Investigating Information Systems Analysts’ Possession of Tacit Organisational Knowledge

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Abstract

Outsourcing of Information Technology (IT) services which are central to business strategy may be risky. Managers have made the outsourcing decision both to concentrate financially on the core competencies and to rid themselves of a troublesome and cost inefficient department. More recent research has, however, cast doubt on the promises of huge savings.

In this paper, we consider the likelihood that outsourcing may lead to the loss of organisational knowledge – that organisations outsourcing their total Information Systems operations may also have lost irreplaceable tacit, cross-functional knowledge which subsisted within the minds of the professional systems analysts.

The findings of our research revealed that expert systems analysts possess a unique organisational understanding and draw on this knowledge to operate efficiently in their environment. We present a model that will allow future researchers to build on our findings and examine whether outsourcing can lead to a loss of organisational memory.

1. Introduction

Outsourcing of the Information Systems (IS) operation is a trend that has been observed in many organisations over the last fifteen years. The outsourcing decision by Kodak in 1989, which established this trend, was motivated by the perception that the budget for Information Technology (IT) was excessive for a non-core business activity [12]. Many organisations have since been motivated by this factor to outsource IS [9, 5]. However, as many authors [9, 17] have argued, IS is both a core activity, deeply intertwined with organisational operations, and an important tool for implementing strategic business decisions. The early promise of outsourcing, which included trimmed and focused organisations together with projected financial savings, has increasingly been called into question – IS outsourcing has become the focus of significant concern within the academic (and, increasingly, the professional) literature [1, 29].

The IS department is in the interesting position of providing services to the whole organisation, developing and enhancing systems which operate both within and between individual departments – systems which are highly interconnected with the operations of and between those departments. We see, therefore, system analysts within the IS department as the most significant group of staff familiar with the organisation’s operation across functional boundaries at the tactical and operational level. A high level of cross-functional knowledge of the organisation’s operation and of its political system (both at a formal and informal level) is, therefore, a major success factor in the effective deployment of information systems.

Research into Information Systems outsourcing has not, so far, seriously addressed the possibility that the loss of organisational knowledge can significantly compromise an organisation’s strategic response. Organisational growth is dependent on the utilisation of organisational memory to select new developments and strategies through so-called second order, or double-loop learning [3]. There are arguments both for and against a conservative approach to organisational knowledge. On the one hand, Earl [9] argues that the outsourcing of
operations which form key parts of business strategy development may, through consequent loss of organisational knowledge, reduce an organisation’s ability to implement changes. On the other hand, Robey et al. [25] have suggested that residual knowledge may impede an organisation’s ability to instigate change. They argue that an organisation is unlikely to enter into business ventures or markets where previous ventures by themselves or other organisations have proved unsuccessful.

In our research programme, we investigate the potential impact of a decision to outsource the IS operation on the long-term strategic flexibility of the organisation. In this paper we will present the model which guides our research and then begin to explore the principal assumption underlying this model – that tacit cross-functional knowledge of the host organisation subsists within the IS operation. It is clear that, if such knowledge could be shown not to subsist within the IS operation, the model which guides the research programme would be valueless. The question which forms the focus of this paper, then, is:

"Does the Information System operation within an organisation hold tacit cross-functional knowledge of the organisation?"

Having established the primary objective of the paper, that is, having demonstrated the possession of tacit cross-functional knowledge of the organisation (we are not concerned here with tacit professional knowledge in a more general sense) by requirements engineering professionals (systems analysts in commercial practice), we proceed to consider the process by which such knowledge is accumulated. We argue that, in the case of systems analysts, knowledge of the organisation is held, not only in semantic memory, but also in episodic memory. “Compiled” knowledge appears to be acquired over time and to be given depth by personal perceptions of events. This type of knowledge can, therefore, not readily be replaced – which suggests that outsourcing can lead to a long-term loss of what we might call “organisational memory”.

Following an explanation of the concepts and the motivation of the research, the paper will build an understanding of organisational memory and tacit knowledge and, thus, contextualise the impact of their erosion within the IS functions of the organisation. In final sections, the findings of the investigation, based on a series of snapshot case studies of system analysts from various industry sectors, are presented and analysed.

2. Basic Concepts and the Conceptual Model

The literature presents two opposing views of the impact of knowledge in strategic changes. The management view stresses the need for knowledge to make informed decisions [30, 2, 14] while some authors argue that residual knowledge may obstruct the process [27, 16]. This dichotomy suggests the conceptual model, illustrated in Figure 1, which guides our examination of the impact of outsourcing.

