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## Imagining the performance zone: Overcoming ambiguity in consumer based electronic performance support systems

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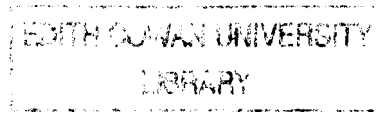
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# **IMAGINING THE PERFORMANCE ZONE:**

overcoming ambiguity in consumer based electronic performance support systems

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Thesis submitted to complete degree of Bachelor of Communications

(Honours)

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The Use of Thesis statement is not included in this version of the thesis.

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I would like to thank everybody I didn't have time to return the call of, to join for beers, coffees, birthdays, etc. Your understanding and support was invaluable. Special thanks goes to Alex and Sue for incessant support and wisdom!

Finally an extra big shout out to Hanne for being the light at the end of this tunnel: *Jeg elsker deg skaten min.*

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## ABSTRACT

The locus of performance support implementation was once the domain of large corporations where its principles offered an attractive alternative to traditional methods of training within the scope of contemporary business practices. Due to economies of scale the large corporations were able to build effective performance support through the precise identification of the PERFORMANCE ZONE. This zone is created through the defining of the three attributes of performance, 1) the nature of the worker, 2) the nature of the task, and 3) the type and amount of support needed.

Increasingly the principles of performance-centred design have been adopted within diverse sectors.

One of which is the embedding of performance centred design principles in consumer software where the developer doesn't have the privileged access to be able to define the above attributes of performance. These consumer electronic performance support systems don't share access to the attributes of performance as other systems.

My thesis is that this deficit of access precludes the newer models being identified as true EPSS, and further, for these models to become true EPSS they must shift developmental focus from the problematics of *defining* the PERFORMANCE ZONE, to those of *imagining* it!



## Chapter 1

## INTRODUCTION

The performance support movement can be seen as contributing to the liberation of computer systems and networked technology from a legacy of ill-fitting paradigms. Thorndike's shadow reign over the realm of computer supported pedagogy had been ebbing for some time, he's foot soldiers such as the all-knowing teacher and the *tabula rasa* student reduced to phantoms. A changing of the guards was occurring, those inspired by radicals such as Bloom and his heretical ideas that the learner is a participant in pedagogy, were gaining favour and influence. Finally economical factors that traced a continuum from computers become more affordable for the home user in the nineteen eighties, to the adoption of the Internet in the mid nineties found Thorndike finally dislodged and estranged.

The performance support movement contributed to a radical rethinking of the role of training in the last fifteen years. A rethinking that has shifted the understanding of learning from an *event model* where training is something that happens to an individual situated in a certain space in a defined time frame to a *process model* where "learning is the outcome of the nature and quality of experiences, regardless of the context they are in (Gery, 1991, p. 20)": A rethinking that traces the shift from Thorndike to Bloom.

The performance support movement was championed within large American corporations where its principles offered an attractive alternative to traditional methods of training, particularly within the scope of contemporary business practices. But increasingly the principles of performance-centred design are being adopted within a more diverse range of sectors. One of the most interesting of which is the embedding of performance-centred design principles in consumer software. This movement is interesting because the considerations involved in designing consumer software to be released on the market are very different to that in designing a highly targeted solution to client defined specifications, as is the case in traditional electronic performance support system (EPSS) models.

These different considerations relate to the ability of each of the models to address a structure known as the PERFORMANCE ZONE. This is a space created where learning translates directly to performing and where the worker's expectations exactly match the requirements of the task (Gery, 1991, p. 13).

For an EPSS to be considered effective it needed to define and maintain this PERFORMANCE ZONE. This paper discusses the attributes that constitute the PERFORMANCE ZONE then outlines the imbalance in the degree to which each model is able to access these attributes, an imbalance that favours the traditional EPSS development model.

The thesis of this paper is that this deficit of access precludes the newer models being identified as true EPSS. Further this thesis claims that for these models to become true EPSS they must shift developmental focus from a hopeless attempt at *defining* the performance zone, to one of *imagining* it!

A suite of four principles is forwarded as conduits to this imagining and a methodology to establish their validity described. Central to this methodology was to substantiate this suite

of principles in a consumer model EPSS, with the logic that as a well *defined* performance zone is expressed through a EPSS, so should a well *imagined* performance zone.

The methodology used to validate the four principles bore unexpected and surprising results. It is not clear from the research conducted if the proposed principles are effective in imagining the performance zone, but what it does indicate is that the *simulacrum* is similar to its *ideal* in the following manner:

If a single attribute of a real performance zone is ill-defined the performance zone is unable to be formed, similarly, if a single principle of an imagined performance zone is ill-defined then the performance zone is unable to be imagined.

## Chapter 2

## LITERARY REVIEW

To orient the reader to the key themes and consequences of this thesis the following survey will outline, firstly, the definitions of electronic performance support systems, their evolution as a response to computer based training, key thinkers, and future directions. Secondly, this survey will focus in on the aspects of electronic performance support systems that specifically concern the main project of this thesis, the nature of the performance zone and the possibility of its simulation within consumer based software.

### WHAT IS AN EPSS?

The term Electronic Performance Support System (EPSS) refers to various computer-mediated systems that are designed to assist a worker through the completion of a specific task. These systems aid by addressing the gap between a worker's knowledge or ability level and that level needed to complete a task. For clarity, they can be contrasted to Human Performance Support Systems (HPSS). Zolper defined HPSS as, "the practice of providing appropriate knowledge to employees via a mentor, supervisor, subject matter expert, staff member, aide, consultant or other appropriate role. ... HPSS is not intended to encompass casual information but rather deliberate knowledge sharing relationships, mostly formal in nature." Shepard uses this contrast with HPSS as a way of defining EPSS through visualisation, where he imagined a familiar situation where a worker has a problem or a question they are not able to solve:

"I could ask Frank, he's a real whiz with Aquarius. But no, that would be the third time I've bothered him today – there's a limit to which I can call on favours.

The Help Desk? Well, they're only really interested in the technical side of the system. And anyway, they're so overworked, it'll be a while before I get a response.

There's always the manual at the last resort. Trouble is, they keep sending me out updates and I keep forgetting to update copy. I'd have to reassemble the whole three volumes before I could look up a thing.

If only there was a resource online, which would give me the information I need straight away – just enough, not too much – an all in clear English. I'd say we'd need an EPSS (Shepard, 2001)."

Similarly O'Gorman defined EPSS by what its not; he contrasted it to "the more traditional, methods of one-off training courses, indecipherable manuals, bulletins and a multitude of software applications (2001)."

The exact form in which an EPSS takes is difficult to describe, as they can be any software/hardware combination that has been specifically designed to improve the performance of the worker. Shepard lists some forms of EPSS in the Table 1 on 14.

So EPSS systems come in a great variety of forms, it may be helpful here to examine two forms from the above list to clarify not only the differences in approaches but also the similarity in objective; the support of performance. The two I'll speak to are *wizards* compared to *demonstrations/simulations*.

Table 1

## VARIOUS FORMS OF EPSS

- |                          |                                      |
|--------------------------|--------------------------------------|
| • Templates              | • Short Tutorials                    |
| • Wizards                | • Intelligent Agents                 |
| • Context Sensitive Help | • Flowcharts, diagrams               |
| • Tips & Hints           | • Demonstrations & Simulations       |
| • Case Studies           | • Strategic Decision Support Systems |

This is a short list of various forms of EPSS, Shepard's (2001) list is in no sense exhaustive but functions well to help orient a reader new to the performance support.

Both Wizards and demonstration/simulations are similar as they act as cognitive scaffolding; bridging information that the worker already knows to a task which is — to varying degrees — beyond their current skill set. The difference between these two EPSS strategies is in their delivery.

Wizards tend to take an opaque approach where many of the steps or processes involved in executing any given task is hidden or heavily masked from the user (Turtle, 1999, p299, Bollaert, 2001). For example *3D Home Architect® Design Suite Deluxe 6* features several wizards, the most ambitious of which is the House Builder Wizard. The user requires no architectural knowledge they simply, "Select from the size, style and element configuration you like best and 3D Home Architect® Home Design Deluxe 6 will generate your new structure already equipped with walls, floors and a roof."<sup>1</sup>

Alternatively demonstration/simulations take transparent approaches where the user is purposefully guided through the exact steps involved in executing a task (Turtle, p299). These may take the form of short digital videos or technical 3D animations. Margaret Eastman and James Sawyer cited good uses for this type of EPSS in industries where, "comprehensive, hands-on demonstrations or simulations [are required] to determine if employees and trainees understand the procedures for jobs with safety, environmental, quality and financial impact (1999)."

