutics has had any great impact in the study of information systems (Introna, 1997). Nonetheless, this research considers phenomenology in general and interpretive hermeneutics in particular, as useful approaches for the study of information use in organisations, especially when that use is viewed in a cognitive context rather than an exclusively behavioural perspective.

### **3.13 Hermeneutics**

Introna (1997), drawing on Palmer, (1969), suggests that the term hermeneutics is of Greek origin, and it is generally translated as 'to interpret'. More specifically, "the word hermeneutics suggests the process of bringing a thing, a situation or a concept from unintelligibility to intelligibility" (Introna, 1997)

Although hermeneutics was originally used almost exclusively to interpret biblical and other sacred texts, its use has over time spread into the interpretation of other kinds and forms of text that are not easy to understand. The appeal of hermeneutics in the study of social sciences stems from the philosophical contributions of Schleiermacher (1799-1834) and Wilhelm Dilthey (1833-1911). For Schleiermacher, hermeneutics was not just a matter of interpretation but of understanding, and that the principle of understanding is always the same irrespective of the type of text. The grammatical interpretation of text is by itself not enough to ensure understanding since "the art of understanding is the re-experiencing of the mental process of the text's author". Thus a full hermeneutic interpretation involves two interacting processes: "a grammatical interpretation of the text and its structure; and a psychological interpretation of the author" (Introna, 1997, p.56). In the psychological interpretation, attempt is made to reconstruct the author's thinking processes in the context of the totality of his/her life. Schleiermacher's conception of hermeneutics took hermeneutics beyond the text, as the main object of understanding, to the author's state of

mind and perhaps the reason for that state of mind. This appears to be the link between hermeneutics and the humanities and social science studies, especially those directed at understanding individual human cognition and behaviour. However it was left to the philosopher and literary historian Wilhelm Dilthey to make this link. Dilthey rejected the use of positivist techniques in the study of humanity and advocated instead the use of concrete, historical and lived experiences as the basis for understanding. To Dilthey, the historicity of our existence is fundamental to understanding humanity and this is hardly, if ever, accounted for in the static categories of positivist investigations.

"We experience life not in the mechanical categories of 'power' but complex, individual moments of 'meaning' of direct experience of life as a totality and in loving grasp of the particular. These units of meaning require the context of the past and the horizon of the future expectations; they are intrinsically temporal and finite, and they are to be understood in terms of these dimensions that is, historically" (Palmer, 1969 quoted in Introna, 1997, p.56).

The purpose of human studies, according to Dilthey is to understand the lived experiences of humans within the context of their full life. These experiences are not the causes or results of some acts of consciousness, rather they refer to the very act of experiencing or living. The role of hermeneutics in understanding these human experiences is through text, which Dilthey saw as a representation of the lived experience and so needed to be interpreted thus. Hence to understand life or lived experiences, which is the purpose of the study of humanity, and now of the social sciences, we need to understand texts that embody those experiences.

Hermeneutics is historically linked with interpretation while the study of humanity is an attempt at gaining understanding to life. These two efforts, according to Gadamer (1989) are one and the same since "all understanding is interpretation". Gadamer contends that it is simply artificial to distinguish the two concepts. This is supported by Hoy's (1978) argument that an understanding represents a particular perspective since understanding is always situation dependent, implying that all situations and therefore all

perspectives can not be attained in the same experience. Also, since interpretation is both historical and continuing, "it is not a mere repetition of the past but participates in the present meaning" (Hoy, 1978). This is especially so when meaning is perceived in terms of signification<sup>13</sup> and import<sup>14</sup>, which are as rooted in the past as in the present.

This participation of interpretation in current meaning is a relativistic proposition as opposed to an objectivist philosophical stance. In objectivism, signs and symbols are put together to convey a unique, inherent meaning with little or no reference to the context or the time and place of interpretation. For relativists, meaning evolves and changes with context so that different interpretations may arise in significantly different historical, political, social and moral contexts. Thus the process of interpretation makes what is interpreted relevant to the context in which the interpretation takes place. This implies that there cannot be a unique interpreted meaning to be recovered from signs as implied in objectivist thinking. Even in everyday language, where text often consists of common language signs and symbols, it is argued that a sign does not have an intrinsic meaning. "The sign by itself is dead: what gives it life is the use" (Introna, 1997 drawing on Wittgenstein, 1956). When we try to understand a set of signs we draw on what we already know and relate it to what we are experiencing. In other words, we make use of our prejudgments in trying to interpret and understand our present experience.

According to Gadamer, we cannot escape from these prejudgments, and this does not imply that all meaning is subjective. Prejudgments are only the starting point to understanding, and prejudice or subjectivism only persists when we fail to move beyond this starting point. Essentially, this starting point is the point of entry into what is known as the hermeneutic circle. Through the hermeneutic circle, we are able to appreciate multiple perspectives, which is necessary for proper understanding since "there is no

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<sup>13</sup> What a piece of information or message signifies to the receiver.

<sup>14</sup> What the information or message implies to the receiver.

single stable, immutable meaning..." (Boland, 1987). We can only access meaning through active participation in day-to-day living, and even then, we have to continuously reappraise and re-accomplish that meaning (Introna, 1997).

To summarise, the conceptual focus of hermeneutics is on understanding and that understanding does not result from a mechanical process of objective interpretation. Instead, understanding involves lived experiences characterised by an iterative process relating context to the object of interest and back, or the part to the whole. Hermeneutic interpretation is hence different from deconstructing a text. In deconstruction, the reader's object is to show that "the text never exactly means what it says or says what it means" (Norris 1988, 7). The reader thus tends to be more concerned with what they can derive from the text and not what the author intended or experienced while creating the text (Beath & Orlikowski, 1994). With reference to information use, the intentions, abilities and experiences of users inevitably influence their information use situations. Therefore deconstructing user accounts of such situations might not be the most effective way of interpreting information use situations in organisations.

The process of information use, especially that pertaining to computer-based information, tend to be regarded as a functional exercise directed towards the attainment of well specified and shared goals. The role of cognition in this process is to relate the experiencing of that information with the desired goals through purposive reflection and action. This functional notion of information use does not fully account for the role of the 'self' and how it relates with other social agents in the use process. The characteristics of the individual self is however central to the modeling of information use situations in organisations since there is no situation without a perceiving agent. The notion of the self therefore needs to be examined. A relevant area of knowledge for this examination is the socio-cognitive approach to work psychology.

### **3.14 Social cognition**

The social cognitive approach to understanding behaviour at work "focuses on how our thought processes are used to interpret social interaction and other psychological phenomena such as the self" (Arnold, Cooper & Robertson, 1995). These thought processes reflect the social world in which we live, as well as formal logic. The individual is seen as continuously striving to understand both the social world and the self in the pursuit of a sense of order and predictability. "The existence of other people - whether or not they are actually physically present - affects the nature of thought processes and ... conceptions of self act as a filter through which information is processed" (Arnold, Cooper & Robertson, 1995). The role of memory in individual information processing is emphasised in this approach and it is generally assumed that people process information in very similar manner in different kinds of situations. Furthermore, our existing cognitive structure or background knowledge partly determines what new information is acquired and how it is acquired. The role of the concept of the self in regulating behaviour is a relevant contribution of this approach to the study of information use situations. The proposition that the way individuals conceive of themselves in respect of their goals, interests, abilities and general disposition towards one outcome or another influences the type of situations they seek, and the behaviours they adopt informs the development of the IUS framework in two ways. First it points to the importance of individual user characteristics in shaping information use situations. Second it suggests that the interest of individual information users, their opinions about themselves, their abilities, expectations and relationships with others, all contribute in shaping information use behaviour. These user characteristics may be especially relevant in situations where the individual has some autonomy in the choice of objectives or processes involving information use.

Two other cognitive psychological concepts that are relevant to information use situations are the notions of self-efficacy (Bandura 1986) and schema. A person's self-efficacy is "the extent to which they believe they can

perform the behaviour required in any given situation," and schema is described as "the knowledge structure that a person uses to make sense of situations" (Arnold, Cooper & Robertson, 1995). Both of these concepts bear upon and sometimes direct behaviour. Their relevance to information use situations, and by extension to the value-in-use of information again suggests the centrality of the individual information user in describing information use in organisation.

User perception of the value-in-use of information is essentially a cognitive phenomenon and this cognition is only partly reflected in user behaviour and task outcome. Information valuation schemas that focus exclusively on outcome therefore tell only part of the story. That part is often concerned with formal organisational objectives that may not necessarily be consistent with user expectation and effort. Social cognitive theories should therefore help us gain more insight into the complex process of information use.

### **3.15 Social theory position**

This research adopts a 'soft' postmodernist perspective. Its claim to a postmodernist view is in the belief that knowledge claims about the value-in-use of information must be set within the conditions of multiple perspectives characterised by various information use situations in organisation. This view is not necessarily informed by the desire for a socially responsive research nor is it an attempt at critical theory, hence its characterisation as 'soft'. The research however shares the postmodern objective of changing ways of thinking - about the value of information in organisation - and subscribes to the need to deconstruct rational output oriented information valuation models with a view to exposing concealed forms of power games, inconsistencies and contradictions in those models. Furthermore, the research acknowledges the key role of the individual user in the determination of the information use situation as opposed to the emphasis on technology and formal organisational structures and procedures, as the almost exclusive

determinant of the value of information. The suggestion is that it is not enough to keep improving or advancing the technology, including formal arrangements about its use, or even the quality of data associated with these technologies. Attention must be equally paid to the context of use of information as a vital factor in determining value. One way to look at that context is through the concept of information use situation. The following is the research strategy employed in this study, which is largely informed by the foregoing philosophical and ideological perspectives.

## **3.2 Research strategy**

### **3.21 Multimethodology**

In so far as case study and phenomenology are regarded as "distinct research traditions" within the qualitative paradigm (Creswell, 1998), this research may be classified as a multimethodology study. The study combines a philosophical position based on phenomenology with a multiple case study method of inquiry. This combination is necessary because neither of the two 'traditions' can fully address all aspects of the research question.

One of the advantages of multimethodology is that the combined methodology may be better able to deal with the complexity and richness of real world situations (Mingers & Brocklesby, 1995). The methodologies can for example, complement each other by providing insight and tools for dealing with different aspects of the research question, which is the case in this study. Other advantages of combining methodologies are that different methodologies can be used at different stages of the study and where the methodologies come from different paradigms, they enable the researcher to view the problem from different perspectives.

Adopting a multimethodology approach however has a number of problems. Perhaps the most prominent of these is the concept of paradigm incommensurability. This concept is based on the assertion that paradigms with opposing ontological and epistemological beliefs are irreconcilable and should not therefore be combined in the same study or intervention (see for



example, Burrell and Morgan, 1979; Aldrich, 1992)). On the contrary, Mingers & Brocklesby (1995) have suggested that although the feasibility of multimethodology is constrained by philosophical, psychological and cultural difficulties it is possible and desirable to combine research methods.

It is not necessary to examine the full range of arguments on either side of the paradigm incommensurability debate here since it is not directly relevant to this study. The two traditions of inquiry adopted in this study are both consistent with the interpretive paradigm even though the case study approach is not exclusive to interpretivism. The problem of paradigm incommensurability is therefore not an issue in this study. However, although they may not be incompatible with each other at the paradigm level, methodologies with different philosophical foci within the same paradigm may pose difficulties at the level of method<sup>15</sup> rather than philosophy.

The research question in this study concerns a single concept i.e. the value-in-use of information in organisation, but it could be conceptualised as comprising two main elements. These are the need to understand the notion of value-in-use of information from the perspective of individual users in various organisational settings and the desire to discern the relevant contexts or information use situations that characterise the realisation of that value. Because these components are dependent on each other, it is better to study them as a single composite phenomenon rather than two separate objects of inquiry. This is the rationale for adopting a multimethodology strategy. The phenomenological component is meant to address the question: what constitutes the value-in-use of information from the perspective of an individual user. The multiple case study strategy is directed at collecting evidence from diverse sources on the basis of which information use situations in business organisations could be characterised. Aspects of the two methodologies are combined so as to enable the researcher to address the two components simultaneously since they cannot be easily separated. The

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<sup>15</sup> Method here refers to the processes and techniques of data collection, recording and analysis, which are inevitably guided by the philosophical and theoretical basis of a study.

study is described as a multiple case study, which draws on knowledge claims founded in phenomenology. This combination is considered as a case of 'methodology enhancement', i.e. "where one main methodology is enhanced with part of another" (Mingers & Brocklesby, 1995).

The methods of data collection, recording and analysis are guided, in parts, by the objectives and protocols of both multiple case study research and phenomenology. Both methodologies use the in-depth interview as the main technique for collecting evidence about the object of study. Participant observation is also a common technique in both traditions but this was not undertaken due to constraints of time, access and the abstract nature of the unit of analysis. Nonetheless effort was made to address both the phenomenological and multiple case objectives of the study. For example during the interviews, questions aimed at discovering the underlying essence of the notion of value-in-use were presented in a non-leading manner in order to allow the user to bring out their own characterisation of the concept. In addition, practical examples of such value experiences were solicited from each user. Similarly, in analysing and interpreting the data, the value indicators were related to the Charles Morris typology as a means of identifying themes in user characterisation of the value-in-use of information. The object was to discern the underlying essence of the notion of information value, as a fundamental notion of value-in-use. The other aspect of the research question was addressed by categorising the situations studied as a means of interpreting the multiple cases. The main features of phenomenology as a research philosophy were outlined in subsection 3.11. The case study as a research approach is examined next.

### **3.22 Case study research**

Some twenty-two individuals from four different business organisations are the main sources of empirical data in the study. According to the qualitative research literature, and in the light of the data collection method adopted, this study could be classified as a multiple case study (Yin, 1993), or a collective

case study (Stake, 1995). However owing to the ambiguous nature of the concept of 'a situation', which constitutes the unit of analysis, it is difficult to determine the number of 'cases' studied. This is especially so when the 'case' is seen as an object of study (Stake 1995) rather than a methodology. According to Creswell (1998), a case as an object of study is a system that is bounded in time and place, in the form of a program, an event, an activity, or an individual. Similarly, a situation can be partially defined in terms of time and space. However the nature of the phenomenon being investigated in this study, i.e. the value of information, is not always captured within discrete limits of space and time. While the value of certain types and forms of information is often dependent on the time such information is received (timeliness) and sometimes on the place of use (availability), the value does not necessarily always alter in a consistent manner when the time and place parameters change. Sometimes the actualisation of value associated with some activity involving information use may be enhanced, delayed, neutralised or negated as a result of activities or other information elements outside the specified place and time boundaries.

A flexible notion of space, and especially of time, is therefore necessary in order to gain insight into such occurrences during information use. For example, the time element could be seen in terms of discrete periods of time (i.e. sec., min, hours, days, weeks, and months) in which case the situation of interest could be mainly task-focused. If time is seen in terms of the employment period or the work history of the human agents, then the focus of the study could change from task-centered to job or position centered situations. Both task centered and job centered situations can refer to single or multiple agents. For a large collection of agents, a relatively longer period of time, and a flexible notion of place, the situation becomes organisation focused. Each of the above scenarios can constitute a single case or multiple cases depending on which major component(s) of the situation is being focused. Hence from the point of view of Stake's (1995) definition of a case study, it is not easy to determine the number of cases in this study.

Nonetheless, a case study is also seen as a methodology of inquiry (Merriam, 1988) in both positivist and interpretive research. As a methodology, a case study can be classified according to a number of characteristics. The rest of this subsection examines these characteristics and relate them to the current study with a view to classifying or placing it within the domain of the case study tradition. First, a particular definition of a case study is presented, and the rationale for adopting this methodology is given. Then a discussion of the various characterisations and limitations of the case study as a research methodology is presented. Second a review of the application of the case study methodology in the IS domain is presented. This is followed by a discussion of the constraints of the methodology in this study.

The case study as a method of inquiry is associated with both positivist and interpretivist research paradigms. The very different forms of knowledge claims in these two traditions necessitate the use of different research techniques in justifying those claims. Nonetheless, many definitions of the case study do not explicitly indicate which type of knowledge claims they refer to. This is often implied, however, from the necessary and sufficient conditions that characterise the definition. For example, Yin's (1993) requirement that a case study research must have clearly stated objectives linked to the research questions and the unit of analysis, and the need to provide evidence to support the research hypothesis is generally seen as a positivist representation. Also, Walsham (1995) report that Benbasat et al (1987) approach the issue of a case-study from a positivist stance probably because they emphasise the importance of testing hypotheses in case study research. In spite of these occasional positivist tendencies, the case study is normally viewed as a qualitative method of inquiry that is widely employed in non-positivist research. As stated earlier, this research is anchored in the interpretive paradigm and it is principally qualitative.

The case study is just one of several methods or traditions of inquiry employed in qualitative research. While these methods may be very different in approach and output, they share some common characteristics, which are

attributed to the qualitative tradition. The following definitions by Creswell (1998), first of qualitative research and then of a case study have informed the choice of methodology and hence conduct of this research.

Qualitative research is an inquiry process of understanding based on distinct methodological traditions that explore a social or human problem. The researcher builds a complex, holistic picture, analyzes words, reports detailed views of informants, and conducts the study in a natural setting (Creswell, 1998, p.15)

A case study is an exploration of a bounded system or a case (or multiple cases) over time through detailed, in depth data collection involving multiple sources of information rich in context (Creswell, 1998, p.61)

This study is suited to the qualitative approach as characterised in the definition above because the value-in-use of information is often affected by many interrelated and non-discrete variables which can only be adequately examined by building a complex, holistic picture of the situations in which information is used. While a quantitative method might provide a more generalised view of such situations, it may not provide the deep insight required for understanding the complexity of the situation. Ragin (1987) highlights a key difference between qualitative and quantitative research by pointing out that quantitative researchers work with a few variables and many cases while qualitative researchers rely on few cases and many variables. The IUS framework, which is presented in the next chapter, is a complex of so many interrelated variables that it is deemed inappropriate to use quantitative methods to investigate situations based on it. With respect to the choice of the case study method, certain key elements in the above definition need highlighting. First the notion that a case study is an exploration suggests a probe into the unknown or the only superficially familiar. This study could be classified as a probe along these lines since very little is known about how individual users actually value information qualitatively and how such valuation affects their information use behaviour. Second, the detailed, in-depth data collection method from multiple sources is

deemed to be the most appropriate method for unlocking the complexity of the situations being studied.

The case study as a research method has been classified in many ways. Yin (1993), for example, classifies case studies according to the overall aim of a study. For Yin, case studies are causal, descriptive or exploratory. The objective of a causal case study is to link the causes and effects of phenomena in order to produce explanatory theories. Descriptive case studies are modeled on *a priori* theories, which guide the design of the study including the data collection. The role of theory in exploratory case studies is almost opposite to the descriptive case. In exploratory case studies, data collection precedes the formulation of specific research questions or theories, which should provide the basis for more rigorous studies about the phenomena or relationships being explored.

Case studies can also be classified according to the nature of cases being studied, the number of institutions or units of analysis and the structures of the units of analysis. A case that is chosen for study because of the researcher's interest in its unique characteristics is referred to as an intrinsic case. When a case is chosen in order to gain a general understanding of an issue or problem rather than the nature of the particular case, then the inquiry is referred to as an instrumental case study. This use of case study is often chosen to provide insights or to develop existing theory. When a number of instrumental cases are chosen and coordinated in a study, the study becomes a collective case study (Stake, 1995, p.4). Case studies are also classified as single or multiple case studies depending on whether they are based on a single or multiple object(s) or unit(s) of analysis respectively. When the unit of analysis is regarded as a single whole, then the case is referred to as holistic. On the other hand, a case with a number of clearly discernible sub-units of analysis is an embedded case study (Yin, 1994).

Although the case study as a research strategy is widely used in many disciplines, including information systems, a number of researchers have highlighted limitations. Yin (1994) for example, proffers the following

reasons why many, mainly positivist, researchers are prejudiced against case study.

- a) Case study findings or reports are seen as 'biased' towards the researcher's views or interest.
- b) The conduct of case studies is seen to lack scientific rigour and hence objective evidence.
- c) Case studies may take too long to complete and the reports are often very long and extensive.
- d) Case studies can hardly, if ever, lead to generalisations owing to their innate unrepresentativeness.

Galliers (1991) highlights similar limitations in the use of case study strategy in information systems research. The difficulty in generalizing single case findings through the use of statistical techniques is one such limitation. The other limitations include the great difficulty to define clearly and control the variables in the domain of interest.

The above criticisms or limitations are largely based on positivist knowledge claims and practices in which the generalisation of research findings over specified populations is a key objective. Qualitative researchers have addressed the generalisation criticism by pointing out that they do subscribe, in some cases, to the need for generalisation but that theirs is a different kind of generalisation. Walsham (1995) for example, draws on Bhaskar's (1979) argument that "generative mechanisms identified for phenomena in the social sciences should be viewed as tendencies valuable in explaining past data instead of wholly predicting future situations", to justify a different kind of generalisation. Such generalisations, he suggests, "should be seen as explanations of particular phenomena derived from empirical interpretive research in specific settings, which may be valuable in the future in other organisations and contexts". Walsham thus supports Yin's (1989) argument that case studies are generalisable to theoretical propositions and not necessarily to populations. Yin refers to this as analytical generalisation,

which he suggests is appropriate with both single and multiple case strategies.

Walsham further suggests that interpretive case studies are generalisable to four types of generalisations: "the development of concepts, the generation of theory, the drawing of specific implications and the contribution of rich insight". Case studies are thus generalisable although generalisation is a less common objective in interpretive research than in positivist work.

In spite of the foregoing criticisms, many researchers agree that case studies are advantageous and perhaps particularly suited to certain kinds of investigation. Yin (1993) and Benbasat et al (1987) suggest that the case study method is appropriate when the phenomena of interest are virtually inseparable from the context so that the research topic needs to be defined from a broad perspective. This necessitates the need for multiple sources of data to address some of the complexities introduced in considering the context. Further, how and why questions are particularly suited to case study investigation strategy (Yin 1994). Other situations in which the case study research strategy is recommended include:

- a) When research and theory are at their early formative stages, (Benbasat et al 1987), so that the case study can be used as a discovery tool (Dunkerley, 1988) and
- b) When there is need to capture reality in detail, (Galliers, 1991) in order to discern the meanings and significance of continuous processes in context (Walsham, 1993).

While the case study is a popular method of investigation in the field of information systems (Farhoomand 1992; Hamilton & Ives 1992; Yin, 1993), Walsham (1995) reports that interpretive case studies have not enjoyed that popularity in specialist information systems journals until quite recently. Nonetheless, it could be said that the interpretive case study research strategy is now an accepted and increasingly popular method of inquiry in information systems research.



It was stated earlier that this research can be classified as a multiple case study but it is difficult to determine the number of cases in the study. This depends on whether a case is seen as an object or a method of inquiry as well as the particular dimension of situation focused. In this regard this researcher subscribes to the 'research methodology' notion of case study and adopts a task level focus in his conceptualisation of a situation. Accordingly this study is seen as a multiple case study as data about several information use situations has been obtained from four different organisations. The first three organisations were used for a preliminary exploration of various organisational settings with the view of testing the applicability of the proposed theoretical IUS framework. The exploration tried to examine how the conduct of the empirical investigation, both in terms of process and content would reflect the assumptions and expectations implied in the theoretical framework.

Both theory and pragmatic considerations guided the choice of the four organisations in the study. One of the key elements of the IUS framework is the external environment of an organisation. The dimensions of this element include the type of sector and industry the organisation belongs to and the particular line of business it is involved in. The decision to study situations from different sectors, industries and lines of business was mainly informed by this element. The four organisations were thus chosen from three main business sectors, i.e. public, private and charity, which were expected to reflect different business environments. The first organisation, the London Borough of Tower Hamlets Council is a public sector organisation at local government level. The second organisation, Landmark Hotel, is a five-star luxury hotel in London, which is privately owned and run. The third organisation, the British Library of Political and Economic Sciences - the official school library of the LSE - is classified as a charity organisation. The fourth organisation, Citibank, is a large international Plc with headquarters in the USA.

While the choice of the three sectors, i.e. public, private and charity was theoretically driven, the selection of the particular organisation within each sector was pragmatically determined. The key determinant was access. It was extremely difficult to gain access to many of the organisations approached for the study. For example, the researcher wrote to the chief executives of 12 London Borough Councils requesting permission for the empirical investigation and received a favorable reply from only one.

Access to private sector organisations was equally difficult. Several insurance companies and one merchant bank in London could only offer access to one person in each organisation when they were approached officially by letter. The other three organisations in the study were hence approached through personal contact. Access to Landmark Hotel and Citibank UK, were gained through employees who are student colleagues of the researcher. The management of the BLPES was approached through the researcher's academic supervisor. In all three cases permission was granted to interview at least five employees in each organisation.

The decision to conduct a multiple case study derives from the belief that multiple sources of information, in different settings, were required to provide useful insights into the complexity of information use situations in organisation. The characterisation of information use situation in this study could be seen as revelatory, in so far as this researcher is not aware of any published works utilising the same framework. Taylor's information use environment (IUE) framework is similar in some respects to the IUS framework but the former focused groups of information users at national, regional or even international levels. Many other studies, especially in the decision sciences and organisational management, have focused on the individual's information use behaviour in organisation. However these studies have mainly focused on specific use behaviours and issues such as decision-making, the disposition and ability of individuals to use specific information technologies and man-machine interface issues. None of them has addressed individual context issues in relation to the value-in-use of

information in organisation. In this respect, this study could be seen as a revelatory case study.

### **3.23 Research techniques**

This research comprises both theoretical and empirical investigations. The theoretical component has taken the form of surveying, reviewing, analysing, cross-referencing, critiquing, and drawing inferences and implications from various kinds of literature relevant to the topic of research. The researcher's personal experiences, intuition and subconscious prejudices have also inevitably permeated, if not guided this component. The relevant literature comes from a wide array of knowledge areas or disciplines including social and cognitive psychology, decision sciences, information sciences, information systems, organisational management and behaviour, axiology, economics of information, qualitative research methodology and sociology. The two components in the study are however not independent of each other since a good theory often either guides or reflects practice. In other words, the theoretical assumptions underlying a research affects how the research is undertaken (Kaplan, 1998). Nonetheless, the methods and techniques employed in the conduct of the two components are necessarily different. Since the conduct and manner of inquiry and reporting of the empirical investigation is one of the main distinguishing features of a qualitative study from a quantitative one, it is important that such conduct is described in some detail in presenting the research. The following is an account of the research techniques and procedures adopted in the conduct of the empirical investigation.

Stake (1995) suggests that the principal use of case study is to obtain the descriptions and interpretations of others since the case will not be seen the same by everyone, and since "good qualitative researchers take pride in discovering and portraying the multiple views of the case". Stake further asserts that "the interview is the main road to multiple realities". This suggests that the interview is the most important technique for data gathering

in a qualitative case study. Although Yin (1989) suggests six sources of data namely: documents, archival records, interviews, direct observation, participant observation and physical artifacts, Walsham (1995) agrees with Stake that interviews are the primary data sources, especially for outside observers in an interpretive study. This study has therefore used the depth interview as the primary technique for gathering evidence. The depth interview, with semi-structured and unstructured questions was preferred to survey type questions because each information user in a specific information use situation is expected to have a unique experience and a special story to tell (Stake, 1995). Evidence from the in-depth interviews was however supplemented with a short questionnaire. The questionnaire elicited data about certain demographic variables, which were deemed relevant to describing the macro context of information use.

All the interviews were conducted on the premises of the participant's organisation and each interview lasted about one hour. The questions were a mix of semi-structured and unstructured questions and were principally informed by the IUS framework but also by relevant leads that emerged during the interviews. All the interviews were tape-recorded. The researcher also took notes occasionally and wrote brief summaries of his impression and any relevant insights within an hour after each interview. The use of a theoretical framework to guide the interview questions and the tape-recording of the interviews proved to be very useful techniques in the research. The framework served as a theoretical guide that defined the scope and direction of the investigation. More specifically, the IUS framework served in three different capacities namely: as an initial guide to the design of the empirical study, as part of an interactive process of data collection and analysis, and as a final product of the research. These three elements constitute the role of theory in qualitative organisational research (Walsham, 1995 drawing on Eisenhardt, 1989).

The use of theory however has its disadvantages. A key disadvantage is the danger of the researcher seeing only what the theory suggests and

stifling "potential new issues and awareness of exploration" (Walsham, 1995). The use of three very different organisations in the preliminary exploration was partly aimed at reducing the possibility of certain preconceived notions about organisational dynamics dominating the investigation. The style of interviewing also helped to reduce the dominance of any particular theory position. Although the theoretically determined framework was utilised as the initial guide in shaping the scope, direction and content of interview questions, care was taken not to lead interviewees to responses expected by the researcher. Therefore both semi-structured and open questions were asked in the interviews. In addition, special effort was made to maintain a reasonable balance between "excessive passivity and over-direction" by the interviewer as advised by Walsham. This was to ensure that the data did not lose the richness expected from depth interviews and also for the researcher to command and maintain the confidence of the interviewee.

All the participants agreed for the interviews to be tape-recorded. This consent was obtained on the day of each individual interview and interviewees were promised that the tapes would be erased as soon as they were transcribed. The use of a tape-recorder as the main recording medium has certain advantages. First, it enables the researcher to capture very rich evidence, which is discerned from both the content and style of responses received. The style may come in the form of hesitations, emphasis, intonation and even periods of silence. Second, it allows the interviewer to be more attentive and hence more involved in the interview process. Apart from the fact that note-taking will only capture part of what is said, it may prevent the interviewer from pursuing important leads if he is only partially concentrating on what is being said because he is busy taking notes. Third, the interviewer could supplement the taped evidence with brief notes that document insights, impressions, suspicions and new ideas that dawn on him during the interviews. Tape-recording a research interview however has some disadvantages. Two of these are:

- a) The likelihood that participants may not feel free to say exactly and all what they might wish to say in a non-tape-recorded session and
- b) It requires more time and effort for the researcher to transform the taped evidence into the form required for interpretation and write-up.

All the above issues apply to the interviews conducted in this study, albeit in varying degrees. The tape-recording of the interviews definitely enabled the researcher to capture a rich set of evidence, which might not have been possible with note-taking alone. Because of the researcher's freedom to concentrate on listening rather than taking frantic notes at the same time, the researcher was able to probe many interesting leads that emerged which had not been hitherto contemplated. In terms of the disadvantages, the researcher felt that most interviewees were only aware of the tape-recorder in the first few minutes of the interview after which it became 'invisible'. However, it might be misleading to assume that the presence of the tape-recorder had no effect on what the participants said. Indeed, this became apparent when some participants, suddenly found themselves to be a little indiscreet and actually said "oh I forgot that I am being recorded, I hope you won't quote me on this". In fact, one participant actually requested for the recorder to be switched off so that he could illustrate a point he was trying to make with a particular example. With regards the time and effort required for transcribing the tapes, the fact that it took on average five to six hours to transcribe each interview of about one hour duration speaks for itself.

Other sources of data used in this research include the interpretation of formal documents, reports and charts, as well as telephone and e-mail. No participant observation was undertaken in this study for the following reasons. First, the object of inquiry in the study is not an easily observable phenomenon, although certain attributions could be made that link it to aspects of human behaviour. Second, the researcher did not have the kind of access to organisations that would enable and facilitate participant observation even if it were possible and necessary.

Further accounts of the conduct of the empirical investigation are given in chapters five and six. Chapter five presents brief summaries of the situations explored in the first three organisations. In chapter six, insights from chapter five are used to investigate and describe a number of information use situations in a fourth organisation. Before that, a framework for conducting the empirical investigation is developed in the next chapter. The development of the IUS framework attempts to link the research questions in chapter one with the adopted notions of information, value, value of information and organisation highlighted in chapter two. The phenomenological approach and related philosophy, concepts and tools presented in this chapter provide the vehicle for transporting the foregoing theoretical elements to the domain of practical application at individual information user level. The situations will hence be investigated and interpreted according to knowledge claims founded in interpretive phenomenology. Both the theoretical and empirical evidence should therefore aim at discerning and understanding underlying themes of user experiences, dispositions and behaviours in various information use situations rather than identifying causality between discrete context factors and corresponding outcomes.

# Chapter Four

## The IUS Framework

This chapter describes the rationale, development and composition of the information use situation (IUS) framework. The purpose of the framework is to guide, rather than rigidly direct, the empirical investigation and description of situations in which information is used in the pursuit of organisational goals. The chapter is divided into three parts. Part one explores the notion of situation in relation to human cognitive behaviour. In particular, it draws on Keith Devlin's (1995) situation theory to provide an ontological characterisation of a situation and to identify the cognitive human processes that feature in situations. Part two presents the composition of the framework and highlights the contribution of a number of IS-related context models including Taylor's information use environment (IUE) model. In part three, the framework is unpacked by identifying the major components and attributes of the six elements in the framework.

### 4.1 Developing the framework

The characterisations of the central concepts of information, value, the value of information and the notion of organisation presented in chapter two provide the conceptual foundation for developing and applying the IUS framework. The development of the framework is informed by several context studies, theories, and propositions in information systems and related disciplines as well as the intuition of the researcher. One such theory is Devlin's situation theory, which provides a useful perspective and insight into the fundamental question of what constitutes a situation. Although this theory is based on the rationalist view of information and knowledge, which is not the philosophical position adopted in this study, it is applicable in this study for two reasons. First, the author does not reject the phenomenological position of Heidegger and Maturana and Varela, which is adopted in this



study. In fact he admits to being 'attracted towards' their theses. "It seems reasonable to me that 'cognition' and 'intelligence' are intrinsically biological and not mechanisable", he writes. Second, in spite of the apparent diametrically opposite philosophical positions, the phenomenological and rational approaches to explaining human cognition and behaviour share some common ground. In particular, they both subscribe to the notion of intentionality, which is central to the concept of information use situations. Situation theory is therefore not necessarily incompatible with the philosophical position adopted in this study. The first step in developing the framework is to define what constitutes a situation.

