

**SPOTLESS WHITE APRON, LABOUR-STAINED COAT
AN EXPLORATION OF THE WAY TACIT AND EXPLICIT LEARNING
ARTEFACTS ARE USED BY HELP DESK CONSULTANTS.**

RUDY NADLER-NIR

Supervisor: Ms. Rahmat Omar



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A. Keywords

- Cognitive apprenticeship
- Cognitive apprenticeship strategies
(modelling, coaching, scaffolding, fading, articulation, exploration and reflection)
- Tacit and explicit learning artefacts
- Community of practice
- Narratives
- Organisational knowledge
- Participatory learning
- Situated learning practices
- Workplace training and learning
- Call center and help-desk



B. Abstract

Spotless White Apron, Labour-Stained Coat, an Exploration of the Way Tacit and Explicit Learning Artefacts are Used by Help Desk Consultants.

R. Nadler-Nir

M.Phil. Research Report, Faculty of Education, University of the Western Cape

This research sets out to explore cognitive processes involved in learning among Help-Desk Consultants (HDC), both apprentices and experts.

This is done through an analysis of two types of artefacts produced and used by HDC, namely, explicit artefacts, in the form of public documents provided by The Company, and tacit artefacts, which are discernible in team-members' personal narratives.

I analyse four themes outlining the respective needs of The Company and its HDC. The four themes are Time, Professionalism, Escalation and elements of Variety vs. Instruction in learning.

A third aspect to this research is the way cognitive apprenticeship strategies are applied during the learning process. I use an analytical model that incorporates the temporal (newcomers and old-timers), and psychological dimensions (explicit and tacit). The conclusion ascertains that as the temporal and psychological dimensions are used in the workplace, they foreground cognitive apprenticeship strategies.

C. Declaration

I declare that *Spotless White Apron, Labour-Stained Coat, an Exploration of the Way Tacit and Explicit Learning Artefacts are Used by Help Desk Consultants* is my own work, that it has not been submitted for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged by complete references.

Full name:

Date:



Signed:

D. Acknowledgements

I thank managers and colleagues in The Company, especially the Help Desk Consultants, their Supervisor and Service Manager, staff at the Inter Library Loans Department and the Centre for Adult and Continuing Education, both at the University of the Western Cape, Janis Sternhill and Kathleen Olden-Powell from the University of British Columbia and Dr Damian Ruth, from Massey University.

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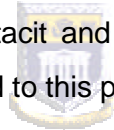
1. Introduction

The Rabbit and the Snare:

“The reason for the rabbit snare is the rabbit. When the rabbit is caught the snare may be ignored. The reason for language is an idea to be expressed. When the idea is expressed, the language may be ignored. But where shall I find a man to ignore language, with whom I may be able to converse?”

Chuang Tzu (BC 369-286, in Pay, 2001)

Language is used to generate ideas, but it is also used to discuss those ideas. Even in rejecting the pre-eminence of language, one needs language to express that rejection. Discourse is established through the co-dependency of language, as explicit, public means of sharing knowledge, and ideas, as the tacit, personal manifestation of the way language is used by individuals. The co-dependency between rabbit and snare -- individual and public, tacit and explicit -- within social learning processes forms the background to this project.



1.1 The Company

I work as Training and Communication Product-Manager for a large, privately owned, Development Company in Cape Town, South Africa. The Company provides legal and financial firms, as well as property professionals, with software products developed in-house. The Company offers a licensing scheme that allows users to “pay per use” rather than purchase applications outright. Users download free software and then, depending on the size of their business, may opt to pay per transaction or pay a monthly rental fee.

The variety in size of user-businesses (from one-person businesses to major legal or accounting firms) as well as the complexity of services offered, necessitate a large support infrastructure such as sales persons, clients handlers and account managers, as well as a sizeable call centre.

1.2 The Call Centre

According to the Call Centre Desk Service Manager, The Company offers free support via telephone and email, as well as at clients' premises. Twenty-six call centre staff, eighteen males and eight females, handles an average of eight thousand calls per month. According to this Service Manager, staff turnover is high due to intense work pressure and low pay. With an average length of service of fourteen months, there is an urgent need for quick – yet comprehensive -- training programs for new call-centre recruits (email correspondence, January 2005).

The centre is made of teams that deal with product-specific issues; while other - larger - teams handle various technical issues (such as hardware and networking) or telesales functions. I focused on a product-centred team in my research because product-team members are not sidetracked by general issues related to users' technical capabilities or purchase needs. Instead, they offer focused, hands-on advice on how to best use the software and its features. In that sense, product-teams are themselves trainers – imparting specific skills and knowledge to clients.

The main problem I face, as the person responsible for training and education in The Company, is that there is little time to provide newcomers with adequate training before they are thrown at the deep end and start answering client-calls. This, apparently, is an industry-wide issue. Lior Arussy (2002, cited in Meisel, 2005) argues that “By stressing speed over service, call centers virtually guarantee that they’ll end up annoying customers instead of helping them.” Meisel (2005) adds that according to “a December, 1996 Harvard Business Review article, 70% of all customer interaction occurs in a call center” and that “Call centers have staff turnover of typically over 25% per year. It is expensive to train representatives to do more than basic operations when they move on to other jobs so often.”

It appears to me that not enough time is invested in understanding how call-centre team members learn and hone their skills over time. This is especially important in an environment in which staff turnover necessitates a robust system for training new recruits, as well as maintaining and expanding existing knowledge bases. From The Company's point of view, effective training should deliver employees that are knowledgeable in identifying potential reasons for product-malfunction and skilful in providing clients with effective solutions. Formal training, therefore, takes up the first five to six weeks after new recruits arrive. Subsequent learning happens through official documents, supervisor's involvement, and personal interaction between team members.

I was keen to explore the efficacy of learning tools such as The Company's official policy documents and assessment tools. I asked myself – are those tools useful? Are they relevant? Do they make a difference? Do they help? Further, I was eager to find out more about the way learning happens personally, as each member gains experience over time and replaces the apprentice's spotless white apron with an expert's labour-stained coat.

This research paper sets to explore those questions through an analysis of artefacts produced by the learning community. My main research question was:

- What role do explicit and tacit artefacts play in the learning process at a help-desk team?

My sub-questions were:

- Which cognitive apprenticeship learning strategies are discernible?
- Were explicit artefacts internalised by learners?

Can it be possible, I posited, to create an analytical model that brings together three major tenets of learning in the workplace, namely, (1) that it involves a socially sanctioned ('legitimate') transition from newcomers (apprentices) to old-timers (experts), (2) that learners rely both on public

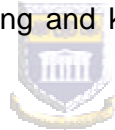
and personal learning channels in order to internalise world experience and externalise ('reify') personal experiences, and (3) that learning is inherently a cognitive process and, therefore, cognitive apprenticeship strategies are used during the processes described above? Such an analytical model can be useful in understanding learning processes in the workplace and in the assessment of training programs' efficiency.



2. Methodology

Discussing the history of qualitative methods, Seale (2004) attributes to the constructionist epistemologists of the 1990s the “philosophical view that all knowledge – not just that of research participants – is socially constructed” (p.108). I feel that the qualitative research methodology is best suited for my research because I aimed to observe the process by which knowledge is created and handled within the specific social environment of Help Desk Consultants.

I chose to use a qualitative research methodology because I wish to explore aspects of learning that cannot be quantified since they reflect learners' personal interpretations of issues such as time, professionalism, escalation and variety vs. instruction. The drive behind my research project is my desire, as a learning-practitioner within a commercial enterprise, to understand learning and knowledge acquisition processes within our company.



The research starts with a literature review. The readings explore various issues related to the view of learning as social activity where a community defines its own structure, learning contexts and identity.

The theoretical background (chapter 4) draws from readings on situated learning and communities of practice, as well as studies done on cognitive apprenticeship. Special attention is given to the discussion of tacit and explicit artefacts produced by the learning community. In my research I used personal narratives - obtained in interviews with The Company's Help Desk Consultants (HDC) - as tacit artefacts, and official Company documents as explicit artefacts.