Whatever its form the end result of an EPSS should always be the same. Miller offers a "results-based definition" of an EPSS as "any computer software program or component" that improved performance through either:

- 1) Reducing the complexity or number of steps required to perform a task (process simplification)
- 2) Providing the performance information an employee needs to perform a task
- 3) Providing a decision support system that enables an employee to identify the action that is appropriate for a particular set of conditions.

Further he writes that one can identify the improvement of performance through a performer to completing a task:

- 1) In less time
- 2) With fewer errors
- 3) With better results
- 4) With less training or external support (Miller, 1996).

<sup>1</sup> 3D Home Architect® Design Suite Deluxe 6. California, Broderbund



## ORIGINS OF THE EPSS

In 1991 Gloria Gery published a book recounting a new perspective on training she developed while working on solutions related to professional development within AT&T in 1989. This book, *Electronic Performance Support Systems*, was to act as the inspiration for a movement. Gery saw a growing difference in the structure of the work place in the late eighties and felt existing technological frameworks could no longer meet industry needs. Further, she was cynical of the application of new technology simply because it was new.

Gery saw the culture and demands of corporate training evolve across four models from 1) situated training with informal access to experts, 2) to a more formal on-the-job apprentice schemes, 3) to when the numbers to be trained exceeded the privileged 1-on-1 master/apprentice system to group training, to 4) instructional systems design and training as an organisational function emerged as institutionalised, structured, and controlled versions of the skill transfer process” (p.8). Gery saw this evolution result in a dysfunctional pedagogy and cites three key criticisms: 1) training was removed from work context, 2) experts were removed from novices, 3) post-training support was reduced to manuals, an occasional job aid, and intermittent supervisory commentary.

This was a time of transition, where through the introduction of new technologies, industry leaders were looking for new training models. Generally this led to the twisting of new technology into outmoded models. Gery wrote that with the introduction of the computer, the videodisk, CD-ROM, multimedia and expert systems, “Uninformed optimism prevailed. Expectations for distributed, ‘just-in-time’, or ‘desktop’ learning, individualised instruction, rapid information access, and improved decision making increased. The good news is that these things are definitely possible. The bad news is that initial efforts at interactive training, on-line reference, and advisory systems have had limited impact. Efforts have been largely limited to automating the prevalent tutorial instructional approach and to putting manuals on-line. (Gery, 1991, p.22)”

Her main criticism sat with the fact that instructional material was being developed from outmoded business models. Howell backs Gery up here; “The reality is that, regardless of how much or how well we do, the problems we are attacking are accelerating at an even faster rate. Or our development efforts are simply taking too long. We are applying radically new technological alternatives to old frameworks without re-examining their underlying assumptions and structures. In our pursuit of solutions, we have assumed that the future should be an extension of the past (Howell, 2001, p17).” Shepard picks up Howell’s point on the acceleration of business time, “Could it be that the world’s moving too fast for training? Your job, perhaps even your career, changes every year or so. The products and services that your organization delivers changes monthly. The whole basis of the industry in which you work may be challenged every few years. There’s so much to learn and so little time to learn it.” Finally Gery brings it back to the deficiencies in training models, “At the heart of an EPSS’ attitude is a belief that most organizations today face a performance crisis that training alone cannot address, conventional training events are inefficient learning tools compared to an EPSS that makes learning just a point-and-click away.”

One of the big criticisms performance support developers have about training models is that they dislocate the worker from their place of work. O’Gorman critiques these traditional training models for institutionalising “clear distinctions between doing (performing the job), learning (acquiring the knowledge and skills necessary to do the job) and reference (acquiring the data and information necessary to do the job). These three things are distinct in terms of location, time and context – the training environment is

usually physically separate from the working environment, people will have time allocated to attend a training course and they would usually be in a different frame of mind when attending a course (O’Gorman, 2001).”

Table 2 below crystallises some of the above arguments by comparing the training assumptions of the period, with realities Gery identified in industry.

**Table 2**

ASSUMPTIONS	REALITY
<ul style="list-style-type: none"> <li>• Training is an event with a beginning and an end</li> <li>• The audience can be defined and is relatively homogenous</li> <li>• Training must be consistent for all learners</li> <li>• Learners see a need to learn what the trainer sees as important</li> <li>• Learners require someone else who "knows better" to structure and sequence their learning experiences and to assess their learning</li> <li>• People must "know" certain things before they can "do" anything (i.e. cognitive knowledge must precede experiential knowledge)</li> <li>• Teaching people "about" things will translate into their being able to "do" things on the job</li> <li>• There will be adequate post-training support systems available on the job. What happens on the job is out of the trainer's control</li> <li>• Instructional designers know better than individuals or groups of learners how those learners best learn</li> <li>• The job situation is static</li> </ul>	<ul style="list-style-type: none"> <li>• Learning is a process.</li> <li>• Groups of learners are rarely similar</li> <li>• Learners control what they learn and retain.</li> <li>• When information about things is forced on people out of context, it is difficult to obtain and maintain their attention.</li> <li>• Learners will learn in the most efficient and effective way to them personally.</li> <li>• When provided with a model learners can assess their own knowledge and skill.</li> <li>• In order to become skilled or proficient at anything, people must have sufficient practice in actually doing the task.</li> <li>• Most post-training job support is unstructured, inconsistent, inadequate, or inaccessible.</li> <li>• Consistent training experiences produce inconsistent and unpredictable learning outcomes</li> <li>• The job situation is dynamic.</li> </ul>

A comparison between the training assumptions of the period with realities Gery identified in industry.

Adapted From Gery 1991 p18-22

So in light of this new set of assumptions Gery proposed a system that moves way from *training* to that of *performance*; from *just-in-case* to *just-in-time*.

It is stressed that the fact this support is delivered through electronic means is not a privileging of digital pedagogy over any other system, but instead simply a recognition that a lot of jobs require a high degree of interaction with computer systems. Carr makes this clear when he wrote that, "Instructional design is far more significant than the delivery mechanism (cited in Gery, 1998)." Similarly O’Gorman notes this change in performance need due to the technologies we use when at work, "As we move from a production-based economy to a knowledge-based economy, performance support becomes more relevant than training.(O’Gorman, 2001)"

Gery (optimistically) wrote,

“The goal of an electronic performance support system is to provide whatever is necessary to generate performance and learning *at the moment of need*. This kind of support has always required human beings in the past. But now we have the means to model, represent, structure, and implement that support *electronically* — and to make it universally and consistently available *on demand* any time, any place, and regardless of situation, without unnecessary intermediaries involved in the process.”

In a very determined manner Stan Malcolm draws the reader’s attention to the differences between traditional training and the EPSS model:

“We need to be clear about the role of learning in PS. People insist that learning is noble in some abstract value-driven sense. The same people tend to fear that PS [performance support] will dumb-down jobs to the order of, say, fast-food cashiers. Well, that fact is that much – most – of what training programs, CBT, and Web based training has been requiring employees to learn is not enriching their lives. I’m not a better person for knowing the arcane codes associated with medical conditions in insurance claim handling. If a PS system can supply those codes, or better still, hide them entirely; I’d rather not learn them, thank you. Instead, let me learn skills that apply, for example, to make better claim decisions (cited in Dickelman, 1999).”

## LEGACY

Following Gery’s pioneering work at AT&T, many others have been brought to performance support, including, Stan Malcolm, Barry Raybould, Gary Dickelman, Duane Degler and Burt Huber. Their contributions to the evolution of performance support will be outlined through the unfolding of the paper.

One of the key legacies of Gery is the establishment of *performance support* as a distinct discipline. This led to a shift from training to performer-centred design (PCD).

Howell describes PCD as offering, “an alternative to the old model of software development. A representation [of the performer] is created by using elements from total quality management, human factors engineering and process, and diversity and usability modelling.” Performance-Centred Design refers to the underlying development principles underpinning EPSS, knowledge management systems and most software applications designed over the last 15 years. To be clear, an EPSS is a specific software solution to a specific performance problem, PCD, alternatively, refers to the principles and strategies designed to make any piece of software more performer centred. Howell emphasises the difference in this model to others is that ‘PCD concentrates not on the components (user, information, system) but on how they work together most productively’ (Howell, 2001, p.18).

Closely related to EPSS was a rise in the recognition of the importance of Knowledge Management [KM]. Davenport and Prusak pioneered KM in their 1998 book *Working Knowledge* (Davenport & Prusak, 1998). Essentially KM is the recognition that information can have high operational value within an organization and should be understood as a corporate asset.