#### **4.11 What is a situation?**

The Oxford English Dictionary has the following entry for situation:

- (i) a place and its surroundings
- (ii) a set of circumstances
- (iii) a position in which one finds oneself
- (iv) a state of affairs
- (v) an employees position or job (situation vacant)

The above definition suggests that a situation could be construed either in terms of space, events or some construct that includes the two. Devlin (1995) summarises the everyday usage of the term as "some part of the activity of the world". Neither of the above definitions is however specific enough to give significant insight into the nature and role of information use situations in organisations. What is required is a definition or characterisation of situation that is related in some way to the process of information use. Aspects of Devlin's mathematical theory of information, i.e. situation theory, provide some insight in this direction. In order to give an adequate characterisation of the concept of situation, it is necessary to first highlight some fundamental features of this theory.

#### 4.12 Situation theory

The purpose of this theory is to model in mathematical language, the phenomenon of information processing and the manner in which information is transmitted from one agent (or situation) to another. Although this is not exactly equivalent to the object of this research, certain aspects of the theory provide useful insights into the notion of meaning with respect to the individual information user.

In situation theory, the notion of a situation is built around two fundamental concepts, individuation and discrimination. Through these concepts, cognitive agents are able to extract or access information from their surrounding. For the purposes of this study, the term cognitive agent will refer exclusively to human beings, even though Devlin suggests that certain non-human agents may satisfy the criteria associated with the term. One such criterion<sup>16</sup> is the capacity of an agent to convert information it perceives from analog to digital form. While this conversion ability is a necessary condition for cognition, it is not sufficient, since the digitalisation of perceived information could only be seen as a cognitive activity "provided the agent has the means of manipulating and utilising the information it obtains" (Devlin, 1995). Dretske refers to this latter requirement as the necessity for cognitive embodiment, which he maintains, is not simply a matter of digitalisation.

The concept of individuation refers to the ability of a cognitive agent - in this case man - to discern or focus on individual objects in the world. Devlin suggests that this is one of the most fundamental cognitive activities of man since "in order to make its way in the world, ... man makes constant use of the ability to individuate objects". He further suggests that what part of the world an agent individuates as a single object depend in part on the agent's purpose. However, Devlin observes that while man often uses individuation

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<sup>16</sup> This criterion is based on the following characterisation of cognition by Dretske (1981): 'It is the successful conversion of information into (appropriate) digital form that constitutes the essence of cognitive activity... Cognitive activity is the conceptual mobilisation of incoming information, and this conceptual treatment is fundamentally a matter of ignoring differences (as irrelevant to an underlying sameness... It is, in short, a matter of making the analog-digital conversion' (quoted in Devlin, 1995 p.18)].

to "carve up the world, ... for many of our purposes, the somewhat less restrictive notion of discrimination turns out to be more appropriate".

Discrimination is the involuntary or automatic tendency of cognitive agents systematically to vary their behaviour according to the type of situations they encounter. Hence both individuation and discrimination are cognitive processes (conscious and subconscious) that relate the concept of situation with human behaviour. Situation theory further proposes that man does not only individuate objects but also the properties of such objects, and the relationships between them.

The cornerstone of situation theory is the proposition that situations are part of ontological reality. Accordingly, it is proposed that the world of every cognitive agent divide up into a succession of situations, which are discriminated by the agent's behaviour. This suggests that human behaviour in general, and cognitive behaviour in particular, is situation dependent. Intuitively, there is nothing new in this proposition since in many instances, people's behaviour could be seen to vary according to the kind of situation they face. For example, people instinctively move away from intense heat and shield themselves from rain. What is however new and highly relevant to the concept of information use situations is the notion of an agent's individuation scheme. That is, for each agent, there is a collection of situations, or highly structured parts of the world that the agent's behaviour discriminates more readily than others are. What this implies is that situations are, in turn, agent-dependent so that "what does and does not constitute a situation is largely a matter of what agent is under discussion" Devlin (1995). This notion is fundamental to the usefulness of the information use situation (IUS) framework. Every situation investigated must have some relevance to an individual. That is, the situation must be in the domain of the individual's individuation scheme. This requirement corresponds with the perceiver concerns perspective on the nature and usefulness of information.

Recognising the individuation schemes of the various information users is thus an important tool for investigating IUSs. However there are both

theoretical and empirical limitations when describing an agent's scheme of individuation. Since many aspects of an agent's activity consist of discriminatory behaviour rather than individuation, many relevant but non-individuated features of situations would not readily feature in an agent's account of their own behaviour. Indeed Devlin argues that agents in general will only have partial information about a given situation. Furthermore, agents are often not able to describe fully all the relations and objects they individuate. Besides, situations ascribed to agents in theoretical or empirical research may be the product of the researcher's scheme of individuation projected onto the agent. In spite of the above limitations, there is a need to discern and describe the underlying schemes of individuation of various information users in organisations as they utilise and evaluate information in their respective functional roles.

Situation theory describes situations as structured parts of reality that an agent discriminates and sometimes individuates as well. This means that a situation is not an individual object but a collection of different objects individuated by an agent. It also implies that situations may comprise other situations as well as other ontological entities. In fact Devlin proposes that the world is a situation, albeit a unique maximum one, of which every other situation is a part. Situations could thus be described in terms of other ontological entities, including situations. This is the basis for the following ontological characterisation of an information use situation.

Ontologically, an IUS is characterised as follows:

$$\text{IUS} \equiv \text{H}_{\text{CIA}} \text{ O S T}$$

In the above identity, H<sub>CIA</sub> stands for some human agent(s) with some concern, interest or awareness for which some information is relevant.

O represents some organisational arrangement or setting. S and T stand for spatial and temporal locations respectively. A spatial location can be either physical or conceptual. For example, an agent is said to be working in a particular organisation when he or she is physically located in buildings

occupied by members of that organisation at the appropriate times as well as when he or she is physically located elsewhere but working for the organisation. Temporal locations can also assume different dimensions. For example, they could be characterised in terms of time units in seconds, minutes, hours, days...years; or in terms of the duration of individuated situations like the duration of tasks and projects, the working lives or career span of employees, distinct phases of an organisation's history and distinct periods of management or technological change.

While the temporal and spatial entities are important in describing information use situations, their role is mainly to define the scope of organisational activities that feature in the various situations. In other words, they give the place and time contexts of the situations in question. Hence the core of the IUS framework comprises the other two entities, namely: H and O. Describing the complex relationships between these entities and information is the core purpose of this research. The framework has a dual role in the study. It is used as a guiding and scoping device in the empirical investigation but it is also presented as a contribution to the debate on what constitutes context in information systems research. The rest of this chapter describes the composition of the IUS framework and the contributing theories and propositions. First, the main features of the human entity are presented and discussed. Here, the socio-cognitive aspect of human behaviour is examined in relation to organisational work behaviour in general and functional information use in particular. Next, the main elements of the organisation entity are identified and the relationships between them established. Theoretical pointers in respect of the properties of these elements relevant to situations of interest in the study are then presented. These properties will guide, albeit not exclusively, the exploration, description and analysis of the situations examined in the empirical investigation.

#### 4.13 Entities of the IUS framework

##### *THE HUMAN ENTITY*

All the definitions and characterisations of value, information, and the value of information in chapter two emphasised the importance and centrality of the human agent in the viability of these concepts. The need for the human entity to interact with an object in the realisation of value, to perceive some phenomenon as information, and to prefer one form of outcome related to information use as opposed to another, implies that these concepts are only meaningful from the perspective of human agents. The fact that this research is focused on purposeful human activities within business organisations points to a central role for the human information user. The human entity is hence one of the main elements of the IUS ontology. This element will, from now on, be referred to as the information user or simply the user.

The presence of a user is a necessary condition for describing information use situations in organisations but it is not sufficient. Generally, intentionalities<sup>17</sup> relevant to their roles in organisations mediate purposeful actions of employees. Such intentionalities are shaped by a combination of formal and informal imperatives, subjective and objective considerations as well as internal and external organisational realities. The rationale and direction of such intentionalities would, in general, depend on the potential and dynamic interactions of the user with the organisation. To understand how such intentionalities come about, we need to investigate the causes of human compulsion and motivation in their roles in organisation.

Two strands of thought that can throw some light on this question are theories of motivation at work and human interest. The behaviour of human agents in business organisations could be explained in terms of either or both of these sets of theories. Depending on which set of theory one adopts human work behaviour could be attributed to intrinsic motivation, extrinsic motivation or some combination of the two. Intrinsic motivation relates to factors that are internal to the employee. Early motivation theories like

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<sup>17</sup> Note that intentionality is not the same as intention since the latter is only one dimension of the array of mental states that constitute the former.

Maslow's needs theory (Maslow, 1943) claim that intrinsic motivation is mainly biological, but critics suggest that such claims overlook the ability of humans to make conscious choices, which could be either rational or irrational. Extrinsic motivation results from external stimuli that cause employees to undertake certain activities according to the dictates of those stimuli. To understand the causes and effects of motivation at work, we need to examine some theories of work motivation.

### *Work Motivation Theories*

Theories on human motivation to work, whether as individuals or in groups, range from those that philosophize about the needs and virtues of work to those that identify specific variables or incentives that are causally related to purposeful human behaviour and action. Generally, such behaviour comprises three interrelated parts: the cognitive, physical, and emotional components. Most organisational work objectives and processes are explicitly directed at the physical and cognitive components and only implicitly, if at all, account for the emotional requirements. Nonetheless motivation theories try to identify all the interrelated influences that guide human behaviour in all forms.

Some of the most comprehensive propositions in this area come from the field of work psychology. At the very general and abstract level, are the following three propositions, which depict very different perspectives on human nature and behaviour. The first two, proposed by McGregor (1960) are commonly known as Theory X and Theory Y. The third was proposed by Schein (1988) and is referred to as the Social Approach. Arnold et al (1995) summarise the above propositions as follows:

*Theory X:* People cannot be trusted. They are irrational, unreliable and inherently lazy. They therefore need to be controlled and motivated using financial incentives and threats of punishment. In the absence of such controls, people will pursue their own goals, which are invariably in conflict with those of their work organisation.

*Theory Y:* People seek independence, self-development and creativity in their work. They can see further than immediate circumstances and are able to adapt to new ones. They are fundamentally moral and responsible beings who will strive for the good of their work organisation if they are treated as such.

*Social approach:* A person's behaviour is influenced most fundamentally by social interactions, which can determine their sense of identity and belonging at work. People seek 'meaningful' social relationships at work. They are responsive to the expectations of people around them, often more so than financial incentives (Quoted from Arnold et al 1995, p212).

Each of the above propositions can explain aspects of employee behaviour in business organisations. Arnold et al, point out that these propositions are "common sense approaches to motivation rather than theories in the scientific sense and that in general the match between theory and common sense is not particularly close". In order to gain better insight into employee motivation, a brief review of a number of substantive theories on work motivation is necessary. Three types of motivation theories are therefore briefly examined below.

#### *Needs Theories:*

The fundamental premise of needs theories is the assumption or belief that all humans have certain psychological needs which are functions of their biological characteristics. This implies that in general humans behave almost involuntarily towards satisfying their needs. One of the most popular needs theory is that of Maslow (1943). This theory was actually an attempt at explaining general human motivation rather than organisational work behaviour. Nonetheless, it was deemed applicable to the work setting. Maslow proposed a hierarchy of human needs comprising of five levels: physiological, safety, social, self-esteem and self-actualization. The theory has however being criticised for several reasons. Three such reasons, which are relevant to this study, are:



- (i) The observation that needs are not strictly hierarchical, i.e. it is not necessarily true that humans aspire to the complete satisfaction of lower needs before considering higher needs.
- (ii) The notion of biological needs seems to preclude conscious and intentional choice behaviour of humans.
- (iii) The difficulty of predicting behaviour from needs since different needs can reflect the same behaviour and vice versa.

The above limitations have made Maslow's needs theory less attractive in work motivation research and practice, especially in the last two decades. However motivation theories based on very specific needs, such as the need for achievement have been more successful (See for e.g. Murray, 1938; McClelland, 1961; Beck, 1983; and Parker and Chusmir, 1991).

*Expectancy theory:*

Proposed by Vroom (1964), this theory is an attempt to explain the choice behaviour of people when faced with several alternatives. This behaviour is construed as a cognitive appraisal of each alternative based on the following three factors: expectancy, instrumentality, and valence. Expectancy is a person's perception of the likelihood of accomplishing the considered action. Instrumentality is the perception or belief that the action will lead to some outcome or reward, and valence refers to how important or valuable the outcome is to the person. The theory stipulates that the extent to which a person tends to take a particular action is determined by the product of valence (V), instrumentality (I) and expectancy (E), i.e. (VIE). This means that if any of the three factors is zero or negative, in respect of a particular action, that action will not be undertaken. Practical experience does not seem to support this view as implied by Arnold et al when they ask: "how many managers can honestly claim that these conditions<sup>18</sup> hold in their organisation?" On evaluation, the VIE theory has several limitations, which

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<sup>18</sup> The conditions they refer to relate to employee perceptions of expectancy, instrumentality and valence in respect of their jobs.

are not particularly relevant to this work. It is worth noting however that some researchers, e.g. Schwab et al (1979), have suggested that the theory "over-intellectualises the cognitive processes people go through when choosing alternative actions". Arnold et al (1995) further point out that the theory is about the process of motivation, with no mention of content. In other words it tries to explain how an individual is motivated to act in a certain way but not why.

*Goal setting theory:*

"A goal is what an individual is trying to accomplish; it is the object or aim of an action. The concept is similar in meaning to the concepts of purpose and intent" (Locke, Shaw, Saari and Latham 1981). The main proposition in goal setting theory is that the characterisation of a goal combined with a person's attitude towards it determines the behavioural strategy the person will adopt to attain that goal. This strategy then becomes the vehicle of performance, guided by the person's ability. Feedback from performance enables the refinement of behavioural strategies. The characteristics of a goal are influenced by the incentives the person has to perform the task, their self-perception, and the manner in which the goal is set. Aspects of goal setting theory that are relevant to the study of information use situations come in the form of specific propositions and observations on human work behaviour (see for e.g., Locke et al, (1981) and Mento et al 1987).

These include:

- a) The observation that goal acceptance by the performer, and to some extent goal commitment, is fundamental for achieving any meaningful performance, especially with difficult goals.
- b) The more difficult the goal, the higher the performance, within certain limits.
- c) For high performance, specific goals are better than general goals.
- d) Feedback is important, both as a way of providing information to the performer and a means of motivation.

Some of the specific incentives that would enhance performance include financial gain, the ability of the performer and participation in setting the goal.

Although goal setting is quite popular in both theory and practice, a number of limitations have been identified. Among them the observation by Austin and Bobko (1985) that empirical investigations have predominantly focused quantitative rather than qualitative work goals. These researchers also point out that, in reality, jobs often tend to have more than one goal and normally, groups of people rather than individuals work collaboratively towards such goals. This suggests that empirical investigations of individual goal seeking behaviour do not address fully the nature of goal centered work in organisations. Two other suggested limitations of goal setting are the proposition that its effect may be limited in organisations with clearly established and entrenched performance norms (Meyer and Gellatly, 1988) and that goal setting may even be harmful for performing new tasks (Earley, Connolly and Ekegren, 1989).

The foregoing propositions on motivation are relevant for understanding not only the various forms of employee behaviour but also the perceived impact of certain types of information in specific situations. The argument is that the full potential value of information is only realised when accompanied by the right form and level of motivation, which could be both intrinsic and extrinsic. User characteristics are hence as important as formal organisational features in shaping information use situations.

Despite the acknowledgment that motivation can be both intrinsic and extrinsic, the school of thought associated with theory X believes that a person's own goal is always invariably in conflict with that of their organisation; hence the need for constant monitoring and control. People who seek their own goals are accused of seeking their self-interest, which is normally described as subjective and personal and not in the interest of their organisations. This is not necessarily always the case as shown in the following brief examination of self-interest theories.

### *Self-interest theories:*

Susan Wolf (1997) describes self-interest, as "interest in one's own good ... and to act self-interestedly is to act on the motive of advancing one's own good". However, she argues that a person's action could only be said to be in their self-interest if such action either advances, or at least minimises the decline of their own good. This leads to the question: what constitutes a person's own good? There are several philosophical, cultural and religious propositions and assertions that address this question. In terms of everyday living, Wolf proposes that meaningfulness is an important component of a good life and by extension, an object of self-interest. Thus if we assume that living a meaningful life is an objective of self-interest then we can gain some insight into self-interest by examining the concept of meaningfulness. Scheim's (1988) social approach to motivation suggests that people seek meaningful social relationship at work. This implies that the concept of meaningfulness is as applicable to organisational behaviour as to other aspects of everyday living.

One way of probing into meaningfulness as an element of self-interest, is to examine the various schools of thought associated with self-interest. Approaches to the concept of self-interest can be categorised into three sets of theories. These are hedonistic theories, preference theories and objective list theories (Derek Parfit, 1984). Hedonistic theories consider a person's good purely in terms of the quality of life experienced. Perhaps the most popular version of these theories is the one that characterises a person's good and hence self-interest, exclusively in terms of happiness and pleasure. Critics of this notion of self-interest point out that for some people personal happiness is neither an ultimate objective nor an exclusively individual experience.

The second set of self-interest theories is commonly referred to as preference theory. Preference theory suggests that a person's good could be described as what the person wants for himself or herself. However if we accept that it is conceivable for people to want things that are not particularly pleasant to themselves, then it is possible for people to consider certain

unpleasant occurrences as being in their self-interest. Such a proposition obviously contradicts the core of hedonist thinking. Nonetheless, it does not negate entirely the value of pursuing happiness and pleasure. Wolf (1997), for example, suggests that "it may be that some things (including pleasure) are good for a person whether the person prefers them or not". In addition, she observes that there are times when a person's preferences are somehow self-destructive or bizarre, implying that our preferences may not necessarily always be in our self-interest.

The two foregoing conceptions of self-interest leave some questions unanswered. The third set of theories, which Parfit called 'objective-list theories' attempts to address these questions. At the core of these theories is the belief that "a person's good includes at least some elements that are independent of, or prior to, her preferences and to their effect on the felt quality of her experience" (Wolf, 1997). These elements could be specified on an objective list as being relevant to a good life irrespective of people's personal preferences. This means that there are certain elements in life which are deemed to be good for a person and hence in her self-interest purely because of objective (public) acclaim. The notion of self-interest as wholly subjective either in thought or felt experience therefore seems inadequate. Equally inadequate is the assumption that what ever we consider as 'objective good' can be wholly independent of our preferences and our experiences (Wolf 1997). Hence an individual's notion of what is good or what is in their self-interest may derive from any or a combination of the following:

- a) The person's personal experience of joy or happiness
- b) The person's particular preference
- c) Objective (public) acclaim of the goodness of certain elements in life

The above characterisations of 'good' in the context of self-interest are somehow similar and related, albeit not identical, to Charles Morris' three forms of value. Experiences of joy and happiness could be associated with operative value. A person's particular preferences often give rise to conceived

value while objective acclaim of goodness corresponds with the notion of object value.

The significance of the foregoing theories of motivation and self-interest in this study is twofold. First they furnish the researcher with a number of alternative perceptions of information use behaviour in organisation. Second they offer a different way of looking at self-interest and subjectivity in relation to employee behaviour in organisation. The proposition that elements of objectivity are often inherent in subjective judgements suggests that instead of regarding it as a purely negative feature, subjectivity should be seen as an inevitable aspect of human behaviour. The subjective interpretation and evaluation of information in organisations is hence not an exception but part of normal behaviour. This position accords with the phenomenological view that subjectivity does not amount to an inferior status of knowledge about the world.

#### *THE ORGANISATION ENTITY*

As stated in chapter one, the scope of this research is limited to the business organisation. The term business broadly refers to the coordinated activities of a set of people brought together for some purpose, and who would otherwise not necessarily be working together. This notion of business organisation excludes naturally occurring cultural and linguistic groups or communities, but is not limited to commercial groupings or for-profit organisations.

Functionally, an organisation comprises the activities of people, governed by various organisational arrangements, situated in time and space. The organisation entity can be viewed as more of a situation than a fundamental entity of the ontology in the traditional sense. The components of the organisation as a situation are many and varied but this study is only interested in those elements that are perceived by information users to influence their value judgments, choices and behaviour. The IUS framework presented below is a conceptual representation of those elements and how they relate to the individual information user in organisation.

## 4.2 The IUS framework

The information use situation framework is presented in figure 4 below.

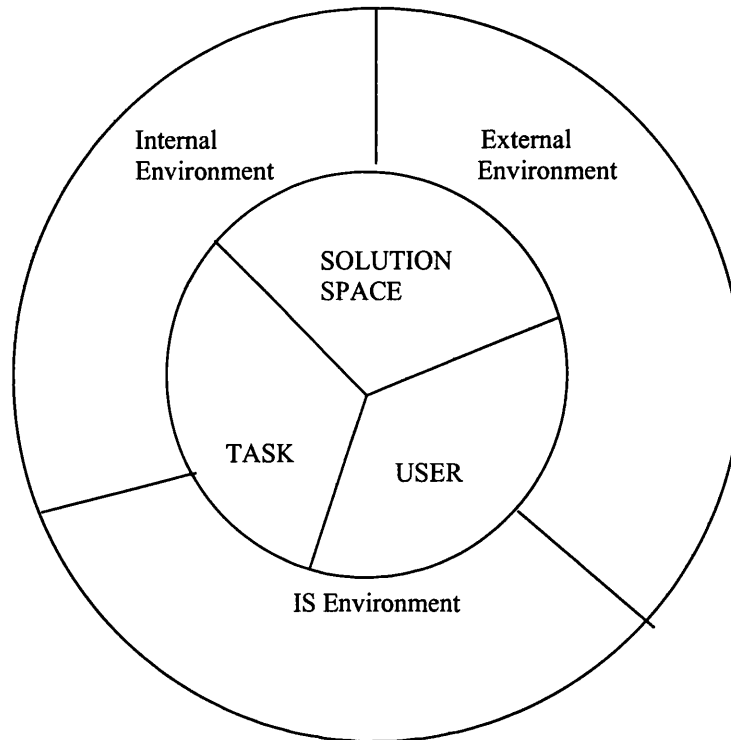


Figure 4 Information Use Situation Framework

The composition of the framework is significantly informed by the four central concepts discussed in chapter two. For example, the notion of value as a relative phenomenon resulting from the interaction between a subject and an object is reflected in the relationship between the individual user and the environmental elements in the framework. This relationship is actualised through the tasks and solution space associated with the tasks. The focus on the individual user derives from the adoption of the perceiver-concerns perspective as the basis for characterising the usefulness and hence the value of information to the user. The task-user-solution space relationship also reflects the mixture of subjective and objective motivations that characterise organisational behaviour in general including information use. The concepts examined in chapter two have thus influenced both the choice of research methodology and the composition of the IUS framework.

The framework consists of two levels. Level one comprises the three sectors of the inner circle in the diagram, which are presented as the core elements that characterise information use situations in organisation. The elements in the outer circle, level two, are seen as environmental elements in the sense that the individual information user normally has little or no direct control over them. Nonetheless, the two levels together characterise information use situations of varying nature depending on which combination of elements becomes dominant. The framework thus proposes that the type of information user, the type of task in which the information is used and the solution space associated with the task together determine the nature and direction of individual value choices, judgements and behaviours associated with functional information use in organisations. These behaviours and judgements constitute both the cause and effect of user perceptions of the value of information used in performing the tasks. However, such behaviours are constantly and dynamically influenced and constrained by the nature of the internal, external and information systems environments of organisations. These environmental elements are therefore construed as active components of information use situations.

Since the framework is meant to be an exploratory guide, there is no indication of the relative importance or strength of influence of each element. Nonetheless, the core-environment divide is construed as an indication of direct and indirect influences on information use behaviour respectively. Table 1 presents the six elements of the framework reflecting this divide.

Table 1 Elements of the IUS Framework

Level	Influence	Elements (Variables)		
1 (Core)	DIRECT	Task	User	Solution Space
2 (Environment)	INDIRECT	Internal Environment	External Environment	Information Systems Environment

While the physical and conceptual domain of the normal business organisation can be construed as one IUS, it can also be seen as a collection of



numerous information use situations. The factors that determine and mediate each of these situations may not only be numerous and dynamically determined but also inter-linked and over-lapping. It is therefore practically impossible to articulate and categorise fully all the elements that might come into play in any specific information use situation. The six elements in the framework do not therefore represent exhaustively all features of every information use situation in organisations. What they represent is a number of prominent and sometimes critical factors, derived from the literature of several information related disciplines and this researcher's personal intuition, which are deemed to influence significantly many information use situations in organisations.

#### **4.21 Contributing studies and propositions**

This sub-section highlights the contributions of the main studies, theories and propositions that influenced the IUS framework. Perhaps the most influential of these studies is R S Taylor's (1991) information use environment (IUE) model. Taylor's model is not particularly geared towards organisational analysis since it is pitched at the societal or national level. It is nevertheless relevant to the form of organisational investigation undertaken in this study, because it provides conceptual tools for investigating and describing the organisational 'setting' in which a variety of information use situations occur. Taylor's IUE framework is summarised in appendix B.

A number of other context studies and propositions have influenced the development of the IUS framework. Although many of these studies do not directly relate to information use in the sense portrayed in this study, they do point to relevant context variables associated with information use in organisation. Their relevance to this work is in the assumption that all informational activities in organisation, including project based activities like systems development, implementation and evaluation involve some element of individual cognition and corresponding behaviour. At a higher level of abstraction, all IS context studies can be seen as investigations of the

relationships between human and organisational characteristics such as purposes, processes, perceived outcomes, and structural and institutional arrangements related to the use of information in organisation. Hence context variables, especially those pertaining to human agents, which are cited as important in other information related activities, could be equally relevant to considerations of individual information use behaviour. It is not difficult to see that staff motivation, attitude, resistance to change, and internal organisational politics are as relevant to everyday information use situations as they are, for example, to systems development projects. One difference, though, is that everyday information use activities are not as clearly marked and bounded in terms of objective, scope, and resources - including time - as are project based activities. Because of this, it is often more difficult to evaluate routine everyday activities and to account for the contribution of particular variables to the accomplishment of such activities. This is why several perspectives on the context of informational activities in organisation are explored in this study.

Some of these perspectives focus on those features that pertain to external influences on the organisation. Others give insight into the nature of internal organisational activities by identifying the major components involved. The Leavitt (1965) model, for example, conceptualises the organisation in terms of four interdependent elements: task, structure, technology and people, all of which are represented in the IUS framework. From a process, rather than a factor-oriented perspective, Mintzberg (1979) proposed the following five co-ordinating mechanisms within organisation: mutual adjustment, direct supervision and three forms of standardisation in the form of work processes, skills and output. The IUS framework accounts for these mechanisms by considering the abilities and dispositions of users, their relationships with each other and the nature of work processes or tasks associated with their jobs.

A number of specific context studies that focus on generic project based activities like systems development, implementation and evaluation have also

informed the IUS framework. Nandhakumar (1996), for example, proposed a layered view of context in the development of executive information systems (EIS). The layers include individual, team, IT department, company and the external business environment. The IUS framework has mapped these layers into two: the core, which corresponds to the individual layer and the environment, which subsumes all the others. Other studies that subscribe to the layered and contingent nature of IS-related context variables include Davis et al (1992), Hackney and McBride (1993) and Poulymenakou and Homes (1996). It is neither necessary nor useful to catalogue every individual influence on the development of the IUS framework. Nonetheless some of the other studies that informed the content, and in some cases the conceptual focus, of the framework are summarised in the table in appendix A. The table identifies the author or researcher, the IS activity the study is about, the context variables proposed, and the element(s) in the IUS framework to which the variable(s) is relevant.

#### **4.22 Unpacking the IUS framework**

The six elements of the IUS framework can be decomposed into a number of non-homogeneous sub-elements, some of which pertain to the more enduring characteristics of information use situations in organisations while the others relate to transient and very specific experiences. The following are some of the main features of each element that will serve as theoretical pointers in the empirical investigation.

##### **1. User**

Ultimately, the use of information could be characterised as an individual cognitive process. Even when information is collectively shared and used by a number of people performing common tasks, such use involves a combination of individual cognitive processes. The manner of such combination may or may not be logical, rational or democratic, but this may have to do more with the procedures and norms governing the eventual

choices for action than with the actual process of cognition. The use of information as content could hence be characterised as an individual cognitive process. The term user in this study therefore refers mainly to individuals.

The behaviour of individuals in information use situations may depend on judgements influenced by their exclusive individual perspective, the perspective of a group (formal or informal), or the perspective of the whole organisation. Within the individual perspective, the information user may exhibit dual perspectives: a perspective that reflects the formal roles and responsibilities of the office and duties they hold and a perspective based on the distinctive human physiological, psychological and motivational characteristics of that individual. The task to be performed in the situation may or may not involve significant decision making but if it does, then the individual's cognitive and psychological disposition becomes crucial in determining which information is relevant to the task. This is consistent with the perceiver-concerns perspective as a basis for studying information use in organisations.

Jungian psychology<sup>19</sup> stipulates that humans exhibit four major modes of psychological function. These functions relate to the ways individuals perceive and evaluate phenomena in their worlds. As cognitive processes, perception and evaluation are each characterised by two main modes in individuals. Perception occurs either through sensation or intuition and evaluation is done through thinking or feeling. Since perception and evaluation are regarded as mutually exclusive phenomena, they combine to give the four modes in the Jungian typology. The significance of this work is in pointing out that individuals differ in the way they appropriate and use information. However, people cannot be easily categorised into neat slots according to these modes even though "in most individuals, a preference for one mode of perceiving and one mode of evaluation is characteristically developed and the alternative modes remain, as a result, underdeveloped or

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<sup>19</sup> Based on work by the Swiss Psychologist and Psychiatrist Carl Jung (1875- 1961)

unconscious" (Mason & Mitroff, 1973). Mason and Mitroff used this typology to classify managers in organisations into the following four 'psychological-types': sensation-thinking, sensation-feeling, intuition-thinking and intuition-feeling. According to this classification, decision-makers in organisations derive their evidence from either hard fact in the form of data or from gut feeling and intuition. In addition, they evaluate decisions and outcomes either through rational logic or through ethical and moral considerations. These differences suggest that neither the concept of information nor the use process could be seen as an entirely objective phenomenon.

Despite the focus on the individual as the information user, it must be stressed that the use of information addressed in this study relates principally to organisational considerations rather than personal individual needs or wants. The user therefore refers to the immediate problem or task owner; i.e. the person who has both the responsibility and authority to make decision or take action in the accomplishment of a task. Some of the relevant variables of the user element include the role, responsibility, level of authority of the user in their current job and in the firm as a whole. Individual abilities and skills such as the user's level of general education and proficiency in the use of IT are also important. In terms of psychological disposition, the user's perception of the significance of their role in the organisation, their level of motivation and attitude towards organisational and task objectives are some of the main situational variables that may characterise the IUS.

## **2. Task**

In so far as every piece of information is consciously sought after and used for a purpose, or for performing some discernible task, it is important to examine the characteristics of such tasks in considering the value of that information. The nature of the task should mediate perceptions and judgements regarding both the potential and actual value of information employed in performing the task. How structured the task is and how dependent it is on computer-based information systems are two important factors that might impact on the

task's performance. Other questions about the nature of the task include whether the task is well defined or fuzzy and what time constraint applies to it. Important indicators in the performance of the task might include the level of autonomy or discretion available to the task performer and the manner and frequency of feedback received. In addition, the importance of the task might depend on whether it pertains to operational, managerial or strategic processes and to which functional role it relates.

### **3. Solution Space**

From a rationalist perspective, it could be argued that every information user makes decisions and takes actions resulting from those decisions according to a number of rational considerations such as:

- a) The perception of what is achievable and what is not, in spite of and, through the use of the information available.
- b) The set of alternative processes or routes available and their perceived implications in terms of the relative cost in time, effort and other resources in comparison to the benefits expected.
- c) Judgements in respect of a and b above in terms of both the operational aspects of the task at hand and the normative socio-political and cultural constraint of the wider task domain.

However, the types of questions that would guide the functional behaviour of individual information users in business organisations are not only about whether a certain solution or outcome is rationally desirable, potentially attainable, or operationally feasible, but also whether such outcomes could and would be accepted, acclaimed, down played, or even rejected by higher authorities. The main components of the solution space would thus include the purposes or objectives of the task at hand and the evaluation schemes associated with the task. The kinds of evaluation schemes associated with the task would not only indicate what kinds and levels of outcome are acceptable but also by whom and what constitutes the 'bottom line'. With reference to a specific task, aspects of the purpose of the information to consider include

whether the information is used as a trigger for predetermined action, the main basis for decisions, or as supplementary information.

The user's opinion about the processes associated with the use of information is also important. Such processes include the information dissemination and interchange patterns in the organisation, the nature and extent of monitoring and control activities including feedback, and the availability of alternative sources of information. Other aspects of the evaluation scheme to consider include whether the task in question has clearly defined performance criteria, who sets and monitors such criteria and what sanctions and rewards are directly associated with the outcome of the task.

#### **4. The Environment**

In this study, every business organisation is seen as a macro information use situation within which numerous other information use situations can and do occur. Each situation, macro or otherwise, can be described in terms of the six elements of the IUS framework. The environmental elements in the outer ring of the framework represent those macro structural and institutional features that reflect the specific characteristics of the organisations in which the situations occur. The characteristics are classified under three main elements: the internal environment, the external environment and the information systems environment. The rationale for this division is the assumption that these components are characterised by different types of forces, which invariably affect information use situations in very different ways.