There are three types of support teams in The Company; namely, technical, product-based and telesales support teams. I chose to concentrate on a product-based help-desk team of HDC providing clients

with product support – both functional and technical - via telephone and email. I excluded technical and sales-related teams because they perform additional functions involving on-site visits for installations and support, as well as for presentations and debt collection. Time constraints prevented me from accessing people who were mostly out of the office, visiting clients and prospective customers.

The sample is made of an entire Help Desk team (eight HDC, and a Supervisor) as well as the call-centre's Services Manager. I have also interviewed a team member who opted to be transferred to another division in The Company. All in all, eleven semi-structured face-to-face interviews were conducted; each interview was thirty minutes long (refer to Appendix 2 for details). The interviews were recorded and transcribed (transcriptions are available on request). I chose semi-structured interviews to cater to my research aims: I sought to obtain personal narratives in order to observe HDC's tacit learning processes and to explore how learning happens personally as each member gains experience over time. Being part of the same Company as those interviewed meant that I was not seen as an outsider. The familiarity, trust and shared understanding of company procedure helped us to establish a rapport and address issues of relevance much faster.

All HDC have at least a post-matriculation professional certificate, either technical or legal. During the research period, the team included four males and four females. Due to time limitations I have focused solely on length of service as a tangible differentiator between team members. Issues such as past employment, education and gender do not play any part in this research.

Help Desk Consultants' length of service spans seven to twenty-four months, averaging 10.5 months. Hence I loosely define 'newcomers' as persons whose length of service is less than or equal to ten months, while 'old-timers' are those who have been with the company longer than ten months. In addition to HDC, I have also interviewed the team Supervisor

and Service Manager. Both are acknowledged experts, and team members – newcomers and old-timers alike, refer to their managers for advice.

I have also interviewed an ex team-member, so as to ascertain whether a person who chose to move to another division carries detectable explicit learning which she had internalised (thus turning it into tacit knowledge).

Throughout this paper, I use anonymous identifiers for all interviewees, in order to maintain confidentiality. Interviewee identifiers and their relevant details are shown in Figure 01.

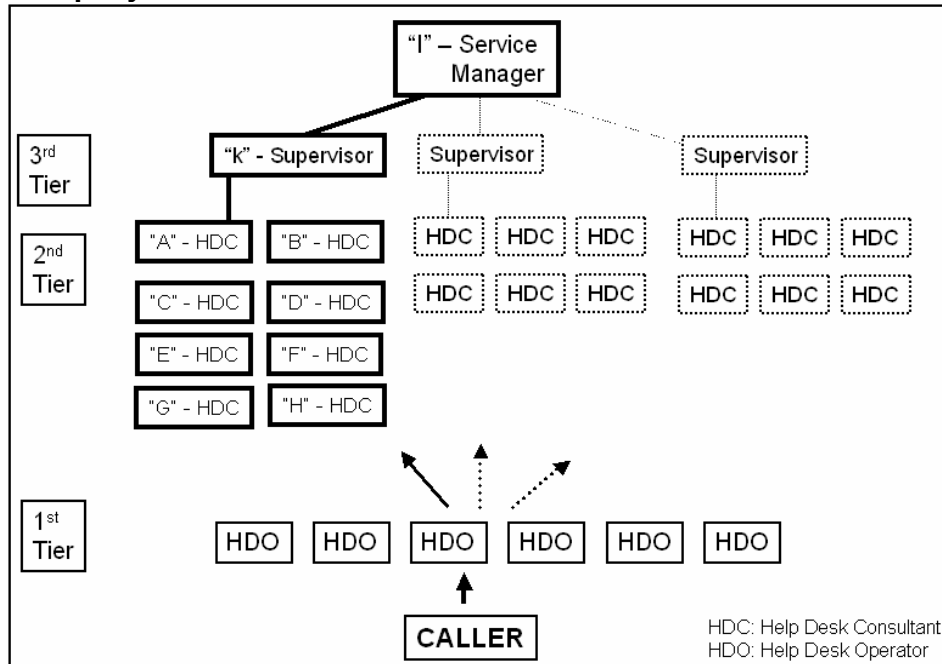
Figure 01 - Interviewee identifiers and relevant details

Position & Identifier	Sex	Service (Months)
HDC 'H'	Female	7
HDC 'G'	Male	7
HDC 'B'	Male	9
HDC 'E'	Female	12
HDC 'D'	Male	13
HDC 'C'	Male	19
HDC 'F'	Female	19
HDC 'A'	Female	24
Team Supervisor 'K'	Female	24
Service Manager 'I'	Female	46
Ex-HDC 'J'	Female	11

During interviews, team members used the generic term “help desk” to describe their team. It is important, however, to place the team within the larger context of The Company’s call-centre, which includes several help desk teams.

Figure 02 shows the structural context of the team interviewed. Initially, first tier Help Desk Operators (HDO) handle callers. They listen to the problem and open a “ticket” – a uniquely numbered electronic file dedicated to the problem described.

Figure 02 - the structural context of the help desk team within The Company's call-centre



Should the HDO not be able to resolve the problem – they will refer the caller (and the ticket) to the second tier – Help Desk Consultants. In addition to describing the caller and the problem, the ticket also indicates the status of the problem, namely, if it has been solved or, if not – what steps are being taken to resolve it. A problem is considered un-resolved as long as the ticket remains open.

I asked seven questions during the interviews (see: Appendix 1). These were open-ended questions that encouraged interviewees to reflect on their learning in the form of free-flowing narratives. The questions were grouped into three sections which were linked to my research questions. Questions 1 and 2 dealt with HDC's view of their own personal and professional history. This section aimed to observe the way HDC's narrated their (tacit) experience and learning history, thus reflecting on the cognitive processes involved in the way they learn and work. Questions 3 and 4 dealt with interviewees' perception of the four themes related to the respective needs of The Company and its Help-Desk Consultants: time, professionalism, escalation and variety vs. instruction (refer to section 5.2

for details). These questions sought to explore how HDC's have internalised explicit artefacts embodied in the notion of "Company needs" and turn them into their own (tacit) values. Lastly - questions 5-7 dealt with interviewees' personal views of success and failure. This allowed me to gauge HDC's perceptions as to how successful they were in delivering on both "Company needs" and their own expectations.

Six documents, used by The Company for training, instruction and assessment, were used. I chose these core documents over procedural manuals and 'how-to' action-sheets because they cover essential aspects of employees' learning and skilling processes, including training, instruction and assessment. The documents allow me to relate my exploration to my theoretical focus, in that they provide explicit instructions.

1. The Product Team Mission Statement (2004) is used because it details expectations from the team, as defined by team members themselves.
2. The Help Desk Consultant Interview document(2004) – is relevant as it outlines criteria for HDC employment
3. The Help Desk Escalation Procedure (2004) - outlines parameters for problem-escalation and defines official reasons for such an action to be taken.
4. The "Welcome to the Help Desk" Induction document (2005)– offers a useful view of The Company's rules and regulations regarding the help desk
5. The Help Desk greeting script (2003) – is relevant because it outlines expectations as far as telephone 'decorum' is concerned, and
6. The KPA (Key Personal Areas) document (2005) – reflects The Company's criteria for success and failure – as evident during employee-assessment.

Ethical considerations

There were overriding ethical considerations with respect to this research project. It was necessary to address the identity of The Company and the interviewees, since they described specific, proprietary procedures. For that reason, both Company and interviewees' identity were withheld.

I had an introductory session with managers and HDC before the project started, where I explained the aims, content and structure of the interviews. I then followed these discussions with a formal letter to the participants – outlining the scope of the project and setting up a timetable for the interviews.

All interviewees signed a confidentiality statement in which their rights to confidential treatment of identity and content were asserted. Subsequently, they were assigned an identifier - to ensure confidentiality.