Figure 1. Overview of our guiding conceptual model.

Erosion of cross-functional knowledge within the organisation (which we, perhaps loosely, term “organisational memory”) may have a serious operational impact. The fundamental assumption underlying this model is that internal information analysts and developers have over time built an invaluable holistic, and largely tacit, understanding of the organisation. These people are in a key position to evaluate the way in which changes can cause a ripple effect throughout the functions of the organisation. The loss of cross-functional tacit knowledge can therefore, we suggest, hinder an organisation’s ability to implement strategic changes and damage potentially successful business ventures.

It has also been found, however, that residual organisational memory can itself hinder an organisation’s ability to learn and undertake strategic changes. Knowledge of past failures cannot simply be unlearned – it seems particularly difficult, in action, to overlook one’s established cognitive maps which connect organisational actions to outcomes [25:6,15:18]. As the organisation moves into new environments and niches, it may have to discard misleading and obsolete knowledge, learn new responses and build new mental maps. Hedgeberg, who described the unlearning activity as an important part of understanding, feels that slow unlearning is a crucial weakness in many organisations.

3. Outsourcing & Organisational Knowledge

3.1. Outsourcing

The outsourcing explosion in the last decade has been facilitated by many factors: financial, business, technical and political [17, 6]. Organisations have made the outsourcing decision primarily motivated by the perceived
benefits of financial restructuring. The injection of cash associated with the sale of an organisation’s IT assets can make an important contribution to a troubled or declining business. The compiled problems of IT budget blow-outs, a shortage of IT staff and management’s resistance to investing in IT has made outsourcing an appealing option [9, 5]. However, the literature suggests that outsourcing facilities central to business development strategies is a risky option and may reduce an organisation’s ability to implement changes. Outsourcing such an operation can erode important organisational knowledge. It appears that the key to successful outsourcing is selective or “smart” outsourcing [16, 9]. The connotation of “smart” sourcing is that organisations will consider the implications of losing key staff with critical skills and organisational cross-functional knowledge before making the outsourcing decision.

3.2. Organisational Knowledge

Alavi [1] offers the following working definition of knowledge based on Huber [16] and Nonaka’s [22] definitions:

“Knowledge is justified personal belief that increases an entity’s potential for effective action” [1:17].

It is important here to also include organisational learning and organisational memory, concepts which are interrelated as indicated in Figure 2.

Learning is derived from observation
Knowledge is built from learning
Organisational memory is stored knowledge
Modification of action to improve performance

Figure 2. The building of organisational memory

Our investigation identifies both explicit and tacit cross-functional knowledge noting the two are neither mutually exclusive nor always clearly differentiable. Tacit knowledge is converted to explicit knowledge through some form of expression. Alavi defined tacit knowledge as:

“Knowledge that is unarticulated, is rooted in action and experience, and is situated in context [1:17].”

in contrast to explicit knowledge which she describes as knowledge that is articulated in some symbolic form.

Levitt and March [18] base their interpretation on theories of organisational learning and behavioural studies of organisations. Their first observation, which is synthesised from the work of Cyert and March [4] and Nelson [20] on organisational behaviour and economic change respectively, is that organisational behaviour is based on the routines of matching procedures to situations rather than on calculating choices. Their second observation is that organisational action is based on past events: decisions are motivated by interpretations of the past rather than expectations of the future.

A person learns by developing interpretations of information through a new understanding of events [13]. Organisations learn in a similar way, although Fiol pointed out that organisational learning is not embedded in any single person but, instead, entails the ability to share a common understanding. Robey et al. [27] explain that learning is accomplished both through formal training and through participating in practice and show that learning and actions are related. It is therefore useful to examine how individual knowledge and skills are acquired.

Dreyfus’ five-stage model of mental activities involved in directed skill acquisition [8] is cited throughout the literature on knowledge attainment. This seminal model gives a valuable insight into the stages of understanding and experience which systems analysts in organisations pass. Many of our skills (e.g. basic general and cultural skills) are developed at an early age and are shaped by hereditary abilities [19]. Dreyfus’ model, by contrast, focuses on adult learning through the stages of novice, advanced beginner, competence, proficiency and expertise – see Table 1.