The internal environment refers to those structural and institutional features of the organisation that affect user behaviour. The external environment is characterised by forces in the immediate environment of the organisation as represented by Porter's forces (See Porter, M, 1985). Instead of five categories as suggested by Porter, they have been reduced to the following three categories: competitors, customers, and regulatory forces. Hence the external environment is concerned with influences on the

information user from competitors, different types of customers, and external regulatory forces. At a higher level, description of the external environment may include the nature of the industry that the organisation belongs to, business and technological trends in the sector, the particular line of business and the effect of globalisation.

The information systems environment refers to the nature and influence of computer and telecommunication technologies and systems in place in the organisation. Features of this environment to consider include the functional role and importance of the information systems at both the individual task level and the general business level, the main uses of computer-based information systems in the organisation and the level of dependency of various tasks on these systems. A high level decomposition of the elements of the IUS framework is presented in table 2. The table provides the general focus and scope of the empirical investigations presented in the next two chapters.



Table 2 Main IUS component elements

<b>CORE</b>		
<b>USER</b>	<b>TASK</b>	<b>SOLUTION SPACE</b>
<ul style="list-style-type: none"> <li>• Official role/position</li> </ul>	<ul style="list-style-type: none"> <li>• How structured</li> </ul>	<ul style="list-style-type: none"> <li>• Sources of information</li> </ul>
<ul style="list-style-type: none"> <li>• Sources and levels of motivation, general disposition/attitude</li> </ul>	<ul style="list-style-type: none"> <li>• Functional role</li> </ul>	<ul style="list-style-type: none"> <li>• Information value objectives</li> </ul>
<ul style="list-style-type: none"> <li>• Expertise and experience</li> </ul>	<ul style="list-style-type: none"> <li>• CBIS dependency</li> </ul>	<ul style="list-style-type: none"> <li>• Task evaluation scheme</li> </ul>
<b>ENVIRONMENT</b>		
<b>INTERNAL ENVIRONMENT</b>	<b>EXTERNAL ENVIRONMENT</b>	<b>IS ENVIRONMENT</b>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Organisation structure</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Types of customers</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> CBIS dependency</li> </ul>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Organisation culture &amp; climate</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Nature of competition</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Main CBIS uses</li> </ul>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Management style</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> External regulations</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Main CBIS business role</li> </ul>

# Chapter Five

## Exploring Information Use Situations

In this chapter, several information use situations (IUS) are explored. The exploration is generally, but not exclusively, guided by the IUS framework, which was presented in the previous chapter. The objective is to discern situational features that bear directly or indirectly on user perceptions of information value and corresponding information use behaviour.

Although the individual user is central to the notion of IUS, it should be noted that an information use situation is not necessarily synonymous with the information user it features. In other words, the relationship between an individual information user and a specific information use situation is not one-to-one. Rather, it should be possible to discern many information use situations for each user. The idea of multiple IUS per user is explored in the fourth organisation and some examples of such situations are presented in chapter six. The rest of this chapter presents the information use situations explored in the first three organisations studied. The environment of each organisation is explored first, guided by level two of the IUS framework. The object is to discern the common structural and institutional features shared by situations identified in the same organisation. After that the specific features of each IUS are presented.

### 5.1 Tower Hamlets Council

The London Borough of Tower Hamlets Council is one of the nine local government administration units in central London. A borough council is by law an arm of government and is thus classified as a public sector organisation. The main duty of a borough council is to provide and manage, on behalf of the central government, a range of services at local level to the people living and working in its borough area. The services typically cover such areas as education, housing, social services and other social amenities such as libraries, parks, local traffic and managing the environment. The 'line

of business' of a local borough council is thus multiple and varied. In order to contextualise the description of the information use situations in Tower Hamlets Council, a brief history and demographic profile of the borough is necessary.

The area of London currently known as Tower Hamlets has been inhabited for some 2000 years (<http://TowerHamlets.gov.uk>, 22/06/98). Located in the East End of London, this area has since the 16<sup>th</sup> and 17<sup>th</sup> century been associated with the trades, industry and commerce as distinct from the West End which was, and still is, mainly inhabited by the gentry and professionals.

The current population of the borough bears a direct relationship to its history. That history reports that the borough has always been a gateway for immigrant populations. Earlier immigrant communities in the borough included Jewish, Chinese and Irish immigrants. At present the main immigrant communities are of Bangladeshi and Somali origins. The total population of the borough is 170,000 and well over one third of this is of ethnic minority origin with the Bangladeshis making up the largest group (23%). The borough has both the fastest growing population in Greater London and the fastest growing youth population (15-21 year olds) in Europe. Unemployment in the borough is the second highest in Greater London with a rate of 18.2% in January 1997 as compared with an average of 9.4% in Greater London and the rest of Britain. Long term unemployment is particularly a problem in the borough with some 4.7% of the unemployed being out of work for more than a year. The foregoing brief history and demographic profile provides a useful background for describing the environment of Tower Hamlets Council as a business organisation.

## 5.11 The external environment

### *The customers*<sup>20</sup>

The customers of the London borough of Tower Hamlets council do not constitute a homogeneous entity. Just as the line of business of the council is multiple and varied, so is the clientele it directly and indirectly serves. The council is principally responsible for providing and managing the required services for the 170,000 inhabitants of the borough. However many services such as street parking, libraries and environmental facilities are not exclusively provided for local residents. Many people who work or frequently visit but do not reside in the borough also use these services. Nonetheless certain services are exclusively provided for local residents. These include housing and social services, which are the two areas focused in this study. The following characterisation of the customers of Tower Hamlets Council therefore refers mainly to the local resident population.

Geographically, the borough shares land boundaries with three other boroughs, Newham, Hackney and the City of London Corporation. Apart from the City of London, these neighboring boroughs are among the poorest and most deprived areas of Greater London. A common feature of these deprived boroughs is that the majority of people who live there are council tenants, in spite of several schemes and opportunities that offer them the right to buy and own their own homes.

In terms of collective behavioural features, employees perceive the council's customers as a collection of different groups or mini communities. Most of these could be identified as racial or ethnic groupings but some pressure groups often cut across racial and ethnic issues to address common concerns and interests. The individual and collective behaviours of people in these groups range from the very docile and passive to the very loud and assertive, and in some cases aggressive. This variety of behavioural patterns bears significantly on the way council employees perceive and execute their

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<sup>20</sup> The public sector has over the last few years adopted much of the language of business so that terms like clients, patients and claimants have been replaced by the term customer to reflect an increasingly fashionable business culture.

functions in the provision of services to their customers. As a result a variety of information use situations ensue, which reflects the ways employees perceive and utilise the information available to them in their respective roles. For example, a senior officer remarked that the council's decisions about the provision of resources and facilities are often influenced by pragmatic considerations geared towards appeasing loud and aggressive pressure groups in the borough and not so much by priorities based on need. In such situations, it is apparent that the value of the relevant demographic information that indicates the needs of various groups is compromised.

#### *Regulatory forces*

Every borough council in the UK operates within the political, economic and social constraints imposed by the central government. From the perspective of individual employees, the biggest of these constraints tend to be financial, since the national government approves how much each borough should spend. In addition, a number of national and international treaties, acts or policies bear on the way these bodies operate.

All the employees of Tower Hamlets Council interviewed intimated that the financial constraints within which they operate significantly affects the way they perform their functions. In addition, some of the managers reported that their decisions are sometimes influenced more by political expediency than rational logic, personal intuition, or agreed council policy. For example, one social services manager stated that his decision on whether a certain type and level of benefit should be paid to an applicant is normally based on his projection of whether or not that decision would be sustained by the appeals panel. The membership of this panel is usually dominated by elected councilors of the party in power in the borough. Thus the political disposition of the appeals panel is sometimes a more important factor in such decisions than the quality of evidence supplied by the applicant or the manager's intuitive assessment of the case.

Other national and international regulatory instruments also influence the way the council operates. These include the various data protection, privacy and computer misuse acts, the equal opportunity laws, and the demands of various pressure groups such as the citizens advice bureau, feminist, ethnic and environmental associations. These demands and influences permeate the information use situations in which individual employees undertake their daily activities.

### *Competition*

There is very little evidence of competition in the council's activities at both individual and organisational levels. Traditionally, most public sector organisations have been run like monopolies. However the drive towards privatisation since the 'Thatcher era' has had significant effect on many public sector organisations. At present, it is not uncommon to find certain aspects of public sector services provided, on contract, by private sector organisations. Increasingly, this trend is leading to competition between councils and the private sector for the right to run these services. Assuming that the majority of council employees prefer the relatively lax and more 'secure' working conditions of the public sector to the generally efficiency-conscious and less stable environment of the private sector, this competition should constitute a significant factor in shaping council employee motivation. However, apart from the threat of privatisation, none of the employees interviewed felt that they faced any kind of competition or threat in respect of their jobs from any one inside or outside the council. Competition is thus not a major factor in determining the information use behaviours of employees of Tower Hamlets Council. Some employees even report that they know very little or nothing about what and how other borough councils in London are doing in their particular functional area. Others have some knowledge of work in other councils only because of cooperative ventures rather than competition.

## 5.12 The internal environment

### *The Organisation Structure, Culture and Climate*

The 1996 local government election transferred control of the council from the Liberal Democrats to the Labour Party. This transfer of political power brought in a new administrative structure. The new labour controlled council adopted what they refer to as "a new and radical corporate structure designed to meet its corporate objectives of breaking down departmentalism and integrating services at point of delivery" (<http://TowerHamlets.gov.uk>, 22/06/98).

The current administration of the council is headed by a corporate management team, which comprises the chief executive and five corporate directors. The chief executive is responsible for providing a corporate and strategic focus for the whole council. The corporate directors are each responsible for coordinating 'a basket of services' and are also individually responsible for either a geographical area or one cross-functional area. Services rendered by the council are divided into 27 service units within the five corporate directorates and each unit is the responsibility of a service head. In addition, each service head is collectively responsible to a project board through which cross-directorate operations are facilitated.

This study involved six employees from three directorates: housing, social services, and support services. It is not necessary to describe in detail the full administrative and operational arrangements in each directorate. Instead it is more useful to locate each individual information user in the administrative hierarchy when describing information use situations involving them.

Overall, the organisation structure of the council could be described as flexibly hierarchical. Almost all the employees interviewed thought that while there are formal requirements stipulating certain vertical and hierarchical communication procedures, a number of pragmatic realities often prevent strict adherence to these procedures. Frequent informal interaction with top officials and the common access to e-mail and other communication

technologies somehow decrease the formality. The ensuing information culture is a mixture of formal information and communication processes embodied in the council's computerised information systems and a less formal atmosphere, in which equally important communication take place.

Management attitude towards computer-based information could be described as keen. However the main role of computerised information in the council is more of a support role than a strategic or pioneering one. The current thrust of IS development in the council is towards the improvement of intra and extra council communication and information exchange through the council-wide office systems and the council's website. The administrative structure of the council is presented in the diagram below.

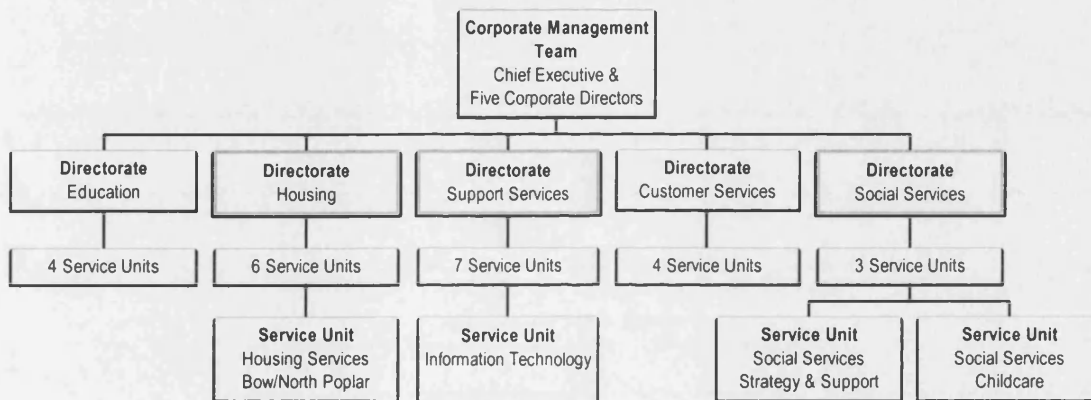


Figure 5 Tower Hamlets Council: Administrative Structure

It is difficult to describe the organisational climate in respect of information use in Tower Hamlets Council. While some top officials are keen to exploit certain information technologies beyond their traditional support role, there is little evidence of a 'council mentality' or attitude to get more out of information. Nonetheless there are tendencies towards enhancing the efficiency of operations through more universal communication mechanisms, better staff skills and IT awareness training.



### **5.13 The information systems environment**

The IUS framework characterises the IS environment in an organisation in terms of three main features: the main business role of the computer-based information systems, the major uses of the systems and the extent of functional dependency on the computer system in the organisation. In a sense, the information systems environment can be seen as part of the internal environment of an organisation. However, the very pervasive and vital role played by information and communication technologies in today's organisations demands that the IS environment be addressed in its own right, especially in a study concerned with information use.

At organisational level, the main uses of Tower Hamlets' computerised information systems can be classified into three: data processing and storage, transaction processing and monitoring, and planning and communication. Five out of the six employees interviewed in this study use the systems principally for transaction processing and monitoring. The sixth person uses it primarily for planning, and all of them utilise the communication facilities to varying degrees.

At individual task levels, the system is used in a variety of ways, depending on the functional role of the employee. Some people use the data and information from the systems as a trigger for pre-determined courses of action in a monitoring and control role. However, such systems-based information is often necessary but not sufficient to ensure the success of the prescribed action. In many cases, supplementary information is required to complete the action. The computer-based information is usually a statement of fact, a periodic snapshot at specific moments depicting the status of transactions between the council and its customers. Examples of this include the weekly printout on the status of rent payments, housing benefit eligibility, and a list of terminated claims. Other users depend on both the data and functional capability of the computer system for their transaction processing and analysis roles. For this group of staff, the computer system is a default tool without which they cannot do their work.

A third category of staff uses the computer-based information as an aid for monitoring, planning and decision making. These people often have more authority and discretion in their roles than the other two categories of staff. That discretion includes how and when they use the computerised information systems. Hence the system is not indispensable to these users and some of them admit that they make very minimal direct use of it or its output. A large proportion of the tasks performed by staff in this category is thus not directly dependent on computer-based information systems.

From the above, it is apparent that certain functions of the council depend significantly on the computer systems while others could be performed without computers. For individual roles, the significance of the concept of computer dependency in describing information use situations is thus relative. However, if we consider the whole organisation, the fact that the main computer systems is not entirely managed and controlled by the council, makes the dependency question significant. For example, users are often frustrated by the inability of the council management to authorise desired changes to the systems, because the mainframe-based accounting system is collectively owned and run by local authorities including Tower Hamlets Council.

#### **5.14 Information use situations in Tower Hamlets Council**

Within the constraints of the relevant organisational environment, the IUS framework stipulates that information use behaviour is directly mediated by the interplay of three main elements. These are the characteristics of the information user, the task in which the information is used, and the solution space associated with the task. This subsection presents an exploratory account of information use situations as perceived by the six employees interviewed in Tower Hamlets Council. For reasons of confidentiality the names of employees are withheld. They are instead referred to as C1...C6, C standing for Council. Similarly, the five hotel employees will be referred to as H1...H5 and the four library interviewees will be L1...L4.

As stated earlier, every information user in an organisation experiences very many information use situations. This study has focused on only one IUS per employee in the three organisations presented in this chapter. Each IUS is centered on a typical task normally performed by the employee. The focus is largely on everyday routine tasks rather than occasional or strategic tasks. This is because even though routine tasks normally form the backbone of business operations, they are often either not evaluated or poorly evaluated so that there is no formal indication of the value of such tasks, let alone the information used in performing them. In spite of this, users often have some perception of how information contributes to processes and outcomes associated with the tasks they undertake. Table 3 presents the six information use situations explored in Tower Hamlets Council.

Table 3: Situations examined at Tower Hamlets Council

User	Job Title	Years in Org.	IT Skill (Self-Assessed)	Task Examined
C1	Assistant Systems Support Officer	6	Expert	Producing a report from a central computerised database
C2	Accounts Officer	>6	Very Good	Terminating a tenancy account
C3	Senior Arrears Officer	<5	Satisfactory	Taking a tenant to court for rent arrears
C4	Area Accounts & Arrears Manager	>10	Good	Taking a rent recovery action
C5	Area Benefits Manager	>6	Satisfactory	Resolving a disputed benefit claim
C6	Research & IT Officer	<3	Expert	Producing a briefing paper for the head of strategic division

The situations are characterised in terms of the role, years of experience, level of IT experience of the user and the specific task performed. These elements were chosen because they are relatively more stable than the other relevant features of the situations. They are therefore used as naming devices rather than full descriptions of the situations. A brief account of the main features of each situation is now presented. The accounts highlight only those features that strike the researcher as relevant to the user's information use behaviour. In some situations only a few factors appear to be relevant to the user's

information use behaviour. The accounts are therefore not of equal length or depth.

#### *C1 - Assistant Systems Support Officer*

C1's main functional role is to provide various types of routine and ad hoc reports for management use. The reports are based on data held on the council's central database in Enfield. C1 could be described as a data processor rather than an end-user of the council's computer-based information. Hence his immediate customers or clients are other council staff, usually managers who receive his reports.

The specific task chosen for examination is the production of the 'housing benefits review form' report. This is a list of recipients of the housing benefits review questionnaire in a specified period. Every six months, the central housing benefits database system in Enfield dispatches questionnaires to all recipients of housing benefit in the borough in a bid to update the records and review eligibility. Because these forms are centrally dispatched from Enfield, individual rent and arrears managers in the various contract areas do not usually know which of their customers are in receipt of that correspondence. The task for C1 is to use his programming and database interrogation skills to extract the said list from the mainframe in Enfield. The respective rents and arrears managers and supporting staff need this report to ensure that none of their customers who is in receipt of housing benefit defaults on their payment. The list is thus used to chase and encourage customers to respond to the review questionnaires.

Apart from his IT skills and knowledge, all C1 requires to perform this task is the relevant transaction data on his AS 400 terminal. C1 describes the report as an important list and suggests that "it is pretty serious if the list does not go out in time". Time is thus an important element in the performance of this task. The evaluation scheme associated with the task is quite simple. The report must reach the relevant managers as scheduled and in the preferred format. Although the validity of the data in the report is quite important, it

actually has very little to do with C1, since he is not responsible for inputting or validating the data. He is thus quite happy to be evaluated in terms of time and presentation criteria. The main factors that influence the performance of this task seem to be the user's IT skills and motivation, the availability and reliability of the computer systems and the evaluation criteria associated with the task.

#### *C2 - Accounts Officer (Rents)*

C2 is a Rents Accounts Officer in the housing department of Tower Hamlet Council. C2's functional role is mainly in transaction processing and monitoring. The task selected for analysis by C2 is the process of terminating a tenancy account. This is an entirely action-based task with no decision-making involved, since the decision to terminate a particular tenancy is taken by other members of the housing department. On receipt of a formal request for termination, all C2 does is to action that request on the computer systems.

The termination action is directly dependent on two factors: Request or advice from the relevant housing staff and the proper functioning of the computer system. In time the various housing staff and managers rely on the task to continually update their workload profiles.

The main type of information required to perform this task is prescriptive. The user is instructed to effect a particular action on certain records in the systems in a particular way. This information is received either through the systems or via hard copy in the form of a proforma. The actual performance of the task is fully dependent on the functioning of the computer systems and no other sources or kinds of information are relevant.

The only performance criterion associated with this task is the requirement that the action is taken within the week the termination is effective. This is quite acceptable to C2 who believes that in spite of other pressures, the task could be done as specified. He states that in about 98% of the time he completes the task as required. Some of the main situational factors that mediate information use behaviour here include, access to the

computer systems when required, pressure of work on the user and the user's pedantic adherence to internal office protocol and procedures.

### *C3 - Senior Arrears Officer*

This user is responsible for approximately 4000 properties owned and managed by the council. His main role is to supervise three arrears officers so that they keep within the laid-down procedures and "make sure that cases are being processed properly right through to court, if necessary". C3's functional role is principally a monitoring and control function, which involves a number of semi-structured decisions and a few limited action options. These decisions could be as much based on hard data as on intuition and feeling, depending on the circumstance. However C3 reports that he is "more the feeling type than the thinking type" and in many cases he has to rely on his intuition rather than hard evidence. He justifies this position as follows: "I think unconsciously, fairness and morality comes into our decisions especially since most of us here have been somehow down the ladder at some point in our life. Even the accountants who are supposed to be working solely with numbers do meet our customers and so they are not just numbers to us but people, we are all human. Our intuition may not always lead us to the right decision-judged retrospectively - but we have to rely on it at the time of making certain decisions".

This user is not very satisfied with the computerised rent accounting system, which is the main source of formal information for his job. He states that the coded format of information available to him does not tell him enough and it would be better if he could input snippets of information into the system, for clarity and as a reminder of the 'state of play'.

C3 chose the task of taking a tenant to court for unpaid arrears for examination. Although this task is guided by fairly well defined procedural guidelines, there are often unanticipated factors, which are not covered in the guidelines. Hence there is some flexibility and discretion in performing the task. In this regard, the user describes his arrears collecting function as a

reactive service. As such outcomes are not always evaluated according to formal organisational objectives. He notes, for example, that success in the court does not necessarily translate into the higher objective of the task, i.e. the actual payment of the arrears. One reason for this is that the court process often takes too long - several years in some cases - and even after the verdict it might take longer still for the payment to come in. Worst still the amount may actually never be recovered. Furthermore, the outcome of the task is sometimes evaluated sub-optimally. For example, C3 considers the eviction of a tenant by court order as a successful outcome of the task in spite of the possibility that the council may never recover the money owed by the tenant. For C3, this outcome is successful because it stops the outstanding rent increasing since it comes off the statistics of outstanding rents. Whether the council will recover the money or not is another matter. Thus certain preferred outcomes of this task do not necessarily translate into benefit for the council. This is not claiming that the eviction of tenants who fail to pay their rent is necessarily detrimental to the council. However it points to the possibility that employees like C3 might be tempted, in certain circumstances, to pursue this option a bit more actively in a bid to improve their performance statistics, which could lead to sub-optimisation.

In addition to routine rent accounts reports and ad hoc feedback from the field officers, this task also requires up-to-date information on housing policy and legal procedures. Much of this latter information comes from legal experts and documentation. Information about the circumstances of the tenants at the time of the court action is also vital. In many cases, the decision as to whether a court action should be taken is swayed by this information, which gives the user insight into the tenant's financial and domestic situation. The bulk of this information is however usually not computer-based.

Several situational factors mediate the performance of this task. These include the user's perception of the relative importance of formal and informal information in performing the task, his personal motivation towards

specific outcomes, the evaluation criteria associated with the task, and the external national and local legislative and political constraints.

#### *C4 - Area Accounts & Arrears Manager*

C4 is one of four area accounts and arrears managers in the council. The council housing directorate is split into four community areas and eight contract-zones. Each area has an account and arrears section, which is responsible to set up and maintain the rent accounts and recover outstanding debts. C4 is thus responsible for managing the rent and arrears accounts of approximately one-quarter of the council's tenants. Like C3 above, this user's functional role is in monitoring and control but at a higher and more aggregate level than C3. As such he hardly deals directly with customers or tenants except in very special cases. This user sees his role as a pure accounting role in which he professes to rely more on information derived from hard data than on intuition. "I would put more weight on the (computer) system. There is less intuition in accounting", he declares.

C4 elected to examine a rent recovery action as an example of a typical task he often performs. As a manager, he does not really decide on or initiate individual rent recovery actions but he is responsible for directing and monitoring such actions in the entire area under his control. The main source of information for this task is the computerised accounting system but this information is supplemented by various formal and informal information interchanges between the field workers and the office-based housing staff. Some of these interchanges are via telephone, formal proformas and system-driven reports. Hence several kinds of information feed into this task and the core systems-based information derived from transaction records acts mainly as a trigger for action.

This combination of different types of information makes the role of factual computer-based information difficult to assess. The key IUS factors here seem to be the organisational culture and climate. The user's information use behaviour seems to be significantly influenced by management's lax



attitude to enforcing sanctions when performance targets are missed. Other factors include the user's low opinion of his role and status in the organisation and the constraining effects of national and local politics.

#### *C5 - Area Benefits Manager*

This user is one of the four area benefits managers of Tower Hamlets Council. His team of 31 staff is responsible for administering various council benefits to one quarter of the borough. He manages and coordinates the activities of these staff who are split into 4 teams. This user's functional role is a combination of monitoring, control and planning. This role involves a variety of decision-making tasks, which utilise both computer-based information and various intuitive and subjective considerations. He does not routinely interact directly with the council's benefit customers, but every now and then his frontline staff forward difficult cases to him, which necessitate meeting the customers concerned.

Resolving a difficult benefits claim is the task selected for examination by C5. A difficult case arises when a benefits applicant refuses to accept the decision of the frontline benefits processing staff. The team leader of the frontline staff would then refer such cases to the manager. Resolving such a case is normally a semi-structured task but in some cases it could be quite unstructured. Depending on the particular case, C5 might tackle the case by following certain laid down procedures, which have in-built discretionary powers or he might rely mainly on his intuition, personal judgement and feelings. The outcome of this task is very significant to C5 because it reflects his skills as a manager and also impacts on his productivity. If the case is not resolved at his level, it goes to the appeals board where it can consume a lot of his effort and time.

This task depends on various types of information in addition to an up-to-date knowledge of the benefits assessment procedure. First, it needs accurate and reliable reports from the computer systems, which is usually the basis of deciding the applicant's entitlement. Second, it requires

supplementary information from manual files on the applicant, which normally contain more details, including evidential documents relevant to the case. The user also needs to anticipate the type of decisions the appeals court would arrive at if the case reached it. The task is thus dependent on information originating from several sources and also on the user's personal intuition, judgement and knowledge of the benefits systems.

Success in performing the task does not correspond to a single clearly defined outcome. Furthermore the various outcomes that may pass as a resolution of the problem may not necessarily depend, significantly, on the quality of information used. Thus even with the right information, the ideal outcome might not be achieved. For example, C5 describes a successful outcome of the task as "when the case is resolved". He however describes three scenarios that meet this objective.

- a) When he is happy that he has done the right thing and the customer is happy and satisfied with the outcome.
- b) When the customer is satisfied even though he has stretched the rules a bit to satisfy the customer.
- c) When the appeals board finds in his favour, if the customer takes the case to appeal.

The user suggests that use of the same information can lead to any of these outcomes, which are clearly not the same, although they are all considered successful outcomes. This is why it is sometimes inappropriate to judge the value of information solely on the outcome of its use. The external environment constitutes an important influence on the user's information use behaviour here. The nature of the political and legislative constraints on the user is particularly relevant in this situation. Other situational factors include the user's management skills, level of authority and self-confidence, and types of customers served.

### *C6 - Research and IT Officer*

The social services directorate comprises three divisions namely, adults, children, and strategy divisions and each division is headed by an assistant director. C6 is the research and IT officer in the social services directorate. He is directly responsible to the assistant director in charge of the strategy division but his duties include information and IT support to assistant directors of the other two divisions. In particular, he is the IT officer in the planning and research unit of the strategy division. The unit is responsible for monitoring and reviewing, and sometimes initiating policies, training, and quality assurance measures.

The main duty of C6 is to ensure that the three assistant directors are provided with relevant information in the areas outline above. To do this he constantly scans a variety of information sources and media on specific issues pertaining to the unit as well as undertaking new research where appropriate. This user's functional role is mainly related to strategic planning and his specific duties are to act as an information provider or resource person and a researcher. Both of these duties are principally directed at formulating strategy that guides the continuous review and planning of the council's social services. In this dual role, this user has as his customers, both the employees of the council and the external customers.

The council's central database and the unit's local AS 400 system are two of the many information sources accessed by this user. He believes that they are adequate and in some cases vital to his work. Their main appeal is in the ease of access and the scope and potential for new kinds of information they offer. However he relies significantly on other formal and non-formal sources of information. Most of these are outside the council even though his unit undertakes some research, usually on very specific issues from within.

The task chosen for examination is the production of an ad hoc briefing paper on a specific issue for the assistant director of the strategy division. Depending on the issue(s) in question the content of the briefing paper may be derived entirely from the council's computerised data resources, or entirely

from outside or a combination of internal and external sources. Because of the user's high level of computer and communication skills, the physical availability of the information required is not much of a problem but the sheer volume and variety of information he receives on a daily basis sometimes makes the cognitive availability of the most relevant information quite demanding.

Successful accomplishment of the task is indicated by the opinion of the bosses about the paper. If they feel that it is an adequate piece of work, then C6 is satisfied that his role has been performed even if the recipients do not agree with the evidence or recommendations in the paper. Hence the reliability of the process of producing the paper and the clarity of presentation are often more important to C6 than the acceptability or adoption of the content. If there are no political, social or cost constraints acting against the rational use of the evidence presented, then the success of the task could be judged by whether or not the paper directly influences relevant decisions on the issues covered. The main performance criteria for this task are the clarity of evidence presented and the timeliness of the information. The Key IUS factors here are the user's IT and research skills, his perception of the usefulness of the task and the prevailing financial and political constraints experienced by the council in general and the research division in particular.

## **5.2 Landmark Hotel**

Landmark is a privately owned five-star luxury hotel in the heart of London. It has a capacity of 305 guestrooms. Some of the main facilities offered by the hotel include a 15-metre long indoor swimming pool, a fitness gym, and steam sauna and massage services. The hotel also features a large number of function rooms with varying capacities for various business-related functions and pleasure. There are 11 such rooms ranging from a ballroom with a maximum capacity of 500 for a reception, to the 'Landmark Room' that sits 14 people as a boardroom. The full complement of functions for which these

rooms are used includes reception, lunch/dinner, dinner/dance, classroom, theatre and boardroom.

The above range of facilities gives an indication of the type of guests or customers the hotel attracts. Although it is open to anyone that can afford it the hotel is mainly used by international and corporate business people. Frequent visitors include North American, Middle Eastern and Asian business people. Most of the staff interviewed believe that, in general, the hotel copes well with the customers although some customers are sometimes particularly hard to please.

### **5.21 The environment**

The Landmark faces fierce competition from the numerous hotels in London. In particular, it faces competition at the top-end of the luxury hotel market from 8 other luxury hotels in London. The staff are however confident that the facilities and services they offer are among the best in the UK and are quite comparable internationally. Asked to rank Landmark Hotel among comparable five-star hotels in the country, the general manager placed it among the top 10%. Three other employees independently ranked it among the top 5, top 3 and the first in UK. In spite of this, they all acknowledge that competition for guests is very fierce and this keeps them alert and perpetually on their toes.

An important tool in maintaining this alertness is the ready access to and the appropriate use of information. The information required covers such areas as the state of facilities and services the hotel offers, current and historical information on guests, market trends, intelligence on competitors, financial and business news, technological developments, internal operations, and staff performance indicators. Although this information is very important to the hotel's operations it is nonetheless a vital tool rather than the main driver of the hotel's business activity.

As a privately owned enterprise, the hotel is not bounded by any direct political constraints apart from certain general legislative guidelines like the

food and hygiene regulations, fire and safety act, and the privacy of information act. Thus the day to day operation of the hotel is guided principally by business considerations. These considerations include industry or sector specific agreements such as the food purchasing agreements, which binds member hotels to buy food exclusively from certain specified stores.

The extent of dependency of the hotel's operation on computer-based information is great. The hotel's reception manager describes the current systems, which was installed only a few months ago, as "not only an information system but also an accounting system as well as an administrative system". This manager believes that the integrative property of the system by which he can instantly access information from all departments that directly impact on his job makes the high cost of the system justified. Nonetheless the hotel can still function, somehow, without the computer system. In fact, just a week before these interviews, the system was down for six days and the hotel continued to function fairly adequately, though with some difficulties. "Man, it was quite chaotic with papers and files everywhere until the system came back alive and the papers disappeared...I personally did not know how difficult it would be because I've never worked in this capacity without computers", said the reception manager.

As a hotel, the products of this organisation come in the form of facilities and services it offers to customers. The provision of many of these facilities depends on computers. For example, computers control the air-conditioning and general heating and ventilation, which are vital aspects of the services offered. Other hotel functions such as reservations and booking, accounting and the maintenance and storage of transactional and historical data about guests all depend on computerised information systems. Because of this, the use of computer-based information in the hotel is widespread but the level and scope of use varies considerably. For some departments, like front desk and reception, the computer system is the default tool of the trade

while others such as food and beverages, and housekeeping use it occasionally and only as a support tool.

Depending on the staff one talks to, the administrative structure of the hotel is described as either rigidly hierarchical or flexibly hierarchical. Across these hierarchies, the hotel operation is divided into a number of functional departments. These include accounting, booking and reservation, front desk, food and beverage, housekeeping and the internal audit unit. The information interchange patterns among employees within and between these functional departments and between staff hierarchies is a mixture of very formal and structured procedures and completely informal interactions. Although there is an understanding that any member of staff could communicate directly with the general manager, when necessary, some employees and certain departments tend to experience more formal and rigid communication patterns than others. This is probably why some members of staff perceive the administrative structure as a rigid hierarchy while others see and experience less formality in the hotel's operations.

To the extent that the general manager is fully responsible for every aspect of the hotel's operation, it could be said that the hotel's administration is centralised. However all the functional departments are seen as specialist units headed by competent professionals who enjoy certain levels of autonomy and empowerment. The fact that the facilities and services provided by the hotel combine into a single composite product from the perspective of guests however demands that the various specialist operations should be carefully coordinated, if not synchronized. This demands a centralised monitoring and control system, which often reflects a highly centralised management structure. Part of the justification for the new and expensive computer system is based on this requirement. The object is to coordinate the activities of all units within the hotel by providing instant and dynamic communication and information sharing facilities. Other reasons for purchasing the system include the need for modernizing the hotel's

operations, and the potential for growth and development of the hotel's facilities.