Limitations of study



The scope of my research was determined by limitations imposed through this course's study-schedule and deadlines. Availability of HDC to interview added further constraints. I therefore opted to concentrate on a single team within a specific call centre.

I have excluded observations regarding gender, age, socio-economic background, education and skill-sets. I was also unable to obtain – in the short time I had for my research - longitudinal observations related to HDC's learning over time and the extent to which they have internalised their learnings. Such longitudinal observations could enable me to observe the 'trajectory' from apprenticeship to expert status.

Another limitation relates to the question whether tacit aspects of one's cognitive processes can be obtained through standard research methods. Polanyi (1958), for example, argues that tacit knowledge is not conscious

to an individual and could therefore never be made explicit. I feel that, once interviewees agreed to share knowledge through their narratives, they made a conscious choice to externalise that knowledge and make it public and, therefore, explicit. The extent to which they were able to do this or not, is difficult to ascertain and remains an almost inherent limitation in researching tacit knowledge.



3. Literature review

3.1 Introduction

The Company discussed here develops and markets a range of software products for legal practitioners. Its call-centre includes several help desk teams; each with a specific, pre-defined task in relation to problems users – mostly lawyers and legal secretaries – encounter while using the software developed by The Company. Some teams focus purely on hardware issues; ensuring the company's software runs effectively on users' computer systems. Other teams are product-centered – they include a mix of people who have technical knowledge as well people who have worked as paralegal practitioners in law firms. Each team is managed by a Supervisor – an experienced help-desk person that handles both administrative issues and expert-knowledge requirements.

In my Literature Review, I set out to explore theoretical and policy aspects relevant to a product-based help desk team in the call-centre. Team members use their social settings and information received from the company to learn their job. In the process they generate, support and sustain a community identity, practice and sense of meaning. I place all of this in a theoretical framework.

Firstly, I look at the emergence of participatory learning concepts within social learning theories. Next, I look at learning and work, giving special attention to the way people form socially situated learning practices, or communities of practice. The next three sections deal with the ways artefacts are acquired or generated, then used, by communities of practice. I then explore cognitive aspects of artefacts – focusing on internalisation. In the penultimate section I address the question: Can one identify tacit or explicit artefacts? Finally, I discuss physical and experiential artefacts, namely, documents and narratives.

3.2 The Emergence of Participatory Learning Concepts

Bandura's (1977, 1986) study of the constructivist cognitive perspective of social learning theory rejects the notion of learning as an individual activity. He argues that learning could become both "laborious" and "hazardous" if people relied only on their own actions and the reciprocal effects these actions produced. Bandura (1977) expands this argument in support of the principle of modelled learning by arguing that most human behaviour is learned by modeling: as one observes people, one is able to "encode" behavioural information that can be used later as model, or "guide to action" (p.22).

Bandura draws on Vygotsky's Social Developmental Theory. Vygotsky (1978) argued that all cultural development activities (such as learning) appear in fact twice – once, on a social level and, subsequently, on an individual level. He stressed that all actions he termed "higher functions" began as "actual relationships between individuals" (p.57). Another relevant aspect of Vygotsky's work here is the assertion that one's cognitive development progresses through engagement in social behaviour, the zone of proximal development (ZPD), which depends entirely on social interaction.

As part of their study of situated learning, Lave & Wenger (1991) found that the concept of social interaction can be expanded from an individual activity to participation within a larger group, a community, in which all participating members get to negotiate their identity, context, and position.

Wenger's (1998) study of participatory learning draws from social theories of learning – stressing the centrality of social participation in the process of learning and knowing (p.4). Accordingly, Wenger identifies four components of a socially-located learning, namely - community ("learning as belonging"); identity ("learning as becoming"); meaning ("learning as experience") and practice ("learning as doing") (p.5).

Other perspectives of social constructivism include the pragmatist view that knowledge acquires meaning when used as experience or as actions that are shared by people (notably, Dewey, 1916, also Hickman, 2001, Rorty, 1979, and West, 1989). Cognitive strategies, such as Vygotsky's "instructional scaffolding" theory (in Rogoff & Wertsch, 1984, p.4) have also evolved.

Lastly - Brown, Collins & Duguid's (1989) work emphasises the idea of cognitive apprenticeship as a collaborative, interaction-based, social activity that enables students to develop and use "cognitive tools" in the process of constructing knowledge in social settings (pp. 32-42).

Carver (1995, in Hedley et al, 1995) lists six cognitive apprenticeship learning strategies, namely - modelling, coaching, scaffolding, articulation, reflection, and exploration (p.206), Casey (1996) adds an element of fading – or gradual detachment from the coaching process, applied by the expert during scaffolding (p. 77).



Modelling happens as learners observe expert thought processes as they happen, coaching involves active observation and guidance of learners by experts, scaffolding and fading are complementing components – learners are given ongoing support as they learn, but active support diminishes - or 'fades' – gradually, allowing learners to assume increased responsibility over the learning process.

As learners feel they have achieved a certain level of knowledge they are encourage to articulate, or demonstrate - what they have learned, as they reflect on the way they address issues – in comparison to the expert. Finally - learners will continue explore their knowledge – its intricacies and boundaries, as they repeat the learning process and expand their knowledge. Ultimately, learners would have created an internal, cognitive, expert-knowledge (Collins, Brown, & Newman 1989).

3.3 The Location and Validity of Learning in the Workplace

According to Boud and Garrick (1999), there is a clear “shift away from viewing educational institutions as the principal places of “valid” learning toward the recognition of the power and importance of workplaces as sites of learning” (p.3). This is a crucial aspect of my research proposal, as I aim to explore how tacit learning happens away from explicit learning channels.

Brown and Duguid (1991) argue that there is a major difference between the way people work and the way organisations describe their work formally. This is largely due to the fact that formal descriptions of work (as evident, for example, in office procedures) and of learning are not derived from actual practice. They, therefore, lack in depth (“details”).

In his ethnographic study of Xerox service staff, Julian Orr (1996) found that, often, formal job descriptions do not reflect job requirements accurately because employers are ignorant of what employees actually do in order to get the job done (p.87).

Weick and Westley (1996) argue against attempts to formalise the acquisition of skills through prescriptive instructions - “To learn is to disorganize and increase variety” whereas “To organize is to forget and reduce variety” (p.440). According to Lave & Wenger (1991), variety increases through the creation of a participatory community. Lave & Wenger (1991) coined the term ‘community of practice’ as they observed how people learn within a social-system. Boud and Walker (1991) define the peer-group in which the learner is immersed as a *milieu* - “Each learner forms part of the milieu, enriching it with his or her personal contribution and creating an interaction which becomes the individual as well as the shared learning experience” (p.18).

Lave & Wenger (1991) argue that learning happens as members participate in the *modus operandi* of their community. Moreover, since “A

community of practice is an intrinsic condition for the existence of knowledge ... participation in the cultural practice in which any knowledge exists is an epistemological principle of learning. The social structure of this practice, its power relations, and its conditions for legitimacy define possibilities for learning" (p.98).

Wenger (1998) finds three dimensions according to which a community of practice defines itself, firstly - that members are mutually engaged "in actions whose meanings they negotiate with one another" (p.73), secondly – that the community is "the result of a collective process of negotiation" and – lastly -- that the community "is defined by the participants" as "their negotiated response to their situation" (p.77).

Weick and Westley (1996) studied the validity of learning, and found that it is difficult to pinpoint precise "moments and spaces" of learning, because such moments tend to "retain vestiges of order, routine and expected exploitation". What is required to pull learning out of rancidity is a dialectic process involving the "uncovering of forgotten meaning, hints at flaws or limits in current practice" (pp.450-451).