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>Level 1 Novice</td>
<td>Rigid adherence to taught rules or plans</td>
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<td></td>
<td>Little situational perception</td>
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<td></td>
<td>No discretionary judgement</td>
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<tr>
<td>Level 2 Advanced Beginner</td>
<td>Guidelines for action based on attributes or aspects (aspects are global characteristics of situations recognisable only after some prior experience)</td>
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<td>Situational perception still limited</td>
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<td></td>
<td>All attributes and aspects are treated separately and given equal importance</td>
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<td>Level 3 Competent</td>
<td>Coping with crowdedness</td>
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<td></td>
<td>Now sees actions at least particularly in terms of longer-term goals</td>
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<td></td>
<td>Conscious deliberate planning and testing rules</td>
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<td></td>
<td>Standardised and routinised procedures</td>
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<tr>
<td>Level 4 Proficient</td>
<td>See situations holistically rather than in terms of aspects</td>
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<td></td>
<td>See what is most important in a situation</td>
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<td></td>
<td>Perceives deviations from the normal pattern</td>
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<td></td>
<td>Decision-making less laboured</td>
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<td>Uses maxims for guidance, whose meaning varies according to the situation</td>
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<td>Level 5 Expert</td>
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No longer relies on rules, guidelines or maxims
Intuitive grasp of situations based on deep tacit understanding
Analytical approaches used only in novel situations, when problems occur or when justifying conclusions
Vision of what is possible

Polanyi [24] identified tacit human knowledge by reconsidering the obvious fact that “we can know more than we can tell” [24:4]. He explained that we can recognise a person’s face amongst a million others, but we cannot tell how we recognise it. He went further and explained how universities try to teach students to identify diseases, rocks, plants and animals by practical exercises and ostensive definition to breach the gap between what the teacher wants to tell and what the words mean. We do not learn by theory alone. Important details that the teacher could not tell, he argues, are only available through direct observation and personal experiences. Polanyi distinguishes between the intellectual and practical knowledge as “knowing what” and “knowing how” and explains that one cannot be present without the other. The acquisition of tacit knowledge was illustrated with an example of subjects receiving an electric shock when they uttered certain syllables. After a while the participant appeared to anticipate the shock at the sight of these syllables, but could not identify them. The participant seemed to anticipate the shock at the sight of these syllables, but could not identify them. The participant appeared to anticipate the shock at the sight of these syllables, but could not identify them.

Tulving’s [28] theory of memory (discussed, for example, in Eraut [11] distinguishes between “episodic” memory for events that are personally experienced and “semantic” memory for general knowledge. He offers a useful distinction between knowledge gained through experience and generalised knowledge, and presents a clear path of tacit learning (A1) as illustrated in Figure 3.

The figure illustrates that the behavioural consequences of learning follow from the interaction of experience and knowledge with memory. In path A, personally experienced events stored as episodic memory are compiled into a representation of general knowledge, while, through path B, knowledge gained from external sources (such as documents or reported experience or knowledge) is added. Path A1 represents the direct influence of event knowledge on performance. Tulving [28] suggests that, in general, multiple learning pathways apply contemporaneously. In the absence of event knowledge, performance is degraded – a view which is consistent with Polanyi’s theory of personal perception.

The model provides an explanation of why both theory and practice are needed to gain understanding [10]. Eraut believes that knowledge has to be transformed to become useable in a contextually appropriate way: “Learning takes place during use, and transformation of knowledge into situations appropriately form means that it is no longer the same knowledge it was prior to it first being used [10:20]. Experience is apprehended and made meaningful at a higher level, and becomes experience that is taken for granted. It can therefore be argued that the individual’s perception of the organisation is not only shaped through lived episodes over time, but is also transformed by the contextual meaning the individual places on his/her experiences.

Much of the research on organisational memory and learning avoids issues about whether an organisation can really do anything by itself, or whether the concept of learning organisation is a “merely apparent” effect of the work of its individual members. Senge [26], for example, concludes:

“Organisations learn only through individuals who learn. Individual learning does not guarantee organisational learning. But without it no organisational learning occurs” [26:114].