## 5.22 Information use situations in Landmark Hotel

Five employees of Landmark Hotel were interviewed in this study. Four out of the five employees are very senior managers and one of them is the highest executive of the hotel, i.e. the general manager. The fifth employee is a supervisory grade staff in the food and beverage department. For reasons given earlier, the five employees are referred to as H1...H5 instead of their real names. The situations examined are presented in Table 4. This is followed by a summary of the main features of each situation.

Table 4: Situations examined at Landmark Hotel

User	Job Title	Years in Org.	IT Skill (Self-Assessed)	Task Examined
H1	Head Storeman	6	Good	Purchasing food & Beverages
H2	Reception Manager	2	Very Good	Resolving a guest complaint
H3	Operations Manager	<5	Good	Resolving a customer complaint
H4	Internal Auditor	>1	Satisfactory	Auditing the purchasing process in the hotel
H5	General Manager	>1	Unsatisfactory	Reviewing the monthly Profit & Loss Account

### H1- Head Storeman

The designation of this user is head storeman (stocks), in the food and beverage department of the hotel. His main duty is to purchase all the consumable goods the hotel needs for both routine use and for special functions. This is an operational task, which is seen as a crucial background support function in the general operation of the hotel.

H1's job is a good example of a single task function. Essentially, all his job entails is purchasing items for the hotel as required. The task of buying food and beverage items on behalf of the hotel is thus selected for examination. This is a very routine task, which is performed on a daily basis. The bulk of the task is quite structured although there is in-built flexibility for



user discretion. The user is told specifically what to buy, and for food items, he is even limited to a number of stores where he can get them. Beverages can be bought from any store of his choice but only if they are the cheapest of the kind at that moment. Time is a very important factor in the performance of this task. In certain cases, it makes the difference between success and failure.

To perform this task, the user needs to receive accurate purchasing requests from the relevant departments. He also needs to access information on the availability and prices of the requested items. The purchasing process is significantly dependent on the computerised price list database, which is the principal source of information for the task. Although the buyer can consult other sources like magazines and colleagues in other hotels, he is mandated to check the systems-based price list first before moving to other sources

As stated earlier, time is a crucial factor in determining the success or failure of this task. If, for example the required items fail to arrive at a particular time, it is sometimes as disastrous as failing to buy them at all. This is one reason why the readily available computer-based price list is highly valued by the hotel. If and when items could not be found on this list, the other sources of product information are utilised and the new information is subsequently incorporated into the computerised database. The key information value objectives of this task include the availability, accuracy and currency of the information and the main IUS features include the competition conscious organisational culture and climate and high user motivation.

### *H2 - Reception Manager*

H2 is the reception manager of the hotel. He describes his job in the following way: "The most important thing is to make sure that all the guests get what they have booked. I have to also make sure that there is enough staff to do all the tasks required. So I actually have two clients, the guests and the staff and

I have to keep both happy and working". Although the reception manager is not actually part of the reservations team, his role involves what he refers to as "selling rooms", if only indirectly. The best way to do this is to ensure that the clients have a pleasant stay in the hotel, which often results in them coming again.

The main duty of this user is focused on customer service management. In this role, he relies as much on computer-based information as intuition, personal experience and general gut feeling. H2 is especially pleased with the high standard of service in his current organisation. "I keep telling my group that this is as good as it can get. I've worked in many other hotels. Every time we check out a guest and he says this is the best hotel I've ever been with a big smile, it suddenly recharges your battery", he remarks.

H2's team relies almost exclusively on the hotel's computer system for the operational task of checking in and checking out guests. The information they require for these tasks is input into the system by the reservation team. This includes information about arrivals, departures, number, status and attributes of rooms, guest preferences and special requests. In addition every member of the reception team is allowed and encouraged to input relevant supplementary information about the guests' stay, including their personal dispositions and habits. If possible, most of this information is input before the guest arrives at the hotel. The computer system is not only the principal source of information for H2 but a very convenient and highly valued one too. He remarks that "what is more appealing is the fact that I can have all the information together. At one go, I can have information from room service, reservations, housekeeping, accounts, guests, travel agencies etc. So in one single view, I can see virtually all the information I need, which shortens the transactions considerably". Time saving is thus the principal indicator of value of the information systems for this user.

H2 chose the task of solving a guest's complaint for analysis. Although routine interaction with guests is normally left to the receptionists, he comes into the picture when difficulties arise. Handling a guest's complaint is a

routine task as it happens every now and then, but it is a very unstructured task. Even though there are some guidelines on how to approach the task, cases are often different from each other and hence require individual approaches. Depending on the nature of the complaint, the task could be handled entirely by H2. If however the demands seem to be beyond his capability or authority, he may seek assistance from other senior personnel and in extreme cases, refer the matter to the general manager. In all of these scenarios, H2 remains an active member of the team seeking a solution to the problem.

The hotel requires that all complaints should be resolved on the premises, which implies that the task has a time constraint. The speed with which complaints are dealt with sometimes serves as an indicator of the effectiveness of the hotel's services.

Depending on the nature of the complaint, the task may or may not need computer-based information. When needed, the system is often used to perform audit trails so that errors or lapses, if any, that may have caused the problem are discovered and adequately addressed. Performance is evaluated in terms of measures like the speed of response and number of complaints dealt with effectively. A report is written on every complaint irrespective of its outcome. This serves as a monitoring and control tool as well as a learning process. The hotel's top management is usually very interested in both the process and outcome of this task and gravely concerned if it is not performed properly. This is because every single task of this nature has a potentially detrimental effect on the hotel's image. The task is thus significant at operational, managerial and strategic management levels of the hotel. As in the case of H1, the main information value objectives here are accuracy, currency and instant access when required and some of the key IUS factors include the organisation's work culture and climate, and the reliability of the information systems.

### *H3 - Operations Manager (Food & Beverages)*

H3 is the food and beverage operations manager at Landmark Hotel. He describes his role as "maintaining the standards of the hotel in the operations and also maintaining the staff and their moral, and generally ensuring the upkeep of the hotel from food and beverage point of view". Essentially, this role takes the form of a communication link between the food and beverage team and other parts of the hotels.

H3 is one of the senior managers of the hotel even though he classifies his position as middle management. His functional role is principally directed at staff and operational processes rather than direct customer service and his main function is described as "active hands-on monitoring and control of all food and beverage operational processes". The information utilised in this role comes from the hotel's computerised information system and other formal documents used in internal communication between and within functional departments. In addition, a considerable amount of informal interaction and information interchange takes place.

This user selected the task of handling a customer<sup>21</sup> complaint for analysis. This task often needs very little or no computer-based information. Since the majority of the complaints that H3 encounters are about the quality of food served, they often have nothing to do with computerised information. Successful accomplishment of the task would hence depend on personal skills, intuitive judgement and various supplementary verbal information and observation. The availability of this information is not always guaranteed and even when such information is available, its reliability and accuracy is often a matter of personal judgement for H3. The information would normally come from the complaining customer and the team of staff directly connected with the service or product in question. In real-time situations, there is no formal means of validating or proving as correct, contested representations from either parties but the overriding objective of always trying to satisfy the

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<sup>21</sup> A guest is slightly different from a customer in the sense that a guest is someone staying in the hotel while a customer might be visiting the hotel for a meal or a meeting.

customer plays an important part in the determination of a solution. Again the performance criteria for this task include the speed of resolution of the complaint and its effect on the customer's opinion about the hotel and by extension his future patronage. "Whatever we do, we want the customer to come back to the hotel", he says. It seems that the information required to accomplish this does not necessarily have to be formally available. This means it is sometimes difficult to determine what the right information is for accomplishing the task.

According to H3, the only successful outcome to this task is convincing the guest that whatever the cause of the complaint, it will not happen again and that the guest is willing to do business with the hotel again. Obviously information plays an important role in ensuring that staff do not commit errors that will give rise to complaints but when such complaints do not arise from staff error, which sometimes happens, then formal information may have very little to offer in tackling or avoiding the complaint. Informal information and interpersonal skills may therefore be more useful in such situations; hence their value needs to be recognised accordingly. For this task to be successful the user must always have a wealth of background, and usually non-formal, information about the customers. He must also possess good communication and interpersonal skills as well as a high level of motivation at work. Some of the key IUS factors here include the user's interpersonal skills, motivation, type of customers and the organisational climate.

#### *H4 - Internal Auditor*

H4 is the internal auditor of the hotel. Her role is to keep a keen eye on the operations of this and another hotel in London under the same ownership. She knows the owner of the hotel personally, which suggests that her interest, responsibility and authority in the hotel might not be entirely based on the formal specifications of her job or position. "Because the owner is in Bangkok,

my job is to see how the hotels operate and make sure that everything is fine and the control system for both hotels operates well", she reports.

Functionally, her role entails the monitoring of the operations of the two hotels and especially the continuous checking of the controls that keep staff and procedures in line with the specified objectives. Various types of information and data are required in this role. Data from the computerised information system is often combined with personal intuition and insight gained through direct observation and interaction to form opinion and judgement about processes and staff performance. The user thus relies on both formal and informal sources of information. As a trained accounting professional, she however puts more premium on formal data and records, although she suggests that an auditor must always have something like a sixth sense which transcends formal data. Much of the formal information comes from the computer system, which the user describes as "better than the old one".

H4 chose the task of auditing (checking) the purchasing process of the hotel for analysis. It is her duty to ensure that the hotel's purchasing team follow the prescribed procedures and that the reports and supporting documents they submit are both authentic and accurate. The main objective of the task is to ascertain that the purchasing team has followed the procedures as prescribed. To do this, she tries to cross check factual data in documents and reports submitted by the team with personal observation and comparison with prescribed procedure.

There are no specified performance criteria either in terms of process or outcome for this task. H4 has the autonomy to choose which aspects of the hotel's operations she wishes to check at any time, as long as she is satisfied that the hotel's controls are not being compromised. She evaluates her performance according to how much of her self-prepared schedule of work is accomplished. In terms of the particular task under review, she characterises a successful completion as when she is satisfied that the purchasing staff members are performing their duty efficiently, are happy, and she has found

no discrepancies (e.g. cheating) in their work. Poor performance in her job as well as the particular task in question comes in two forms. First, she considers it poor if she fails to meet her schedule of work and second, if she fails to discover a discrepancy or malpractice, which is discovered later by someone else. This second element is a source of irony for H4. As an internal auditor, her duty is primarily to prevent malpractice but it is also her duty to discover those that she is not able to prevent. The irony or point of dilemma is, as she put it "I hate to find something wrong but also I am sometimes annoyed that I have not found anything". On the one hand, it gives the impression that she is performing her duty effectively and on the other, it may appear that she is not doing anything and that her position is in effect redundant. Because of this, the user prefers to base the evaluation of the task in question on process rather than outcome. The two performance measures she associates with her job and hence the task under examination are (a) whether she meets her schedule of work as planned and (b) whether her bosses in both London and Bangkok are satisfied that she is doing her job well. The user's motivation and ability to do the job effectively constitute the main IUS factors here. These are mediated by the socio-political factor of her being personally 'related' to the owner of the hotel.

#### *H5 - General Manager*

H5 is the deputy managing director of Landmark UK and the general manager of Landmark Hotel, London. H5 is responsible for every aspect of the hotel's operation but the main thrust of his role could be described in terms of planning, monitoring and control. In a highly customer centered business, this involves hands-on and shop-floor activities as much as traditional office or desk based managerial work

H5 relies on various formal computer-based and other forms of information to perform his role. The hotel's new computer system is a reliable and vital source of information for this user but occasionally, depending on the purpose, information is sought from external consultants. "I assume it is

reliable if it comes from a consultancy company", he says. From an operational perspective, he believes that computer-based information is indispensable to the hotel but only as a support tool rather than a key resource or business driver.

The task of reviewing the monthly profit and loss statement was chosen for examination by H5. In this task the profitability of the hotel in a particular month is compared with the figures for the same month in the previous year and decisions are made for a course of action depending on the result. Again there are no formally specified performance criteria associated with this task. Apart from the overall performance of the hotel, which could be related in some way to the task under examination, H5 evaluates this task according to his personal satisfaction about the quality of the report and the effectiveness of the decisions and actions they trigger. That effectiveness is measured purely in terms of performance outcomes such as increase in sales or reduction in cost, since these outcomes are in effect the highest objectives of the activities in the hotel. Some of the key IUS factors that influence information use behaviour here include the level of user discretion and authority, the hotel's financial position and the extent of competition faced by the hotel.

### **5.3 The British Library of Political and Economics Science**

The British Library of Political and Economic Science (BLPES) is the official library of The London School of Economics and Political Science. From its name, it is apparent that the library is mainly devoted to the social sciences. On the library's crest, it claims to be the world's greatest social science library.

#### **5.31 The environment**

The library's customers are mainly students and academics of the London School of Economics and other colleges of the University of London. It also serves a large number of external users from the United Kingdom and abroad. The demographic characteristics of these customers vary widely, ranging



from British and foreign teenagers pursuing first degree courses to experienced researchers and academics from various countries of the world. Because of this heterogeneity it is difficult to describe, in general terms, the behavioural relationships or nature of interactions between the library and its customers. Some of the staff interviewed regard the bulk of the customers as demanding, difficult and generally aggressive. Others believe that apart from a few bad apples, the customers are normally considerate and not different from the 'average customer'.

As part of a charity status organisation, the library is not a 'for profit' organisation. It therefore does not face direct competition in the commercial sense. However it competes with other similar institutions in terms of the scope and quality of services it provides. For example, part of the UK-wide assessment of research in universities concerns the quality and range of library services they provide. In the 1998 assessment, the BLPES scored among the top three university libraries in the UK. In this respect, the library faces strong competition from other university libraries in the country. As one staff put it "we have to constantly think about our position and our corporate image, as it were".

The daily operations of the library are guided by a number of national and international regulations and acts. The most prominent of these are the various data protection acts, copyright laws, and a number of national and international inter-library arrangements and agreements. Generally, most members of staff interviewed think that these regulations are necessary and quite useful although some believe that some of the regulations constrain their work.

The librarian, who is also the director of information services, heads the library. She is supported by the deputy librarian and three sub-librarians, who are each responsible for the four main functional divisions of the library. The divisions are external services, information services and collection development, archives and rare books, and collection management. Staff in the library could be classified into three categories: professional librarians,

public service staff and library administrators. These are however not mutually exclusive categories since some staff fall into more than one category. The four employees interviewed in this study are all operational staff from two of the four functional divisions, namely: management and external services and archives and rare books. The staff interviewed however come from all the three categories above. The organisation structure of the library is presented in the figure 7.

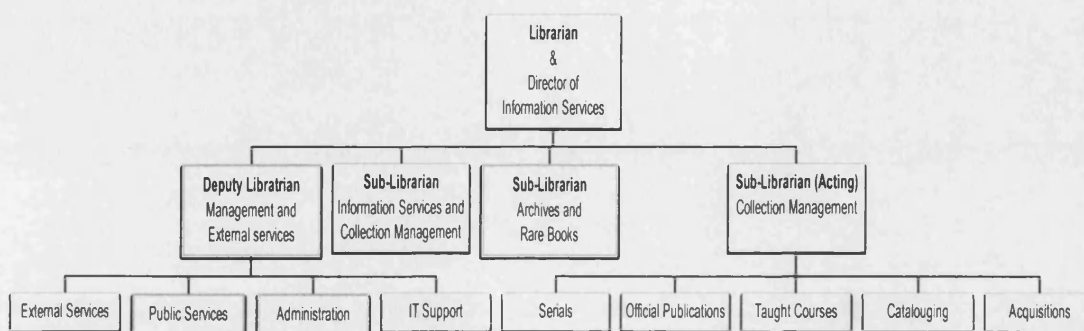


Figure 6 BLPES Administrative Structure

The role of information and communication technologies in the library service in general has changed through the past decade from that of a support tool to an important component of the service provided, and then to the driving force behind certain types of services. New computer and telecommunication technologies have been the main vehicle for this change, which has engendered new forms and levels of services. This in turn has altered the customer base of the library, which is no longer limited to people who physically visit the library. The environment of the library is hence highly dependent on computer and communication technologies. In fact these technologies are now part of the services and products offered rather than just tools. Examples of such services include CD ROMS, on-line journals, electronic images of documents and several remote access services. Nonetheless, though computer-based information is widely used throughout the library, the scope and manner of use varies accordingly to the roles performed by individual users.

The four situations explored in the BLPES are presented in Table 5, followed by a summary of the key features of each situation.

Table 5: Situations examined at BLPES

User	Job Title	Years in Org.	IT Skill (Self-Assessed)	Task Examined
L1	User Services Circulation Supervisor	>4	Good	Training new staff for Front desk duty
L2	Senior Library Assistant	>6	Satisfactory	Inputting admission data into a computerised database
L3	Library Assistant	<1	Satisfactory	Resolving a disputed loan
L4	Archives Assistant	>2	Very Good	Producing an archives list of publications

### 5.32 Information use situations in the BLPES

#### L1 - User Services Circulation Supervisor

L1 is the user services circulation supervisor. This is essentially a 'front-line' position, which means that L1 spends most of her time at the service counter. In addition to serving customers over the counter, she is responsible for supervising and training reception staff as well as managing overdue book loans.

The task of training new employees in the library's admission policy was chosen by L1 for examination. This task involves a number of preliminary decisions followed by the actual process of delivering the training. This is a routine task, which the user performs every two months. The task could be said to be semi-structured because although there are guidelines on what should be done, there are no precise laid down procedures on how it is done.

The main source of information for performing this task is the admissions policy manual. The manual specifies the content of the training but does not show how the training should be done. The formal information thus provided for the training is necessary and important but not sufficient to ensure an effective training.

The objective of the task is to ensure that the reception staff is adequately knowledgeable and equipped to perform their front desk duties properly. This objective is not however easily measurable, especially immediately after the formal training session. Even with the right information, the objective is not always necessarily achievable. Other factors such as the commitment and capability of the trainees and the knowledge, skills and experience of the trainer play an important role. The availability and reliability of the computer system is vital since the training involves the use of the system, but the trainers knowledge about the admission policy and her training skills are crucial to the success of the task. The main evaluation criteria include completing the task as scheduled and the performance of the trainees at the front desk on completion of the training. However, while the former criterion applies to the trainer, the latter is largely taken as an assessment of the trainees and not the training process. The relevant IUS factors here include the assessment criteria in place, the organisational climate, the user's training skills and level of motivation.

### *L2 - Senior Library Assistant*

L2 is a senior library assistant in the BLPES. According to her, this is a supervisory position but her actual duties and responsibility do not reflect this position. She points out that "If I was a normal senior library assistant, I would have several staff working under me, but I am not. I am a grade 3 senior library assistant but I don't have any supervisory responsibilities, I basically work as a library assistant". She describes her duties as "serving users at the front desk, and dealing with routine and sometimes complicated inquiries". Thus the thrust of her work is in customer service, which involves some basic transaction processing and background clerical work.

This user believes that she is rendering an important and valuable service but she has not been given the authority and responsibility commensurate with her formal designation. She therefore feels undervalued by management. This is probably part of the reason why she appears to be

very poorly motivated and generally unhappy at work. She has a very negative attitude to both her work and the library as a whole. When asked how the success or failure of the library would affect her, she replied as follows: "I am afraid I don't care, I know that is a very negative thing to say but I really don't care". She thinks that the work processes and nature of supervision she receives are oppressive and not motivating. In addition, management does not ensure that she is given all the information and training she requires to perform her job effectively. Instead, she is expected to know more than she is provided with. Nonetheless, she is very confident about her capability to meet the requirements of the job.

L2 believes that IT is vital in the library's work but thinks that management's trust in IT and the expectations from it are excessively high. Because of this, she suggests that the cost of the technology might not be justified. Asked to describe management's attitude towards computer-based information in the library, her reply was "I think they think it is God, you'll forgive me for being vicious but they think it is God". In addition to the computer system, the other main sources of information for this user are her colleagues and bosses, and the various work manuals. The user is however not particularly impressed with the first two sources. For example, she points out that decisions made by the IT department are often not very good. "When they upgrade the system, they actually sometimes make our job more difficult". Furthermore, she often gets conflicting answers from colleagues and bosses when she inquires about something she is not sure of. Because of this, she would rather not ask any one if she could help it. She therefore does not have a very high opinion about her formal sources of information.

The task of inputting data into a library admissions database was chosen for examining. This database is part of a project geared towards offering an on-line reference service to all users. The input task has a clearly defined objective, i.e., to input exactly 90 records per day. The user does not believe that this objective is appropriate. She argues that the rigid adherence to a quantitative objective can easily result in a poor quality of work. For

example, as long as she can input 30 records per hour, "it does not matter that the records are full of bad spellings and other typographical errors." She therefore believes that she is being paid for the "sheer volume of work... and it feels like working on an assembly line". She points out that this sort of work leaves no room for personal initiative. This is compounded by the continuous monitoring of her performance, which she blames on "too much management structure in the library administration". Asked how she evaluates or assesses her own performance, she replied that her only criterion is whether she has satisfied her boss, by meeting the set target. "If I do my job, she'll leave me alone", she added.

This user is convinced that both management attitude and the nature and organisation of work processes are as important as information in the performance of her job. Her very poor opinion of the former as well as aspects of the latter suggest that this user is not working in a conducive environment and hence does not experience much value in her information use situations. The management style, user motivation and the task evaluation criteria are some of the main IUS factors that influence this situation.

### *L3 - Library Assistant*

The main duties of L3, who is a library assistant at the BLPES, include checking-in and checking-out books and attending to various customer queries and inquiries. Off counter, she is responsible for disputed loans and missing items in general. This includes the levying of fines for overdue and missing items as well as taking decisions on disputed loans. This is an operational role within customer services and the actual tasks she undertakes are mainly transaction processing and some clerical work. L3 relies very much on hard data, in the form of transaction records as well as formal policy and procedural information, in performing her duties. Nonetheless, there is room for personal judgement and intuition when it comes to dealing with disputed loans and missing items. "We don't always follow the rule. For

example, if an academic member of staff is involved in a disputed loan, we may decide not to invoice them since we don't want to bother them too much", she reports. However on the whole, L3's role demands that she must rely more on information based on hard data than intuition or feeling.

The task of resolving a disputed loan was chosen for analysis. This task involves some decision-making and follow up action. The decisions are usually semi-structured even though there are formal procedures that must be followed. The library policy demands that each case of disputed loan should be completed in two weeks but time is not really a crucial element in the performance of this task. Often the loan periods of items in dispute are simply extended until the case is resolved. This creates a backlog of cases but does not attract any form of sanctions for the staff in charge. L3 is fully responsible and accountable for this task since no senior personnel is directly concerned or interested in it. The task is however monitored through a monthly statistical report compiled by L3 and occasionally it attracts managerial attention if performance falls far below the expected standards.

The information required to perform this task comes from both paper-based sources and the computer system. However the task cannot be performed without computer-based transaction records that indicate the status and history of the loan. The task also utilises information from the borrower, as an external source. Various book catalogues and library manuals may also be consulted in the process. Most of this information is relatively easy to access.

The objective of this task is to resolve the dispute between the borrower and the library in such a way that the outcome is fair to both parties. This is not a clearly defined objective since it does not refer to very specific outcomes. Although the task is guided by the policy and related procedures of the library it often depends on the task performer's personal judgement and her perception of fairness. Thus even with the right information, the objective may not necessarily be achieved. Key IUS factors here include the

organisational climate, user attitude and motivation and the solution space of the task, especially the task monitoring and control procedures.

#### *L4 - Archives Assistant*

L4 describes her job as "collections management". This involves sorting and listing collections of papers and other items relating to various topics. To do this, L4 goes through all the items detailing their relevant features and then writes an overview for each item or set of items. The listings are stored in the archives' computerised database as a cataloguing, information retrieval, and reference tool and resource. Other duties of L4 include the conservation of documents and helping readers with searches for items on the database.

L4 chose a very specific task she was currently undertaking for us to examine. The task was to list a collection on a pressure group that was set up to look into how the elderly are looked after in institutions. Producing good and accurate lists is a very meaningful and satisfying experience for L4. Both the process and output are sources of joy. The quality of the lists produced does not only reflect the proficiency of the individual staff that compiled it, but also the image of the archives unit and the library as a whole. When archives lists are compiled, they are often for specific use but are also kept and made available for future use.

The unit's computerised database plays an important role in the performance of the task. However, depending on the topic and the availability of in-house materials, the task may require information from external sources with little or no input from the in-house system. L4 is entirely free to seek information from any source although there are formal guidelines for judging the reliability of those sources. She also has to rely on her personal judgement and professional skills to decide on which bits of information to highlight in the list. This is in effect a judgement of relevance and usefulness on behalf of prospective users of the list.

The objective of the task is to produce a comprehensive list of available materials relevant to a specified topic. The process for attaining this objective



is however not structured and there is no single output that exclusively meets this objective. As such there are no rigid performance criteria for the task. Apart from the implicit requirement that the task should be completed within a 'reasonable' period of time, evaluation of the task depends on how the result (the list produced) compares with similar lists in other libraries and the standards for producing such lists. Some of the main IUS factors that influence the performance of this task include the physical and intellectual access to various information sources i.e. the IS environment, and user motivation and skills.

We will now examine all the IUSs explored above with a view to categorising them.

#### **5.4 Categories of IUS in three organisations**

The belief that every information use situation is unique and therefore different from any other may be theoretically attractive in considering the cognitive use of information but it is not practically useful in business organisations. In practice organisations cannot afford the time or the resources to cater for every individual IUS. In addition, information use situations are not stable phenomena that could be uniquely associated with individual information users or specific and discrete IUS factors. Nonetheless, we should be able to discern some similarities and differences between various information use situations that would enable us to categorise them.

The fifteen information use situations explored are different from each other in many respects, but they also share a number of similarities on the basis of which they could be put into broad categories. For example, situations within the same organisation share the same macro environmental features even though these features may not necessarily affect information use behaviours in the situations in an identical way. Similarly, although the combination of each task and user is unique, these elements share some common features, which mediate the various information use situations. The

following categorisation is presented at three levels. First the features of the environments corresponding to the three organisations studied are summarised. Second, the core (level 1) of the situations are categorised based on the main features of the tasks, solution spaces and the relatively more stable characteristics of the user. Third, the more fluid and transient characteristics of users are summarised.

The summary of the three environments is based on the following features of the environmental elements of the framework.

- The internal environment
  - The current overriding business objective of the organisation
  - The management style
- The external environment
  - The customer base and level of competition
  - External regulations
- The information systems environment
  - CBIS use and dependency
  - Main CBIS business role

The organisation structure, culture and climate elements of the framework have been replaced by the current overriding business objective of the organisation. This is because the latter feature seemed to be the main driver of the organisation climate, which was found to exert a significant influence on user information use behaviour. In addition, the organisation structures of the three organisations were not sufficiently different to be contrasted. Most staff thought the structures were flexibly hierarchical but the management styles were less similar.

The accounts of IUS presented in this chapter suggest that the prevailing business objectives of the three organisations are not the same. While the council is principally focused on delivering value for money services through efficiency of operations and better management practices, the library strives for effectiveness through innovative services driven mainly by information technology. Both of these organisations have a captive customer base in the

sense that they do not operate in a free market environment in which customers purchase their services voluntarily. Unlike these organisations, the hotel operates in a free market and a highly competitive business environment in which services are purchased voluntarily and usually at point of delivery. Consequently its main business value objective is differentiation, as a means of consistently providing a high standard of service and facilities in order to maintain and improve business image and profitability.

Both the extent of competition faced by an organisation and the type of customers it serves also influence the IUS considerably. The other key environmental elements are the extent of dependency on computer-based information and the main business role of the information systems. As stated earlier, the computer systems are synonymous with information for some users while they are only nominal tools for others. Users therefore perceive and use such systems in very different ways and this reflects in the nature of their respective information use situations. The main business role of the information systems may be equally important. Questions pertaining to this feature include whether the computerised system is an indispensable support tool, a strategic and innovative weapon, or just another office equipment. The environments of the three organisations based on the above features are summarised in table 6.

Table 6 Summary of organisational environments

Tower Hamlets Council
<ul style="list-style-type: none"> <li>• <i>Current overriding business objective:</i> Efficiency of operations through value for money services and management.</li> <li>• <i>Management style:</i> Bureaucratic and centralised management but some autonomy of functional divisions. Strong chief executive.</li> <li>• <i>Customer base &amp; level of competition:</i> A captive clientele delivered through a non-voluntary and prepaid service arrangement. Very little competition at business level.</li> <li>• <i>External regulations:</i> Strong influence and constraints from national and local politics in the form of national government policies, financial constraints, pressure from local counselors and resident pressure groups. Other regulations include citizens' rights and privacy and data protection acts.</li> <li>• <i>Dependency on CBIS:</i> Mainly dependent on the computer system for transaction and data processing and its supporting role in monitoring and control, including operational or short term planning.</li> <li>• <i>CBIS business role:</i> Vital support tool &amp; means of efficiency savings.</li> </ul>
British Library of Political and Economic Sciences
<ul style="list-style-type: none"> <li>• <i>Current overriding business objective:</i> Effective services through innovative use of information technology.</li> <li>• <i>Management style:</i> Functional divisions more autonomous. Influence of top executive less apparent</li> <li>• <i>Customer base &amp; level of competition:</i> Mainly captive clientele. Prepaid service delivery. Some sense of competition with other university libraries for status or position rather than customers.</li> <li>• <i>External regulations:</i> Very little, if any, external political influence. Main constraints are financial and perhaps technological. Also copyright and data protection laws.</li> <li>• <i>Dependency on CBIS:</i> Complete dependency on CBIS for core services.</li> <li>• <i>CBIS business role:</i> Information technology led change, through innovative services and efficiency of operations.</li> </ul>
Landmark Hotel
<ul style="list-style-type: none"> <li>• <i>Current overriding business objective:</i> Differentiation of business through consistently high standards of services and facilities.</li> <li>• <i>Management style:</i> Less boundaries between and within hierarchies and functional divisions. More direct communication and interaction between all levels of staff.</li> <li>• <i>Customer base &amp; level of competition:</i> Free market customer base. Service purchased voluntarily and at point of delivery. Fierce competition from other luxury hotels in London.</li> <li>• <i>External regulations:</i> No political influence. Main constraints relate to business and sector regulations such as food and hygiene laws, data protection and fire and safety regulations.</li> <li>• <i>Dependency on CBIS:</i> CBIS is vital and extremely useful but it is not a driving force of the business.</li> <li>• <i>CBIS business role:</i> coordinating and facilitating effective service delivery.</li> </ul>

The situations are next categorised according to the core (level 1) elements of the IUS framework i.e. the relevant features of the tasks, the solution spaces and the more stable characteristics of the users.

### *Category one*

In this category the tasks are highly structured. The processes are largely predetermined and the outcomes of the tasks predictable. The tasks are also highly dependent on the computer system, which makes it virtually impossible to perform them when the system data and functionality are unavailable. The bulk of these tasks are found in the operational and supervisory levels of administration. The immediate information user or task performer is a technically capable personnel usually with relevant IT skills, qualifications or experience. The users often believe that they are playing a vital, if not crucial support role in the organisation and that information is key to the organisation's success. The main type of information required by these users is often prescriptive and their roles are mainly in support of monitoring and control functions and in transaction processing. The main sources of user motivation here include the user's confidence and sometimes pride in their technical capability and their disposition to empathise and cooperate with others within the same functional group. The notion of information held by these users is largely focused on data as an objective representation of reality and for many users, this representation is inconceivable without the functionality of the computer and telecommunication systems.

For the specific functional roles of these users, the notion of information value is based on the availability and completeness of the data required for the tasks. Other value indicators include the format of the data and the functional capability of the computer system. Accuracy is viewed as a value indicator but mainly in the sense of the correctness of processing methods and the absence of syntax errors rather than an overriding concern about whether the data reflects reality. The main value objectives associated with tasks in this category are speed and efficiency of operations to deliver

outputs on schedule. Where specific performance criteria are stipulated, these are usually in terms of time and throughput or specific qualitative measures like layout and clarity of reports. The feedback period is usually short or medium term and is often based on exception reporting; i.e. feedback is only received when performance is unsatisfactory. In most cases a single error or lapse in the performance of the task does not seriously affect the functioning of the relevant department or the organisation as a whole. Examples of situations explored that fall into this category are those associated with C1, C2, and L2.

### Category two

The tasks in this group are less structured than in category one. The use of CBIS is vital but not completely indispensable. In many cases, there is need for supplementary, non computer-based information in performing the tasks. The tasks are mainly, but not exclusively, in the supervisory to line management levels of the administrative hierarchy. User skills, qualification and experience vary widely in this group but the common source of motivation is the level of authority and responsibility of the user. The notion of information is not restricted to computer-based information, which often acts as a trigger for predetermined action choices, since such choices depend on supplementary information, which sometimes override the rational dictates of the formal computer-based information. Most tasks in this group pertain to the monitoring and control function, which includes some operational level planning. The main value objectives of information are timeliness and accuracy. The notion of accuracy here includes completeness, up-to-dateness and a reflection of reality. Other value objectives include the clarity and understandability of the reports, which provide information for tasks in this category. Feedback is periodic, with intervals ranging from weekly or monthly to biennial periods of performance appraisals. Single lapses are not necessarily disastrous but in the case of the hotel (H1) for

example, the consequences could be serious. Examples of situations in the study that belong to this group are those pertaining to H1, L1, C3 and H4.