Weick and Westley's (1996) view of the unearthing of valid knowledge as dialectic process is echoed in Lave & Wenger's (1991) concept of legitimacy in participation. They argue that learning is given validity when viewed as a situated activity that "has as its central defining characteristic a process that we call legitimate, peripheral participation" (p. 29) through which the community *legitimises* newcomers by allowing them partial (*peripheral*) participation, so as to enable new generations of recruits to take over from old-timers. This happens "over time" as they move from being legitimate peripheral participants to become full-participants.

3.4 The Generation of Artefacts

According to Wenger (1998), communities of practice create - over time – joint repertoire (such as routines, artefacts, methodologies, narratives and symbols). This repertoire is used by the community to negotiate meaning (pp.82-83) as part of the reification of participation process, which Wenger (1998) explains as ‘the process of giving form to our experience by producing objects that congeal this experience into “thingness” ‘ (p.58).

Defining artefacts in a larger context, reminiscent of Wenger’s “repertoire”, Cook and Yanow (2001) argue that “Human action includes the ability to act in groups. Over time and in the course of joint action or practice, a group of people creates a set of intersubjective meanings which are expressed in and through their artefacts (objects, language, and acts)” (p.16).



According to Polanyi (1966, cited in Nicolini et al, 2003) “when we learn to use a language, or a probe, or a tool, and thus make ourselves aware of these things as we are of our own body, we *interiorize* these things and *make ourselves dwell in them*. Such extensions of ourselves develop new faculties in us” (p.65, italics in the original). These faculties, in turn, affect the way we see – and experience -- the world.

Vygotsky (1978) and Piaget (1952) reject the notion of learning as an outcome of a mimetic process. Rather than imitating others, individual learners carry elements of prior knowledge (templates, “schemata”, conceptual artefacts) that are then used to internalise new knowledge. Vygotsky (1978) argues that during the process of internalisation, social elements become psychological (in other words, Vygotsky describes a cognitive process).

Observing the way artefacts are involved in cooperative work, Christensen (2003) sees these as conceptual bridges between two worlds - "If we follow Taussig (1993) maybe we can describe an artefact as constituted between the real (physical phenomena: materiality etc.) and the real made up (social practice: sign system, etc.)" (p.18).

Lave and Wenger (1991) address the question how artefacts affect participants' "access to understanding". They found that artefact used by the community of practice form a major aspect in member participation because such artefacts "carry a substantial portion of that practice's heritage." This means that artefact are more than just tools, to be used by participants – rather, they are connecting participants to the history and the cultural values of the practice (p.101).

3.5 Tacit and Explicit Artefacts

The term "tacit knowledge" originates in Polanyi's (1958) study of knowledge. According to Polanyi, true knowledge-acquisition cannot be defined *a-priori* by rules and algorithmic principles. In addition, knowledge has both a public and a personal facet and, finally, underlying all observable, explicit knowledge is a fundamental, subjective and personal knowledge that is tacit in nature. This means that, while knowledge is explicitly distributed, socially, it contains a layer of personal experiences and subjective - tacit - knowledge. Reber (1993) termed this layer "cognitive unconsciousness" because it denotes an aspect of our skills and actions that is not accessible to our outer cognitive processes (p.8). Ryle (1949/1984) differentiated between embodied, functional, knowledge (which he termed "knowing-how") and theoretical knowledge ("knowing-that") (p.25).

Ambrosini (2003, p.32) notes contentious definitions to the term "tacit knowledge": some see it as a notion of skill (Nelson and Winter, 1982), others term it "Know-how" (Corsini, 1987; Kogut and Zander, 1992) or even a "Recipe" (Kogut and Zander, 1992); Spencer (1994) sees Tacit knowledge as unarticulate and implicit, while Hu (1995) sees it as un-codifiable, and procedural (as opposed to declarative) knowledge. Shirley

and Langan-Fox (1996, in Ambrosini 2003, p.21) equal tacit knowledge to intuition.

According to Yanow (1996), tacit knowledge is communicated through artefacts other than language. Brown and Duguid's (1991) dictionary-analogy (p.134) can be adapted here to illustrate the difference between explicit and tacit artefacts. For example, when I use my word-processor to write a letter, the application's spell checker (the explicit artefact) is used in conjunction with my letter (the tacit artefact, which carries my skills, knowledge and subjective experiences) to generate an item of knowledge that can be sent out to someone.

Wenger (1998) differentiates between objects (artefacts) that involve "making, designing, representing, naming, encoding and describing" and those that include "perceiving, interpreting, using, reusing, decoding and recasting" (p.59) – the first denoting explicit artefacts, while the second involving tacit ones.



3.6 Using Physical Documents and Experiential Narratives as Artefacts

Cook and Yanow (2001) described artefacts exchanged between community-members as "intersubjective meanings" (p.16). Used in this context, intersubjectivity indicates a mutual exchange of personal experiences involving two perspectives: an individual, internal (experiential) perspective and a communal, public (physical) perspective.

Brown and Duguid (2000) highlight the importance of documents as physical artefacts around which communities form. These "textual communities" do not use documents only as receptacles for information. Rather – documents help in the creation, structuring and validation of information. "More intriguing, perhaps, documents also help structure society, enabling social groups to form, develop and maintain a sense of shared identity" (pp.189-190). Whether printed or digital, documents' mobility enables them to become fundamental artefacts in communities because, when shared, they form a bond between community members

and create “a common sense of purpose and social identity” – ideas that have been obscured by the view of documents as mere information carriers (p.197).

Wilson (2002) differentiates between 'knowledge' and 'information', defining knowledge as “what we know” – our subjective, personal, experiential-codex – whereas information consists of the messages uttered during communication. In themselves, these messages are devoid of knowledge.

The argument against the way information takes precedence over subjective experience is echoed in Gabriel's (2000) discussion of narratives as experiential artefacts: “Once narratives were free from their enslavement to facts, an immense new landscape for organizational research was opened”. In that context, organizational stories – being a form of narratives-- should be seen as “folklore elements that become part of organizational culture” (pp. 5-6).

Barthes (1966/1977, cited in Gabriel, 2000) argues that “narrative may incorporate articulate language, spoken or written; pictures, still or moving; gestures and the ordered arrangements of all the ingredients.” Narratives are present in an “infinite number of forms... at all times, in all places, in all societies... there does not exist, and never has existed, a people without narratives” (p.5).

Wenger (1998) finds that “On the one hand, we experience the world as we make it amenable to our practices.” As an example, he discusses wine-tasting *skills*. “On the other hand, our sense of ourselves includes the objects with which we identify because they furnish our practices”, such as the ability to use wine-tasting *vocabulary* (p.70).

3.7 Selected criticism

Fenwick (2001) cites constructivist learning theorists such as Anderson, Reder, and Simon (1996, cited in Fenwick, 2001) who argue that knowledge is not context dependent and therefore premises on which

situated learning theories rest are “misguided” and “overstated”. Instead, they argue that learning can be conceptualised only in relation to the type of knowledge acquired. In a process involving transfer and adaptation of knowledge, learners adapt and change new concepts to apply to familiar concepts (p.38).

Other arguments suggested that the view of learning communities is somewhat idealistic, as it ignores the possibility that learning communities might enforce negative learnings. Apprentices, for example, may adopt negative traits, practices and values (Salomon and Perkins, 1998, cited in Fenwick, 2001, p.38). Additional issues include “dimensions of race, class, gender, and other cultural/personal complexities, apparently ignored by situative theorists” (p.38). Fenwick challenges the notion of movement from the community’s periphery to its “identifiable center” and rejects the view of “participation as hierarchical” (p.39).

Finally, Fenwick points out that situated perspectives have not addressed issues of resistance and dysfunctionality within the learning community. If members resists, she asks, does this still constitute “meaningful participation”? (p.39)

Jan Nesper (1994) rejects both Lave and Wenger's (1991) views of learning as legitimate peripheral performance in "communities of practice", and the Vygotskian view of learning as a process involving the internalisation of external experiences. Nesper replaces the notion of “isolated social interactions or localized communities of practice” with a more expansive view of global networks, operating in spatial and temporal modes as part of a generalised system of knowledge. ‘At the core, my argument is that learning isn't a[n] internal psychological process [...] this statement is a familiar point, made in various ways by Vygotskians, students of "situated learning," and others’ (p.3).