Hedberg [15] offers a descriptive model (Figure 4) to explain the system in which individual action leads to organisational action which, in turn, raises environmental responses. The environmental responses are related back to the individuals in the organisation and influence their knowledge and preferences, which will influence their future action.
learn from acting. The organisation is merely the stage. It is therefore personal experiences that modify organisational responses [15]. However, experiences are captured by routines and remain within the organisation after the members who experienced them have left. As the individuals develop their personalities, habits and beliefs over time the organisation preserves norms, values, traditions, culture and mental maps as organisational memory. This heritage knowledge is then transmitted to new members [18, 15].

4. Method

In the paper so far, we have described our motivation for investigating organisational memory and tacit organisational knowledge within the IS operation, then briefly reviewed the theoretical literature which describes these concepts. In this section we describe the structure of an empirical, qualitative study which we have undertaken with a view to establishing a link between the bodies of theory which reflects to knowledge in organisations and the effect of outsourcing.

4.1. Research design and data collection

We selected a qualitative and interpretive approach to data collection and analysis. The interpretative research uses rigorous methods, collecting qualitative data to develop a rich understanding of social and cultural context [21]. In this exploratory investigation, where we are trying to elicit feelings and motivations, it is appropriate to utilise qualitative interviews.

We selected ten systems analysts from five different industry sectors to participate in a series of snapshot case studies and, in a series of taped interviews, posed semi-structured, open-ended questions. The theoretical literature described in Section 3 guided our data collection, but we nonetheless both sought richness of literature described in Section 3 guided our data collection, but we nonetheless both sought richness of

4.2. Analysis of text

The taped interviews were transcribed and examined to find indicators of formal and tacit cross-functional knowledge. There were 152 sentences containing indicators that would assist our research theory building. The abbreviated sentences were then coded according to context and combined with sentences of similar meaning. Finally, the sentences were grouped around four major issues which emerged, after the interviews, as being the key concerns to the participants:

1. Understanding the “Big Picture” (the organisational context)
2. Knowledge of people and the social structure of the organisation
3. Knowledge gained from experience (individual perception of situations)
4. Documentation (in Tulving’s terms, public prepositional knowledge)

As the interviews were analysed, it also became clear that it was both possible and useful to group the interviews into categories determined by the background and experience of the interview subjects.

4.3. Grouping of Subjects

Subjects were classified according to industry experience and familiarity with their organisations. In undertaking this classification, we differentiate between inexperience and unfamiliarity:

- A systems analyst will, normally, have completed some formal education equipping the subject with a solid foundation on which to build professional expertise through industry experience. We would argue that compiled professional experience, which might include analytical, technical, managerial and interpersonal skills, is “portable” between jobs/employers.
- Conversely, “familiarity” (or organisational knowledge) is specific to each organisation and relates to how things get done and how decisions get made in practice. Aspects of this familiarity might include knowledge of internal politics and culture, competitive structure of the organisation and the implementation of strategy in practice within the organisation. Subjects in our sample fell conveniently into two “familiarity” categories, thus it was not necessary for us to consider seriously an appropriate boundary between these categories. Those subjects considered to be “unfamiliar” had been employed by the organisation for less than
eighteen months; those considered to be “familiar” had been employed by their organisation for several years.

Consequently we structured our analysis of the interviews around four potential categories of analysts as illustrated in Figure 5 and explained in Table 2.

<table>
<thead>
<tr>
<th>Categorisation according to experience and organisational familiarity</th>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Familiar</td>
</tr>
<tr>
<td>Unfamiliar</td>
</tr>
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Fig 5. The four subject categories

Table 2. Summary of categories of analysts

Category 1 Inexperienced and unfamiliar.
The two subjects in this category were employed in a fast-paced and new technology-centric industry. They had been with the organisation less than eighteen months and were graduates with less than two years’ postgraduate professional experience. They assigned all aspects equal importance but appeared to test the boundaries of organisational procedures. This would place them between the levels “Advanced Beginners” and “Competence” according to Dreyfus’ model.

Category 2 Experienced and unfamiliar.
This subject in this category worked for the same organisation as did those in Category 1. The subject had about ten years’ experience in the industry, but had been with the organisation just one year. Industry experience places this category at Dreyfus’ level of “Expertise” but due to the lack of organisational familiarity only at the level of “Competence”.

Category 3 Experienced and familiar.
The seven subjects in this category came from various industries within the newspaper, banking and automotive sectors. All interviewees had at least 10 years’ professional experience and had worked for their current employer, often in a variety of positions, for more than ten years. This category was clearly at the level of “Expertise” in Dreyfus’ model.