Lawton describes KM as, “... the process of capturing collective expertise wherever it resides and then distributing it to where it can be of most use in relation to better performance and increased productivity (Lawton, 1999).” Christensen furthers this introduction of knowledge management by making explicit its link with performance support, “As the worker improves performance by applying knowledge in new ways, the challenge is to capture that event and feed it back into the work context – which is the performance support system” (Dickelman, 1999, 10).

Knowledge management is related to performance support because performance support is dependent upon the provision of knowledge to the worker at the point, and in the amount

she needs it. A study of knowledge management can make the performance support developer more conscious of the different forms of knowledge, and hence the different was of capturing it and delivering it as performance support. Authorities of KM identify three types of knowledge:

**1) Explicit:**

This type of knowledge can be understood as fixed, authorised and acculturated into an organisational workflow or operational plan Bollinger and Smith describe explicit knowledge as that which is “clearly formulated or defined, easily expressed without ambiguity or vagueness, and codified and stored in a database (Wickert & Herschel, 2001).”

**2) Tacit:**

This is considered to be the unarticulated knowledge residing in a worker’s head that is often difficult to describe and transfer (Bollinger & Smith, 2000). Many KM experts consider this type of knowledge as more valuable than explicit. This is because it represents the applied knowledge of the everyday workflow, as opposed to the idealised rules found in organisational manuals. Tacit knowledge is often more clearly understood as Internal Knowledge (IK) and incorporates the skill set and history that each individual worker brings to the current work environment (Zolper, 2000). Examples of tacit knowledge are an individual’s talents, personality traits, knowledge/comfort of an organization’s culture and power structures (Wickert & Herschel, 2001). Further, Grayson and O’Dell include lessons learned, know how, judgment, rules of thumb, and intuition as forms of tacit knowledge (cited in Bollinger & Smith).

**3) Inexpressible:**

The concept of inexpressible knowledge is important for KM developers to understand. It is recognition that there are limits to any organization’s ability to manage knowledge, and more importantly it is critical to know where those limits exist (Gill, 2000). Inexpressible knowledge includes highly internalised or intuitive knowledge where the worker may not be aware that they are even applying a certain type of knowledge to complete their tasks.

O’Gorman suggests a fourth type which is a hybrid of tacit and inexpressible, that is a forbidden type of knowledge. This knowledge is termed “‘black knowledge’ – it is not approved or formalised in any way, if it is documented at all it is very haphazard and is generally inconsistently spread through a company. It spreads because it is useful knowledge.” Black knowledge can be things such as an intuitive understanding of design, to supposedly secret web proxies.

## **FUTURE DIRECTIONS**

Many EPSS advocates, Raybould in particular, attribute the useability of many Web-based applications and e-commerce systems to the adoption of performance centred design principles. He wrote, “Terminology may change, but the thing is that the approaches and methodologies that the PS community have been developing over the past ten years are exactly what is needed to ensure knowledge management systems and web-based e-commerce systems will be successful and result in improved human and business Performance. That’s the exciting thing; the terminology is not important. What is important is that there is now a community or professionals who have a structured set of design principles and mythologies that together form a repeatable process for designing systems that achieves business results.(1999, p4).” He even suggests the adoptions of the term, PERFORMANCE-CENTRED E-BUSINESS (p. 4).

The evidence of this embedded performance support is driven by the needs of commerce. Cichelli argues that “Today the PC web-based systems are those driven by electronic commerce, where if people can’t easily buy, revenues plunge, market share is lost, and business fail (cited in Dickelman, 1999, p. 8).” Further Raybould adds, “Since businesses transactions are moving directly to consumers and bypassing intermediaries such as customer service representatives, PCI is critical to completing transactions (cited in Dickelman, 1999, p. 8).”

Gery wrote,

”The only reason we had intermediaries in the past is because they had access to the data and could perform transactions. Now the data and transactions are universally available, whether its purchasing a car or buying stock or doing research. The value proposition of dealing with an intermediary has diminished substantially by information and transaction access; the web does that. (Grey cited in Dickelman, 1999, p. 8).”

The second big direction of PCD is in integrating various computer systems within an organization through a consistent performance centred user interface. Cichelli wrote, ”The opportunities that EAI [Enterprise Application Interface] present for PS practitioners include designing interfaces that help the performer maintain context, focus on tasks, and focus on goals without worrying about data and data interpretation (cited in Dickelman, 1999, p. 11).”

## THE TWO FORMS OF EPSS

Electronic performance support systems were originally envisaged as large-scale solutions to the big scale corporate performance problems that traditional training solutions are no longer able to address. You just need to survey the companies cited as example of case studies in Gery’s *Electronic Performance Support Systems*; American Express, AT&T, Intel, IBM, Dow Chemicals. These were large scale, costly projects. But from the mid to late 1990’s performance-centred design principled had spread into many different software fields. As early as 1995 Gery began noticing small-scale and consumer market software that exhibited high degrees of performance support within their design. Gery fell short of calling them EPSS, but did write glowingly of them.

This new form of EPSS contrasted with Shepard’s heavily integrated view of what an EPSS is. Shepard believed that to maximise performance support an EPSS needed to be built so as to address a very specific locus of performance issues. To address this locus he wrote that an EPSS could only be organization specific, not generic, and further, department specific, not organization wide (Shepard, 2001). But the newer form appears to reject this strict definition. “In the consumer marketplace, software is emerging with characteristics and behaviours that actively support performance development”, Gery wrote, “These performance-centred systems are the next step in the evolution of performance support. Performance Technologists must and will play an active part in both their advocacy and design. Ultimately, no consumer or large-scale software system should be considered acceptable until day-one performance is generated for novice performers while still accommodating the requirements of expert performers. (Gery, 1995, p. 1)”

Gery didn’t explicitly name these two models, but in the balance of this paper they will be identified as *integrated* and *consumer* models. It is the tension between these models that will develop into one of the key themes of my thesis, but for the moment, let me clarify the two models with some examples.

First lets address the *integrated model*.

Miller offered a very succinct definition of an integrated EPSS as “a software program that contains both performance support and business applications. While it may consist of one or more software programs, it is typically designed as an integrated unit that does not incorporate existing software applications. This type of system combines and integrates performance information and process simplification.”

An example of such an EPSS is the one designed for American Express customer support staff. This EPSS was designed to decrease the training time it took to get the average worker

to a level of competence, and aid existing workers within information on the products and services American Express supported which alternated on a high rotation. The ambitious goals of this EPSS are listed in Table 3 below.

Table 3

- To provide an electronic environment within which the full range of employees, from novice to expert, could function on the job.
- To enable novices to perform as experts
- To structure a systems environment that would reduce the amount of factual. Product, procedure, and process training requirements and would permit more case-study or scenario-base training and increased training time on customer service and personal skills development.
- Reduce reliance on trial and error as the basis for on-the-job learning
- Provide interactive, flexible communications and on-the-job training on new products, services, systems compatibilities, and procedures.
- To provide up-to-date reference and training on-line and reduce requirements for paper-based information and help desks.
- To Provide alternative access methods to information and resources to users

The projected performance outcomes of the American Express EPSS.

To develop this system an incredible amount of access to the workers and representatives was granted by the client, as well as access to the systems they work with and the workspace they work in. This type is called *integrated* because it taps into, and extends, the very information and communications infrastructure of the client organization.

Miller wrote that an “integrated EPSS can be as custom program designed and developed for a specific organization” while the newer form of consumer EPSS, “designed to perform a specific business function that is typical for most organizations (1996).”

This newer form of EPSS is far less ambitious than it’s precursor. They are a solution to a perceived performance problem in industry in general. An example of a consumer EPSS is Andrew Morrisons’ *Veterinary and Medical Dictionary for MS Word*, which is a downloadable Add-In for MS Office. The dictionary extends Office’s default dictionary to include words most Office users would never need. But for an Orthodontist such an EPSS can offer a great deal of performance advantages. Barry Raybould sees one of the opportunities offered through incorporating an EPSS solution is to address the gap between expert/novice knowledge (1996, Dillon, 1996). Such an EPSS may address the expert/novice in the Orthodontist’s practice. One would presume the Orthodontist would know the correct spelling and grammatical use of terms like *gingivae*, *alveolus*, and *buccal*, but others working in the office, which may need to prepare reports, may not. The spelling and grammar check included as a part of the dictionary may go some way of addressing this gap. Another consumer EPSS could be *Family Lawyer® 2004 Deluxe Home & Business* that supports performance through the provision of contract, and leasing templates.

In a nutshell the differences between these two models can be described as follows: *consumer EPSS*’ are created by developers who perceive a performance problem in industry in general, or a sector specifically, and then advance their software as the answer to that problem. On the other hand, *integrated EPSS* are created by developers who are tendered by a client company to address a specific internal performance problem that has identified.