### Category three

Category three tasks are mainly unstructured. Aspects of computer-based information may be useful but, in some cases, the task is performed better if rational dictates of hard data are ignored. Depending on the administrative structure of the organisation, tasks in this category directly impact all levels from line and middle management downwards. For users in this category decisions may depend as much on intuition, experience and personal judgement as on formal hard data. The key information value objectives here are relevance, reliability, good presentation and instant access when required. Because single errors or lapses are more likely to be costly than in the other situations, feedback is often instant and evaluation is more qualitative and pragmatic than quantitative. The main quantitative performance criteria are in terms of budget constraints applicable to various departments or sub-units. The main functional role is monitoring and control, which includes short to medium term process planning. Because many of the tasks are reactive rather than planned, it is difficult to determine their full information requirement. Sometimes, it is even more difficult to assess the contribution of new information to task outcomes. Staff in this category tend to be graduates or employees with considerable work experience in the organisation or in a similar position elsewhere. Because they are in charge of whole departments or functional units, these users consider themselves as crucial players in the organisation and some of them attribute successful outcomes more to their individual abilities to perform their jobs than to the information resources they utilise in performing their duties. Situations that feature C4, C5, L4, H2, H3 and H5 fall into this category.

In terms of information requirements and the corresponding value objectives, the above three categories of IUS can be characterised as follows. In category one, the tasks cannot normally be performed without computer-

based information since the system data, usually in electronic form, is the raw material utilised in the task. The main information value objectives are the availability and completeness of the necessary data and adequate functionality of the computer system.

For category two situations, computer-based information is necessary but often not sufficient to see the task through. In many cases, the systems information acts as a trigger for a number of predetermined action choices. However, actions undertaken as a result of these choices often depend on vital supplementary information, which come from manual files and other informal sources. The main task value objective is a combination of efficiency and effectiveness of operations. The part played by information is to facilitate the attainment of business performance targets assigned to the various functional units and sub-units. The important information value objectives here are timeliness, accuracy and ease of access.

In category three, computer-based information may or may not be directly used in performing the task. When used, this information sometimes acts as a source of reference for purposes of clarification rather than the main determinant of decisions or required actions. The bulk of the information may come from manual sources such as paper transaction files and policy documents. These are supplemented by the user's interaction with other employees as well as customers and their general experience, intuition and motivation. The objective of tasks in this category is to keep the organisation on course and in particular, to prevent expensive errors and mishaps. The key information value objectives include reliability, timeliness, and appropriate format. The effects of lapses or errors in situations in this category are often unpredictable. These range from minor inconveniences to major operational mishaps or scandals that could result in financial loss for the organisation.

A possible fourth category, which was not featured in the categories above because only one IUS (C6) is relevant to it, is one in which the tasks are focused on mapping out new directions either in terms of process or objective



for the organisation. The in-house computer-based information system is very useful in situations in this category but in some cases the tasks involved may depend entirely on information acquired from external sources so that only the functional capability of the internal system is utilised. The key information value objectives associated with tasks in this situation are reliability and physical and intellectual access. The main task objectives are novelty and acceptability of the output as a vehicle for positive change. Tasks in this category are often ad hoc rather than routine and concerned with various levels of planning. The information users in this category perceive themselves as highly skilled and crucially important players in the organisation even though some may not have the power and authority to put their recommendations into action.

The key features of these categories are summarised in table 7. The table is based on the core elements of the IUS framework in table 2. The user's official role and position is not included in table 7 since it was found to be less important in comparison to features like sources of motivation, experience, and perceived proficiency in IT. Furthermore the psychological and emotional features of the users are analysed separately as discussed below.

Table 7 Categories of IUS across the three organisations

IUS Element	Category 1	Category 2	Category 3	Category 4
<b>TASK</b>				
<b>Structure</b>	Highly structured	Less structured	Unstructured	Highly unstructured
<b>Functional role</b>	Data/ transaction processing	Monitoring and control	Monitoring & control, short-medium term planning	Technical support in strategic planning
<b>CBIS dependency</b>	High, Indispensable and routine use	CBIS necessary but not indispensable	Minimal but some vital uses	High, Indispensable
<b>USER</b>				
<b>Sources of motivation</b>	Technical capability, Perceived importance of role	Level of authority and responsibility	Meeting targets	Technical capability and perceived self-importance
<b>Expertise (IT skills) &amp; experience</b>	IT Expert	Various	Graduate or very experienced staff	Expert research & IT skills
<b>SOLUTION SPACE</b>				
<b>Main Source of Information</b>	CBIS data, policy documents & technical manuals	CBIS data, Manual data & informal supplementary information	CBIS mediated reports, Policy documents & external socio-political news	Diverse sources, internal data, & external research findings
<b>Task evaluation criteria</b>	Output on schedule & in required format	Meet specified Performance target	Meet Budget target	Novelty and socio-political acceptability
<b>Information value objectives (What is 'good' info?)</b>	Available & complete information in required format & reliable CBIS	Timely and accurate information on business transactions	Relevant & reliable information, instant access facility	Relevant and reliable information.

The third level of analysis of the situations explored relates to the emotional and psychological characteristics of the user, which were not specific to any category outline above. They however affected user information use behaviour significantly.

The following are some of the most important features identified from the situations explored.

- User's general attitude and interest in the organisation.
- User's perception of the importance of their role in the organisation.
- User's level of motivation towards specific task outcomes.

Because these features often change within short periods of time and sometimes during the performance of the same task, they cannot be related to the more stable features of the categories outlined above. However a summary of the different characteristics identified in the situations is presented in table 8, followed by a discussion of the effects of these features on the specific situations they relate to.

Table 8 User intentionalities in the three organisations

<b>Disposition and attitude towards organisation</b>	<b>Very positive</b>	<b>Positive</b>	<b>Indifferent</b>	<b>Negative</b>
<b>Users</b>	H2, H3, H4	C1, C2, C5, C6, H1, H5, L1	C4, L3, L4	C3, L2
<b>Perceived importance of role</b>	Crucial	Vital	Nominal	Not important
<b>Users</b>	C5, H1, H2, H3, H5	C1, C6, H4, L1, L2, L4	C2, C3, C4, L3	
<b>Motivation towards task success</b>	Very high	High	Indifferent	Negative
<b>Users</b>	H2, H3	C1, C2, C5, C6, H1, H4, H5, L4	C3, C4, L1, L3	L2

The range of intentionalities summarised above had important bearings on user information use behaviour. Users with very negative dispositions towards the organisation were also negatively motivated towards the success of the tasks examined even when they perceived their role as vital in the organisation (e.g. C3, L2). L2 for example, only worked towards minimum

acceptable levels and made little effort to seek useful information that was not formally available to her. C3 came across as largely indifferent to the success or otherwise of the council as a whole as well as his task of taking court action against debtor tenants. For example, he was quite satisfied with outcomes that reduced the outstanding debtor list even if the council did not recover the monies owed.

On the other hand, users with very positive dispositions also generally perceived their roles as crucial or vital and were equally motivated towards the success of their respective tasks (e.g. H2, H3). These users sought information from a variety of sources and combined it with their interpersonal skills and experience to accomplish their task goals. The value of the formal information available to them was hence enhanced by their positive attitudes. It may be significant that almost all these users came from the hotel, which had the least bureaucratic management style. Apart from C3 and L2, the rest of the users from the council and the library were either slightly positive or indifferent towards the welfare of their organisations. Could this be due to the nature of the organisational environment that partly characterised their information use situations? This question will be examined in the next chapter, which describes a number of information use situations in a fourth organisation.

#### **5.41 Insights**

The information use situations portrayed in this chapter present a view defined by the IUS framework used as an exploratory tool. Owing to its exploratory nature, only features that seem relevant to the respective information use behaviours are highlighted. As the exploration progressed, it became apparent that some elements of the framework are more relevant to the concept of information value, and the associated information use behaviour in certain situations than in others. Accordingly, the descriptions of the various situations do not feature exactly the same elements. For example, the influence of the external environment on information use behaviour was

more pronounced in situations at Tower Hamlets Council and Landmark Hotel than at the BLPES. The situations at Tower Hamlets were especially influenced by certain aspects of the external environment. These include the type of customers and the financial and political constraints encountered. The external environment of Tower Hamlets Council hence attracted more detailed investigation than the other organisations. Another example is that the age of users in all three organisations appeared to be of little, if any, relevance to information use situations, in comparison to factors such as the hierarchical position of the user and length of service in the organisation. Because of this, age does not feature in the description of all the IUS presented.

The next chapter describes a number of information use situations in a consumer bank. The descriptions are more detailed accounts of information use situations guided by the IUS framework and insight gained from the exploration.

## Chapter Six

### Describing Information Use Situations

The previous chapter explored information use situations in three organisations using the IUS framework as a 'casting net'. That exercise resulted in a number of insights which guided the empirical investigation of information use situations in the fourth organisation. Key among those insights were the following:

- a) The IUS framework as presented in chapter four does not necessarily cover all relevant features of information use situations in organisation.
- b) Information use situations are by nature dynamic, implying that their main features and corresponding influence on value perceptions often change with time.
- c) Different users perceive what seem like the same features differently, probably because of the influence of other non-common IUS variables.
- d) In many situations only a few features tend to dominate the nature of the IUS and sometimes only one or two.

The above observations suggest that it is not practically useful to describe information use situations exclusively according to the IUS framework. It is also not necessary to account for every element of the framework in describing information use situations. A more useful approach is to describe the situations according to those features that are perceived to be most relevant to the related information use behaviour and notion of value at the particular time. In this regard, the framework should be seen as broad and generic diagnostic tool rather than a model of information use situations. The key features of information use situations in organisations would therefore often constitute a subset of the IUS framework. This is the rationale for summarising the key features of the situations explored in chapter five. That summary provides a broad guide to the investigation and description of the situations presented in this chapter.

Seven middle managers of the consumer-banking branch of Citibank, UK, (situated at Hammersmith in London) were interviewed. For each interviewee, the IUS relating to two different tasks were examined in order to investigate the idea of multiple IUS per user. That is, the proposition that information use situations are not uniquely determined by the characteristics of the user or the particular task undertaken. Questionnaires were also sent to 55 employees of the bank in order to capture a more general view of the macro organisational features of the situations studied. Seventeen questionnaires were returned and insights from those questionnaires have been incorporated in the descriptions and interpretation of IUS that follow in this chapter and the next.

The information use situations investigated at Citibank are now described below. As with the situations explored in chapter five, the seven employees of the bank will be referred to as B1, B2, ...B7. The environment of Citibank, Hammersmith branch, is described first. Then the individual situations pertaining to five<sup>22</sup> out of the seven interviewees are presented. Next, the situations are categorised according to the elements of the IUS framework and the key notions of information value that emerged from the study. The usefulness and implications of this categorisation are discussed in chapter seven.

## **6.1 Citibank**

Citigroup Inc. is a world wide financial services holding company, with headquarters in the USA. The company operates in four business segments: investment services, consumer financial services, property and casualty insurance services and life insurance services. The group currently employs about 160,000 people and its total revenue is estimated at over \$7 billion. The banking arm, Citibank (or Citicorp) is said to be "the number 2 US bank, after

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<sup>22</sup> These situations are chosen because they are considered representative enough in the sense that they exhibit most of the features discerned in the study. The situations that are not described here still feature in the interpretation and discussion presented in chapters seven and eight.

Chase Manhattan and it has 3,400 locations in 98 countries and territories worldwide" (<http://www.citicorp.com>, 25/11/98).

### **6.11 The environment**

The bank has a strong interest and track record in the use of information technology to facilitate and advance financial services and products. For example, it claims to be "the world's no. 1 issuer of credit cards" and it was one of the first banks to introduce 24 hour banking services. Other IT led services currently offered include PC banking and Internet banking.

As a global organisation, the bank is managed through structures based on regional and business functional divisions. The worldwide operation is divided into three main regional units: North America; Europe, Middle East, Asia & Africa; and South America & other parts of the world. Each region is comprised of several local business units located in various countries within the region. A business manager, who is the ultimate authority in that local market place, heads each local business unit. The business manager's responsibilities are to ensure the growth of the business, meet business targets in terms of revenue and expenses, give the right brand message by representing the bank effectively in the local market place, and generally ensure that the operations run smoothly while adhering to the organisation's rules and procedures. Each business manager is supported by the following functional units or departments:

- *Marketing department:* This unit is responsible for 'selling the bank' through promotion strategies, customer advertising and selling brand messages.
- *Sales and distribution unit:* This comprises all the distribution channels such as the sales forces in the sub-branches, the mobile external sales force, the telephone banking unit, the ATM outlets and now the PC and Internet banking services. The main function of this unit is to ensure the availability of the bank's products and services to the widest range of customers. The unit acts essentially as the operational arm of the



marketing department as it often works towards product targets and strategies set by the marketing department.

- *Operations and technology division:* This unit is responsible for managing all the technology systems including the processing of transactions.
- *Finance department:* The finance department is responsible for overseeing financial control of the business. This is done by ensuring that the books are balanced through various forms of regulatory reporting like income statements, profitability analysis per business branch or type of customer, and through budgeting.
- *Human resources department:* This department handles all staffing issues including training.
- *Credit control unit:* The credit team manages all credit checking and approvals related to the bank's business.

The above functional divisions form the nucleus of the bank's organisational structure and is replicated at each local branch. External to this nucleus is the regional management structure. Each local business manager reports to the regional management team, which is responsible for one of the three regions. The main duties of the regional management team include setting priorities for the region, monitoring operations and allocating resources to different businesses. The composition of each regional team is similar to that of the local businesses, so that for each local functional unit, there is a corresponding regional unit to report to. The organisation structure of the bank is thus a hierarchical matrix structure. For example, the local technology and operations director reports to the local business manager but also to the regional technology and operations director. This is the same for the other functional units or departments. An important duty of the regional management teams is to ensure that certain common goals and standards are achieved and that policies are applied with consistency across the regions and by extension worldwide.

Above the regional management structure is the corporate management team, which is responsible for the global business. This team is directly

responsible for certain programmes which are external to the main structure of the bank but are part of the global business. The advance development group is one such programme, which interfaces with various businesses, at both local and regional levels, for purposes of enhancing the business through innovative use of technology and partnerships projects. This group is not really part of the main (traditional) structure of the business, but two of the employees interviewed in this study belong to this group, and the group's role is sometimes very crucial to certain businesses within the bank. The diagram below shows the organisational structure of the consumer-banking branch of Citibank, UK, situated at Hammersmith. It specifically shows the relationships between the branch and the higher level management structures, and the advance development group.

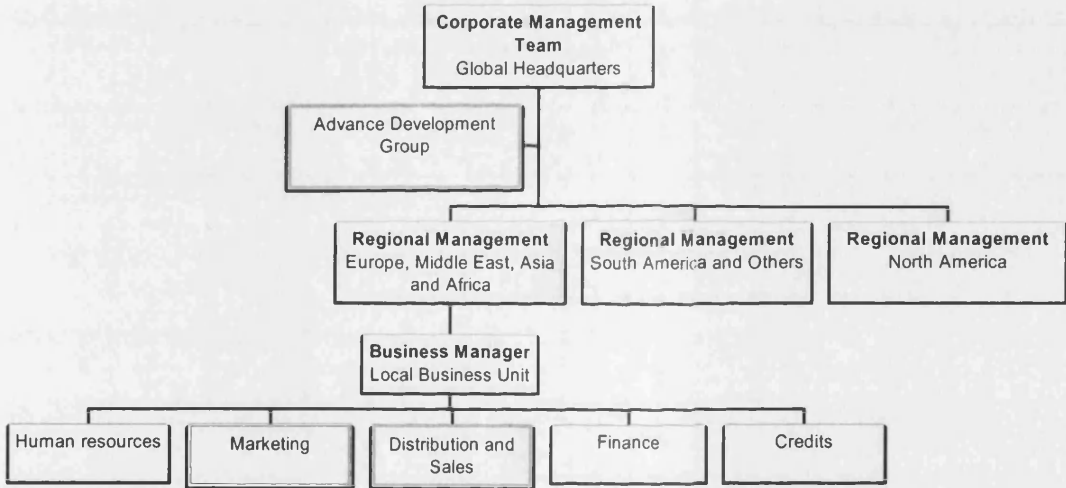


Figure 7 Citibank Administrative Structure

The information use situations investigated at Citibank are now described, starting with the main features of the environment.

Citibank's current organisational climate reflects a combination of all the business objectives of the other three organisations in this study. The order of priority of those objectives indicates the current thrust and direction of the bank's business activities. Most of the employees interviewed believe that achieving effectiveness in the business through innovative use of

information technology is the bank's first priority. Second, the bank strives for differentiation as a means of gaining competitive advantage through high standards of services and facilities. Efficiency of operations is ranked third even though some employees feel that they work within tight financial constraints. This order of priority is not static, as it tends to change with time. For instance, just before the interviews were completed, news emerged about a pending merger between Citicorp and Travelers Group, another US-based company. Although details were still thin on the ground this news signaled a change in emphasis in the above business objectives. Suddenly, there was greater emphasis on efficiency of operations in many departments as the budgets of certain divisions were reduced overnight by up to 50%. For these divisions, the key business value objective suddenly switched to efficiency as the first priority and all other considerations became secondary. This new climate inevitably affected the ensuing information use situations.

Like the hotel, in the previous chapter, Citibank acquires its customers from the free market and competition is very fierce. However the nature of the relationships between the bank and her customers is different, in some respects, from that of the hotel. This is probably because the type of services offered by the hotel generally call for short term and transient business interactions with customers, while the bank maintains relatively more stable and longer periods of relationship with her customers. Hence the two businesses do not interact with their customers in a similar way even when they face comparable levels of competition. The bank's operation is strongly dependent on computer-based information systems, as computers are now virtually indispensable to many core functions and services. The main external constraints are national and international financial regulations and data protection laws, although some element of internal Citibank politics at corporate, regional and country levels feature strongly in some situations.

## 6.12 Information use situations at Citibank

Table 9 presents the situations examined at Citibank. The features used to characterise the situations here are slightly different from those used in chapter five. The difference is that the user's self assessment of their IT skills has been replaced by the perceived power/position balance in their jobs. Although many of the tasks examined involved the use of information technology, the power-position balance was found to be more important than IT skills. This is probably because all the users interviewed at Citibank had to take decisions and effect actions that affect many functions and tasks. Furthermore, all of them assessed their IT skills as good or very good, indicating that the users' perceptions of their proficiency in the use of IT were very similar.

Table 9: Situations examined at Citibank

User	Job Title	Years in Org.	Power-Position Balance (Self-Assessed)	Task Examined
B1	Process Support Manager	23	Power less than Position	1. Contracts management 2. Monitoring the image processing team
B2	Marketing Manager (Customer Acquisition)	> 1	Power less than position merits	Planning a marketing project
B3	Marketing Manager (Consumer Intelligence)	> 4	Power more than position	1. Modeling a business plan 2. Financial analysis of customer accounts
B4	Direct Sales Manager	> 7	Equal	1. Managing the direct sales team 2. Training staff on quality
B5	Distribution Director	> 10	Power less than position	1. Sales tracking 2. Business development
B6	Assistant Vice President (e-Citigroup)	> 4	Equal	1. Managing EMU website development project 2. Acting as a resource Person
B7	Director e-Citigroup (AMEAA Region)	> 7	Equal	1. Producing a monthly expense analysis 2. Originating external business partnership

For each employee, two routine but different tasks were examined. The information use situations associated with these pairs of tasks were similar in some cases but very different in others, indicating that the nature of IUS is not exclusively dependent on the characteristics of either the user or the task. The following are the situations identified at Citibank.

#### *B1 - Process Support Manager*

B1 describes his job as looking after various teams responsible for several operational processes in the bank. One team is responsible for the administration of contracts pertaining to the supply of various services to the building by external businesses. Examples of such contracted services are the supply and maintenance of Xerox copiers, restaurants and company cars. Another team, called the service center, is responsible for the distribution of mail throughout the building as well as processing and forwarding the bank's customer statements. This team is also responsible for the file imaging process in the branch. A third team takes care of all aspects of mortgage customer services. B1's job could be described as a mixture of technical, management and customer service responsibilities, although he does not interact directly with external customers.

At local business level, B1 classifies his position as middle management and he has worked in the bank for 23 years. He describes his role in the organisation as "a leader" and believes that he is very capable in his current job. When asked about what motivates him most in the job, B1 ranks personal satisfaction first and the expectation of rewards such as higher salary or promotion a distant fifth. Could this be due to the fact that B1 is a shareholder of the bank or a feeling of job security due to the many years of service to the same organisation?

B1's notion of information is "facts based on data", and in his specific role, the main source of that information is the bank's computer-based information system. In particular, this user relies predominantly on the functionality of the Microsoft Outlook software, which is the main medium of

information interchange between him and the various groups that he monitors and controls. This information is called 'management information statistics' and is usually in the form of a spreadsheet received via e-mail. The most important value attribute for this information is timeliness, which is delivered through the facility for instant access offered by the system or through quick responses to requests and queries. The user remarks that completeness of information is important too but not crucial, since they can always send the spreadsheet back and forth until it is up to the level of detail required. B1's value objective for this information is principally outcome focused. For him the most suitable and hence most valuable information is one that is just enough to deliver what is formally required by management. However he believes that information that conforms to his personal preferences in terms of the format and content is more valuable than one which only promises the desired task objective irrespective of other considerations. This implies that although the main value focus is on the attainment of task objective, the key notion of information value for this user is operative value rather than object value or conceived value. Some of the reasons for this may be due to the type and nature of tasks in B1's job, which are now examined below.

The two tasks selected for examination are contract management and the monitoring of image processing work in the bank. In contract management, B1 acts as the point of contact for suppliers of various services to the building. His role is to ensure that the terms of the contracts are upheld and that the services are delivered as stipulated but he does not personally take part in negotiating or offering the contracts. This task is very unstructured since it often has no specific objectives or procedures apart from targets for efficiency savings, which are set occasionally by senior officers. The user is generally left to decide on objectives and processes as he sees fit at a particular time. The main sources of information for the task are e-mail based progress reports, electronic spreadsheets, invoices, personal observation and occasional face-to-face meetings with the suppliers. The task

is thus significantly dependent on the computer system and probably because there are no specific task objectives, the user believes that it is more important to avoid making mistakes than maximizing output.

The task is mainly a monitoring and control task in which the most desired attributes of the information used are correctness, availability when required, and especially its electronic form and medium, which according to the user saves time and effort. Thus time saving and the facilitation of task performance are key indicators of value to this user. Because there are no specific performance criteria associated with the task, the user reports that in reviewing the monthly billing process for services delivered, for example, he has the "option of doing nothing about it or doing something". Hence there are no specified ways of evaluating the performance of this task apart from self-evaluation. Correspondingly, the feedback, sanctions and incentives associated with the task are implicit rather than explicit. This means that the user understands that inadequate levels of services will get to the attention of senior officers who will provide the necessary feedback. However, when services run as expected, they tend to go unnoticed and hence do not attract feedback from above. The user suggests that the impact of inadequate performance or an error in performing the task is not crucial to the bank. He also believes that it is generally very easy to rectify such situations and in some cases it might even turn out to be positive for the organisation.

The image-processing task involves the scanning of bank documents into image files, which are made available to consumer banking staff. The work is performed predominantly by teams of temporary staff who work in day and night shifts. B1 describes the work as "a very straight forward but high volume process in which quality and timeliness are very important as well as the management of people". His monitoring role involves checking that the volumes of output are adequate and that there are no pressure points in the process as well as ensuring that staff is of the required standard.

This task is largely semi-structured since it has a specified objective and certain predefined procedures, which are not rigidly fixed. The main

objective is to ensure that the various teams meet the daily output targets. The predefined procedures include the daily comparison of output with set targets. The sources of information for this task are a daily spreadsheet-based job status report sent by e-mail and a 5-10 minute chat with the supervisor of the unit. The information in the spreadsheet is used to make decisions on issues such as staffing levels and quality control measures.

Unlike the contract management task, this task has the specific objective of ensuring that the processing unit meets the stipulated output targets. These targets are both qualitative and quantitative although the quantitative aspect attracts more attention and emphasis. The task also pertains to the monitoring and control function and the most desired attributes of the information used are availability in electronic form, timeliness and accuracy. Feedback from senior officers is more frequent here although there are no specific sanctions and incentives linked with the performance of the task.

### *B3 - Marketing Manager - Consumer Intelligence*

B3 is a marketing manager responsible for the consumer intelligence unit of the bank. An important function of the unit is the segmentation of the bank's customer base in order to answer important questions about current products and services as well as future developments. Various aspects of this function take the form of strategic projects undertaken by a team headed by B3. Although much of the work is research focused, B3 describes his role as "not exclusively research focused because it goes all the way onto implementation". The bulk of his work is therefore seen as strategic planning, which involves some element of monitoring and control.

There are three main sources of information for this work. The first is market research carried out at regional and divisional levels of the bank. Second is published information within the local market and third is the bank's transaction based consumer data from which various MIS reports are generated. Occasionally, the bank engages external consultants to investigate



specific issues of interest. A large proportion of this information comes in the form of statistical data, which is further processed and analysed by the user in search of insights and solutions to pending issues. The analysis derives usable information from the data by identifying themes of messages relevant to the marketing function. The value of that information is principally viewed in terms of its contribution to decision making. "If it is available in a clear concise way that leads me to make clear analytical decisions then that's what I mean by value". This characterisation of value refers mainly to object value and perhaps indirectly to conceived value in the sense that the user assumes the decisions will lead to the desired business outcome.

Because of the business intelligence focus of his role, the highest value attributes of such information are its newness and rarity or exclusivity. This means that published reports on generic market trends, for example, are useful to B3 but not really very valuable. He regards them as background information and that there is not much difference if he does not receive them. His perception of the value of information is principally directed by the purpose of use or need, which is often situation specific. He however maintains that, in his role, the attributes of the information are often tied with the source. For example, he suggests that since he cannot know the accuracy of much of the data and information before use, the information is assessed according to the trust he places in the brand or the credibility of the source. Although there is no official policy that mandates B3 to seek information services from a particular supplier, he admits that in general, he normally uses companies that he in particular or the bank in general has used before.

The two tasks examined with this user are the modeling of a business plan and financial analysis of customer data. The first task is concerned with strategic planning while the second is a combination of research, short term planning and monitoring and control. In the financial analysis task, various kinds of data (e.g. transaction data, valuation data, market research and market segmentation data) are collected and analysed in order to discern trends that might be useful in enhancing business performance. The business

modeling task combines this data with some assumptions about possible changes in customer or business activities to project revenue generation scenarios into the future. This is essentially a what-if analysis.

B3 regards both these tasks as largely unstructured even though they often have what he regards as "well-defined objectives". The business manager in consultation with a team of directors sets the objectives. Examples of such objectives are the requirement to increase revenue in a particular business stream by a certain percentage in a specified period or demand that a new product be launched by a certain date. The unstructuredness of the tasks is borne out by the fact that B3 believes he has total freedom in the way he sets about achieving the objectives. "I have no methodology to follow apart from the one that I create, and I design the reports, too"; he emphasises. He is also free to use whatever data he chooses and there are no performance criteria on these tasks apart from the macro objectives towards which they are directed. B3 believes that sometimes these objectives are not appropriate because the people who set them do not understand the operational requirements of the tasks. Because of this, he is often not given adequate resources to perform the tasks. The main shortage is often in staff. "Primarily, there are not enough people and the flip side of that, not enough time. Sometimes you have to go back and say I am not going to do this, it cannot be done, because there is no time", he reports. Furthermore, he suggests that those who set the objectives tend to have very little inkling for what the data analysis might bring up so that they are often genuinely surprised at the result. This makes it very difficult for them to set very specific and enforceable performance criteria. Because the tasks are usually project based, they are evaluated mainly in terms of meeting project deadlines. The focus is therefore as much on efficiency of operations as on effectiveness of outcome.

Both tasks are highly dependent on the use of computers and B3 believes that it would be inconceivable to perform either task without a computer. Apart from the required hardware and software functionality of

the computer system, an important value requirement is the format and scope of the variety of data used. For example, it is vitally important for both tasks that the data used is representative of the population being investigated and in the case of the business modeling task, the scope of coverage of the data may be more important than considerations of accuracy. As stated earlier, perceptions of the value of the information are based on the extent to which it can serve as the main basis for taking analytical business decisions. Because of the exploratory nature of both tasks and especially the projective nature of the business-modeling task, it is not easy to ascertain errors or lapses in the task performance (apart from technical error) since their effects become apparent later. However, if and when such lapses occur, they may result in "grave consequences" for the bank. Nonetheless, it is possible, even though difficult to rectify such errors.

B3 describes his position in the bank as middle management and believes that he is a "crucial player" in the organisation. He has worked in the organisation for more than four years and has spent over a year in his current position. He perceives the administrative structure of the bank as flexibly hierarchical and believes that he actually wields more power and authority than his position merits. This affects the way he perceives and uses information although he could not explain how. To this user, the contribution of information towards achieving the objectives of the tasks examined above is as much as 75%. The notion of value associated with that information is mainly object value, i.e. the user directly associates the quality of the information used with the type of business decisions taken and by extension business outcome.

The situations relating to the above two tasks share many features in common. The relationships between the user, the tasks and the solution spaces seem to be quite similar and the user's perception of the organisational environment for each task is virtually the same. As stated earlier, the key environment variable is the organisational climate, which in this case, is highly efficiency focused. The effect of this on user notion of value is that

tasks are evaluated principally in terms of meeting performance targets, which are stipulated in terms of cost, revenue and time. It is not surprising that most employees in this environment, including B3, describe their key source of motivation as "the joy of meeting targets".

The key features of B3's IUS could be summarised as follows: The unstructured nature of the tasks gives the user considerable autonomy in the performance and evaluation of the tasks. This combines with the user's almost conceited belief in his capability, to produce a very positive disposition in the user. Furthermore, the fact that the user believes that he has more authority or power (for example, over colleagues of similar rank) than his position merits seems to heighten his sense of responsibility and his motivation at work. This combination of high motivation and self-confidence affects the user's information use behaviour. The high motivation affects the manner of use of information in a positive way and the self-confidence coupled with the autonomy in operation enables him to extend the scope of use of information available to him considerably.

#### *B4 - Direct Sales Manager*

B4 describes his duty as being "responsible to grow the business from a direct approach". This essentially involves managing a team of nine direct sales, self-employed individuals who go out and seek business for the bank. In addition, B4 is responsible for delivering training courses on 'quality' to all the staff at Citibank, Hammersmith branch.

B4's role in the direct sales function is to monitor and control the activities of the team. His training duty is also seen as a sales promotion activity rather than a human resource development exercise. The main objective of the quality training course is to improve the level of services offered by the bank and to ensure that the quality of those services is consistent throughout the bank. At individual trainee level, the objective is to "instill a quality state of mind in the individual".

The above duties are clearly distinct from each other and their information requirements are very different. For the sales management function, B4 requires information that would enable him to monitor and evaluate the performance of the direct sales team. For this, he uses a management information system consisting mainly of a sales contact database, which tracks the activities of individual sales personnel in the field.

The information required for delivering the training come from a manual on quality prepared by outside consultants. The effect of the training is evaluated over time, by monitoring the performance of specific tasks assigned to the trainees at the end of the course. However B4 believes that this exercise is not an evaluation of the delivery of the training, but of the trainees. This seems to suggest that both the content and process of delivery are assumed to be adequate and that the success of the training is solely dependent on the abilities and efforts of the trainees. This is borne out by the training slogan that "quality begins and ends with the participants".

The two tasks examined with this user are the monitoring and control of the direct sales process and the delivery of training on quality. Although both tasks are very important to the bank, B4 regards the training task as supplementary to his main duty in direct sales management. As such the user sees himself as more responsible and accountable for the outcome of the direct sales function than the training. Apart from the fact that the training outcomes take longer to discern and evaluate, the user is of the opinion that negative outcomes or less successful results would not be attributed to him. On the contrary, the direct sales task has well defined performance targets, which are routinely monitored and interpreted as a reflection of B4's performance. Thus the short-term objectives associated with these two tasks are quite different. In the case of the training, a smooth delivery from the point of view of B4 is considered a success while success in the direct sales task is judged solely from outcome. Accordingly the information value objectives of the tasks are considerably different.

The quality manual, which is the main source of information for the training task, prescribes both the content and procedure for the training. To B4 the value of that information is assessed according to the perceived validity of the content and the effectiveness of delivery as prescribed by the procedure. In terms of the Charles Morris typology of value this is mainly conceived value. The efforts and dispositions of the trainees, which are beyond B4's personal control, mediate the link between the content and process on the one hand and the eventual outcome on the other. Therefore the contribution of the information used in the task is seen as very necessary but not sufficient to guarantee the desired outcome.

In the direct sales monitoring task, the user believes that the outcome is significantly dependent on the quality of information used. That quality is concerned with both the content and process of interaction between him and the direct sales force on the one hand, and between the team and its customers on the other. From B4's monitoring point of view, the key value attributes of that information are its availability (when required) and the facility for interactive communication. The importance of these attributes signifies the target-oriented nature of the task. The rationale is that in many cases it is more useful to receive, on time, incomplete and not so accurate monitoring information than information that is more accurate and complete but late. Interactive communicability is thus one of the key value attributes of the information resource used here.

This task is evaluated principally in terms of quantifiable performance targets and inability to meet these targets reflects on B4 but this is not necessarily disastrous to the bank. There are no formal and direct sanctions and rewards associated with either of the two tasks in question. However B4 gives the impression that he is highly motivated while performing both tasks for very different reasons. For the training tasks, his motivation derives from the belief that the values prescribed in the training manual are similar to his own personal values and he is therefore eager and willing to spread those values among the entire staff. Two reasons for the user's motivation in the

direct sales management task are that he regards the direct sales project as his creation and the fact that his team is currently the best sales team in the local market area.

B4 has worked for the bank for over 7 years and has spent just over a year in his current position. He describes himself as a crucial player in the organisation and believes that he is very capable in his job. To this user, the key drivers of Citibank's business are "the team of highly motivated and self-reliant staff", and information technology. "We have always been known as the technology bank, we have always used technology to give us a competitive edge," he says. "In addition, if you look at the type of individuals who work for this organisation, those individuals are mostly self-reliant individuals looking to meet targets and task goals so the human resource contribution is very significant".