Category 4 Inexperienced and familiar.
Subjects in this category (once a well-populated category prior to extensive university education in IT) are employees who transferred from other parts of the organisation to work (and be trained on the job) in IT. No subjects in this category were identified in time for our study, the idea of internal training in IT appears to have moved out of favour, although following our study we become aware of a Melbourne organisation which had re-established the practice. Unfortunately, their programme has not been in place long enough for qualified interview subjects to become available.

The research subjects were then analysed separately for each category, and the findings divided into appropriate issues of:

- Organisational Awareness (Examining levels of cross-functional knowledge of the organisations)
- Performance Support and Tools (How tacit knowledge was used to enhance performance)
- Culture and Objective Alignment (Assess the level of understanding of explicit as opposed to implicit goals and organisational culture)

The findings were compared across the categories to accentuate any differences between, for example, the “Unfamiliar and Experienced” and “Familiar and Experienced” analysts and are presented in the result section of this paper.

5. Results

5.1. Organisational Awareness

The overall organisational awareness exhibited by both interviewees in Category 1 was shallow and narrow, focusing on their immediate section and problems. Neither expressed much interest in the global and industrial context of the organisation or the products it produces, and related most of their responses to the systems area. The subjects referred to this large organisation as a “huge bureaucratic monster” with structured rules and procedures for system implementations and changes that seemed a hindrance rather than assistance to them. The graduates were assigned mentors, who assisted them to develop important relationships with experienced systems analysts. They felt that the knowledge of valued analysts was important not only to bridge the gap of knowledge they had, but also saw a benefit in developing influential relationships.

Conversely the subject in Category 2 felt that organisational awareness was of paramount importance, and had made it top priority to familiarise himself not only with the organisational structure, but also with the jobs of his colleagues and how their work might impact on one another. He also stressed the importance of following the
organisational objectives and keeping up with new developments in the industry, to be aware of the “big picture”. However, he placed little significance in the systems per se, and was confident his industry experience would enable him to operate any system efficiently as he remarked, “The system is a system, you don’t need anything special to understand a system”. The subject also felt, in contrast to the subjects in Category 1, that the rules and procedures were helpful tools to synchronise system changes and projects and hinted that “rogue” teams were hindering rather than fast tracking developments.

The subjects in Category 3 conveyed a deep involvement and pride in their organisations and jobs. They felt that unless they had complete knowledge of not only the organisation, its divisions and overall global situation, but also every detail of the products they produced, they would not be able to operate efficiently. In contrast to Categories 1 and 2, they perceived the organisation, the system and the people as an integrated whole and felt an integral part of its structure, culture, processes and systems. They were aware of the distinct skill sets of colleagues and would call on those people to gain specific information. However they related that people were usually contacting them for help.

The subjects in this Category appeared to be unaware of the organisational rules and procedures that seemed so controversial in the other Categories.

The criticism of the organisational rules and procedures by the subjects in Category 1 is consistent with behaviour of the competent learner described in the Dreyfus model of skill acquisition [7]. Dreyfus discovered that without the “rule-testing stage” and the acceptance of risk and responsibility, the competent learner would become bored and regress rather than advance to the next level of performance [7]. However, the subject in Category 2 sees the value of rules and procedures from an overall perspective because of his understanding of the organisational objectives. This would indicate that he is at the higher level than Category 1 on the Dreyfus model as a proficient learner. The subjects in Category 3 operate from a deep holistic understanding that resides with the “expert performer” in Dreyfus’ model of skill acquisition.

It is at this skill level, where enough situational experience has been attained, that we are able to detect indicators of tacit knowledge and appreciate how the foundations of this knowledge is gained. The subjects were continually updating their overall understanding to retain their level of knowledge.

5.2. Performance Support and Tools

All the categories recognised the importance of developing relationships and networks of people they could call on not only to extend their organisational understanding, but also to increase skill levels and efficiency. It was obvious to them that the systems changes and developments needed to be done in collaboration and they agreed that initiatives that were similar and able to impact each other were developed more efficiently together. However, the subjects in Category 1 could also see a benefit from having people “on your side” to enable them to move outside the formal procedures and give them the “clout” to get things done, which new graduates would normally not have. The subjects in this category were eager to perform well and be noticed for advancement as well as personal satisfaction, and were therefore mindful of developing relationships not only with experienced analysts, but also with the more influential staff. The subject in Category 2 had developed relationships by exchanging knowledge with colleagues within the organisation as well as externally. Contrary to Category 1, he felt the relationships increased efficiency and allowed people to bounce ideas off each other. He explained “You assume that, whenever you’ve got a problem, someone else has had the same problem before you”. He was actively developing solutions based on other people’s efforts. The subjects in Category 2 and 3 had the ability to anticipate problems and stressed that there was no easy way to find errors, just a lot of “footwork”. These categories had implemented resourceful and clever solutions not only based on ideas from other people, but the subjects in Category 3 had also utilised their historical knowledge.