Nesper discusses time and space as major aspects of knowledge. He observes a global system that supports the notion of individuals as

contributing units “linked to one another, to those around us, to world economies and global flows of culture that shape and provide resources for everyday practice “these individuals form part of what he calls “networks of knowledge builders” (p.6). Nespors argues that cognitive learning theories gave too much importance to individuals and “the self” and that subsequently they divorced the psychological aspects of learning from the social aspects. Nespors cites Newman (1990), who defines cognition as a property not of individual students but of the “interactional systems” in which students engage (p.7). According to Nespors, when knowledge is internalised, it becomes devoid of the social element – and it exists in its larger, global context.

While Fenwick (2001) Nespors (1994) and others’ criticisms of situated learning merit thorough consideration in research that may involve knowledge acquisition and usage within a social practice, I found that they are less relevant to the specifics of my research – especially as far as the sample I chose is concerned. Nespors’s model of learning within global networks involving dynamic dimensions of time and space could not be applied to the call centre’s highly regulated, local-by-design environment.

I therefore opted to follow the Vygotskian view of cognitive learning and expand it to include the model of cognitive apprenticeship strategies (Carver, 1995, and Casey, 1996).

I set out to explore whether members of the help-desk team, newcomers (apprentices) and old-timers (experts) use cognitive apprenticeship strategies as they learn, explicitly and tacitly. I seek to investigate whether these cognitive apprenticeship strategies offer enough “disorganised variety” (Weick and Westley, 1996), so as to foster the creation of expert knowledge among Help Desk Consultants.

Lastly, I will follow Polanyi’s implied definition of tacit knowledge as “hidden” and, having established that artefacts form an essential part of the repertoire used to exchange knowledge and generate meaning, the

question is: Can one detect an internalisation of explicit knowledge, so as to make it tacit, as well as externalisation of tacit knowledge, so as to make it public?



4. Theoretical background to the research

The repertoire generated over time by communities of practice includes artefacts, such as documents, tools, stories and symbols (Wenger, 1998). These artefacts form part of the system used by the community to negotiate meaning “over time” Lave & Wenger’s (1991). The temporal aspect of learning sets apprentices apart from experts, while the cognitive (“psychological” - Vygotsky, (1978)) – aspect differentiates world experiences from experiences that have been internalised by learners. Finally – the cognitive apprenticeship model foregrounds the temporal and cognitive aspects and assigns an observable hierarchy, involving the expert and the apprentice.

4.1 Newcomers (apprentices) and old-timers (experts)

The community enables (legitimises) members’ meaning-generation through a participatory transition (trajectory) from newcomers (apprentices) to old-timers (experts), and from peripheral to full participation in the community of practice. It follows that length of service is a major form of distinction between members.

As each community member externalises objective experiences and exchanges them with other community members, these “set of intersubjective meanings” (Cook and Yanow, 2001) form the basis for the group’s sense of meaning and identity.

As *legitimate* members, apprentices are not excluded from usage of -- and contribution to – the general body of knowledge (Spender, 1996). There is, however, an awareness that a path exists, leading apprentices on the road to gaining knowledge and expertise. This research set out to explore artefacts - used and generated – by community members with various lengths of employment.

4.2 Tacit and explicit

Artefacts are used to help learners address both public and personal aspects of their practice. Artefacts hold parts of the community's history and heritage (Lave and Wenger, 1991, p.101) and serve as conceptual bridges between physical and socially-constructed aspects of community life (Christensen, 2003, p.18).

Artefacts have two complementary functions. On the one hand, they may serve as tools in the process of "reification" (Wenger 1998, p.59), assisting one's experiences to become concrete.

On the other hand, artefacts serve to "*interiorize*" external experiences and "*make [them]selves dwell in them*" (Polanyi, 1966, cited in Nicolini et al, 2003, p.65, italics in the original). During the process of internalisation, social elements become psychological (Vygotsky, 1978) as part of one's cognitive processes.



Reification happens as shared personal experience takes on a concrete form and becomes a body of knowledge – such as policy documents and work procedures. Internalisation, on the other hand, can be discerned only by glimpsing at apprentices' personal – or tacit – view of the world of work around them.

4.3 Cognitive apprenticeship model

Cultural development (including learning) happens at both social and individual levels. Social behaviour consists in participation within a peer group (*community of practice*, also, *milieu*) whose members are constantly busy generating identity, meaning and context – for themselves and for their practice.

Learning may be modelled but it is not mimetic. Rather, it is a process of encoding social and behavioral information. Cognitive apprenticeship

principles assume that a clear hierarchical system, involving an expert and an apprentice, exists and that knowledge is shared within clear learning strategies (Carver, 1995, and Casey, 1996) involving modeling, coaching, scaffolding and fading, articulation, reflection, and exploration. This research uses an analysis model that foregrounds cognitive apprenticeship strategies against the background of the temporal (apprentice / expert) and cognitive (internal / external) aspects.

The model is used to analyse four themes outlining the respective needs of The Company and its HDC, namely: time, professionalism, escalation and elements of variety vs. instruction in learning.



5. Analysis

5.1 Introduction

*“Our mission is to provide fast efficient service to all our callers in a friendly professional manner. Trying to make every call a pleasant one”
Mission statement of the product Help Desk team (p.1)*

I set out to explore three learning aspects in a help desk team, namely – the role that explicit and tacit artefacts play in the teams’ learning process, which cognitive apprenticeship learning strategies are discernible, and – lastly – ascertaining whether explicit artefacts were internalised by learners.

The Company’s help desk team is comprised of eight Help Desk Consultants (four males and four females) and a Supervisor. While call-centres require a large number of expert-practitioners, The Company strives to maintain an effective call-centre facility because clients expect expert-assistance to be readily available when using a product. Since the software is offered free – and revenues are generated only when clients actually use the software, it is also in The Company’s best interest to ensure “maximal up-time” (interview with Service Manager ‘I’, February 2005).

The Company’s main reasons for the creation of the call-centre are:

1. Providing clients with immediate, effective solutions to problems they encounter using software designed by The Company.
2. Increasing client awareness of the most effective ways of using the software.
3. Learning about problems with the software, as well as client needs and requirements – and passing these on to the Research and Development (R&D) team.
4. Encouraging clients to use the latest versions of the software and showing them how to upgrade the version they have.

5. “On selling” services by encouraging clients to use other services offered by The Company (Email correspondence with the Service Manager, January 2005).

All actions taken by Help Desk Consultants are geared towards a quick, effective resolution of the problem. If this is not possible, HDC may choose to hand-over the problem to one of the local branch managers for a site-visit to be arranged or they may opt to consult their team-colleagues. Should the problem remain un-resolved, HDC may escalate the problem by referring it to their Supervisor. According to The Company’s policy documents, HDC are expected to use the various resources at their disposal and do their outmost to offer quick, effective solutions to callers’ problems.

5.2 Themes explored

Four themes, outlining the respective needs of The Company and its HDC employees, emerged from my analysis of Company explicit policy documents and HDC tacit interview-narratives (Figure 03). The difference between The Company needs (manifested as public requirements) and HDC needs (indicating personal desires and wishes) follows the cognitive apprenticeship model, where company experts provide public modelling and coaching, while HDC apprentices undergo a reflective, personal learning process.

Figure 03 – Respective Company and HDC needs

Theme	Company’s public needs: Requirements, evident in explicit policy documents	HDC personal needs: Desires & wishes, evident in tacit narratives
1. Time	Problems must be solved as quickly as possible.	Crucial role in the transition from ‘apprentice’ to ‘expert’
2. Professionalism	Competent, skilled Help Desk Consultants	To become experts in what they do
3. Escalation	A system where solutions are offered by all team-members	To expand the boundaries of their knowledge.
4. Variety vs. Instruction	Dynamic, flexible problem solving team that uses a cumulative knowledge base.	To learn & record effective solutions to a variety of problems

The four themes, with the corresponding needs of both Company and HDC, foreground various learning-theories. The social nature of learning is evident as team members help each other solve client problems.