#### *B5 - Distribution Director*

As distribution director, B5 describes his job as the responsibility for acquiring and keeping customers for the bank. He maintains that this position is not equivalent with the traditional sales director role, which is almost exclusively concerned with customer acquisition. Making sure that the customers are retained is as important in his role as the acquisition aspect.

The functional tasks undertaken in this role pertain mainly to strategic planning and monitoring and control. Information used in the performance of these tasks come from a variety of sources, both internal and external, and the banks computer-based information system is the key medium for much of this information. The day to day monitoring information comes in the form of management information that reports on performance indicators like the number of new customers acquired, which products are sold, and which customers are more profitable. B5 suggests that this probably account for only 5% of the information that crosses his desk daily. About 50% of the information he receives relate to planning rather than to direct monitoring and control. The planning information is normally about coming attractions,

future sales plans, marketing plans and such issues. Most of this information comes in the form of e-mail. For strategic planning purposes, this information is supplemented with historical data on the bank's services, market place data, and intelligence on competitive products and services. Unlike the monitoring information, which is mainly internal, some of the planning information comes from external sources and the user's perception of their relative values is based on very different considerations. In fact he feels that some 45% of the information he receives daily is not particularly useful to him. This is mainly information copied to him by people who feel it is important to them to copy him but he suggests that "it would probably not bother me if I did not see such information in the first place".

Because the daily monitoring information is often focused on specific measurable targets, the notion of value associated with it is mainly based on content and timeliness. "Information that is valuable to do my job is that which will tell me how we as a group are performing". However, because of the tendency for information overload arising from the receipt of unwanted and unimportant e-mail, the user states that his first consideration of value is usually based on the subject matter or purpose of the information (conceived value). Thus even before the content is evaluated, the purpose of the information determines the importance and hence the priority attached to it. For information originating from external sources, another key value indicator is the reputation of the source. However, the link between reputation and information quality is based on history and trust, both of which do not necessarily indicate actual quality. Nonetheless, in the absence of a better or an easier way of assessing quality before use, the reputation of the source remains the main indicator.

B5 chose the tasks of sales tracking and business development for examination. Sales tracking involves the daily monitoring and control of sales progress in the UK consumer banking market. To do this, the business initially sets out sales objectives for nine consecutive quarters per planning



cycle. These are then broken down into monthly and daily performance targets, which are compared with actual performance figures.

The business development task is concerned with finding ways to enhance sales through different channels, products and opportunities. This is a strategic planning exercise, which utilises information from diverse sources. The task is very unstructured since it does not have very specific and predefined objectives or procedures. On the other hand, the sales tracking task has very definite and measurable objectives and the process involved is of necessity clearly predefined. This is because "it is important that everybody measures in the same way, otherwise you cannot have a sensible conversation on how you are performing", B5 remarks. The sales tracking process is therefore quite structured although it changes over time as certain types of information become more important and others become less important. Because it is so structured, the information used in performing the task is evaluated primarily according to the extent to which it facilitates the attainment of the performance targets. These targets come in the form of quantified sales output in certain business areas for specific periods of time. The key value attributes associated with such information are accuracy and timeliness. Accuracy here refers to the extent to which the information reflects the true position of sales performance at the specific time and timeliness refers to the availability of the information, as and when needed.

The objective and hence the performance criteria for the business development task are less specific. The information used in this task is required to indicate tendencies and probabilities rather than accurate representations of reality. Accordingly, its quality is judged according to user perceptions of relevance, reliability and ease of use, a combination of object and conceived values. Because this type of information is mainly exploratory, the immediate value objectives associated with it include the novelty, exclusivity and the rarity of insights and discovery that emanate from its use. These objectives are neither easily measurable nor predetermined in detail in

advance. The two tasks examined above are hence considerably different from each other.

The information use situations that occasion these tasks are dissimilar in several respects. First, the solution spaces of the two tasks are quite different. As stated above, both the immediate objective and performance criteria for the sales monitoring task are predefined in detail as opposed to the business development task. In addition, the source of information for sales monitoring is almost exclusively internal while the business development task often requires information from a myriad of internal and external sources. Second, although the information user remains the same, his roles in the two tasks are considerably different. While he is usually the leader or highest authority in the sales monitoring team, he is often an equal participant with others in the business development team. Furthermore, the deliberations of this team are subject to approval by higher authorities.

Both tasks rely significantly on the use of computer-based information but the uses are quite different. In the monitoring role, much of the information comes in the form of spreadsheet data compiled by the sales staff. From the perspective of B5, the system is used principally as a communicating medium in this case. Very little processing or data manipulation is required at B5's level. For business development, the system is used for more than just communication. The functionality of the system is used to investigate alternative scenarios in search of evidence in support of specific recommendations. This may include what-if analysis and combining data from several sources. Furthermore the impacts of the external environment on the two tasks are quite different. While external regulations have little or no effect on the sales tracking task, B5 suggests their effect on the business development task is generally constraining. Examples of sources of such constraints are patent, monopoly and data security laws, which sometimes frustrate certain business development plans.

Within the UK business, B5 classifies himself as a senior manager. He has been in his current position for just over a year but has worked for the

bank for over 10 years. Although he perceives his role in the organisation as a leader, B5 believes that the actual power he commands is less than what the position deserves. Nonetheless, he does not think this affects the way he perceives and uses information. The user believes that the cost of information technology in the organisation is too high, even though he suggests that information is the most important resource he needs in his job.

#### *B7 - Director (e-Citigroup)*

B7 is the director for Europe, Middle East, Asia and Africa (EMEA) in the advanced development group, now renamed the e-Citigroup. This group's main responsibility is to deploy front-end technology through the consumer branch banking outlets of Citibank all round the world. This technology is used to provide and maintain services like Internet banking, smart cards, PC banking and interactive television services. B7's role is to act as a single contact point and representative of the e-Citigroup in the entire EMEA region. The group provides the necessary technologies and services by creating partnerships between the bank and various external businesses. Requests for the creation of such partnerships may come from either a particular business unit of Citibank or from a prospective external partner. In either case, B7's role is to locate the right people in each organisation and to originate the right project to achieve the desired objectives. New projects and partnership ideas are sometimes originated by B7 or by other members of the e-Citigroup. In such cases, B7 creates and facilitates linkages between the appropriate external partners and the e-Citigroup on the one hand, and between the group and the relevant business units of Citibank on the other. Like many other Citibank ventures, the partnerships are formed in respect of specific projects, with time and cost related performance criteria.

B7's job is difficult to classify in terms of the traditional functional roles in business organisations. When she originates projects and partnerships, she acts as both an entrepreneur and a strategic planner. In other circumstances, she is a coordinator and an enabler of projects originated by others. For these

roles she needs various types and forms of internal and external information. The internal information required concerns what and how the local consumer banking units in her region are doing, what their strengths and business priorities are, and any relevant business and socio-political issues that affect their work. Two key types of external information she requires are what she calls "local product market information" and company profiles. This information is received in various forms such as hard copy, electronic and oral forms through research companies, internal Citibank meetings and personal external contacts. Because of the large amount of information she receives this user describes valuable information in terms of its relevance to what she is doing at the moment and its timeliness. She prefers very concise and precise information since she usually works under great pressure.

Much of the research-based information is not personally assessed or evaluated by this user. She relies on the group's research department to do that for her. "We have a research department and that's their job, to be able to evaluate and pass the right information to the right person". For such information, which is mainly concerned with more developed countries, the credibility or brand name of the source is a key factor in the evaluation. The brand name associated with the source becomes an attribute of the information and it gives a sense of object value to the information. However in less developed countries, the key source of credible information is personal contact. "In an emerging country you know those brand names don't reach information, it is who you know and who your contacts are. You get quality information on the phone because you know such and such a person on a friendship basis...and if you go to Reuters, you will never get that information". Hence for B7 the perception as to what makes valuable information depends on the nature of the information she is looking for and where she is at a particular time. In short, she does not have a generic notion of what constitutes valuable information in her role.

B7 selected the tasks of producing a monthly expense analysis for the advanced development group in the UK and originating an external

partnership for examination. The expense analysis task is semi-structured since there are no formal requirements as to what B7 should produce or how to proceed although there are prescribed procedures in other departments of the bank on how to do expense analysis. All the information for this task comes from internal bank sources such as the financial control department and the expense and payroll-processing department. The data is received in both electronic form and hard copy and the analysis is mainly computer-based although the user suggests that it could be done without computers. Because this task is taken up on a voluntary basis, as it is not part of B7's job specification, it is not seen as a very crucial task in the bank. In fact B7's motivation in taking it up was largely personal.

As a former financial controller, B7 admits that she enjoys performing the task and also feels that there is no one else in the group equally capable to do it. Secondly as head of the group in the EMEAA region, she wants to ensure that excessive spending by other members of staff is not attributed to her. Thus the main objective of this task is to inform the top management of the advanced development group about individual expense behaviour in the region. Although there are no explicitly stated requirements in terms of the output of this task, there is an implicit performance criterion associated with it based on the bank-wide standard for expense analysis. This criterion is however not rigidly applied to B7 and she does not receive adequate feedback about the task. Hence this user feels that errors committed in the performance of the task do not have much effect on the bank as a whole.

On the contrary, originating or enabling an external partnership is B7's key functional role in her current position. As director, she is responsible for the performance of the entire advanced development group in the EMEAA region. Her personal performance is thus evaluated according to the number and quality of external partnerships established in the region. However the task of establishing an external partnership is highly unstructured. The task often has no specific performance criteria apart from broad time-bounded revenue goals. It is thus extremely difficult to evaluate B7's performance in

this task. For example, she points out that even when her boss promised to negotiate a good bonus for her on condition that she completes three more 'deals', there were no specific performance criteria associated with those deals. "When for instance do they consider the deals as complete? Is it when the deals are signed as valid contracts or when the projects associated with them are up and running or when the deals achieve the desired results?" she asks.

The information required to perform the task is equally unspecific. Although many of the projects that ensue from the task are often largely dependent on computer-based information systems, sometimes B7 requires little or no direct use of computer-based information. In addition to internal and external research-based information on markets and products, B7 usually needs intelligence on the industry she is dealing with as well as an understanding of Citibank's internal capability to successfully utilise the services of the prospective external partner. Much of the later information is often highly informal but crucial to the success of the task. Thus the main value objectives of information used in this task are to give the user new insights into what is possible and available in the market, to enhance the decisions in choosing among the possibilities and to act as a justification for these decisions. Accordingly, the main value attributes of this information are availability, perceived reliability and timeliness. Because this task is inextricably linked with the quest for innovation and competitive advantage, the timeliness of the information is crucial and in many cases requirements for completeness and accuracy are of secondary consideration. Errors in performing this task are difficult to discern immediately but their impact on the bank can range from trivial to serious loss of opportunity and hence revenue.

B7 describes her hierarchical position as senior manager locally, but middle management globally. She has worked for the bank for over 7 years but has spent less than 3 years in her current position. She describes herself as a very capable and crucial player in the organisation whose main role is in

setting corporate vision and representing the bank externally. For this role much of the formal information she uses serves in a supplementary capacity, usually to support or justify decisions that are mostly based on intuition, pragmatic considerations and a collection of informal pieces of information. The value of this information is viewed principally in terms of conceived value, i.e. the belief that it will contribute significantly towards achieving the desired objective. In addition, because of the considerable autonomy in her job, the operative value of the information plays a key role. This means that considerations of value also include the extent to which the format and content of the information meets the user's preferences.

The two situations described above are clearly different from each other, indicating that the same user can experience very different information use situations. The significance of these differences and their relationships with the notion of information value in organisations are explored in the next chapter. Before that all the situations investigated at Citibank are categorised below.

### **6.13 Categorising IUS at Citibank**

The information use situations explored in chapter five were categorised according to certain features of the elements of the IUS framework. In particular, the categorisation was chiefly informed by how structured the task is, the user's functional role, expertise and motivation in performing the task, and the way the task outcome is evaluated. Because the situations described in this chapter exclusively feature middle management functions in one organisation, they do not show sufficient differences according to the above criteria. For example, all the employees interviewed either perceive themselves as highly qualified and very capable in their jobs or they have long experience in the bank, so that they all display similar levels of self-confidence. In addition, most of the tasks examined fall within the semi-structured to unstructured range and virtually all of them are evaluated according to predetermined target objectives, even though the task

themselves may not have very distinct performance criteria. Furthermore, the situations examined at Citibank revealed certain features that were not encountered in the three previous organisations. One such feature is the identification of two distinct information use situations for the same user, and in some cases, identical information use situations for two different tasks.

The criteria employed in chapter five are therefore relevant but not informative enough for the situations described in chapter six. These situations are therefore categorised according to those features that are considered more relevant to them. The features pertain to two of the three core elements of the framework, task and solution space. The third element, the user, cannot be easily categorised because of the following reasons. The sources of user motivation were not apparent from the evidence gathered apart from the fact that all the users were highly target or goal driven. All the users also indicated very high levels of confidence in their abilities and generally perceived their roles as important in the organisation. Most of them were middle managers in charge of projects running in their functional areas. The characteristics of the user element based on the attributes in the IUS framework (table 2) were hence very similar for all the situations examined. One important difference in user characteristics however was in the amount of power they had in comparison to the position they held in the organisation. However, this feature cannot be meaningfully categorised in relation to the other situational elements. It is therefore analysed separately and summarised in table 11.

A new feature of the solution space emerged while examining situations at Citibank. A number of users were particularly aware of the potential effect of a single error or lapse in performing their respective tasks. The user's perception of the effect of such errors is therefore one of the criteria used in grouping IUS at Citibank.



The following are the main criteria for grouping the eleven information use situations identified in Citibank.

- TASK
  - i) The functional role of the task
  - ii) CBIS dependency of the task
- SOLUTION SPACE
  - iii) The type and sources of information used
  - iv) The task evaluation criteria
  - v) The main information value attributes desired
  - vi) The perceived effect of a single error/lapse.

Using the above criteria, five groups of IUS in the Citibank study were discerned.

#### *Group A*

Situations in this group are principally dependent on routine computer-mediated reports. Some of this dependency is by default or by preference even though computer-based information is not necessarily indispensable in performing the task. The reports are mainly based on transaction monitoring data and they are used for the monitoring and control of routine business activities in the bank. The two most desired information attributes in these situations are accuracy and timeliness. Accuracy refers to the need for the content of the report to reflect the true state of the business activity being monitored. Timeliness is the requirement that the report is always received at a time that will allow for appropriate follow up action if required. Because these tasks pertain to routine monitoring and control activities the performance criteria associated with them are normally based on the targets set for the activities they monitor. These targets are often quantitative, measured initially in terms of throughput and later in terms of cost-savings or revenue in specific time periods. In general, single errors in performing tasks

in these situations are not considered disastrous to the organisation and they are often relatively easy to rectify.

The situations classified in this category are B1, B41<sup>23</sup> and B51. B1 refers to the IUS pertaining to the two tasks examined for the process support manager, i.e. contract management and monitoring the bank's image processing team. The situations in which the two tasks are performed were found to be similar enough to be regarded as the same. B41 and B51 refer to situations that feature the monitoring of the direct sales team by the direct sales manager, and sales tracking activities of the distribution director, respectively. These situations feature only one each of the two tasks examined for these users. This implies that the situations relating to the other tasks are sufficiently different to be considered separately.

#### *Group B*

Tasks that feature in situations in this group often involve extensive data analysis. The data comes from both internal transaction records and external research undertakings. The main source of information is computer-based data originating from within and outside the organisation. Because of the large quantity of data involved, the computer system is indispensable in these situations. The main use of information here is for strategic planning, based on predominantly medium but sometimes long-term objectives. The value attributes most desired of the data utilised in these situations are: (a) the extent to which the data covers the population to whom it refers, (b) the perceived reliability of the data, reflected by the method of collection and/or the reputation of the source, (c) the currency of the information derived and (d) the rarity or exclusivity of the information. The first three features relate mainly to object value while the fourth relates to conceived value.

The tasks performed in these situations are in general unstructured even though they may involve certain well-known procedures. The tasks

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<sup>23</sup> B41 refers to the situation involving the first of the two tasks examined with B4; similarly B52 refers to the situation involving the second task associated with B5.

may not therefore have specific performance criteria, apart from the general macro-objective to which they are directed. The medium-to-long term nature of these objectives implies that they cannot be adequately evaluated at the time they are performed. Single lapses in performance may however be quite expensive for the organisation. The situations B3 and B52 fall into this group. B3 refers to the situation featuring both tasks examined for the marketing manager (consumer intelligence). The tasks are the modelling of a business plan and financial analysis of customer data. Again the situations relevant to the two tasks are similar enough to be taken as identical. B52 refers to the situation involving the business development task of the distribution director. The other situation identified in respect of this user was classified earlier under group A.

#### *Group C*

A high degree of technical know-how, awareness of current trends and industry standards, and diverse sources of information is required for tasks that feature in situations in this group. These tasks are in general project based and the user is responsible for managing the entire project. The user's role is often both operational and managerial and as such requires a combination of technical, business and monitoring information. The sources of that information are both internal and external and the computer-based information is again indispensable in performing these tasks. However, unlike group B situations, the internal bank computer-based information may not be as important as the users technical know-how and information from external sources. The reliability of the information as well as the physical and intellectual availability, which are partly determined by the form, medium and clarity of the information are some of the main value attributes desired here. The functional capability and efficiency of the computer system are also important. The tasks are evaluated according to the objectives and constraints of the projects. Like all projects, the constraints are in terms of time and cost (budget). When the organisational climate is highly efficiency focused, these

become the primary performance criteria, even though the real task objectives are sometimes less quantifiable and may therefore be less objectively evaluated. Because of this, unless the task outcome is significantly below expectation the task is usually evaluated principally according to the project constraints of time and cost. Lapses in task performance in this category often have grave consequences for the organisation. However users believe that it is difficult but possible to recover from such lapses.

The situations B2 and B61 belong in this category. B2 involves the task of planning and executing a marketing project (e.g. a product launching advertising campaign by the marketing manager for customer acquisition). This was the only task examined for this user. B61 involves a project for developing and implementing a website for the bank's EMU transactions, undertaken by the assistant vice president (e-Citigroup).

#### *Group D*

The main feature of situations in this group is that they involve tasks that are considered supplementary to the main duties of the users concerned. The supplementary duties may be very important to the organisation but perhaps not crucial to the key functions of the business. Some users take on these tasks voluntarily while others are requested to take them on usually because of their expertise in the relevant area. The user's level of expertise and knowledge in the relevant area is key in performing tasks in these situations. This expertise is enhanced by technical information from specific manuals and other published materials. Thus the tasks may not rely significantly on the formal internal computerised information system. Because most of the required information derives from user know-how, the main value attributes required are how up-to-date the user's knowledge is and the availability, ease of access and clarity of any supplementary information that may be required.

The tasks undertaken in these situations may pertain to more than one functional role. For example, the 'quality training' duty in B42 is primarily regarded as a marketing function but it could also be conceived as an

administrative or personnel role geared towards human resource development. The other two situations that fall into this category i.e. B62 and B71 may be seen as indirect contributions to the marketing and financial control functions respectively. In the B62 situation, the assistant vice president (e-Citigroup) acts as a resource person or an enabler for the development of the Internet website for Citibank, Spain. B71 involves a monthly expense analysis task, undertaken voluntarily by the director of the e-Citigroup in the EMEAA region. Because of the add-on nature of these tasks, they often do not carry clearly defined performance criteria apart from the implicit understanding that users are expected to perform them professionally and effectively. Where budget constraints are applied, there is an added requirement for efficiency. In general, single errors are perceived by the users to have minimal effect on the organisation although the real effect is difficult to quantify.

#### *Group E*

Occasionally, certain users are assigned duties that cannot be described in terms of the main traditional functional roles found in the organisation. Sometimes such duties involve a combination of various specialist roles, with no clear boundaries either in terms of scope or nature of the task. The task of originating and facilitating external business partnerships undertaken by the director of the e-Citigroup (EMEAA) is one such duty. The situation that occasions the performance of this task, B72, is the only one in this group. The unbounded and unstructured nature of the task makes it very difficult to identify the types and sources of information required. The user often requires information on market trends, business intelligence, product and technological developments, internal human resource profile, local and regional office politics and so on. Some of this information can be acquired through formal and informal internal channels but the most crucial information needed comes from external sources. The most important information value attributes in this situation are availability when required

and reliability. In the case of very informal sources, the reliability of the information is judged, among other things, by the user's relationship with the source, gut feeling, and local business and market trends.

Tasks in this category may be described simply as entrepreneurial activities since they do not fit into any specific functional role in the organisation. The tasks are evaluated according to interim results or outcomes, which are considered instrumental to the achievement of the main business objectives and goals. For example, successfully negotiating a partnership contract between the bank and an Internet Service Provider (ISP) company for the purpose of providing Internet banking to customers is only an instrumental objective. The terminal objective and value is that the bank should increase its customer share, business volume and its profit. Hence although the tasks often have broadly defined performance criteria in the form of interim targets, the tasks are better evaluated over a longer period, based on the real business objectives. On the other hand, because there are numerous other variables between the completion of the task and the eventual business outcome, the current IUS should only be seen as a partial contributor to that outcome. Nonetheless the user believes that a single error or an inadequate level of performance has serious consequences for the bank. Because of the dynamic and very competitive nature of the financial services sector, any such error will result in the bank lagging behind its competitors and hence losing competitive advantage. Table 10 summarises the above groupings.

Table 10: Categories of IUS at Citibank

IUS Element	GROUP A	GROUP B	GROUP C	GROUP D	GROUP E
<b>TASK</b>					
<b>Functional role of task</b>	Routine monitoring & control	Strategic planning through data analysis	Managing projects	Cross-functional supplementary duties	Entrepreneurial activities
<b>CBIS dependency</b>	High, but CBIS is not indispensable	Very high. CBIS indispensable	High, CBIS indispensable	Low, occasional use of CBIS	Low, some use of CBIS but not routine
<b>SOLUTION SPACE</b>					
<b>Main source of info</b>	Routine computer mediated reports	Data on internal business transactions & external trends	Internal & external business data and info, CBIS often indispensable	User expertise, published information	Internal business & research data, informal contacts, business intelligence
<b>Task evaluation criteria</b>	Meeting operational targets	Not specific; aims at improving general organisational performance	Project constrains of time & cost; effectiveness of process and product	Not specific, professionalism expected	Interim performance Targets
<b>Information value objectives</b>	Accuracy, timeliness	Reliability, currency, adequate scope, rarity	Reliability, physical & cognitive availability, CBIS functionality	Availability, clarity, ease of use and currency of user expertise	Availability, reliability
<b>Effect of single lapse</b>	Not disastrous, could be easily rectified	Often expensive for organisation	Grave consequences for organisation	Perceived as minimal but real effect difficult to assess	Serious consequences

The IUS elements in table 10 are slightly different from those used to categorise IUS across the first three organisations (table 7). One difference is that the task structure feature has been eliminated since most of the tasks examined at Citibank were largely semi-structured or unstructured. The situations could not therefore be grouped according to this feature. Instead, the effect of a single error or lapse in performing the tasks examined was found to be a more important influence in the situations studied. Another difference is that characteristics of the users at Citibank could not be easily categorised according to the user element in the IUS framework. For example, all the users interviewed displayed comparable levels of motivation and IT expertise; and nearly all of them were middle level managers who were either graduates or highly experienced staff. Table 10 does not therefore feature the user element. The main feature of the user that was found to be relevant in the Citibank situations is the user's perception as to whether the power and authority they had in the organisation was commensurate with their formal position. This feature is analysed in Table 11.

Table 11: User's perception of their power/position ratio at Citibank

<b>Power/position Balance</b>	<b>Power less than position</b>	<b>Power equal position</b>	<b>Power more than position</b>
<b>Number of users</b>	3	3	1
<b>Perceived effect on information use behaviour</b>	None	Positive	Positive
<b>Interpreted effect on information use behaviour</b>	Negative (due to extreme caution in decisions & actions)	Positive (aware of appropriate checks and balances and generally satisfied with level of authority)	Positive & Negative (confident in decisions and actions but disposed to some high risk ventures)

In the next chapter, the categories of situations explored in all the four organisations are re-examined and interpreted with a view to discerning the underlying notion of the value-in-use of information from the perspective of the individual user in organisation.



## Chapter Seven

### Interpreting Information Use Situations

The accounts of information use situations described in chapters five and six are only useful when interpreted and understood. Such interpretation should reflect the perspective of the individual user as well as the overall organisational purposes, norms and values that guide the activities featured in the situations. It must also endeavour to uncover the relevant 'lived experiences' of the users that feature in the situations rather than just deconstructing what they say about the situations.

We should start by reiterating the purpose of the study, which is to gain insight into the concept of value of information in organisation. In particular, the study investigates the role of situational factors in determining or influencing the value-in-use of information. By describing and categorising a number of information use situations, this study aims to contribute towards the enhancement of information value in organisations.

In hermeneutics, the process of interpretation is fundamentally linked with understanding. Therefore to interpret a text, an event or a situation is to attempt to understand it. However, that understanding must always be seen as representing a particular perspective. Since the process of interpretation is both historical and continuing, the understanding should be as much a function of the past as it is of the present and the future. The purposes and processes of information use are therefore as important in the interpretation as the experiences of the actors featured in the situations being interpreted.

Introna (1997) suggests that a full hermeneutic interpretation involve both the grammatical interpretation of the text and its structure, and the psychological interpretation of its author. In this study, the researcher plays the role of the interpreter while the users in the various organisations whose perceptions, values, aspirations and discernible behaviours feature in the situations are regarded as the authors. In addition to interpreting what the various users said about their respective information use situations and how

these relate to the concept of information value, this exercise also attempts to discern the cognitive, emotional and socio-political features of user behaviours in those situations.

The accounts of information use situations given in chapters five and six are themselves interpretations since they were created by the interpreter and not by the 'authors' directly. Those accounts should be seen as initial steps in gaining understanding of the relevant situations. This chapter takes those steps further by providing an abstraction and summary of insights gained from both the theoretical and empirical accounts given in the entire study. Before that, we need to restate our conception of what constitutes a situation.

It was observed in chapters three and four that the concept of a situation is somehow fractal in nature i.e. each situation could be seen as comprising many other situations. In practice, the particular situation individuated by users depends on which elements in their domain of activity gain attention as sources of concern, interest or conscious awareness. A situation can therefore be moment (time) focused, individual user focused, organisation focused, task focused, solution focused or be based on some combination of these elements. However, situations are not finite entities or phenomena that are uniquely determined by a fixed set of variables. This observation is especially significant in the light of Hoy's (1978) suggestion that understanding is always situation dependent and that humans can only individuate limited situations in specific perspectives during a particular experience. Understanding is hence a unique but varying experience.

From the perspective of business organisations, it is both impractical and uneconomic to attempt to understand, and hence cater adequately for every individual information use situation. It is more practical for organisations to address categories of information use situation in a bid to improve the value-in-use of information in those situations. Lif (1999) takes a similar approach in proposing a user-interface modelling method for systems development. He introduces the concept of 'actor model' as a representation

of the characteristics of each category of users. He argues that this is necessary because "it is seldom possible to model each individual end-user due to tight time schedule and budgets". This chapter will hence focus on categories of IUS rather than on every individual situation.

The rest of the chapter takes the following form: first the key features of the categories of IUS discerned in chapter five are summarised and interpreted through the use of several examples. Second, the main notions of information and value across the categories are presented, together with the principal uses of information in the three main functional roles studied. Third, a generic characterisation of how situational factors affect the value of information at individual user level in organisations is presented. Theoretical support for this characterisation is presented in addition to empirical evidence from the cases studied. The chapter concludes by discussing the implications of the above interpretations for information systems theory and practice, especially for information systems implementation, evaluation, and management.

## **7.1 Generic categories of IUS**

The groups A - E presented in chapter six should be seen as mini-categories within the more general categories of IUS given in chapter five. However both set of categories relate to only one of the three dimensions of IUS examined in this study. That dimension concerns the fit between the more stable characteristics of the user, the task and the solution space associated with the performance of tasks. The other two dimensions concern the macro organisational environment and the user's emotional and psychological characteristics, which were summarised in tables 6 and 8 respectively. Factors relating to these two dimensions are often dominant in directing user information use behaviour but not stable enough to be categorised together with the other IUS factors. The following categories of IUS are hence described according to the common features of the tasks, users and solution space of the situations examined.

*Category one:* is described as situations involving very technical and often operational tasks. These tasks are generally quite structured with clearly specified performance and evaluation criteria. The evaluation and feedback periods are short and output is generally in support of line management functions. Examples of such tasks are the report producing duties of C1 (assistant systems support officer); the tenant account termination task performed by C2 and the data entry duties of L2, a senior library assistant. The criteria for evaluating C1's task are the production of the required report on time and in a specified format. Feedback is almost immediate if these conditions are not met. For C2, the tenant's account must be terminated within the week the request is made. There is a weekly feedback from the senior arrears officer if this is not accomplished. The data-inputting task of L2 is even more structured in the sense that both the process and evaluation criteria are rigidly enforced. For example, L2 is expected to input 30 records per hour for three hours everyday. This is monitored daily and failure to meet the target results in some form of penalty. The data entry process itself is directed by the input interface of the database system. L2 comments that there is no facility for her to modify the template offered by the system even when certain data items cannot fit into the fields predefined for them. This makes her feel that sometimes the data she enters is not very meaningful. Because her performance is monitored purely in terms of quantity and not quality she even doubts the usefulness of the database system she is helping to create.

Apart from the current organisational climate, which had an overriding influence on most information use situations, the main drivers of situations in this category include the technical expertise, motivation and capability of the user; the reliability of the available information technology, and the monitoring and evaluation practices and criteria that apply in the situations. Because none of the tasks in the category can be performed without the computer system, the availability, reliability and functional capability of the technology is very important. In the three situations above, all three users

had adequate technical expertise but very different levels of motivation. L2 was particularly ill motivated in her situation because, among other things, she disapproved of the rigid monitoring and exclusively quantitative assessment of her work. It however appeared that there were deeper socio-political problems with this user. She felt that the library management either did not value her service or did not assign her duties and responsibilities commensurate with her formal position in the organisation. This perception seemed to have a very negative effect on the manner of use of the information available to this user. For example, although she did not deliberately commit errors, she made no attempt to rectify silly mistakes when they occurred since she knew that the task was evaluated purely on quantity of records entered and not the accuracy of those records. Her lack of interest in the organisation as a whole however seemed to be the most crucial determinant of her IUS. She believed that this situation was principally because of the organisation culture and climate, which according to her, was manifested in management's greater interest and trust in information technology as compared with human resources. Unlike L2, both C1 and C2 were adequately motivated in their roles, probably because they believed that their technical expertise was recognised by management. Their performances were also neither rigidly monitored nor evaluated exclusively in quantitative terms. These users therefore conceived their situations as relatively more conducive to enhancing the value of the information they used.

*Category two:* Mainly semi-structured or less rigidly structured tasks characterise situations in this category. In most cases the objectives of the tasks are predetermined but the users are allowed some discretion with respect to processes and procedures employed. The tasks in this category often involve supervisory level routine monitoring and control functions as well as some direct operational business functions. The key IUS drivers here are the user's perception of the importance of the task, the evaluation criteria applied to the task, including the sanctions and rewards associated with it

and the timely availability of relevant information. This category contains the highest number of situations examined in the study. This implies that a large number of the situations investigated involved the performance of routine monitoring and control tasks. Two key factors that determine the success of these tasks are the availability of the appropriate monitoring and control information and the ability and disposition of the user.

An important aspect of such disposition is the user's perception of the importance of the task. For example, because H1 believes that his food purchasing duty is absolutely crucial to the hotel, his information seeking and use behaviour is often very intensive and extensive. He professes to be very keen to get the best bargain for the hotel and in doing so, he does not limit himself to formal sources of information. On the contrary L3 does not put great premium on her task of resolving disputed loans in the library. Although there are prescribed procedures to perform this task, she often fails to follow them because she does not think the task is of particular importance to the library. She does not therefore seek and utilise the necessary information in the most appropriate way. B1's contracts management task seem to fall between the above two extremes. This user is a long serving staff and shareholder of the bank and as such is highly interested in the success of the bank. However he feels that sometimes decisions and actions he takes in performing the task may not have significant effect on the bank as a whole. Thus while B1 believes that it is important to perform the task well, he is not always certain of the significance of the task. This obviously affects his information use behaviour. For example, he reports that it is entirely left to him to decide whether to take action or not if he finds that contract services are not being delivered to the appropriate standards, or that there is some room for cost savings. Since he does not take part in negotiating the contracts, sometimes he decides to take no action, indicating that he does not think his role is crucially important. The monitoring information he gathers is thus not always used in the most effective way.

Another good example of a situation in this category concerns C3's task of taking court action against a client for overdue rent arrears. Although there are council policies and procedures that guide this action, the user has certain discretionary powers when performing the task. He can delay the action purely on grounds of compassion and the justification for this compassion is usually based on informal information and knowledge. This user seems to believe that the task is necessary but not especially vital to the success of the council. As stated in chapter five, there is a possibility of a mismatch between the formal objective of the task and the user's personal performance objective, which may lead to sub-optimisation. In general, it seems that the role and value of formal (computer-based) information utilised in this process is not always adequately appreciated by the user. Hence the timely availability of information on the status of current rent accounts is necessary but not sufficient to ensure the success of the task. Because the user is not held responsible for unsuccessful outcomes of the task, his perception of the importance of the task and hence his motivation to perform it well tend to be at best average. This suggests that there may be room for improving the scope and manner of use of the information, which might lead to higher value realised.

*Category three:* Category three situations involve tasks that range between the semi-structured to the fairly unstructured. Sometimes both the immediate objectives and processes employed in performing these tasks are flexible to some extent. The tasks usually pertain to aspects of monitoring and control duties at line to middle management levels. Again, organisational climate is very important for situations in this category. The user's sense of duty, responsibility and motivation are highly important here as routine decisions often affect several operational tasks in the relevant sections or departments. The availability - in appropriate format - and accuracy of reports on routine business activities are key to the success of most tasks performed in these situations. Users in this category are mainly supervisors or line managers

with responsibility for short-medium term operational decisions within their administrative, monitoring and control role.