## THE PERFORMANCE ZONE

The coining of the term PERFORMANCE ZONE is generally attributed to performance guru Gary J. Dickelman, and describes a space generated when the EPSS developer is able to quantify the three factors of performance;

- 1) The nature of the performer
- 2) The requirements of the task to be performed, and
- 3) The amount and type of support needed.

In Dickelman's words the performance zone is "... the place where there is an accurate representation of the business activity and appropriate representation for the people who have to do the works and just enough information (1996)." The Venn diagram in Figure 1 on page 22 is the common model used when discussing the PERFORMANCE ZONE.

Huber refers to the performance zone as the three actuals, "Actual performers doing actual work in their actual environment. (Dickelman, 2001, p31)"

It is the degree to which a developer is able to identify and then reinforce the performance zone that impacts the eventual effectiveness of an EPSS. So the degree to which an EPSS needs to be developed around a concretely defined performance zone cannot be overstated.

In discussion the PERFORMANCE ZONE two important aspects need to be raised. Initially, of course, the triadic attributes need to be explained, just what do each of those spheres represent? And secondly discuss various techniques forwarded as ways of evaluating the PZ. It is not enough to say that *product A* has a PERFORMANCE ZONE, but just how effectively does the PZ of *product A* compare to that of *product B*?

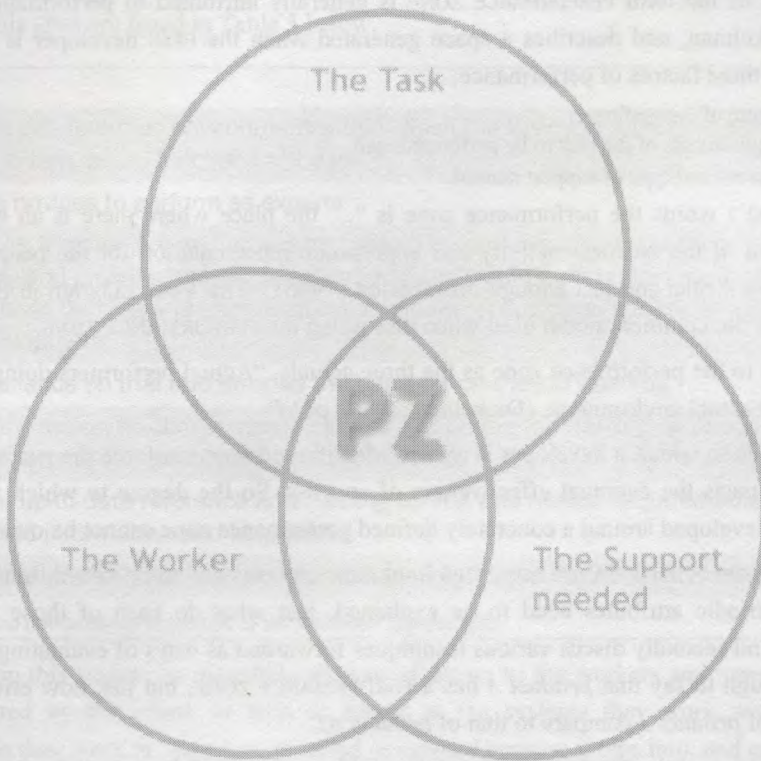
As the discussion of the PERFORMANCE ZONE unfolds patterns will begin to form before the reader; that these two models of EPSS have two different and unequal sets of accesses to these attributes of performance. It is this inequality in access that lead to the crux of this paper, where I ask: *can the PERFORMANCE ZONE can be imagined?*

Just before we get in to the definitions of the attributes that make up the performance zone lets look at one more orienting quote related to the performance zone, one signposting the function of its attributes:

"These elements [attributes] are chosen to work together to produce a synchrony of process, content, and context. The maximum performance comes from the confluence of giving the user just enough information at just the right time so that he or she may carry out the tasks at hand efficiently and effectively. This intersection or overlap is named the Performance Zone (Howell, p18)."



Figure 1 The Performance Zone



The performance zone is defined by the intersection of contexts developed when the three attributes are concretely defined.

**1) The Nature of the Worker**

The skills, attributes, motivations, background and education of the worker.

**2) The Nature of the Task**

The processes, procedures, occupational health and safety needs, and steps involved in completing the task.

**3) The Right Amount and Type of Support**

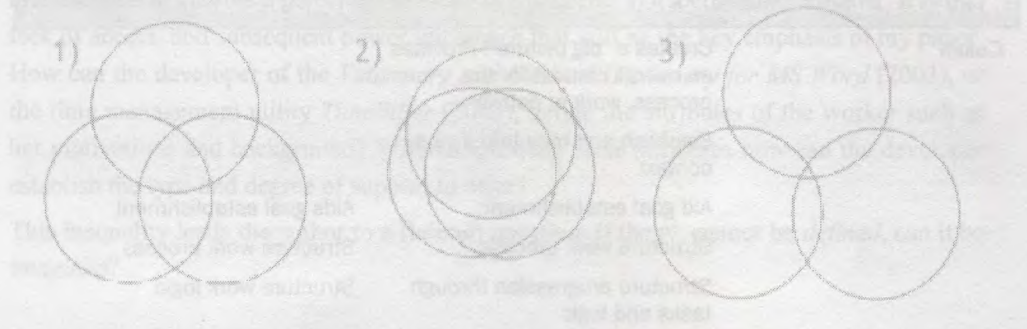
The appropriate provision of assistance in relation to the worker and the task.

So now we have an understanding of the attributes in isolation we actually develop sympathy for Gery's very Zen:

"The performance zone is the area in which things come together. It is the place where people *get it*, where the right things happen, where the employee's response *exactly* matches the requirements of the situation. It is the place where employees put together all the individual dance steps that they have mastered. The dance, the dancer, and the music are one (1991, p. 13)."

Lets now turn our attention to how the performance zone is measured and evaluated. The Venn model featured in Figure 1 (above) is the idealised model often used to describe the PERFORMANCE ZONE, but, of course, the world is never ideal, and Figure 2 on page 23 represents a small range of alternatives.



**Figure 2 Modelling the effectiveness of the Performance Zone**

Of the models Figure 2.2 would represent the most effective performance zone.

Effectiveness is represented by the degree the individual spheres overlap, and the degree to which the PERFORMANCE ZONE is diluted. Conversely, Figure 2.3 would represent the least effective.

These models are used to demonstrate the effectiveness of the PERFORMANCE ZONE produced by an EPSS. But how are EPSS actually evaluated, how are these models of effectiveness tested established?

Gery's approach is a 'results-based', similar to that of Miller (Gery, 1999, Miller, 1999). The degree to which the PERFORMANCE ZONE was successful defined is mirrored as the degree that performance was actually improved.

Gery developed a list of 26 attributes and behaviours an effective EPSS should feature high degrees of. Gery doesn't imagine that all EPSS will have all of the attributes and behaviours listed in high degrees, but "the more of these attributes evidenced by the software and the higher the level of representation of the attribute, the more powerful the software in generating performance (1999)."

One of the characteristics of Gery's list is its comprehensiveness, so many points to consider, some of which are very similar in some contexts, and in other contexts not relevant. Almost as a reaction to this, Debra Sleight condensed this list into a slightly more manageable eleven. Sleight's dimensions gain in eloquence what they lose in comprehensiveness. I have compared both of these systems in table 4 (page 24).

I have contributed a further distillation of Gery's dimensions but dividing them into four role-based personas: 1) Coach, 2) Guide, 3) Librarian, and 4) Help Desk. These role-based personas will be discussed later in this when I justify the proposed suite of principles developed to image the PERFORMANCE ZONE.

In summary a performance zone is to be considered well defined and reinforced (hence resembling the second model in Figure 2 (above) if the user of an EPSS evidences strong performance improvements along the relevant Geryian or Sleightian dimensions.

From a discussion of the attributes of performance and how they contribute to concrete performance outcomes through the conduit of the EPSS, patterns related to the ways in which each of the two types of EPSS are able to access the attributes should of begin to form. If a developer needs to develop a high representation of a healthy sweep of the above dimensions we can see that only developers of *integrated* systems will have the necessary access to get this information.

*Integrated* EPS solutions, as explained earlier are client sponsored and are designed to reflect specific policies and business cultures of the client organization, and are designed with privileged access to its work place(s).