Participation within one's peer-group during the process of meaning-generation legitimises the peripheral position of apprentices because they get both support and feedback from long-serving peers. Team members negotiate their identity as they progress from apprentice to expert. The joint repertoire – created during team meetings – consists in the electronic listing of the team's tried, successful solutions. Expertise – residing in explicit Company documents - is modelled by the team Supervisor and bolstered by HDC who encode the information by matching tacit knowledge to input from peers.

Explicit artefacts are used as road-signs, pointing HDC in the right direction, from The Company's point of view. In that sense, explicit artefacts support the cognitive “modelling” of expertise undertaken by the team's HDC Supervisor and Service Manager, as well as their peers.

5.3 Time

According to team Supervisor 'K' (24 months with the team), time is used to gauge Help Desk Consultants' capabilities. “You have targets to reach and you have... to be logged in for a certain amount (of time that) you have to account for... obviously we have to keep track of that ... there isn't really any other way to track whether a Consultant is productive and efficient at what they're doing.”

Time is the most discernible unit-of-measure in the help desk environment for all concerned, namely – clients, HDC and Company. The Company associates a quick, effective solution with capability, while Help Desk Consultants link it to the emergence of expertise. An ideal situation involves an effective problem resolution within the shortest length of time. The number of calls and the length of each call are automatically logged

by a system that produces reports with statistical data on each Help Desk Consultant.

The Company's Key Personal Areas (KPA) document – the main tool for employee assessment – states clearly that “Resolution Time is the maximum amount of time allowed for the completion of a task / request“, with a maximal time limit of 45 minutes (p.4).

Help Desk Consultants' view of time-constraints varies. 'D' – a male HDC, (thirteen months with the team), agrees with the explicit view of time as a positive indicator - “(with) exceptional trouble-shooting skills you can get to the base of the problem in a very short period of time if you know exactly where to look, big plus.”

On the other hand, ex-member 'J' (female, eleven months with the team before transferring to another division), points out that the system has shortcomings - “There's been a whole bunch of times when I've been stuck on a call for an hour, sometimes an hour and a half. And I mean that's just – it turns your call stats around like that... One day you might get all the short calls and ...you tell them to do this and its okay, thanks bye. And it's finished and ... you've solved fifty problems a day. Then the second day comes; you spent an hour and a half on the phone with one client and then just a while after that you spend three calls of half an hour each. That day your call stats might [show] ten calls or ten problems that day.”

'A' – a female HDC with the longest service-record with the team (24 months) – takes the explicit limitations in her stride - “Time is a factor...in that the clients are very pressurised... We can't sit on the phone much longer than necessary” however, she admits that “(chuckling) – I usually get the long calls and the documents and... make sure it works; not always the quick answers, you know. There are (other) people that go very quickly through a whole lot of small problems. I find my niche in life is on the end of the scale.”

Evidently, HDC have tacitly applied cognitive reflection and exploration to the explicit instructions. As they reflect on the need to provide clients with quick solutions, they explore variations to the rule, discussing cases where a quick solution may not be necessarily the best one. 'G', a male HDC (seven months with the team), sees a situation where impatience and anger may cause him to spend less time researching the problem. "You get clients who could maybe get a little a bit angry, especially, if they're put on hold for a while, while you make your research of ... the particular error that they get. And, like they say, in business, time is money."

Other clients take longer to understand how to address the problem due to lack of technical knowledge. 'E', a female HDC (twelve months with the team), reflects on her need to apply a soft, constructive attitude - "with a non-technical person, it takes that much more extra from you to sit and say listen, we understand you're not technical. Let's take that extra time just to sit and explain what we're going to do; why we're doing it and what it's going to cause. So it's all about that." One can see how HDC use cognitive apprenticeship strategies like reflection and exploration to re-fashion their job-requirements. The tacit outcome is less prescriptive than the explicit documentation.

5.4 Professionalism

It appears that – as far as professionalism goes - explicit expectations from HDC centre more on issues of behaviour and conduct than on skills and capabilities. A main criterion for assessment on The Company's Key Personal Areas (KPA) document, for example, is the extent to which the HDC is "Always treating clients with respect and professionalism" relationships with other team members, Supervisors and managers are to be "courteous and professional - using appropriate language and mannerisms" (pp.3-4).

Under the “Professionalism” section in The Company’s induction document (given to all new recruits) one finds that “Professional behaviour includes appropriate business language” and that “appropriate and acceptable office behaviour includes speaking discreetly to one another” and “Employees should demonstrate the highest standards of moral and ethical behaviour. Offensive words and phrases, jokes about sexism, religion, creed, race, etc. and rude gestures will not be tolerated” and the use of alcohol, “is prohibited during working hours”. Other professional attributes include a “business casual – shirts with collars” dress code, excluding Fridays and weekends, when a casual dress code is allowed. Professionalism is also expected in the way telephones calls are answered - using the appropriate scripts. (p.2)

Help desk Consultants, on their part; try to make sense of the concept of professionalism by linking it specifically to their interaction with the caller – not with each other.



‘A’ lists respect, efficiency and product knowledge as crucial elements in a professional relationship with clients. “Efficiency would be acknowledging your clients. Understanding what they require; and which area of the product they require it and then being able to respond to that call for assistance and either give it yourself or get somebody who can give it to them.”

Male HDC ‘B’ (nine months with the team), links professionalism with customer satisfaction “that is the service I provide each client... (so they know) that they can call in even if it means five times a day for the same thing; not to become irate, to have that client become irate; but for that client to feel comfortable speaking with me. Fixing the problem or not, as long as the client is happy. At the end of the day the focus would be on getting the problem sorted out. But, over and above that, having a happy client, for me, is what would complete a successful transaction”.

'D' feels that, unlike his previous employers, "more often than not everybody, management, supervisors, other colleagues, are interested in knowing what's going on. What do you find is bugging you or is tricky or where do you see room for improvement. And throughout all that, I find that it's actually become quite a nice place to work in because they actually listen to you... when you walk into... (The Company) building, if anything, the place is laid out really nicely. The place is neat. You know where you are when you get there. You walk through R&D; you know you're in R&D. You walk into Helpdesk it looks like Helpdesk."

The team managers provide HDC with cognitive modelling and coaching in order to encourage professional attitude when facing clients. HDC can see how their managers handle clients – during referrals or escalation, at the same time; managers assist HDC in developing a personal professional ethos. According to a female Service Manager 'I' (46 months in service), "in terms of professionalism, I think it's really a case of having people... well-trained; well-spoken; but able to articulate; able to get a point across, even if they are dealing with, what I would call, technically challenged people. We, as a company, need to make sure that we are able to deal with a diverse set of skills levels and product knowledge levels across a great number of customers." Almost none of the issues mentioned in the explicit documents (such as language, ethics, moral norms, dress code and alcohol) were listed by the HDC as relevant indicators of professionalism – yet, they serve as Key Personal Areas for focus during staff assessments.

5.5 Escalation

According to the Help Desk Escalation Procedure document "In the event of a task or request not being completed to the client's total satisfaction or within the required time frame, the task will be escalated" and "heighten the level of expertise and resources assigned to a task/request" – in order to "accomplish the timely solution to a task or request logged" (p.3).

The Company's Key Personal Areas (KPA) staff assessment document maintains that the desired situation is when all calls are resolved, handed over (to the branch managers for a site-visit) or escalated (referred to experts on the team) "to agreed criteria" (p.1).