Some examples of situations in this category are those involving the following tasks: B6's task of supervising the EMU website development project (B61), C5's task of resolving a disputed loans claim, H3's task of resolving a customer complaint in the hotel restaurant and L4's task of producing a collection list for the library's archives. Each of these tasks has certain predefined procedures but they are in essence largely unstructured and the user sometimes employs trial and error in performing them. Because the success of these tasks is often time-dependent, the availability of the necessary information in the required format is very vital. For example, B6's EMU website project is aimed at producing competitive advantage for the bank by offering an outstanding Internet-based service ahead of the bank's competitors. The timing of the completion of the project is crucial. Likewise, the time taken by C5 to settle a disputed claim affects the productivity of his department. In the case of H3, the hotel has a policy of settling all customer complaints on site, which means that the user is often under great pressure of time to complete the task before the guest leaves. L4's archives list-producing task is equally time sensitive since users often expect and prefer instant access to the material requested. It is therefore very important that the information required to perform these tasks is readily available and it is in the desired format. However, perhaps the most important drivers of situations in this category are the user's sense of duty, responsibility and motivation, and the general organisation culture and climate. For example, the culture of pursuing continued excellence and differentiation of services in the hotel (H3) contrasts with the focus on efficiency of operations in the London Borough Council (C5). Although the two users concerned appeared to be equally capable in their respective jobs, this difference in business focus and organisational climate was evident in the level of effort, commitment and perceived importance they applied to their respective tasks.



Similarly, while B6 was very conscious of competition from other banks in the EMU website project, L4 was aware but not directly influenced by competition from other libraries. The difference did not necessarily make one user more motivated than the other but it created different degrees of the sense of urgency and of importance of the tasks in question. This mediated the users' information seeking and use behaviour and the corresponding personal criteria for evaluating such information.

*Category four:* the tasks in these situations are again very technical. As such they often require highly qualified or experienced users in the appropriate fields. These users are however different from category one users because they have more authority and responsibility to take important business decisions and do not just perform support functions for decisions taken by higher authorities. The nature of tasks in this category is often unstructured and they are mainly in support of strategic planning duties. Extensive data and information analysis is involved and the source of that information is unlimited. The extent of analysis required and the amount of data involved often make the computer system indispensable in these situations. The functional capability and reliability of the computer-based information system is hence a key factor in performing the tasks. Because the tasks are so unstructured, the user's expertise, self-confidence and perceived level of authority or power in relation to their formal position are important determinants of the IUS. Since the tasks are necessarily evaluated in the medium to long term, the main evaluation criteria are often in terms of business performance targets over a period of time. Apart from these, user performance may be assessed in terms of the associated project-based constraints, which are usually specified in terms of cost and time.

The situations classified under this category include the business modelling and financial analysis tasks of the marketing manager, consumer intelligence (B3); the business development task of the distribution director (B52); and producing a briefing paper by the research and IT officer (C6). All

these tasks require high computer and information processing skills and extensive functionality of the computer system. The users have considerable freedom in determining the objectives and procedures associated with the tasks. B3, for example, reports that he is not restricted to any method in either of his tasks and he sometimes rejects the targets set by his bosses. The high level of self-confidence and authority he commands makes this possible. Likewise C6 is very confident in his own technical ability and has considerable freedom in the performance of his duties. However the environment of the London Borough Council is different from the bank, and this affects the two situations in very different ways. While the key influences in the former come in the form of political and cost constraints, fierce business competition and the need for innovation and competitive advantage drive the latter. These influences impact on both the user's conscious and unconscious effort in the use of information. For example, the business development task of the distribution director involves the periodic formation and review of business performance targets and processes. Crucial information for this task includes industry benchmarks and trends and intelligence on the performance of main competitors. This information inevitably affects the user's effort, determination and commitment, which in turn influences his information use behaviour. On the contrary, C6 does not have to measure his performance against any outside indicators apart from national policies and guidelines regarding the provision of social services by local councils.

*Category five:* Tasks that characterise situations in this category may best be described as ad hoc combinations of undertakings that are often as emergent as pre-planned. Because of this, the tasks are better described in terms of user responsibility rather than the nature of the task. When a user is given the sole responsibility for an assignment that involves multiple users, and tasks, both within and outside the organisation, and at various layers of the administrative hierarchies concerned, the role of that user may involve virtually all the other functional roles found in the organisation. The nature

of the tasks to be undertaken cannot therefore be easily described. However in the case of the situations explored in this study, it should suffice to indicate that the tasks examined were highly unstructured, both in terms of objectives and processes, and most times the courses of action were more emergent than planned.

Only one situation studied fell into this category. The task of originating and facilitating business partnerships between Citibank and other businesses was so unstructured that the user described her role as a "one-man band". By this she meant, that apart from the macro objective of creating profitable business opportunities for the bank, it was entirely left to her to decide what to do, when, and where to do it. However, because of the very competitive business environment, her disposition and effort in performing the task were mediated by the desire for competitive advantage over similar businesses. In spite of this, because the performance criteria associated with this task - in the short term - were so 'fuzzy', success in performing the task seemed to depend entirely on her self-motivation, energy and expertise. The characteristics of the user seem therefore to be the key IUS variable in shaping the information use behaviour. When her unit's operating budget was however suddenly cut by 50%, the whole situation changed overnight. The organisational climate, which now reflected the need for efficiency of operations through cost reductions, became the key driver of the information use situation. This re-organised the value priorities from the previous focus on effectiveness, innovation and competitive advantage to efficiency and survival. Before this, the main factors that determined the nature of that IUS were the user's business, communication and interpersonal expertise, her motivation and energy to cope with the pressure of work, and the level of resources and incentives provided for the task. These factors were obviously mediated by environmental influences such as business and technological trends in the relevant sector and the level of competition faced by the bank.

## 7.2 Different notions of information

An important feature of the situations presented above is that users do not share a common notion of information across the categories. The situations studied suggest that user notion of information vary along the following three dimensions.

- (a) Main source of information for the user
- (b) the role of information in the user's work
- (c) the perceived value attributes of the information

The following table relates these dimensions with the three main functional roles that featured in the situations studied, i.e. data and transaction processing, monitoring and control, and strategic planning.

Table 12: Notions of information by functional role

<b>Main Functional Role</b>	<b>Main source of Information</b>	<b>Role of Information</b>	<b>Desired (value) Attributes</b>
<b>Data &amp; transaction processing</b>	Data & computer based information systems	Raw material & tool	Availability, completeness, electronic format
<b>Monitoring &amp; control</b>	Aggregate data, exception reports, plans, policies, procedural documents	Reflect status/reality of task performance	Accuracy, timeliness, increasing desire for instant access & interactive communication
<b>Strategic planning</b>	Multiple sources of data/information. Market reports, analytical and projective information, intuition and news	Basis for new insight, confirmatory, justification & rationalisation	Reliability, physical and cognitive availability, exclusivity and timeliness

The roles correspond roughly to tasks that feature in situations classified as category one, categories two and three, and category four respectively. It was stated earlier that situations in category five involve all the three functional roles, although in the B72 situation, the user perceived her role as mainly belonging to the strategic planning function.

From the table, it could be seen that both the role of information and the principal value attributes desired are different for the three main

functional roles found in traditional bureaucratic organisations. Nonetheless irrespective of the functional role associated with the situation, all information use situations affect the information use process in a number of generic ways.

### **7.3 Generic effects of IUS**

In spite of the above categorisation, all information use situations seem to mediate the information use process in certain generic ways. This subsection outlines three such ways as discerned in the study. It must be noted that it is easier to discern the influence of information use situations as holistic phenomena on user behaviour than to identify the impact of specific IUS elements. This is probably because users are often not in control of, or even consciously aware of, certain influential elements of the situations they operate in. In other words, they discriminate rather than individuate these elements. Users are also sometimes reluctant to reveal to the researcher, the true drivers of their situations. Furthermore, situational elements are by nature interdependent and dynamic so that organisational outcomes and their effects on individuals may not be easily attributed to the role of discrete situational factors. We will now examine some generic ways in which information use situations mediate the use and value of information in organisation.

#### **7.31 Three characterisations of IUS**

IUS of all categories seem to affect information use behaviour in at least three generic ways. These correspond to the characterisation of information use situations as (a) filters (b) mediators of use behaviour and (c) as frames of reference for evaluating informational activities. In practical use situations, these characterisations are often indistinct and hence are not always obvious to the user since information use (i.e. cognitive use) is not necessarily a structured linear process. Nonetheless, for analytical purposes the three characterisations could be seen to affect the value of information in very distinct ways.

### *Information use situation as filters*

The first and perhaps most desirable attribute of information to users in every organisation is relevance. When users receive or encounter some information in their functional roles in organisation, the very first conscious or unconscious decision they come to is whether such information is relevant to their current situation. McCreadie and Rice (1999) suggest that access to information by individuals is influenced or constrained by physical, cognitive, affective, economic, social and political factors that characterise their situations, and that these factors also influence both the use and evaluation of information.

Because these factors are often not the same for different users, each user tends to individuate and utilise only those aspects of information that are relevant to their situation. This individuation and the corresponding judgement of relevance may pertain to whole chunks of information or minute aspects of the information encountered. In either case, the process of consciously or unconsciously appropriating selective elements of available information amounts to a filtering action. The extent and nature of filtering required depends on the nature of the situational imperatives and the filtering may take any or a combination of the following forms.

- a) The tendency to direct the user's attention to only those aspects of the information that are perceived to be relevant to the current situation.
- b) The need to transform or convert the information - in terms of notation, form, and format - into a more understandable and usable state for a particular user.
- c) The requirement to extend the information with other, often less formal, information in order to be sufficiently useful in the relevant situations.

Although these forms of filtering can occur in every information use situation, empirical evidence suggests that the nature of the IUS determine the kind and extent of filtering applicable. For example, the filtering phenomenon was found to be more applicable to situations that feature the more unstructured

tasks, with less specific objectives, and for users with more authority and discretionary decision making responsibilities. If we consider the five categories as a continuum ranging from category one to category five, these types of situations are found in the latter half of the continuum i.e. categories three, four and five. However, even within these categories not all dimensions of the filtering action are equally applicable. For example, since all the users interviewed share a common language (English) and were also reasonably computer literate, there was very little need for the conversion of formal reports into other languages or alternative notations. However, the other filtering roles of discrimination and the need for supplementary information were applicable to many situations. For example, the situations B52, B72 and C6 necessitated frequent and extensive filtering of the information that is usually available to the users. The main needs for filtering were to identify items of information for relevance and to acquire the necessary supplementary information to make such information more meaningful. B5 sought such information from trade journals and colleagues while B7 relied mainly on personal information contacts inside and outside the organisation.

Middle managers, who received formal reports often 'filtered out' much of the detail in the report and only concentrated on aggregate figures or main themes. B5, C4 and H5 are examples of such situations. In B51, the user was only interested in aggregate sales figures per business unit, per product or per customer category. C4's interest centred mainly on comparing arrears levels with the targets set for the relevant period. H5 used the information in the hotel's monthly profit and loss account in a similar way, i.e. to compare aggregate profit and loss figures with the targets set for the relevant period. In all these situations, much of the detail of the reports was filtered out even though such detail could be valuable when reasons are sought for failure to meet the targets.

In situations featuring both monitoring and control, and planning tasks, the aggregate figures and themes in the necessary reports often require

supplementary information plus adequate background knowledge for them to be sufficiently useful. On the other hand, situations in categories one and two, which feature more structured tasks, very specific task objectives, and less discretionary decision making tend to have less need for supplementary information or for filtering-out unwanted information. This is probably because the users are given access only to discrete items of formal information, which constitute the minimum required to perform their respective tasks. In other words, the information they work with is normally already formally filtered through devices like data input and output forms. This filtering however often necessitates the need for supplementary information. The inclusion of devices such as notepad fields in many database applications reflects the recognition of this need. However, various design and hardware restrictions often limit the effectiveness of these devices.

L2's data input task was so structured that she had no need to validate the data, apart from some basic system-enforced syntax requirements. She therefore needed very little, if any, supplementary information. Similarly, C2 received information for terminating tenancy accounts on proformas, which conveyed only the minimum necessary information for completing the task. Because the information was conveyed to him through a formal proforma authorised by a higher authority, he believed he had no right to question the validity of the information therein. He therefore used the information as directed even if he personally doubted its accuracy. This is not because he had no authority to validate the information but that he believed the task should be performed by diligently following established procedures.

#### *IUSs as mediators of use behaviour*

One of the most important factors in the cognitive use of information is the concept of meaning. Through meaning information leads to action<sup>24</sup>, which constitutes use behaviour. However, the meaning of information is often dependent on context (Sciore and Segel, 1994; Wiederhold, 1994; Grimshaw et

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<sup>24</sup> The term action is used in the widest possible sense. It refers to any response, including the taking of decisions that may or may not result in discernible physical action.



al 1997), which McCreddie and Rice<sup>25</sup> (1999) describe as "the larger picture in which the potential user operates ... and in which potential information may become available".

Mingers' (1995) semiotic account of the relationship between information and meaning - discussed in section 2.2 - suggests that a "receiver's knowledge, intentions and context determine what counts as information". In other words, individual (personal) context factors affect the transformation of signification into import, which is the principal determinant of action for the receiver. This action, which is not always necessarily physical or externally observed, constitutes use behaviour. Thus by mediating import or specific meanings, information use situations become important determinants of use behaviour.

The effect of import on use behaviour could be viewed in at least two dimensions viz.: the scope of use and the manner of use. Scope refers to all the possible implications or areas of application indicated by the receipt of the information and the manner of use accounts for, among other things, the extent of interest, motivation and effort of the information user. Both of these effects often bear directly on the discernible outcome of the use behaviour, which is normally seen as the indicator of the value-in-use of the information in question.

The role of IUS as a filter outlined earlier could be seen as one aspect of its role as a mediator of information use behaviour. The filtering role does not only indicate conscious and unconscious judgements of relevance but may also result in perceptions of added value. For example, C3's supplementary information on the financial status of tenants often influences his decision to take court action against the tenants. The decision sometimes saves time and money for the council, which are indicators of the value of such information. Knowing that a certain tenant has just lost his job would indicate that the

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<sup>25</sup> These researchers further characterise context as 'all the precursors to information seeking, which they maintain, is different from a situation. They define a situation as 'the particular set of circumstances from which a need for information arises'.

council would gain very little, if anything at all, by taking such tenant to court. C3's experience suggests that giving the tenant time and then carefully negotiating with them about flexible payment terms often produce more profitable results for the council.

By their nature, situations in categories one, and to a lesser extent category two, involve tasks that are more rigidly procedural. They therefore offer less opportunity for variations in the scope of applicability of the information used in these situations. However, there can be huge variations in the manner of use of such information, which inevitably affect the value realised.

Some examples of situations here include H1's food purchasing task in the hotel; L2's data input and C1's report producing task. The procedures for performing these tasks are well specified so the user has very little scope for exploring other uses of the information available to them. However the user's expertise, interest and commitment to success can have significant effect on the success of the task. For instance, H1 is constrained by hotel policy to purchase foodstuff exclusively from certain stores. The stores provide a formal price list to the hotel periodically. However H1's high level of motivation enables him to get better prices from these stores by searching for more competitive prices and requesting the relevant stores to match those prices. Such cost saving has to do with the manner of use of the available information, which is a feature of the user's information use situation.

On the contrary, because L2 is very poorly motivated in her situation, she tries to perform her data entry task to the very minimum level required. While she does not deliberately commit errors, she is unlikely to make extra effort to rectify grammatical or syntax errors that she finds in the data. This obviously affects the eventual value of the system she is helping to create. C1's motivation and interest in his report-producing task was found to be at a level between that of H1 and L2 as described above. As such he made some effort to deliver more than the minimum required but was not over zealous in performing the task. For example, he sometimes suggested new layouts for

the report in addition to what was requested, to enhance and facilitate the use of the report.

Situations in category three and especially categories four and five often feature less structured tasks, with higher levels of user discretion. As such both the scope and manner of use of information in these situations are significantly more dependent on the nature of the IUS. For example, the perceived value of information used in situations B2, B3 and C6 is often more dependent on the user's perception of its reliability than accuracy. Because the user has considerable discretion on how to perform the task, it is often within his power to decide whether or not to use certain items of information and also how and where to use them. This means that IUS can affect both the scope and manner of use of such information. B2 comments that because he is free to seek and use information from anywhere, and because there are several sources of the same information, his perception of the credibility of the source plays a vital role in his judgement about reliability. B3 considers both the method of collection and analysis of data as important indicators of reliability. C6 normally encounters vast quantities of data and information and makes routine personal judgements and relevance as he goes along. These judgements and dispositions affect both the scope and manner of use of the relevant information. Furthermore, because supplementary information is often necessary to augment the value and usefulness of the formal information available, the user's perception of the relative importance of the two kinds of information becomes crucial. B7, for example, believes that in certain parts of the world (i.e. Africa, Middle East and Asia), supplementary informal information is more crucial to the success of her task than what she calls "the formally available information". H2, B5 and C3 also believed that supplementary information from informal sources are as important to their respective functions as the formally supplied information.

### *IUS as a frame of reference for evaluation*

From an individual user perspective, measuring the value of information from the outcome of use suggests a further role for information use situations in the evaluation process. To examine this role, we must first clarify the role of information in functional human behaviour. That is, when information is especially sought and utilised for a particular purpose, as opposed to information people come across naturally or effortlessly in their living experiences. The former type of information is principally used in an instrumental capacity in business organisations. The need for such use arises from the "awareness that something in a process of problem solving needs to be addressed, explained, challenged, supported or expanded, through access to and use of information" (McCreadie & Rice, 1999). This means that the value of information is measured by the user's perception of the extent to which it brings about the desired objective of its use (conceived value). Since different individual users may not necessarily always have similar perceptions of the objectives and processes of information use because of differences in their respective information use situations, it could be argued that IUSs have an effect on the evaluation process.

The evaluation of the instrumental use of information could be seen as an attribution process. That is, it is an attribution - by the user in this case - of the extent to which the information in question is responsible for the nature of the outcome, and the processes associated with its use. Moon & Nass (1998) investigated empirically the attribution habits of people when interacting with computers. Drawing on attribution theory in social psychology, and in particular the self-serving hypothesis, the researchers investigated the role of similarity<sup>26</sup> and user control<sup>27</sup> in the attribution process.

The self-serving hypothesis states that "people tend to predict the courses of their own behaviour, to themselves as well as to others, in a self-serving

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<sup>26</sup> Similarity refers to the extent to which an individual perceives the 'personality' of the computer system as similar to their lives, for example, whether they are dominant or submissive.

<sup>27</sup> User control refers to the extent to which a user perceives that he or the system is in control of the interaction process.

manner" (Nisbett & Ross, 1980, quoted in Moon & Nass, 1998, p.80). In other words, people would in general attribute successful or positive outcomes to their own efforts and capabilities, and failures or negative outcomes to external factors. Furthermore, they (people) tend to take the "opposite pattern of attribution with respect to the outcomes of others" (p.80). Nonetheless, it is acknowledged that self-serving biases are not universal (Moon & Nass, 1998) since they depend on numerous situational variables. Put another way, the tendency and intensity of self-serving bias in individuals is also a context-mediated phenomenon. Thus the process of attributing value-in-use to information is significantly influenced by the information use situation.

The various dimensions of a user's IUS may affect perceptions of information value in different ways but their collective effect tends to constitute an emergent frame of reference that forms the basis for evaluating the user's informational activities. In this regard, insight from the situations presented in chapters five and six suggest that:

- (a) An individual's situational perception is a central factor in their ability to attribute outcomes to specific causes.
- (b) Attributions of value, i.e. perceptions of negative or positive effects are not necessarily always outcome focused. Sometimes a user's predisposition toward a particular direction or feeling influence value perceptions even before outcomes are considered.
- (c) The personal, institutional and structural factors that mediate information use behaviour as context elements collectively serve as a frame of reference from which the user perceives the causes and effects of both the processes and outcomes that ensue.

Information use situations may thus be seen as both conscious and unconscious frame of reference for individuals engaged in informational activities, and such activities inevitably involve the continuous evaluation of the contribution of information toward relevant outcomes.

The notion of a dynamic purpose-process-effect cycle of information use implies that users are continuously engaged in the evaluation and re-

evaluation of the information use process. During the evaluation, each stage of the cycle may be challenged, altered or redefined according to the prevailing situational imperatives as perceived by the user. This process is not necessarily always rational or consciously undertaken but is nevertheless influenced by the nature of the user's information use situation. However, some users may not have the authority to challenge, or alter the purpose and the predefined procedures pertaining to the tasks they perform. In addition, even their personal evaluation of the effects of their performance may not be of much consequence in the organisation. For example, L2 believes that her personal opinion, about the efficacy and usefulness of the database system that she was helping to create, did not matter to management and was therefore of no consequence. The situation is different for C1, who believes that his contribution is valued by management.

For these users (i.e. users in categories one and two), the nature of their information use situation does not count as an important frame of reference for evaluating their informational activities. As such the value of information in these situations tend to be judged according to predetermined objectives set by other users with often very different IUSs. The thirty records per hour objective set for L2's data entry task, C2's one week time limit to effect the termination of a tenant's account and C1's report layout requirements are examples of such predetermined objectives. The users concerned do not necessarily always conceive of these objectives as value indicators but they are bound by them. L2, for example, believes that a qualitative assessment of her task is a better indicator of value than the prescribed quantitative criteria. Likewise C1 does not always believe that the report layouts requested by the various recipients are the most effective ways of presenting the information he produces. C2 report that he does not question instructions and schedules formally given to him even if he personally thinks that they are not appropriate. It is thus possible for users in these situations to work towards objectives that they do not necessarily think of as valuable.

As the tasks become more unstructured and complex and as user discretion, authority and responsibility for outcome increases, the user's IUS increases in importance as a frame of reference for evaluation. This is partly due to the fact that the user may have the authority to challenge, alter or revise the objectives and processes associated with the tasks they undertake. The task of modelling a business plan undertaken by B3 is one of the best examples in this category. Apart from very general business objectives such as increasing revenue in a particular business stream, in a specified period, and by a given percentage, or launching a new product by a certain date, the user has total freedom in the choice of interim task objectives and procedures. In addition, because he believes that the people who set the objectives often have very little idea of the operational requirements, he sometimes requests that the objectives be altered if he feels that they cannot be met. By altering the objectives and processes, the user sets new standards for evaluating the outcome of the task in general as well as the value of the information used in performing the task in particular. Hence by influencing the evaluation process, the user's information use situation serves as a frame of reference for evaluating the value of the relevant information.

This suggests that the value of information in situations classified under categories 3 - 5 may be more dependent on the use process than on the innate qualities of the information. A user's disposition to work towards the objectives as set, or to alter those objectives would influence the way he uses the available information. Since the tasks are so unstructured, the user's disposition to take risks or to experiment with new ideas will affect his information use behaviour. In the case of B3, his high self-confidence and disproportionate level of authority and power helped to create a very motivating IUS. B7 had a similar situation until her unit's operational budget was suddenly reduced by 50%. These two users assessed the role of information not only in terms of the formal organisational objectives but also according to the nature of their respective information use situations. However as stated earlier, the nature of the organisation climate often

overrides the pragmatic dictates of the nature of an individual IUS. This was quite evident in the case of B7, whose IUS changed suddenly overnight as a result of the drastic cut in her operational budget. Several months after conducting this study, the researcher learnt that she had resigned her position in the bank.

The great influence of organisational climate on information use situations does not necessarily diminish the contribution of the characteristics of information to the value realised from it. However, the value often comes from the fit between those characteristics and the nature of the information use situation. Sometimes that fit is simply a matter of user perception, motivation and ability. At other times it derives from internal and external structural, social and political imperatives that impinge on user behaviour. These factors together relate to the three layers of IUS features presented in this study, namely, the organisational environment; the more stable features of the task, user and the solution space; and the often temporal and changing intentionalities of the user.

The generic roles of IUS presented above cut across all categories of IUS but are not equally evident in each category. For example, the roles of IUS as a filter and as a frame of reference are more evident in categories 3, 4 and 5 while IUS as mediators of use behaviour relate to situations of all categories.

#### **7.4 Relating the IUS categories with the generic roles**

The nature of the situations described in the five categories presented in this study affect user perceptions of information value in very different ways. In terms of the generic roles outlined above, the differences reflect the extent to which the situations act as filters, as significant mediators of use behaviours and/or as frames of reference for evaluation. Findings of this study indicate that each of the five types of situations exhibit all the above roles but often not in equal measures. In other words, some information use situations necessitate more filtering action or have more direct influence on contingent



user behaviour than other situations. Also, sometimes the nature of the information use situation constitutes the principal criteria for evaluating the information encountered in the situation. Table 13 shows how the generic roles relate to the categories of IUS identified in the study.

Table 13: IUS categories and generic roles

	<b>Filter</b>	<b>Mediator of use behaviour</b>	<b>Frame of reference</b>
<b>Effect on information use</b>	Influence relevance judgement, focus on specific aspect of information and/or indicate need for supplementary information.	Extend or reduce the scope of application and effort in the use of information.	Modify the evaluation criteria and hence the indicators and measure of information value
<b>Most relevant IUS categories</b>	Mainly 3, 4 & 5	1 & 2 (mainly effort aspect)  3, 4 & 5 (both aspects, and categories in increasing order of relevance)	4 & 5

The above table indicates that certain generic roles are more relevant to certain categories of IUS than others. For example, IUS acts as a frame of reference, this feature is more relevant to situations where the users have greater autonomy in their information use behaviour than in the more structured task situations. The filtering process is also more pronounced in situations in categories three, four and five. Nonetheless, in spite of these differences, users in all categories of IUS seem to have a common underlying notion of the value-in-use of information. This notion is manifested through various indicators of value. The next subsection examines the information value indicators discerned in the study.

## 7.5 Information value indicators

In tables 7 and 12, 'good information' is described by all users in terms of the attributes of information, not the outcome of use. This might suggest that user notion of information value is principally based on object value, i.e. the

attributes of the information guarantee the value derived from its use. However, this study has argued that the process of use of information is equally, if not more important than the innate quality of the information. That process is always mediated by the purpose of using the information. This means that the information is used in an instrumental capacity and that the user's perception of the quality of such information is always relative to some objective. The desired information attributes in tables 7 and 12 should therefore be seen as indicators of conceived value rather than object value. The difference here is that conceived value is a projection based on user perception while object value denotes a user-independent relationship between the information and desired outcome.

Although certain attributes of information (e.g. accuracy, timeliness) are considered generically 'good' in all information use situations, the empirical evidence suggests that the meaning and importance of these attributes are relative. For example, timeliness in some of the situations examined meant receiving the required information at the scheduled time. For others, it meant a surprise receipt of information that lead to some opportunity or gain. Similarly, the notion of accuracy was found to be relative too. In some situations, accuracy referred to the method of information processing. In others, it was a measure of how the information reflected reality in respect of a particular business transaction or state of play. These differences in meaning and focus make it difficult to rely on the attributes of information as generic indicators of value.

The situations examined in this study suggest that a more generic indicator of information value relate to the 'fit' between the objectives and processes of information use. These objectives are not necessarily always formal or related to organisational goals. Nonetheless the completion of tasks is the most immediate primary objective for users in all categories of information use situations. Information is instinctively assessed according to its capacity to facilitate the performance of the task at hand. However, that capacity sometimes indicates utility rather than value. For value, the user

must appreciate and identify with the objective and/or the process of using the information. This notion of "desirable ends plus judgement of acceptable means" (Robson, 1997) defines a concept of information value that seems fundamental to all information use situations. "If it is available in a clear concise way that leads me to make clear analytical decisions then that's what I mean by value", declares B3. Implicit in this definition is the assumption that the decisions will lead to the desired objective for which the information is being used. The requirement for the information to be clear and concise reveals the need for the information to facilitate the process of its use. This facilitation of process may lead to the user liking at least the process, if not the objective and the outcome as well. Hence the underlying essence of the notion of value-in-use of information is the perceived potential of the information to facilitate the performance of a task, which should lead to some desired result.

It could be seen that this notion of information value involves all three dimensions of value as defined by Charles Morris. The quality of the information, the perceived potential to achieve a certain objective and the user's level of preference for both the process and objective of use of the information all contribute to determining its value-in-use. Because these dimensions are interrelated, the value-in-use of information becomes a composite of all the forms of value.

A reasonable starting point for measuring this value is to first identify the generic indicators of value that are consistent with the above notion of the value-in-use of information. These indicators could then be assessed by users in the various categories of IUS. A method for quantifying such assessment is a suitable topic for further research since it is beyond the scope of this study. However, this study identified the following indicators of value as a first step in determining and measuring the value-in-use of information in organisations.

The indicators identified in the study are as follows:

- a) The facilitation of task performance
- b) Facilitation of communication
- c) Enhancement of user knowledge
- d) Creation of positive user attitude and motivation
- e) Time, cost and effort saving which might result from all above.

Although the above indicators of value could all be related to information, they cannot be attributed exclusively to the quality of the information. As argued through out this study, other variables including the way the information is used, play an important role in determining the value of information. This is why it is very difficult to quantify the value-in-use of information in a generic, non-situation-specific form. Nonetheless, the above indicators of value could be used to solicit user assessments of value in respect of the performance of certain tasks and a suitable weighting system used to compute a composite value measure. Different weighting system could be developed for the various categories of IUS identified in the study. Such as system would recognise and reflect the different levels of relevance of the generic indicators of value across the categories of IUS. For example, the role of user motivation and attitude may be more crucial in situations involving the more unstructured tasks (categories 4 & 5) while time saving may be more important for situations in categories 1 and 2.

## **7.6 Implications for IS theory and practice**

The foregoing interpretation of the nature and effects of information use situations in organisation has a number of implications for current information systems theory and practice. These implications do not constitute substantive theories but they provide some insights into the relationship between context and information use behaviour in organisations. They should therefore contribute to IS thinking and practice, especially in the areas of IS development, management and evaluation.

## 7.61 Main findings

The main conceptual propositions in this study could be summarised as follows:

- a) The (cognitive) use of information is an individual-centred phenomenon characterised by a dynamic purpose-process-effect cycle.
- b) All three Charles Morris notions of value are relevant to information use situations, i.e., the functional use of information in organisations is not just influenced by the characteristics of the information but also the user's perception of its usefulness and the extent to which the information is appreciated and accepted.
- c) Information use situations generally act as filters, mediators of use behaviour, and as frames of reference for evaluating informational activities in organisation, and the nature of these situations is often dynamic rather than static.
- d) Differences in the nature of information use situations imply different notions of information and information value as well as different evaluation criteria.

In addition, the following findings address the main research question of the study:

- e) Organisational culture and climate and the user's intentionalities are crucial in shaping the nature of information use situations.
- f) The underlying essence of the notion of value-in-use of information concerns the user's perception of the potential of the information to facilitate their work in general and the performance of the specific task that is a cause of concern, awareness, or interest.
- g) The effect of IUS on information use behaviour could be analysed at three levels: the organisational environment level; the fit between the capabilities of the user, the task and the solution space; and the emotional and psychological dispositions of the user in specific situations.

The three levels of analysis presented in (g) above constitute an amendment to the IUS framework as proposed in chapter four. The original theoretical proposition conceived of the framework as comprising two levels i.e., the environment and the core. Insight from the empirical investigation however suggests that the user's intentionalities should constitute a separate dimension in order to bring out the crucial role played by such intentionalities in determining information use behaviour.

### **7.62 Implications**

The proposition that information use is an individual-centred phenomenon suggests the need for greater focus on the individual user when considering the value of information in organisation. This suggestion is based on the premise that the value of information is as much, if not more, a function of the use process as of the innate attributes of the information. Hence IS development projects should focus as much on the process of use as on the objectives of the systems and the quality of information they provide.

The more democratic IS development methodologies and approaches such as the participative approaches and the Scandinavian trades-union approach seem to meet part of this requirement. However these approaches tend to be more concerned with macro issues relating to the characteristics of the systems being developed and its effect on users, and not necessarily on the nature of individual information use situations. Progress in research to improve the user interface of systems is also a positive contribution in this area. Other efforts to address this issue includes the use of user-profiling technologies by some information providers to supply information tailored to perceived individual needs. However, as pointed out by Peter Drucker (1999), "no matter how good the reports; no matter how good the theory; nothing beats personal, direct observation". In the context of providing information for various knowledge workers, especially for senior executives, this suggests that the users themselves should work out their information needs, instead of leaving it to IT people or other data providers. Furthermore

the fact that such needs fluctuate and change according to the nature of the situation suggests a more flexible and adaptable approach to requirements specification.

For the more unstructured tasks, much of the formal information provided may be only valuable when appropriate background knowledge and informal information compliments it. In such situations the aim of systems development should be to provide access to diverse sources of reliable information rather than specific high quality information. This is probably the rationale behind contemporary Intranet technologies.

In the area of information (systems) management, the dynamic nature of IUSs suggests the need for regular monitoring and appraisal of the information use situations of the crucial knowledge workers in the organisation. Because individual user perceptions, dispositions and motivation can be as important as structural and institutional factors in ensuring value, it is important that managers keep abreast of changes in the relevant information use situations. The role of IUS as a mediator of information use behaviour suggests that the innate qualities of information do not exclusively determine the value realised from its use. This is because such value depends on both the manner of use and the scope of use, which are both mediated by the IUS. While the scope of use may not be very important in situations that feature very structured tasks, the manner of use seem to be influential in all types of situations. Furthermore, both the scope and manner of use are often affected by the user's emotional and psychological disposition at the time of use. These features may in turn be influenced by the prevailing organisational climate.