Several of the analysts in this category had a scientific background and intuitively drew on these analytical skills to apply logical reasoning. One subject referred to his problem-solving skills as “skills you don’t realise you have. They become second nature like reading. Your eyes are drawn to the mistakes”. The subjects explained that they had gained their experience by working through situations as they had presented themselves over their years with the organisation. They were aware that their perceptions of the problems and solutions were essentially personal and only acquired over time. One subject explained that you always lose something when you train a new person, and that a high staff turnover could therefore reduce understanding: “You get somebody who has 100% of the knowledge. They train a new person and only 90% gets transferred to them, then only 90% of 90% and so on. After a couple of years it comes down to the person who doesn’t know what they are doing.”

The subjects in all categories agreed that knowledge is best gained from personal experience and observation. As one subject stated clearly “There are no books to teach you this stuff, it’s just experience”.

All the categories supported the concept of documentation and agreed that verification of systems changes was mandatory but, interestingly, they disagreed...
on what could be codified. Category 1 could not think of anything that they were unable to document, and depended on their notes not only to relieve information overload, but also for future revision and study. They distrusted verbal communication and felt that documentation would, should the need arise, enable them to relate circumstances and events and hopefully escape criticism. They expressed a need for a document of the whole organisation, the sections, the people and most importantly of all the systems and projects including various impacts. The subject in Category 2 had initially suggested that this type of documentation would be useful in the induction of new staff. However, after a year in the organisation he now feels it would not be possible to maintain such documentation given a fast moving environment. He consequently believes the value of such a set of documents would be doubtful. Ironically, the subjects in Category 1 argued later in the interviews that reading documents was not only time consuming, but that they were also difficult to comprehend. Category 3 felt that the concept of a knowledge database was an excellent method to distribute and share information, however, the subjects in this category pointed out that it requires a high degree of management’s commitment of resources, which inevitably has led to the incompleteness and validity of the information stored. They explained that not only would it be time consuming to codify everything satisfactorily, but they also felt it was impossible to document their perception of the organisation, circumstances and their knowledge of people.

Polanyi inquired “how can one see a problem?.. For to see a problem is to see something that is hidden.” [24:21] He cited Plato to emphasise this contradiction “to search for the solution to a problem is an absurdity; for either you know what you are looking for, and then there is no problem; or you do not know what you are looking for, and then you cannot expect to find anything.” This suggests strongly that “if all knowledge is explicit, i.e., capable of being clearly stated, then we cannot know a problem or look for its solution and if problems nevertheless exist, and discoveries can be made by solving them, we can know things, that we cannot tell” [24:22]. The subjects in Category 3 displayed the abilities to anticipate problems and implement solutions at a level that is characteristic of expertise. Their intuitive responses and ability to zero in on the accurate region of a problem were strong indicators of a deep holistic understanding of the situations, and supports Dreyfus’ [7:31] observation of expert tacit knowledge. The consensus of all the subjects that knowledge is best gained from personal experience and observation is consistent with Polanyi’s [24] findings that practical experience tends to bridge the gap between what the teacher wants to tell and what the words mean. He explains that we do not learn by theory alone, but that important details the teacher could not tell are left behind. These can only be perceived by practical experience. One subject illustrated this point in his remark “I had to live with them, work with them, talk to them – for just about a year before I had really understood.”

5.3. Culture and Objective Alignment

Goal alignment is a slippery concept. Schneider [27:157] points out that not only is “organisational culture” subjectively determined and, in any event, local in scope but:

- explicit (expressed) culture and politics often differ from the implicit (intrinsic); and
- The implicit culture - and the hidden assumptions that underpin it - is generally a source of great subjective variety.