During escalation, HDC can involve their peers or pass the problem on to their supervisor. Cognitively, the relationship between the 'apprentice' (HDC) and the 'expert' (team supervisor) involves modeling - as the supervisor addresses the problem while the HDC observes the supervisor and the emerging solution. Having noted the process, the HDC can internalise (understand) the problem and its solution. The supervisor supports (scaffolds – used here as a verb) the learning process while gradually reducing - or fading - actual involvement in the relationship between the HDC and the caller.

Further, HDC describe the problem, its symptoms and gravity, to the expert involved, repeat the caller's description of the problem and add their own assessment of the problem. From a cognitive perspective, describing their reasons for escalating the case involves an articulation of the problem and the learnings involved - as HDC unsuccessfully tried to resolve the problem. They will also reflect on their action as they explain to the expert why they chose a certain course of action over another.

I expected that HDC would consider escalation as an abdication of sorts – 'passing the buck' on to a colleague or manager and absolving themselves from responsibility. Surprisingly, the general view – almost common wisdom – was that escalation is a process whereby an HDC becomes aware of the limits of his/her knowledge and expertise and – rather than wasting the caller's time – refers the problem to another, more knowledgeable, person for resolution. In the process - escalation becomes a prime opportunity for acquiring new knowledge.

For 'E', escalation does not mean "handing it over because we don't (want) to do this. We are handing it over... (with) the possibility ... that we

could come back to that person ourselves with a possible solution. An escalation would be classified as ... (the problem) being handed over to someone internally, by us, who is going to look at it but it is still going to be open in our names. The ticket will still be assigned to us.” The ownership of the ticket (and hence, the client and the problem) does not pass on to the expert – or peer – during escalation. This demonstrates the demand for integrity, as manifest in explicit Company documents. It also bolsters HDC learning by making sure that they are exposed to the eventual resolution of the problem, as they “close” the ticket after the problem has been resolved.

There are clear indications that HDC use escalations as learning opportunities. Some HDC note a decline in escalations frequency with time. According to ‘B’, “as you become upskilled, you know, the longer you are on the helpdesk, the more the familiar these problems and the solutions are. And thus they become fewer and further between the escalations because you are now able to sort out the problems instead of passing in onto some one else to sort it out for you”

Often, explicit documentation leaves the specific criteria for certain decisions to HDC (tacit) discretion. For example – it does not indicate at what point HDC may decide to escalate a problem. ‘B’ maintains that the decision is a personal one – “I will decide to escalate an issue when I can tell it’s over my head... for example, me coming from an IT background, I don’t have a deep understanding of the [legal] process. So, when something goes a bit too deep for me ... I will choose to escalate that task.”

According to ‘H’, female HDC (seven months with the team), “Escalation comes when you’ve really done some extensive troubleshooting with the person and you can’t seem to go any further or you can’t seem to find a resolution. Then you escalate it to somebody else.” The decision when to escalate a problem depends on HDC’s tacit assessment that they have reached the limit of their knowledge on the issue at hand. Another reason

for escalation is more prosaic, 'H': - "if it's a bit urgent, and the client has perhaps got a time limit, then we'll ... set as an escalation and the Consultant will ... try and sort it out" Supervisor 'K' adds that "the client ... just gets frustrated because it's taking too long to solve the problem telephonically... They reach a point where they think: 'okay now I've done enough, I can't actually do anymore'... they actually haven't got time to spend on the phone with us. So there's those levels of ... client frustration".

As we see, when explicit instruction is insufficient, HDC use tacit discernment – based on a reflective assessment of their knowledge and its limits.



5.6 Variety vs. Instruction

The last theme explored here emanates from Weick and Westley's (1996) assertion that "[t]o learn is to disorganize and increase variety" whereas "[t]o organize is to forget and reduce variety" (p.440). I have found that variety is clearly associated with tacit properties. While they accept and use explicit instructions, HDC rely on variety in day-to-day learning.

Company explicit documents outline expectations from HDC by listing instructions and laying out procedures that are required in order to fulfil those expectations. Variety - as a departure from explicit instructions - is evident as HDC assign their own, personal, meaning to the task. As an example, The Company Escalation Procedure Document lists four criteria for escalation - "(1) The task progress is in danger due to lack of personnel or goods required, (2) Caller satisfaction is not as expected, (3) Response time is not met for a task, or (4) Communication problems (missing info for a task logged)." HDC, on the other hand, said that they would consider escalating a problem only when they feel they have reached the limits of their knowledge of the problem at hand.

HDC are aware that instructions and procedures are often generic, non-specific, directives. Moreover, Help Desk Consultants know that they "own" the problem until it is resolved. Resolution, however, depends on undefined criteria such as client satisfaction. As 'A' sees it - "you don't let go until that person is happy. Most of us, I think, close our tickets with saying, okay, successful, client is happy." Since explicit documents cannot define subtle goals such as client happiness or satisfaction, it is up to HDC to make sure that the client is satisfied. To achieve this, they sometimes need to contravene other explicit imperatives- such as time limits.

I have found that HDC increase variety mostly through sharing information with peers and management. This is done via email, in peer-to-peer

discussion and as a team – during weekly meetings. According to ‘E’, “we’re always learning and cross-skilling each other. I think we have to, because ... everything ... is just moving so much faster –pace (of) technology is increasing... So, I mean, we are always learning from each other every single day”. Ex-HDC ‘J’ adds - “If ... (team members) receive any feedback, they always send out emails to everybody informing them of what’s going on. So you are always kept up to date with any changes or anything happening. You will always know. We were also encouraged to (share) amongst ourselves... any information that might be relevant to someone else or if you think that someone else won’t know this, or anything interesting that you might have found, we were encouraged to share with the rest of the group.”

HDC agree that the team’s weekly meetings enable effective sharing of knowledge. ‘C’ (male HDC, nineteen months with the team) maintains that if he has an un-resolved problem “I’d be carrying that same burden” until the next weekly meeting “and we’ll discuss it and everyone will have solutions by the time the meeting is over”. For ‘D’, “Anything that we ... have problems with we get to ... air it in the meeting. We get to brainstorm and spitball a lot of ideas and sort of revise on any problems that have been happening... Which is ... what I consider the point of the whole meeting. And I get this hour off the phone (Chuckles).” ‘H’ adds “In our weekly meetings, you will come up with a certain query... a problem that you couldn't find a solution to; or if it's something that you could (offer, it) helps the others a lot, because somebody else might have the solution to your problem. And you could also find yourself with a problem that somebody else has got and you've got solution, so you can help that other person out.”

‘H’ maintains that “you basically get knowledge from the other Help Desk Consultants or anybody else in the office...maybe there's a keyword or something familiar in the problem that somebody else could have dealt with. In that way we would try different things, try different problems. So,

we actually see those difficult calls as a challenge to ourselves; as an opportunity to learn something new.”

Interestingly, there is a well-defined process through which tacit knowledge becomes explicit again. It happens when knowledge is shared among team members, who capture it in their PCs. According to ‘C’, “everyone going into the meeting has little files that they’re writing down ... I use [it] myself... so you just basically (write down the problems and their solutions) and then you have them at your disposal all the time.”



6. Conclusion

This research paper set out to explore learning at a call centre team along two thematic dimensions. Firstly, it explored usage of explicit and tacit artefacts by Help desk Consultants (HDC). The public (explicit) vs. personal (tacit) axis foregrounds the notion that such artefacts are part of the *repertoire* produced in communities of practice as they engage with each other and negotiate an identity – both as individuals and as a group (Wenger, 1998).

HDC are given explicit documents that outline clearly The Company's requirements and are expected to use this knowledge in real-life client-calls. Explicit artefacts such as Company documents support an instructional / procedural view of HDC work. They outline expectations on delivery in a wide range of issues including time management, professional attitude and moral / ethical behaviour, as well as problem ownership and problem escalation.



Engagement within the community of practice is done through a participatory process situated along the second axis – that of apprentices vs. experts. As apprentices gain experience, their learning is made legitimate by the experts (Lave & Wenger, 1991). Each Help Desk Consultant's knowledge is legitimised by the Supervisor as well as by peer HDC who refer to each other for assistance.