The concept of IUS as a frame of reference for informational activities also suggests the need for a dynamic and sometimes emergent, rather than a static and rigidly pre-planned, approach to the evaluation of information in organisations. This is especially pertinent in situations where users have considerable discretion and authority in performing their duties. Where possible, such users alter the criteria for evaluation so that what counts as

value is determined by the nature of their information use situations. The common management practice of holding periodic appraisal interviews with individual employees partly addresses these issues. However, such interviews tend to focus more on the appraisal of past performance than on the diagnosis of factors that influenced the performances. In addition, the exercises often focus largely on objectives and outcomes and not on means. In cases where information is viewed principally in an instrumental capacity, this exercise may not reveal much about the nature of the information use situation and hence its effect on value.

One way to enhance this process is to supplement the regular (normally biennial) interviews with non-regular sessions that could be called by either the employee or the manager. In such sessions, special attention should be paid to user information needs and processes, especially the need to know beyond the immediate objectives of the user's main functional duties. This is especially important in the light of the observation that users filter out information that they think is irrelevant to their immediate objectives, and this in turn affects the scope and manner of use of such information as well as the user's perception of its value.

By extension, the important role of the individual in characterising the nature of information use situations has implications for information evaluation approaches. First it calls for a revision of the notion of information value in business organisations. According to Hilliard (1950) and Sinden & Worrell (1979), value is not the same as utility. Rather, value is affectivity that may or may not result from utility. There is greater value therefore when the individual user appreciates and prefers the objectives, processes and outcomes of information use i.e. when operative value is evident. This is not necessarily at variance with the realisation of organisational objectives since, as suggested earlier, user self-interest is not always detrimental to the good of the organisation. Of the three Charles Morris notions of value, only one, i.e. object value, approximates to the notion of utility used in the field of economics. The other two, i.e. conceived value and operative value, depend



as much on the characteristics of the subject as of the object. Hence in terms of information use, the individual user is crucial to the actualisation of the conceived value and the operative value of information. Because all these notions of value affect, dynamically and perhaps simultaneously, the evaluation process at individual user level, they contribute to the eventual value realised by the organisation. Information evaluation methods, especially those relating to complex and unstructured tasks in organisations, should therefore focus as much on the user and on the use process as on the outcome or effect of use. This is to ensure that value actualised in all three stages of the information use cycle is recognised and to appreciate that aspects of such value may be latent at the time of evaluation.

The above notions of information value may be difficult to appreciate in the current competitive business climate, which focuses mainly on immediate and tangible outcomes. Peter Drucker's (1999) suggestion that "the purpose of information is not knowledge but to be able to take the right action", clearly characterises this limited notion of information value in the current business climate. Of course knowledge for knowledge's sake is of very little value to business organisations but much of the productive actions taken in organisations are significantly mediated, if not directed, by knowledge accumulated over a period of time. In many cases, the role of current information is to trigger action that is designed and assessed according to previously accumulated knowledge, so that the value realised through such action is not exclusively due to the current information.

The crucial roles played by organisational culture and climate in shaping information use situations also has important implications for IS development and management. For IS development, it suggests the need for contingency plans and built-in flexibility to accommodate changes in organisational culture and climate that may result from developments such as mergers, take-overs or diversification in product lines and markets. For information (systems) management, managers should be aware of the potential effect of sudden changes in organisation climate on user

perceptions, expectations and motivations in respect of information use. The popular concept of 'management of change' is an appropriate vehicle for addressing these issues and it is especially important that information related issues must be proactively rather than reactively addressed.

Finally the different notions of information that prevail in the various categories of information use situations suggest that IS developers must adopt a multi-dimensional approach to providing information in organisation. For some users, information consists of information technology plus data and associated policies, manuals and instructions. These users can hardly perform their duties in the absence of any of these components. As such the key value attributes of such information are availability, functional capability and reliability of the systems.

Other categories of users employ information technology, either by default or by choice, in performing various tasks but the technology is not necessarily indispensable to them. These users conceive of information in terms of a combination of information-as-content and the medium of delivery. In some cases, the format of the information is crucially important. Much of this information is used for monitoring and control purposes and the value attributes desired are usually accuracy, timeliness and ease of access and use.

When the information needs of certain types of users is however diverse, unlimited and unstructured; the role of information technology becomes difficult to define. In situations where such needs relate principally to strategic planning and related decision making tasks, the key notion of information that prevails is information-as-content and the two most desired attributes of such information are reliability and timeliness. When the key objective of use is innovation or other means of attaining competitive advantage, then the rarity and exclusivity of the information becomes crucially important.

Although the above attributes may not be necessarily mutually exclusive, it is difficult to see how they can all be delivered together. For example, information systems development or delivery methods that may

ensure perpetual availability of information (e.g. Internet) may not necessarily deliver accuracy or reliability. Likewise perceptions of reliability (e.g. reputable brand names and high hit-rate of websites) may not guarantee accuracy, rarity or timeliness. The delivery of appropriate and valuable information should therefore be guided by situation specific requirements, which can be appreciated by investigating and describing information use situations in organisations.

# Chapter Eight

## Conclusion

What do we mean by the value of information? How is that value actualised in organisations? What factors influence that actualisation? The purpose of this research is to contribute to the debate regarding these questions and to provide insight and tools that might bring us closer to adequate and useful answers to these questions. The researcher's interest in this topic derives from the common proposition that the value of information depends on the context of use. Context is however a widely used term with a variety of meanings and applications. The objective of the research is hence to find ways of describing the context of information use in organisation that would give a better insight into the concept of value-in-use. The study conceives of the process of information use as an individual cognitive activity, which is mediated and conditioned by situational imperatives. The concept of information use situation, which is focused on the individual user, was hence employed to investigate the context in which the value of information is actualised in organisations.

The research argues that we can gain useful insight into the concept of value-in-use of information by carefully describing and interpreting information use situations at individual user level in organisation. Such insight could then be employed to enhance the actualisation of information value at all levels of the organisation. This argument is based on the premise that much of information value derives from the manner of use, not just from the quality of the information.

An IUS framework was developed and empirically applied as a 'casting net' in exploring and describing IUSs in four business organisations. This chapter summarises the main findings and contributions of the study. It also discusses the limitations of the design, conduct and theoretical foundations of the study. The chapter concludes with suggestions for further research.

## 8.1 Review of the study

Chapter one highlighted the importance and need for valuing information in today's organisation and suggested that an exclusive focus on the quantifiable value of information is inadequate. It argued for a wider notion of information value that includes qualitative aspects of value as well. This entails a reconceptualisation of both the process of information use and the actualisation of information value. It also argued that an exclusive outcome oriented view of information value is inadequate since (cognitive) information use is an interactive process characterised by a dynamic purpose-process-effect cycle, in which value is actualised at all stages of the cycle.

The main research question was how do we describe the context of information use so that we can gain useful insight into the value-in-use of information? The study distinguished between exchange value and value-in-use but argued that, ideally, they should be at least related, if not equal, since exchange value could be seen as a measure of (potential) value-in-use. The chapter pointed out the limitations of quantified (money) value as a surrogate for information value and argued for the recognition of both tangible and intangible, or direct and indirect, value of information.

Chapter two discussed the main concepts, definitions and propositions, which provide a solid theoretical foundation for the development and application of the IUS framework. In particular, it examined various philosophies, definitions and characterisations of value, information, and the value-of-information. The notion of organisation and the role of information systems in organisations today, were also examined. This exposition provided the researcher justification for the specific notions of information and value adopted in the study. This includes the Charles Morris three-pronged characterisation of value (i.e. conceived, operative and object value) and the purpose-oriented perceiver-concerns perspective of information. These characterisations emphasised the importance and crucial role of the individual information user in the actualisation of information value, which

was reflected in the IUS framework as well as in the conduct of the empirical investigation.

Chapter three presented and described the research methodology of the study. The philosophical assumptions were based on the interpretive research tradition in general and on the phenomenological hermeneutic position in particular. Insight from the concepts discussed in chapter two, especially the dynamic and recursive nature of the information use process suggested that a survey method of inquiry would be inappropriate. Support for the adoption of an interpretive approach also came from arguments and examples of other works cited in the chapter (e.g. Boland 1987, Creswell 1998, Walsham 1995, and Stake 1985)

A multimethodology approach involving a philosophical position based on phenomenology and a multiple case study strategy was adopted. The combined approach was used to explore, describe and interpret IUSs in four business organisations. For the first three organisations, the main emphasis was on exploration with the objective of testing the applicability and usefulness of the IUS framework. The exploration gave important insights into the conduct of the empirical investigation as well as the efficacy of the framework as an appropriate tool for the exploration. In the fourth organisation, the focus was on description and interpretation, but the interpretation involved relating the features of all the situations examined in the four organisations. In addition to the research design, chapter three presented and justified the main techniques used in the empirical investigation. It also highlighted the social theory position that underpins the research.

The main objective of chapter four was to develop and operationalise the IUS framework. The process drew on Keith Devlin's ontological characterisation of a situation as well as theories of self-interest and work motivation from social psychology. The object was to examine how the purposes, processes and effects of information use relate to user performance at work and hence to the corresponding perceptions of information value.

These theories provided useful insights into the relative importance of structural and institutional imperatives (theory X) versus user self-motivation and disposition (theory Y) in determining performance at work. The conclusion was that while user self-interest, which may be largely subjective, is an important driver of user effort, aspects of such interest are often based partly on objective indicators. This implies that self-interest is not always necessarily detrimental to organisational (objective) interest. Hence the pursuit of self-interest could, in some cases, enhance organisational value.

In operationalising the framework, the research drew on a large number of context-studies in the IS domain including R S Taylor's information use environment framework. These studies informed the choice of attributes for the six main elements of the IUS framework. However the empirical investigation suggests that often, only a few attributes dominate information use behaviour in organisations. The framework is hence presented as a generic guide for exploring and describing IUSs rather than a substantive model.

Chapters five and six presented accounts of information use situations as explored in the first three organisations and as described in the fourth organisation respectively. These situations were categorised according to certain common IUS features

The dependency of IUSs on the characteristics of either the task or the user was investigated in chapter six. For each user, the IUSs pertaining to the performance of two tasks were examined and described. For some users and for certain pairs of tasks, the situations appeared to be quite different while others were found to be similar enough to be regarded as the same situation.

In chapter seven, the situations explored and described in chapters five and six were interpreted with a view to discern the ways they influence user perception of information value. In addition to proposing various notions of information value associated with each category of IUS, the chapter highlighted three generic ways in which IUSs affect the value-in-use of information as they mediate the use process. These ways constitute the

characterisation of an IUS as (a) a filter, (b) a mediator of information use behaviour, and (c) a frame of reference for evaluating informational activities. Through these characterisations, a number of implications of this study were proposed in the areas of IS development, management and evaluation.

## 8.2 Main findings and contribution to IS

The main findings of this study should to contribute to both the theory and practice of information systems. The theoretical contribution is in the form of concepts and insights, which are not necessarily new, but which have been identified as important elements in understanding the notion of value-in-use of information in organisation. The contribution of this study is in highlighting the importance of these concepts to the notion of information value. For example, the application of Charles Morris' three characterisations of value (i.e. conceived, operative and object value) to information suggests a notion of information value that combines both the objectivist and subjectivist philosophical positions. It also indicates a multi-dimensional view of information value that incorporates both a functional or rational view and an aesthetic or affective view. In addition, these dimensions are not restricted to considerations of outcome alone in the information use process. Thus information value could be realised as much in the determination of purpose and the enhancement of the process as in the outcome of use. This suggests that organisations should pay as much attention to the process of informing (information as a verb) as to the quality of the information (noun). Since operative and object values can be realised in both process and outcome, we cannot fully account for such values if (a) we focus just on outcome and (b) we attribute value exclusively to information as a thing and not to the process of informing the user.

In a more practical realm, the research points out the incomplete and sometimes inadequate nature of formal computer-based information in certain situations. This highlights the importance and indispensability of other forms of supplementary information in ensuring the usefulness of



formal information. With the increasing pervasiveness of communication and information technologies, there is a tendency to conceive of information mainly in terms of discrete elements that are processed, stored and disseminated through these technologies. However, the process of gaining and using information involves a dynamic and recursive network of ideas, themes, purposes, evidence and intuition, which cannot be fully captured in the discrete signs and symbols processed by computers. Besides, the value realised through the use of information is only partly attributable to the inherent quality or object value of formal information. Furthermore, the value of information in business organisations is often time-dependent. One way of interpreting this dependency is that such value could be seen as having at least two dimensions: a current value and a future value. Depending on the situation, neither of these is sometimes apparent to the user, but this is not the same as saying that the information has no value. In so far as the information can cause a reaction in the user, it could be said to have value. Such value may be latent at the time, delayed, or sometimes actualised in a form that is not recognised by the prevailing evaluation criteria.

The various modes of information valuation highlighted in the study also contribute to our understanding of the information use process. The research posits that users evaluate information in three interrelated modes. These are pre-use, during-use and post-use modes. However, our conceptualisation of information, either as an object (thing) or a process, and the approaches and methods we employ to evaluate it often focus on only one mode at a time. For example, methods that are based on impact and outcome assessments are mainly post-use focused. On the other hand, econometric methods of value projection and various forms of risk analysis tend to be largely pre-use based even though the economics notion of information value is outcome-focused.

Increasingly, user-interface issues have become part of the evaluation of information systems. The ergonomics dimension has thus become an important aspect of IS evaluation. Although the overall objective of

information systems remain largely outcome focused, user interface evaluation criteria are of necessity focused on the during-use stage of the cycle and to a lesser extent on the pre-use stage. The great interest in user-interface issues in the last 5 - 10 years is an indication that these issues play an important role in the user's perception and hence evaluation of information. All the three modes of information evaluation thus feature in the user's overall perception of value. However each mode relates mainly to one of the three stages of the dynamic information use cycle as shown below.

- a) Pre use - The purpose or objective of using the information
- b) During use - The nature of the process of use
- c) Post use - The outcome or impact of use.

It is worth noting that all the stages of the information use cycle are situation-mediated and the situations may be as much a reflection of organisational needs and constraints as of individual user characteristics. This means, for example, that the purpose of using some information could arise from a combination of formal and informal objectives as well as rational, emotional and political influences. Similarly a combination of formal procedures and subjective user dispositions and capabilities may determine the processes employed in using the information. Likewise, outcome or impact may be evaluated according to formal organisational objectives and norms as well as the user's subjective frame of reference.

The contribution of the above observations to information (systems) evaluation is in the call for a broader focus of evaluation methods that would encompass all three modes of evaluation. It also emphasises the centrality of the individual user. It is not enough to evaluate information by either the outcome or object quality alone since the use process both mediates and actualises value. For example, information often contributes to the determination of the purpose of its own use. It also facilitates the tasks undertaken and provides the means for the appreciation and evaluation of the outcome of use.

A more practical contribution of the study to information systems, especially IS management, is the IUS framework. The framework provided the researcher with a starting point and focus in the study of the vast terrain of IS-related issues that constitute 'context'. The framework is thus seen as an exploratory tool but also as an end product of the study. As stated earlier, the study is more interested in the insights gained about the nature of the information use process and how that is influenced by situational factors than in modeling information use situations in organisations.

In defense of this position, the casting net metaphor associated with the framework needs to be briefly examined. When a fisherman uses a casting net for fishing, the main objective is to catch some fish and not to prove that the net is an effective tool for fishing. Nonetheless, the latter proposition may be inferred from the former. That is, if the fisherman catches a lot of fish, he may conclude that the net is an effective fishing tool. The opposite inference may not however hold automatically. Thus failure to catch fish may not necessarily indicate the ineffectiveness of the net as a fishing tool. Other factors like the choice of fishing site, the weather, and the skills of the fisherman all contribute to the result of the fishing. If however the efficacy of the net is in question, then factors like the size and shape of the net, the mesh size and the nature of the material it is made of come into play. Nonetheless whether the net is an effective tool or not, its use can reveal a lot about both the process of fishing and the fish caught or not caught. Perhaps the most important of these would be the fisherman's perception about the shape and size of fish in the area, which would be reflected in the type of net he chooses. Other revelations might include whether the site is a good fishing site or not and the types or kinds of fish that populate the site. All these findings can contribute useful insights into the fishing process, and these could be employed in devising appropriate fishing methods, including the choice of appropriate fishing tools.

The role of the IUS framework in this study is very similar to the role of the fishing net in the above scenario. The nature and composition of the

framework reveals among other things, the researcher's perception of the nature of information and the process of use. For example, the focus on information-as-content and on the individual user in organisation suggests that the researcher perceives the process of information use as an individual cognitive process. This is in spite of the pervasiveness of technology-led solutions to information-related problems and the popularity of group or teamwork.

Both the composition and manner of use of the IUS framework as presented in this study should contribute to the debate on what constitutes context in IS activities. This contribution is both theoretical and practical since it adds to the debate on the value of information and the context of use and also provides a tool for exploring such context. The framework proposes the need to address both the subjective and objective realities of user behaviour simultaneously, especially when the object of interest is information-as-content. In this regard, the framework could be used to direct the attention of IS professionals to those aspects of information use situations that bear significantly on user behaviour. The categories of users presented in this study should also help information systems and service managers to cater for the information needs of various groups of users.

At a more general level, the contribution of this study is aimed at line and functional managers, including information systems/resource managers in organisation. The roles of IUS as a filter, mediator of use behaviour and a frame of reference for evaluation highlighted in the study should prepare such managers for the different situation specific notions of information value that exist in their organisations. Accordingly, different approaches to delivering and evaluating information in the various categories of IUS should be adopted. For example, categories of IUS in which the tasks are very structured with very low user motivation could be addressed by working on the user's socio-psychological disposition rather than focussing on the efficacy of the information systems. Similarly, situations where the user is highly motivated and confident in their ability and authority to deliver the desired

results could be carefully monitored to avoid unnecessary risk taking by an overzealous user. This is especially important when the tasks involved are unstructured so that the user often has some autonomy in defining both the objective and process of information use. Table 11 suggests that a high power/position ratio for users is not necessarily always good for the organisation since it might lead to high levels of risk taking by the user. Managers involved in task and job design therefore need to balance the level of autonomy and discretion allowed with the level of risk permissible.

The three levels of analysis of information use situations is also significant for managers in business organisations. The crucial roles played by the prevailing organisational climate and the user's socio-psychological disposition underscores the need for user awareness and acceptance of macro organisational objectives and policies, including the reasons for sudden changes in policy and direction. The importance of such awareness is to facilitate the realisation of operative and conceived values, which are more applicable to the value-in-use of information in most situations than object value. Unless the user understands and appreciates the macro level objective of a task, they may not appropriate the necessary operative and conceived values that are consistent with organisational goals. The absence of such appreciation often results in suboptimisation in spite of the quality of information and technology used.

The ultimate objective of this study is to contribute to the enhancement of the value-in-use of information in organisation by understanding the situations that characterise the use. This understanding does not include a method for quantifying such value although it may provide useful insights in that direction. The study is therefore not directed at strategic managers or accountants interested in quantifying the value-in-use of information. Further research is required to relate the indicators of value discerned in this study to money value.

At the research level, this study should contribute to the literature on access to information and information use behaviour. In particular, it should

contribute to the identification of influences and constraints to information use behaviour. Research conducted by McCreddie and Rice on "six relevant research literatures" in this area revealed that "specific focus on affective influences or constraints was essentially non-existent, except for a small coverage in the organisational communication literature " McCreddie and Rice (1999). Hence in all six streams of research (i.e. Library Science, Information Science, Information Society, Mass Media, Organisational Communication and Economics of Information) affective influences are not considered important in determining access to information and its use. This study contributes to this debate by emphasising the importance of user intentionality, which includes affectivity, in determining perceptions of information value. This importance is manifested in two ways in the study. First the notion of value-in-use of information proposed is based on the Charles Morris typology of value and one of the three dimensions of this typology is operative value, which is concerned with the user's affective disposition or preferences. Second, the user's psychological and emotional characteristics is identified as an important dimension when investigating information use situations. Hence this study proposes that both the characterisation of the context of information use and the notion of information value associated with such use must include an affective component. This proposition should also be useful in other areas of Is research such as the specification of human-computer interaction (HCI).

### **8.3 Limitations of the study**

This study has been exploratory. As such it can be said to suffer from the constraints encountered in every exploration. Two important dimensions of such constraints are the tools employed in the exploration and the conduct of the process itself. The main tool employed in the research is the information use situation framework and the exploration involved a combination of theoretical and empirical investigation. Hence the limitations of the study would concern (a) the composition and application of the IUS framework and

(b) the adequacy and insightfulness of the process of research including the methodology adopted.

The main limitation of the IUS framework is that it constitutes a rather static tool that is employed to investigate and model a dynamic phenomenon. In particular, it does not explicitly account for time, which is an important element in describing an information use situation. For example, certain characteristics of the user, such as emotional disposition and motivation, do not remain static over time as he performs different tasks or even the same task. In addition, aspects of the solution space, such as the way tasks and outcomes are evaluated sometimes change suddenly. For example, when B7's annual budget was cut by 50% in preparation for the bank's proposed merger with another company, it suddenly became more important to her to work within budget than to increase productivity and effectiveness. The framework does not explicitly account for such differences in situations concerning the same task type at different times. Another limitation is that the framework does not model an information use situation. This means that the composition of the framework must not be seen as complete or exhaustive. However the researcher believes that it is neither possible nor necessary to account for every element that mediates an information use situation since only a few key factors often drive information use situations. The motivation to describe an information use situation is therefore not to account for every possible feature of the situation but to identify the main factors that would influence user behaviour in that situation.

Another limitation of the framework is that although the elements of the framework are interrelated, no account of the relationships is presented. However, the choice of an interpretive approach in applying the framework is in recognition of this limitation. Through an interpretive phenomenological investigation, some of these relationships could be discerned.

The main theoretical concepts and arguments employed in this research reflect the researcher's established position on the concepts of value, information, and what constitutes a situation. This position holds that value

is always relative to a subject and that information must be defined in terms of a purpose and relative to a user. The inseparability of information technology and information as content is also recognised although the focus of the study is on content. An information use situation is thus defined in terms of the concerns, awareness and interest of the user as the central element. A possible criticism of the above characterisations is their seemingly disproportionate focus on subjective elements. If we accept that the primary purpose of formal information acquisition and use in organisations is to achieve the formal objectives of the organisation, then it might appear that value considerations that focus on the individual user are not particularly important. This is not necessarily true since, the research argues that (a) the process of information use is essentially an individual cognitive activity and (b) that individual self-interest and subjective notions of value are not necessarily always at variance with the formal objectives of organisations. The study therefore argues that it is important for organisations to realise the inevitability, relevance and potential value of the subjective features of information use situations.

The design and conduct of the study also have a number of limitations. Both the choice of organisations and the situations studied were partly guided by pragmatic realities although they were also informed by theoretical considerations. The situations presented may thus not be seen as representative of any sector, organisation or functional role. Nonetheless the findings of the study are generalisable to concepts such as the filtering role of information use situations and the importance of supplementary information in realising the value of formal information. With respect to the conduct of the interviews, it seems that a maximum of two interviews per user was not enough to establish adequate and in-depth understanding of the very complex phenomena and concepts investigated. For effective interpretation, the researcher required much more insight into the varied experiences and motivations of the users, which probably needed multiple exposures to the situations studied. In other words, a full phenomenological study might have



been more insightful. This was however not possible owing mainly to constraints of access to the users. However where possible, e-mail and telephone contacts were used to supplement the face-to-face interviews. The choice of a multiple case study may also be criticised. It could be argued that a single embedded case study would have been equally, if not more, effective in achieving the objectives of the research. However the constraint of access to many users in one organisation or to one user for an adequate period of time was partly responsible for the choice of multiple organisations.

#### **8.4 Further research**

The most important drivers of information use situations identified in the study relate to the nature of the organisation culture and climate and the characteristics of the user. Yet the IUS framework presents the internal environment, which accounts for the organisation culture and climate as an indirect environmental factor. It would be useful to undertake a detailed definition and investigation of the effect of this element on the following:

- (a) User motivation.
- (b) User perception of the significance of their contribution to the success of the organisation.
- (c) The relative importance of information and non-informational resources in user perception of task success.
- (d) The effect of the above factors on user perception of the value-in-use of information.

By investigating these effects it may be possible to confirm or reject the proposition that information use situations are often dominated by one or a few pervasive elements. It may also be possible to assess the role played by user discretion and initiative in actualising information value.

Because of the dynamic, but not necessarily evolutionary, nature of information use situations, it might be more insightful to conduct a study like this in a longitudinal rather than a 'snapshot' mode. The aim of the longitudinal study would not be to discern characteristic trends in the nature

of situations relating to particular task types, users, and organisations but to capture over time enough swings in the various situational features that will enable us to build richer pictures of the relevant situations. Apart from accounting for the time dependency of the nature of information use situations, such a study would establish the role and effect of the latent or delayed value of certain types of information in business organisations.

## Appendix A

Table 14: IS-Related Context variables

Author or Researcher	IS Activity	Context Variable	Relevant IUS Element
Franz & Robey (1987)	IS Implementation	Characteristics of User & the Organisation	User & Internal Environment
Kling (1980)	IS Implementation	User Interest	User
Ginzberg (1981)	IS Implementation	User attitudes & Beliefs	User
Adams (1975)	Systems Development	User influence, Attitude & Perception	User
Robey (1979)	IS Usage	User attitude (expectation)	User
Schultz & Slevin (1975)	IS Implementation	Effect of system on user performance, Interpersonal relations & Goals	IT/ IS Environment & Solution Space
Kwon & Zmud (1987)	IS Implementation	Top management support, Motivation, Capability of user.	Internal Environment & User
Kimberly & Evanisko (1981)	Innovation	Job tenure, Educational background, Organisational role	User
Tornatzky & Klein (1982)	Innovation Behaviour	Compatibility, Relative advantage & Complexity of IS	IT/IS Environment
Steers (1977)	Innovation	Specialisation, Centralisation, Formalisation	Internal Environment
Tushman & Nadler (1978)	Innovation	Task uncertainty, Autonomy, responsibility, Feedback	Task & Solution Space
Claudio Ciborra (1987)	Information (systems) use - Transaction cost	Task & technology uncertainty, Environmental uncertainty, complexity, Strategic behavioural uncertainty	Task, User, IT/IS Environment & External Environment
E.Burton Swanson (1987)	Information (Systems) Use	User cognitive style, Psychological type, Job characteristics, Goal congruence, User satisfaction, Challenge to rationality & emotionality, Organisational need to know & to influence, Demographic variables	User, Internal environment, External environment.

<b>Author or Researcher</b>	<b>IS Activity</b>	<b>Context Variable</b>	<b>Relevant IUS Element</b>
Jane E Klobas (1995)	Electronic information resource use	User attitudes, Motivation & Perceived behavioural control (Theory of Planned Behaviour). Perceived usefulness, perceived convenience perceived ease of use, attitudes to outcome, social pressure & information quality.	User, IT/IS Environment, Internal Environment.
Gayle Yaverbaum (1988)	End-User Environment - Users, Organisations & Tasks.	User satisfaction, Motivation & Attitude, Task complexity, Task environment, Management activity & support, User Cognitive style, Age, Education, Job experience, Participation, Autonomy & feedback.	Task, User, Internal Environment.
Pitts, Watson & Kavan (1995)	Evaluating IS success	Use, User satisfaction, Individual impact, Organisational impact	User, Solution Space.
Baskerville & Smithson (1995)	IT and new organisational forms	Organisational learning, Structure & Power.	Internal Environment.

## Appendix B

### Taylor's Information Use Environment (IUE) Model

The purpose of this model is to describe the information seeking and use behaviour of sets or groups of people based on a variety of common characteristics they share. These characteristics are categorised into six elements as presented below.

#### 1. Sets of People

This element describes sets of people in terms of their informational behaviour. Taylor defines informational behaviour as "the sum of activities through which information becomes useful". Criteria for distinguishing different sets of people can be according to some set of variables or based on some *a priori* established groupings resulting from historical or social acquiescence. For example, a group of people can be described according to their professional education or their occupation since it is believed that "their training, occupation and usual activities are made up, in part, of sets of information behaviour unique to the group under consideration" (Taylor, 1991).

Taylor distinguishes four broad classes of people; the professions (e.g. engineers, lawyers, managers etc.); the entrepreneurs (e.g. farmers, small businessmen etc.); special interest groups (e.g. consumers, citizens groups etc.), and special socio-economic groups (e.g. the disabled, minorities etc.). These groups, he points out, are not however mutually exclusive since some people can belong to several groups simultaneously. For the purposes of describing information behaviour, individuals are considered only in their formal publicly recognised professional or occupational roles.

The type of data suggested to describe individuals belonging to these groups includes demographic and non-demographic variables. Education is highlighted as perhaps the most influential of the demographic variables and

the manner of media use, social networks, attitude towards new technology, innovation and risk taking are cited as relevant non-demographic variables.

## 2. Problems

Taylor suggests that different sets of people or groups confront different kinds of problems over varying time frames and that each discernible set can be said to share some typical problems relating to their common concerns. Although these problems are not static, each of the definable IUEs is assumed to have "a discrete class of problems spawned by its particular setting and by the exigencies of its profession, occupation or life style". Thus problems are not only identified by their subject matter, but perhaps more importantly, by their nature according to which they are perceived as both endemic and important. A number of dimensions that could be used to illuminate the criteria for judging the relevance of responses to these problems are suggested as follows:

- Structure: Whether the problem is well structured or ill structured.
- Complexity<sup>8</sup>: Whether the problem is simple or complex.
- Assumptions: The extent of mutuality of assumptions regarding specific concerns.
- Familiarity: Is the problem amenable to procedural and well-established methods and techniques or is it tackled through trial and error.

## 3. Setting

This element is concerned with the physical and conceptual domain in which a specific class of people are seen to work and live and which affects the way they seek and make use of information. Suggesting that the bureaucratic organisation is but one setting rather than the only setting, Taylor proffers the

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<sup>8</sup> Complexity is defined as the number of interactions of problem variables.

following four elements as sources of general influences on information behaviour that characterise a setting.

- **Domain of interest:** The principal focus here is the role or function of the unit of concern. Each domain of activity is assumed to have certain characteristic attributes with regards to, for example, the availability of information or patterns of dissemination peculiar to that domain. Considerations as to whether a unit operates in the public or private sectors are also proposed as relevant to the character of the setting.
- **Access to information:** Both the perceived and actual ease of access to information are important variables that affect the use of information. The effect of the setting on the ease of access to information is thus important in characterising the setting.
- **History and experience:** The extent to which certain kinds of new information produce discernible organisational outcomes depends on the experience and degree of specialisation of organisational processes. The history and general experience of the organisation is thus important as a context for judging the contributions of specific informational activities.

#### 4. Resolution of problems:

Some of the questions posed under this element include; what constitutes, for a given set of people, resolution of a typical problem? What are the attitudes towards the benefits and costs of information use? What are the criteria for information choice? The answers to these and other related questions should throw light on the way a given set of people view their problems and what they anticipate as resolution. Taylor agrees with Knott & Wildavsky, (1980) that in fact these perceptions and anticipations are in-built and subconscious means of controlling the amount of information used. These perceptions thus

influence both the manner of information use and the judgements about the effects of use.

#### 5. Perceptions of information:

Taylor proposes that how a given set of people perceives information is both critical and significant in determining the way it uses and values it. This is based on the assumption that "because they structure their universes differently, different sets of people see and use information differently". Hence perceptions are an important factor in shaping the information seeking and use behaviour of people.

#### 6. Decision Processes:

This element addresses questions of whether decisions in certain domains of activity are wholly logical and rational, or non-rational; and how contextual factors affect and mediate these processes. The aim is to situate problems and solutions in a variety of contexts that transcend the purely rational domain. Taylor suggests that there is a need to have a better understanding of the non-rational or less rational environmental factors since "it may not be wise to discount the importance of hunch and intuition, based on experience and personal association".



## Appendix C

Table 15: List of IUSs by category

Category One: Mainly technical and operational tasks		
USER/SITUATION	JOB TITLE	TASK
C1	Assistant Systems Support Officer	Producing a housing benefits review form report
C2	Accounts Officer (Rents)	Terminating a tenancy account
L2	Senior Library Assistant	Inputting data into admissions Database
Category Two: Largely operational & supervisory monitoring and control tasks		
B1	Process Support Manager	1. Contracts management 2. Monitoring image processing work
B41	Direct Sales Manager	Monitoring the direct sales team
B51	Distribution Director	Sales tracking
B62	Assistant Vice President e-Citigroup	Distant supervision of website development.
B71	Director e-Citigroup	Producing a monthly expense analysis
C3	Senior Arrears Officer	Taking court action against a tenant for unpaid rent arrears
H1	Head Storeman	Purchasing Food & Beverages
H4	Internal Auditor	Auditing the hotel's Food & Beverage purchasing process
H5	General Manager (Landmark Hotel)	Reviewing monthly profit & loss statement
L1	User Services Circulation Supervisor	Training new employees for reception desk services
L3	Library Assistant	Resolving a disputed loan
Category Three: Mainly line management monitoring and control tasks		
B2	Marketing Manager (Customer Acquisition)	Planing a marketing project
B42	Direct Sales Manager	Training staff on 'quality'
B61	Assistant Vice president e-Citigroup	Managing the bank's EMU website development project
C4	Area Accounts & Arrears Manager	Taking a rent recovery action
C5	Area Benefits Manager	Resolving a disputed benefits claim
H2	Reception Manager	Resolving a guest complaint
H3	Operations Manager (Food & Beverages)	Resolving a customer complaint
L4	Archives Assistant	Producing a collections list
Category Four: Medium and long term strategic planning tasks		
B3	Marketing manager (Consumer Intelligence)	1. Financial analysis of customer data 2. Modelling a business plan
B52	Distribution Director	Business development
C6	Research & IT Officer	Producing a briefing paper
Category Five: Sole responsibility for assignments/project based functions		
B72	Director e-Citigroup	Originating an external partnership

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