One subject in Category 1 related that he had bent the rules and cultivated relationships to enable him to work on initiatives that had not been scheduled. The procedures required to gain approval for such jobs seemed too slow and restrictive and usually a request for unscheduled jobs came from the managers. This rule-testing stage is an important phase in skill development and therefore the flexibility of action being described by this subject is not, of course, unexpected. It is however, a two-edged sword:

- On one hand, the subject is able to be reactive to changing needs and, thus, flexible;
- On the other, the subject does not have a sufficiently broad knowledge of organisational strategy to fully evaluate the implications of a reactive refocusing of its priorities.

The subject from Category 2, however, displayed an interest in the organisation and was focused on benefits which had the potential to advance the organisation overall efficiency, conservation of resources and generally working smarter. He argued that inexperienced graduates were very good at developing clever solutions, but lacked the overview to evaluate whether the issue needed a long- or short-term solution or if, indeed, it should be developed at all. The subjects in Category 3 were very organisationally focused and immersed in their jobs and their industries. Not only did they seem to be enjoying their jobs, but also appeared to be very good at them. They did not follow any rules, nor was there any noticeable constraint placed on the subject in this category. It would seem they were very trusted employees of the organisations. This category was clearly at Dreyfus’ level of “Expertise”. An expert intuitively sees what to do without applying rules. He/s does not solve problems. S/he does what normally works and, of course, that normally works. The expert achieves objectives apparently without having past objectives in the conscious mind.
6. Limitations of Observations

In the case of the organisational unit in which interviewees in Category 1 and 2 work, we can observe:

- High staff turnover
- Relative organisational stability
- An unclear relationship between the unit and the organisation more generally.

It is possible that the subjects’ views were idiosyncratic or unduly influenced by the specific environment in which they work. Nonetheless, the views expressed by the subjects are not in conflict with the expectations of the research in the light of interviews with subjects in Category 3. The subjects interviewed in this category were from a wide range of industries. Having a broad sample of data can strengthen the investigation by representing a wide range of possible opinions. However, care must be taken to represent not only the entire scope of the industry sectors, but also in the depth of the samples. If we are to generalise from a sample it is important that it is large enough to represent the entire population. It only takes a few conflicting opinions to distort the results from an investigation with only a small number of participants. Our investigation had two subjects from the automotive industry and only one from each of the other sectors. This is obviously not enough to mask any inconsistency.

The boundaries of what we consider to represent “experienced” and “familiar” systems analysts (2 Years and 18 Months respectively) were determined post hoc, after we examined the sample. Although, as discussed above, our “familiarity” categorisation was not problematic, a weakness which suggests a need for further research is acknowledged.

7. Conclusion

This research was motivated by the trend, over the last fifteen years, towards outsourcing the IS functions in organisations. It was felt that the loss of key systems analysts could seriously diminish the tacit organisational cross-functional knowledge which is needed to implement changes and new design features. It was anticipated that this loss could affect the strategic responses of an organisation. The basic concept was illustrated in the model (Figure 1) which guides our overall research programme, and further research was argued to be predicated on confirmation that IS operations within organisations hold tacit or informal cross-functional knowledge of the organisation.

This project forms the first part of a systematic investigation and evaluation of the impact of IS outsourcing on strategic flexibility within organisations. Further research will provide a guidance for managers to understand what part of IS must be done within the organisation to preserve the internal knowledge and what may, perhaps, be done better by outsourcing.

The information gathered in this research has given a clear indication that experienced long-term employed systems analysts do, indeed, hold tacit cross-functional knowledge which they utilise, not only to implement changes, but also to find problems. Tacit knowledge of the functions of the organisations was shown to be held by systems analysts and the research further revealed that the analysts generally believed the most important tacit knowledge was their knowledge of people. It appeared the people were the intrinsic part of the sections, the culture, the processes and the overall organisation. Much knowledge possessed by the more experienced analysts had been accumulated over time through situational experiences and interactions with colleagues. Significantly, the more experienced the analyst, the more likely s/he was to believe that it was impossible to codify considerable portions of their knowledge – and, thus, share our conclusion that organisational memory, once lost, cannot readily be replaced. Having confirmed our assumptions we may proceed, with confidence in our foundational work, to undertake detailed analysis of the implications. We look forward to presenting this analysis at a future conference.

The results presented here are, perhaps, not surprising. However the very existence of tacit cross-functional knowledge of the organisation amongst systems analysts which might be lost is a fundamental assumption of the model – and an assumption about which the formal literature has so far been silent.

8. References