Table 4

MY PERSONAS	GLORIA GERY	DEBRAH SLIGHT
Coach	Creates a "big picture". Provides an overall context for the process, work or activity	
	Establish and maintain a work context	
	Aid goal establishment	Aids goal establishment
	Structure work process	Structure work process
	Structure progression through tasks and logic	Structure work logic
	Reinforce and link activity to business strategy	
	Institutionalise current best approach	
Guide	Reflect natural work situations	
	Use metaphors and direct manipulation of variables to capitalize on prior learning and physical reality	Evidence of progress
	Provide alternative views of the application interface	Provides alternative views
	Provide alternative views of the support resources	
	Observes performer actions and data	
	Provide contextual feedback	Provides Contextual Feedback
	Advise	
	Shows evidence of work progression	
Librarian	Provide support resources without breaking the task context	
	Contain embedded knowledge in the interface	Evidences Embedded Knowledge
	Business knowledge available in support resources and system logic	Incorporates Business Knowledge
Help Desk	System information contained in support resources	
	Provide alternative knowledge search and navigation mechanisms	Provides Alternative Knowledge Search
	Layered	
	Provide access to underlying logic	
	Automates tasks	Automates Tasks
	Allow customisation	
	Provide obvious options, next steps, and resources	Provides Obvious Options and Steps
	Employ consistent use of visual conventions, language, visual positioning, navigation and other system behaviour	

This table compares Gery's comprehensive list of behaviours and attributes of an EPSS to Slieght's condensation

Developers of *consumer* EPS systems, alternatively, do not. Remember that *consumer* EPSS are designed to address a perceived in industry in general, not a client in particular. It is this lack of access, and subsequent power imbalance that will be the key emphasis of my paper. How can the developer of the *Veterinary and Medical Dictionary for MS Word* (2003), or the time management utility *TimeBiller* (2003), define the attributes of the worker such as her motivations and background? Without knowing these attributes how can the developer establish the type and degree of support to offer?

This inequality leads the author to a (lateral) question; if the PZ cannot be *defined*, can it be *imagined*?



## Chapter 3

## RESEARCH QUESTIONS

Already established is that the effectiveness of any EPSS depends upon its ability to identify and support the PERFORMANCE ZONE, and that both models of EPS systems do not share the same degree of access; consumer models find their access in deficient compared to the integrated model.

This thesis examined the question whether this deficit could be addressed and further, proposes the possibility that where the performance zone can't be reliably or completely *defined*, it can instead be *imagined*. My research questions are as follows:

### 1) Can the PERFORMANCE ZONE be imagined?

By imagining, what is meant is the ability to simulate the PERFORMANCE ZONE, or to replicate it its outcomes through a different set of processes.

#### A) If so, how

What existing interface design strategies exist that can, in isolation, or combination, produce outcomes in the end user similar to those produced the authentic PERFORMANCE ZONE?

#### B) If so, how well

How convincing a counterfeit will this PERFORMANCE ZONE make?

The balance of this paper will document the investigation of these questions and of the methodologies used in answering them.

## METHODOLOGY

The research questions were addressed through a three step process that began with a concentrated study into the ontological and systemic nature of the PERFORMANCE ZONE. This step was an attempt to answer the research questions by unearthing principles that will allow the defining of the PERFORMANCE ZONE by proxy (thus imagining it). These principles were, in fact, unearthed and the next step involved their validation. This validity occurred through the fashioning of a consumer EPSS designed solely from said principles; to be their substantiation. The final step in answering the research question involved evaluating the developed EPSS upon its ability to evidence the performance outcomes one would expect to see from the authentic PERFORMANCE ZONE.





Chapter 4

DEFINING AN ANSWER

The initial question to be posed in defining an answer was one asking where to begin. How does one begin to formulate principles aimed at *imagining* the PERFORMANCE ZONE of an electronic performance support system?

The concept off the PERFORMANCE ZONE is complex and, by its nature, highly dependent upon contingencies – the motivation of the worker, the technology they use at work, the political topography of the workplace – it appeared the only thing concrete about the PERFORMANCE ZONE is its *outcomes*, its effect upon performance.

Identified earlier were two systems devised to evaluate the degree of performance outcomes generated from EPS systems. These being Gery’s list of 26 attributes (the most comprehensive) and Sleight’s derivative list of 11 (the more cognitively manageable). I will be using Sleight’s dimensions as performance outcome markers to answer the research question. Can a PERFORMANCE ZONE be *imagined* that will *replicate* high degrees of these dimensions? I have repeated Sleight dimensions in Table 5 below.

Table 5

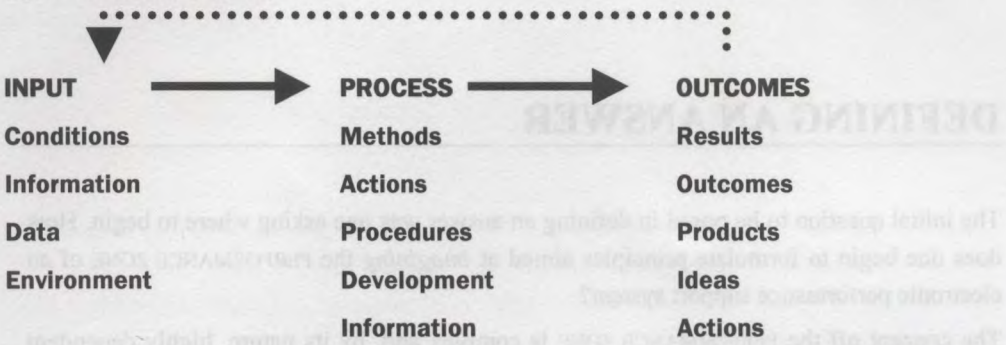
SLIGHT'S DIMENSIONS
1) Aids Goal Establishment
2) Structures Work Process
3) Structures Progress Through Logic
4) Evidence of Progress
5) Provides Obvious Options and Steps
6) Provides Contextual Feedback
7) Incorporates Business Knowledge
8) Evidences Embedded Knowledge
9) Automates Tasks
10) Provides Alternative Views
11) Provides Alternative Knowledge Search

The PERFORMANCE ZONE can only be identified *a posteriori* by gauging how effective the EPSS was in measurable outcomes such as *aiding goal establishment*, or *institutionalising best practice*, or *providing alternative knowledge search interfaces*. An EPSS is evaluated upon its outcomes!

The concept of *outcomes* features highly within of systems theory. Edmonds, Branch & Mukherjee (1994) wrote of systems and how they contribute to contemporary instructional design practice by providing it with new theoretical frameworks. Systems can be modelled as, "characterized by input data and output data processes that are clearly defined; an explicitly defined locus of control; and interrelationships of various components which comprise the system (p.56)." Figure 3 below is a simple model of a system.



Figure 3 A model of a system



Adapted from Edmonds, Branch & Mukherjee (1994, p56)

Employing a systems based model to address the research questions meant that the only known of the performance zone, the *outcome*, could be placed within a theoretical context. It is an outcome generated by certain set of *inputs* being subject to a certain set of *processes*. If the above model can be accepted, could it be held that *an* imagined PERFORMANCE ZONE will similarly be an *outcome* generated by certain sets of imagined *inputs* subject to a set of imagined *processes*? If this is so focus shifts from imaging the PERFORMANCE ZONE itself, to an imagining of inputs and processes.

What inputs and processes will combine so that any piece of software designed from it will offer the measurable performance benefits found through an authentic PERFORMANCE ZONE? The study turns to an investigation into existing and accepted instructional and information design strategies.

What strategies, in isolation or in combination, already create outcomes that would rate highly within Sleight's system? What conventional instructional design methods work to allow a piece of software in *goal establishment*, or in *structuring work logic*? Sleight's dimensions should from now on be treated as the evidence of the PERFORMANCE ZONE, consider them in a metonymic relationship.

Resulting from this study, an appropriate suite of strategies and methodologies were, in fact, articulated. This suite of four strategies are listed in Table 6 and described below.

Table 6

THE DEVELOPED PRINCIPLES
1) Employment of Adaptive Interfaces
2) Employment of Diversity Modelling
3) Engagement with Client Knowledge Management
4) The Maintenance of Work Context

These four principles only work in combination. Individually none of them are able to imagine the PERFORMANCE ZONE. The first two principles are concerned with imagining the worker, while the second two principles are concerned with imagining the context of the performance.

The following passages outline how this suite was developed, beginning with a clear explanation of the scope and location of each of the principles. Secondly I'll discuss the tools and models developed to reduce the wide pool of possible principles down to the four listed below. Finally an explicit connection will be draw between the four principles and Sleight's dimensions.