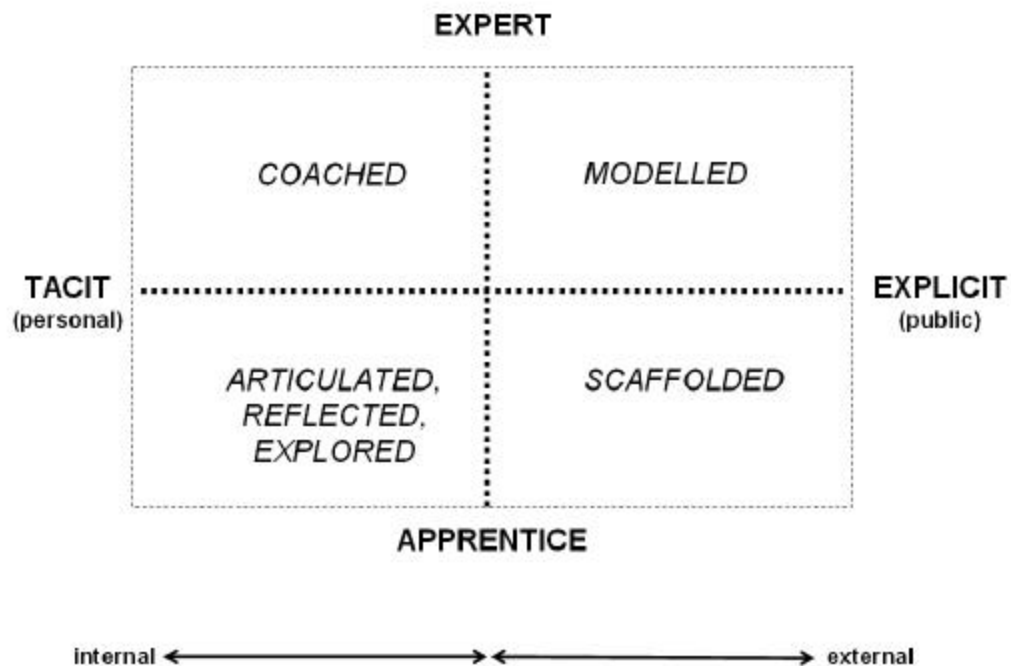
Carver (1995, in Hedley et al, 1995) lists several assumptions related to the interactions between apprentices and experts. Firstly – the experts must be proficient and skilful in both knowledge and training capabilities. There is an acknowledged need for HDC to rely on their Supervisor and their (more experienced) peers for knowledge.

Secondly, the relationship between expert and apprentice is expected to last over time, it is not a short term, once-off relationship, and thirdly, it

needs to be professionally relevant to both expert and apprentice. Both supervisor and HDC share a vested interest in a quick, effective resolution to the client's problem.

My research shows that, as I observed the two axes as a single structure (Figure 04) it becomes clear how HDC and their supervisor use cognitive apprenticeship strategies for learning and knowledge acquisition.

Figure 04 – The two thematic axes foreground Cognitive Apprenticeship strategies



Considering the four quadrants in Figure 04, one can see that explicit artefacts (such as instructions in Company documentation) become meaningful when modelled by the expert, (the team supervisor or, often, a more knowledgeable peer) who offers a demonstration of how relevant issues need to be addressed.

The apprentice, observing the way the expert handles the issue, is able to follow the expert's step-by-step scaffolded example. Explicit documents – and modelling - cannot offer a definition for intangible concepts like client

satisfaction and happiness. They also differ from HDC view on issues of professionalism and problem escalation.

While modelling involved a mimetic element because apprentices observe how the expert does things, during coaching the expert observes the way apprentices do things themselves. This element necessitates both the HDC and supervisor to interact on a tacit level.

As HDC learn, they come to term with intangible concepts like client satisfaction and accumulate solutions to client problems. This process is done tacitly because there is no explicit way to acquire and access personal experiences and perceptions. HDC substantiate their learning through reflection and exploration of what they have learned against the background of explicit imperatives set out by The Company. In the process, HDC internalise explicit artefacts (modelled or documented) and make it their own tacit-artefacts. Thus, explicit documents become tacit notes and modelled behaviour becomes one's personal practice.



Significantly, the process does not stop here. HDC use simple WORD documents that they keep on their PC. Whenever they learn a new solution, definition or rule of operation – or amend an existing one, HDC enter the information in these documents and refer to them for solutions, occasionally. In a way, it is through recording items of information (thus converting them into explicit artefacts) that internalisation becomes relevant.

6.1 Research application and further study

The analytical model discussed here offers three distinct tracks for application and further study.

Firstly, the way tacit and explicit artefacts were used by HDC at The Company suggests that training programs offered in the workplace need to differentiate between knowledge that is instruction-based and knowledge gained through personal observation and that is subsequently internalised by learners.

Future study in this regard may investigate forms of knowledge internalisation, as well the ways by which tacit knowledge becomes, once again, explicit through information-exchange among peers.

The second, temporal, track, takes cognisance of the strong bond between apprentices and experts. In the context of HDC at The Company, a robust system of mentorship may improve knowledge integrity and facilitate the handing over of expertise from old-timers to newcomers.

Future study of temporal aspects of knowledge and expertise vs. length of service may investigate issues such as the efficacy and usefulness of fast tracking. Long-term effects of up-skilling courses vs. dedicated mentorship programs can also be studied.

Thirdly, the cognitive apprenticeship track places the subjective, internalised, learning experience at the centre of the learning process. Learners are seen as both knowledge recipients and disseminators. The tacit aspect of learning, discussed here, leads me to believe that a peer-to-peer mentoring system could work successfully side by side with expert-based mentoring.

Future study can address the overall concept of expertise – is expertise an independent, objective quality or is it a dynamic quality that may be assigned by the learning community as it legitimises learners (apprentices and experts alike)? This investigation appears to be firmly rooted in Vygotsky's "zone of proximal development".

Finally: I have discussed my research limitations, which precluded me from considering aspects such as past employment, education and gender (p.7). Future studies may consider these aspects independently or in relation to the temporal, psychological and cognitive tracks discussed here.



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8. Appendix 1

Questions asked in interviews:

First, two short questions about you:

Question	Description
<ol style="list-style-type: none">1. <i>Tell me about yourself, - who you are, family, education and how you got to do what you do in your present job.</i>2. <i>Tell me about what you do here, at [Company Name].</i>	Questions 1 and 2 deal with Consultants' view of their own personal and professional history.

Now, let's talk more about the qualities required from a help-desk person, here at [Company Name]:

Question	Description
<ol style="list-style-type: none">3. <i>How do you understand the concept of professionalism, here at the [Company Name] help-desk</i>4. <i>How do you understand the concept of Escalation, here at the [Company Name] help-desk?</i>	Questions 3 and 4 deal with interviewees' perception of the main themes explored, namely – Time, Professionalism, Escalation and Variety vs. Instruction

Question	Description
<ol style="list-style-type: none">5. <i>Tell me about the types of difficult clients you deal with, here at the [Company Name] help-desk</i>6. <i>What, in your opinion, makes a top-quality help desk?</i>7. <i>What, in your opinion, makes a top-quality help desk consultant?</i>	Questions 5-7 deal with interviewees' personal views of success and failure.

Appendix 2

Schedule of interviews:

Identifier	Interview date
HDC 'A'	14 February 2005
HDC 'F'	15 February 2005
HDC 'C'	16 February 2005
HDC 'D'	17 February 2005
HDC 'E'	18 February 2005
HDC 'B'	21 February 2005
HDC 'G'	22 February 2005
HDC 'H'	23 February 2005
Service Manager 'I'	24 February 2005
Ex-HDC 'J'	25 February 2005
Team Supervisor 'K'	28 February 2005