### Employment of Adaptive Interfaces

Howell's concept of the Morphing Waldo was very intriguing as a design development attitude (2001, p 16). Within robotics Waldoes are specifically understood as a "remote-controlled prosthetic device that becomes an extension of the controller so that he or she can manipulate objects in a distant and in potentially dangerous environments (Howell, p18)." It is this aspect of building a protective agent that lead to Howell's concept of the Morphing Waldo, which "is a mini program that sits between the larger program and the user thus acting as a 'skin' to sperate the user from the seldom-used and less-desirable functions of the larger application (Howell, p. 18)."

This intermediary feature of the Morphing Waldo addresses one of the opportunities identified by Gery, and Cichelli. Variously they both note of the increase in the amount of computer systems a worker needs to use within the contemporary business environment. Enterprise Application Integration (EAI) and Enterprise Resource Planning (ERP) systems are increasingly complex and according to Gery need a PCD user interface to mask the interactions with the multiple systems and "to provide the user with a constant way of accessing similar data and functions. (Dickelman, 1999, p11)". Not only do these big systems need a "protective skin", Molander notes smaller consumer software are featuring "far more data and functions that a single user would ever want to be able to use (Molander, 2001, p. 1)," and a Waldo could be used to mask these options or show them based on certain rules.

As helpful as acting as a common interface over various systems is, a Waldo's functionality will be limited if it didn't have the ability to *morph*, that is, adapt to the needs and preferences of the user.

Howell's Morphing Waldoes are actually examples of EXPERT SYSTEMS that use adaptive interfaces to allow an application to grow in complexity as the worker's confidence with the application grows. These systems monitor how the user is interfacing with the application, and from assimilating that data is able to model who the user is and their preferred style of working.

Wickert and Herschel (2001) offer an example of these systems from a specifically e-commerce perspective;

"The more a customer uses a [e-commerce Web] site and its ordering system, the better the [systems generated buying] suggestions become, since the intelligent agent software 'learns' from each visit. This form of 'learning' is achieved through comparison of one person's 'click-behaviour' and ordering history with that of all other customers that have looked at the same information or ordered the same product or service. Then, the software suggests information, products or services based on what these references customers looked at or ordered."

Above Wickert and Herschel describe how a commercial web site adapts it's interface to the user's preferences but expert systems can also be designed to adapt their interface according to a user's comfort level, learning style, speed, even motivations or aesthetic preferences.

Adaptive interfaces allow the development of a program shell that is more flexible and able to reconfigure its user interface to the needs and the preferences of an unknown user. Consider, as Wickert and Herschel suggest Amazon.com<sup>2</sup>, the designers of the underlying system didn't know to any definite degree who the user would be, but once inside this site it feels like it was custom built for you. A slightly more contemporary example is some of

<sup>2</sup> <http://amazon.com>

the advertising strategies Google.com<sup>3</sup> offers. They have a partnership with Blog provider Blogspot.com<sup>4</sup> where Google scans the blogger's entry for keywords, and then places targeted advertising on the page addressing those keywords.

The attribute of expert systems that simulates 'learning' plays an important part in allowing an EPSS to still provide relevant support as the worker matures and becomes better at performing. Rosenberg wrote that performance systems "must adapt if it is to continue helping performers with increasingly challenging tasks. It would be nice, for example, if Mr. Paper Clip – who I no longer need when crafting a letter – would assist me in the difficult area of styles. I wish he could adapt to my needs (cited in Dickelman, 1999, p9)."

### **Employment of Diversity Modelling**

As employing principles of adaptive interfaces will allow the EPSS to morph the delivery of the process to the preferences of the user, it is the use of Diversity modelling that will allow the developer to begin to imagine specific archetypes of users (Dickelman, 2001b, Cooper, 1999). Diversity models will give the developer a ground from which to develop an adaptable interface strategy.

The basic unit of the diversity model is persona. Pulsinelli & Roubie described the utility of personas in allowing "design teams to imagine a concrete user, or users, who are representative of the target population.(2001, p.22)"

Personas should be given concrete characteristics like names, interests and preferences (Pulsinelli & Roubie, 2001,p. 22, Dickelman, 2001b). Cooper offers the caveat that "personas are to be precise but not necessarily accurate."

Both Dickelman and Cooper advocate allowing the personas to have the final say in disputes over design and interface decisions – what would *Sally* prefer, or which colour would *Luke* like?

Obviously this simulation play lends itself very easily as a tool to imagine the unknown workers, and works hand-in-hand with adaptive interfaces. The developer now has some concrete personas to cognitively model the demands they'll make in the interface and the problems they'll confront

### **Engagement with Client Knowledge Management Systems**

All organizations are subject to the probematics of capturing, codifying and disseminating information within itself. What flagged KM as a specific set of strategies to examine was a quote from Mike Chance of Mantissa Group consultancy. He wrote; "There was no one person who understood all of the pieces' as well as the group did (cited in Mayor, 1995)."

If an EPSS, through adaptive interfaces and expert systems, is able to alter itself to reflect the client's established system, the speed the user can progress from learning to performing will be much quicker. If an EPSS can employ the elements of expert systems that will allow formal and informal knowledge to be captured and delivered at the point of need and the point of performance, much of the context of the task will be, to a degree, imagined.

### **The Maintenance of Work Context**

The final principle leverages knowledge management in imagining the work context. An EPSS requires day-one performance, so when building an interface and designing processes

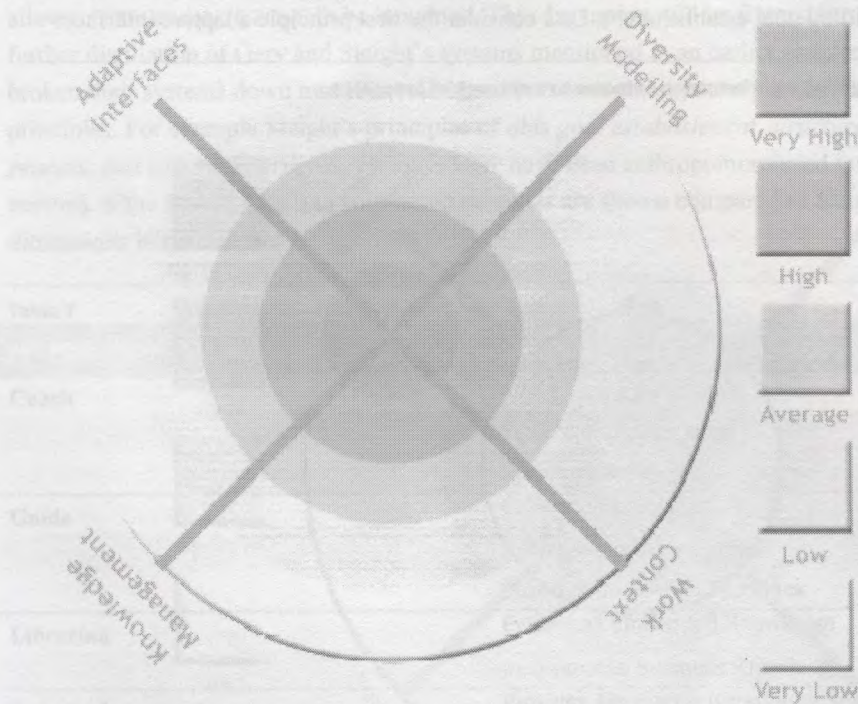
<sup>3</sup> <http://www.google.com>

<sup>4</sup> <http://www.blogspot.com>

and metaphors, why not build on top of what the worker already knows instead of adding to what they already know? Performance support should not feel like learning, but of doing (Gery, 1998).

## THE DEFINING OF THE PRINCIPLES

**Figure 4 The tool to test instructional design strategies as a network**



The above suite was uncovered from the development of a tool designed to test the outcomes of multiple instructional design and interface design strategies as a network. The aim of this tool was to establish how effectively a chosen network of strategies was able to address and manifest each of Sleight's dimensions. Remember Sleight's dimensions have already been located within a metonymic relationship with the outcomes of the PERFORMANCE ZONE.

To be able to define the suite of principles a tool needed to be developed to validate prospective principle's ascendancy to the suite. Relating back to the systems model, I needed to develop a tool to represent the *processes* that will lead to a replication of the PERFORMANCE ZONE *outcomes*. This tool is represented in Figure 4 above, and resembles a spider's web. How does it work?

This model is essentially series of scaled dimensions. These dimensions are arranged around the parameter of a circle, each running from the parameter to the centre. Each dimension is designed so that its scale increments as it travels towards the centre – that is, the lower representations of a particular dimension are found closer to the parameter, while higher representations are found closer to centre.

The finished tool features the four principles as the scaled dimensions, but through the development they covered the gamut of Instruction design strategies from micro worlds, to drill and practice.

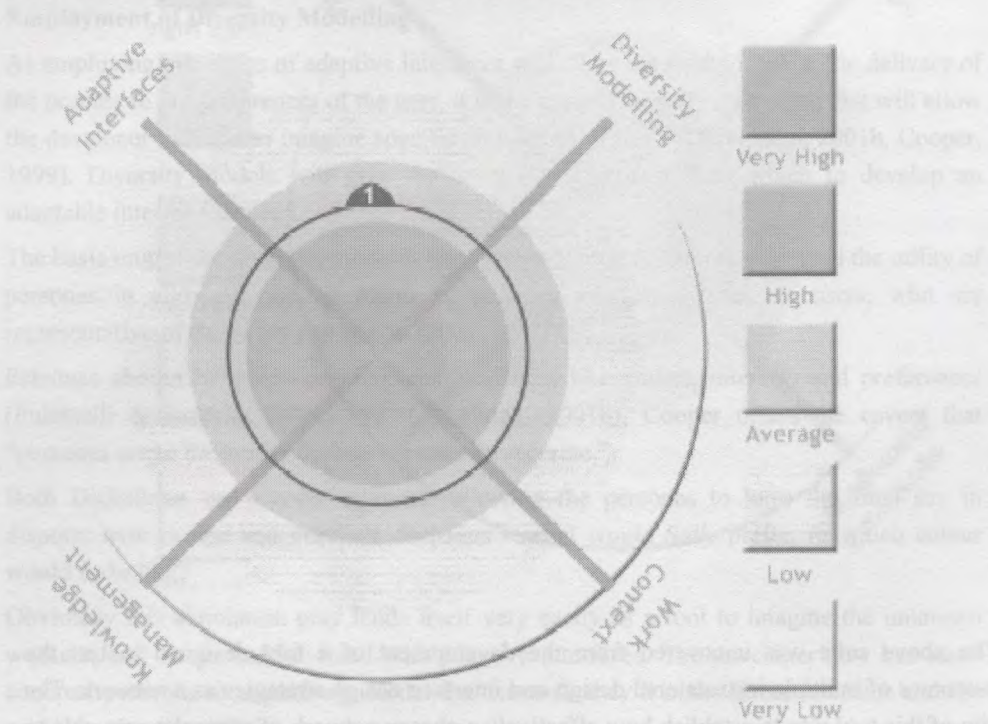
Against each of these dimensions I rated one of Sleights's PERFORMANCE ZONE outcomes, and from connecting the four plots a circle or ellipse is formed. The tighter the circle or



ellipse the more able those dimensions, as a network, are able of imagining that performance outcome.

Further explanation is probably still needed. Figure 5 below is an example of my model where the scaled dimensions represent the four proposed principles, and where the performance outcome being tested is *Aids Goal Establishment*. Sleight's dimension Aids Goal Establishment, is being mapped to the four principles according to the degree each of those principles are able to, in isolation, effectively address and manifest the performance outcome of aiding goal establishment. Lets consider the first principle adaptive interface.

**Figure 5 Interrogating a performance outcome to a network of processes**



Can the use of adaptive interfaces be used to establish the goal of a task for the worker? The ranking was quite qualitative, based mostly on the degree the concepts being compared have been linked in the literature.

I then repeated this step with the remaining principles; how useful would diversity modelling be in helping an unknown worker establish a goal, how useful is recognising the unknown organization's existing KM system aid in goal establishment within the unknown worker(s), and finally how useful would a recognition of the worker's context be in helping the worker see the task in relation to the wider context.

All of my dimensions were considered to be highly useful in aiding goal establishment, and so when Sleight's dimension is plotted to the model it forms a tight circle. The tightness of the circle represents the fact it could be successfully *imagined* using my principles.

The balance of Sleight's dimensions would be evaluated in the same manner at aids goal establishment.

THE IMAGINING

The four principles have been introduced and explained, further the tool developed to verify they has been described. This section will now explicitly explain how the suite will allow a PERFORMANCE ZONE to be imagined. This discussion will be framed through the further distillation of Gery and Sleight’s systems mentioned in an earlier chapter. I have broken their systems down into four role-based personas anthropomorphising sets of principles. For example Sleight’s principles of *aids goal establishment*, *structures work process*, and *structures progress through logic* have been anthropomorphised into the persona of the Coach. The four role-based personas are shown compared to Sleight’s dimensions in table Table 7.

Table 7

MY PERSONAS	DEBRAH SLIGHT
Coach	Aids goal establishment
	Structure work process
	Structure work logic
Guide	Evidence of progress
	Provides alternative views
	Provides Contextual Feedback
Librarian	Evidences Embedded Knowledge
	Incorporates Business Knowledge
Help Desk	Provides Alternative Knowledge Search
	Automates Tasks
	Provides Obvious Options and Steps

This table compares Gery’s comprehensive list of behaviours and attributes of an EPSS to Slieght’s condensation

Much of the assertions made through the following discussion are premised upon an understanding of Piaget’s processes Adaptation through Assimilation and Accommodation, of Bloom’s taxonomy of Knowledge, and of Howard Gardner’s theory of Multiple Intelligences.

COACHING

- Aids Goal Establishment
- Structures Work Process
- Structures Progress Through Logic

Adaptive Interfaces

A user interface that is malleable to the needs, style and preferences of an individual worker will allow that worker to construct an internal schema in relation to effectively establishing the scope of the task. If the interface is able to present the steps needed to



achieve the task in a way familiar to the worker they are able to concentrate on performing, not interpreting.

The aspect of the coach is present through the way that the user interface (through targeted cues and conventions) supports the worker in mentally modelling the presented task.

### **Diversity Modelling**

Designing around a strict set of diversity models will help the developer to visualize ways different workers could breakdown the steps of a task and, further, use this information to dictate what cues and process the developer builds into the interface.

As a base example, setting up two personas where one is left brained and the other is right brained, will present the development team with two very different models of how a worker may approach making sense and breaking down the steps of a presented task.

The aspect of the coach is present in that the developers have considered the ways in which diverse personas would mentally model the presented task, and a consideration of the types and amount of support they would need to create this mental model.

### **Knowledge Management**

Designing an EPSS that is open enough in architecture to tap into existing knowledge practices offers performances advantages including offering the a familiar model to work through such as organisational procedures around role, responsibilities, and privileges. How are similar or related tasks done; in what steps, by who, duration of task, resources required, etc.

An open enough architecture can see the EPSS as a solution that existing practices can be transferred into.

The aspect of the coach is present in that the developer can provide support that is sensitive to the corporate culture of a particular organization, as a human coach would.

### **Work Context**

Designing within in the established work context allows the designer to mentally model from existing interfaces within client workflow. Premised on the worker having attained a degree of competency with existing software applications, an EPSS with a similar 'skin' will appear as a comfortable extension of the existing work practice, not a new application to learn.

The aspect of the coach is present in that the worker can troubleshoot through problems by transferring the mental models they have created to understand the existing applications, to solving whatever problem they find in the new EPSS.

## **GUIDE**

- Evidence of Progress
- Provides Obvious Options and Steps
- Provides Contextual Feedback

### **Adaptive Interfaces**

For a worker to know just how far they have come, or perhaps more importantly, how much work is left to go is an important factor in motivation. An interface that is able to provide targeted cues customised to the worker's preferences, whether it be textually, graphically, aurally, etc, will place the worker in an empowered and performing mode.

The aspect of the Guide is presented through the developer providing targeted orientating cues and progress makers through the presented task.

### **Diversity Modelling**

Similar to the argument for diversity modelling within the coach aspect. Different workers relate to sequenced tasks differently and developing personas who exhibit various schemas, again, such the left/right brain continuum will contribute to the developer's understanding of the variety of cues and stratagems that need to be embedded within the interface.

The aspect of the Guide is presented through the ability of the EPSS to support the worker's particular sequential and orientation needs.

### **Knowledge Management**

An EPSS developed with an open enough architecture can tap into existing organisational models of mapping. For example there may be a QA procedure that must be followed when completing a set of similar or associated tasks. Allowing this incorporation of existing practices will tap into the worker's existing mental model of how things are done within the organization.

The aspect of the Guide is presented through the ability of the EPSS to support the worker through cues and processes specific to the culture of the client organization.

### **Work Context**

An EPSS that can reflect, as close as possible, the conventions of the client's existing software, especially the way in which that software implements task progress mapping, may minimise or even eliminate the need for the worker to *accommodate* a new set of conventions.

The aspect of the Guide is presented through the ability of the EPSS to support the worker in assimilating the new conventions with the conventions they are already familiar with.

## **LIBRARIAN**

- Incorporates Business Knowledge
- Evidences Embedded Knowledge

### **Adaptive Interfaces**

Using adaptive interfaces and expert systems the EPSS can provide embedded organisational knowledge to the user at point of need. This knowledge may not necessarily be directly associated with the core execution of the task, but may be needed to support a decision the worker needs to make concerning the task. For example an EPSS may be helping a worker with a MS Office merge mail task. But to complete the task the worker needs to be reminded of the official format the organization contact details need to be set in.

The librarian aspect is represented as an agent that is able to provide information (codified or not) to the worker on request.

### **Diversity Modelling**

Personas based upon workers of different roles, backgrounds, or systems privileges can allow the developer to determine what kind of information those personas need, when, and in what form would they prefer it to be delivered in.

The librarian aspect is represented as an agent that has been designed to be able to deliver knowledge at point of need in various delivery media.

### **Knowledge Management**

An EPSS built with an open enough architecture can interrogate the wider system to gather information about the environment and about the current worker. For example it may be

able to determine the privilege access level of the worker and provide them with an interface modified on their access. Administrators may be given extra functionalities through an EPSS like setting up or alter existing worker profiles.

The librarian aspect is represented as an agent that knows information about the worker and provide the right information to them. Compare MS Office's Clippy, to Wickert and Herschel's description of amazon.com (2001). If one is to ask Clippy an identical question four weeks apart you will receive the same noise filled suggested answers. The Amazon web site alternatively, changes its options according to your actions last time you visited. It is this type of agent the Librarian aspect will be most similar to.

### **Work Context**

An EPSS that is designed to fit seamlessly within an existing workflow can rely on established cues and conventions for delivering time-of-need support. If there is a part of the screen of an existing program reserved for accessing help, or for showing more information, then the EPSS designed should mimic this strategy.

The librarian aspect is represented as an agent that orders and delivers information through a system the worker is already familiar with.

### **HELP DESK**

- Automates Tasks
- Provides Alternative Views
- Provides Alternative Knowledge Search

### **Adaptive Interfaces**

An EPSS designed with an adaptable interface should let the worker be aware that it is scaleable, and offer intuitive options to customise the complexity, speed, aesthetic, etc. It shouldn't confuse.

The Help Desk aspect is represented in the way the interface makes the worker aware of the degree they are able to customise and set the model of the task process, and to keep the worker empowered through the process.

### **Diversity Modelling**

Personas reflecting both different roles and different responsibilities, and workers of different intelligences (Gardner<sup>5</sup>) will allow the developer imagine the different expertise and comfort levels within the workers.

The Help Desk aspect is represented in the consideration of facilitating the worker in finding the balance between task automation and user control.

### **Knowledge Management**

An EPSS that is aware of the wider knowledge management systems of the client organization can incorporate these systems to extend or cross check user queries, or remember the worker's preferences: does this user prefer a hands on approach, or do they prefer the EPSS to automate as much as possible?

The Help Desk aspect is represented as the empowering support of the EPSS the help the worker find their comfort level with the application.

<sup>5</sup> <http://www.pz.harvard.edu/Pls/HG.htm>



**Work Context**

Again work context is all about the promotion of assimilation; an EPSS should attempt to work off existing and established schemas. Don't automate where the worker wouldn't expect it, or offer supporting information explaining why the option exists, provide familiar search techniques and methodologies, etc.

The Help Desk aspect is represented as the reassurance that the help systems and the ways to model and interact with the information are the same as the worker has been familiar with.

**SUMMARY**

The process of divining the four principles, the tools developed to validity them, and the arguments as to precisely how these principles address the outcomes of Sleight's dimensions have been made. The defining stage is over, now it's time to look at the second step in answering the research question, the substantiation of the principled through the development of an EPSS.



## Chapter 5

**BUILD**

The principles by which the PERFORMANCE ZONE is to be imagined through have now been defined; next step is to design a way to test them through substantiation and developing an actual EPSS from them.

The particular performance problem decided upon for the EPSS was related to brand management within small business and community sectors. This problem was chosen as it was

- 1) contained in scope,
- 2) a common consideration throughout many sectors, and
- 3) could be performed by different people within the organization in different roles and responsibilities.

The resulting EPSS, The Branding Survival Kit (BSK), is a MS Office Add-In application, aimed at helping the client organization develop, archive and manage their brand. It is designed to be highly modulated to allow easy updates or extra functionalities as they are designed. At the moment the three existing features of BSK are:

**1) Corporate Store**

A database of blank MS Office templates designed for the worker to customise to their organization. Templates are one of the basic instruments of performance support (Shepard 2001)

**2) Template Wizard**

A folder where all current branded material such as letterheads and fax cover sheets are kept

**3) Encyclopædia**

A Dictionary of common design desktop publishing and prepress terms.

In addition to these features a simple knowledge management system is integrated designed to help capture and archive corporate and internal knowledge. When saving a new template to the organization's *Corporate Store* the worker is asked to complete a process that involves embedding meta data to the file. This process is referred to in this thesis as TAGGING. The embedded information can be accessed at a later date by another worker as a performance aid, to help them decide which template they need to use for a particular purpose.

In the early design development phase a lot of effort was exerted to avoid the first challenge of designing EPSS'; the urge to make the application instructive. Shepard, amongst others, goes to great lengths to focus the designer's intent to produce 'measurable on-the-job performance improvements rather than other results such as transfer of knowledge (2001).' The Branding Survival Kit is not designed to teach the principles of document management, intellectual property, or even design. Instead, its goal is to subtly (invisibly?) manage the client's brand in the background as they go about their every day work writing letters, sending off faxes, and managing staff rosters. Finally in preparing for the development of the EPSS O'Gorman's rule of thumb needed to be in the foremost consideration. "[An EPSS] should be something that is of immediate benefit to the end user, not just one more thing that they have to learn how to deal with in the course of doing their job (2001)."

## THE INCORPORATION OF THE FOUR PRINCIPLES

This section will explain how The Branding Survival Kit (BSK) was developed to substantiate the suite of four principles of 1) adaptive interfaces, 2) diversity modelling, 3) knowledge management, and 4) work context. As this discussion unfolds various caveats will be mentioned related to concerns that crept in through the developmental stage, concerns that threatened to impact the eventual success of the program. In particular these concerns relate to the choice of development tools BSK was built in; and my own programming skills. Many times while programming BSK one of Gery's premonitions often came to head; "... as the logic, the tools, and the ability to program them improve, dynamic performance support will improve." By dynamic she was refereeing to expert systems and the employment of adaptive interfaces. She was right. Without a powerful command of the range of programming languages needed to traverse all of the (often conflicting) protocols involved in getting one system to speak to another the developer can soon fall into a spiral of errors.

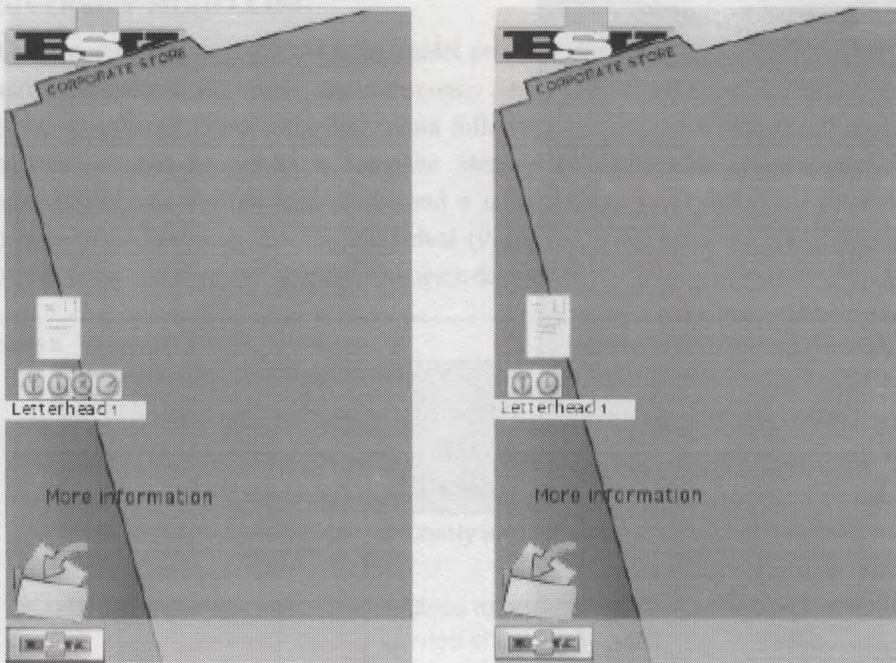
### ADAPTIVE INTERFACES

The fact that code allowing an interrogation of end-user's systems is quite complex, and that coding this access would of raised many privacy and security issues in the evaluation stage, this code is not included in this version of BSK. In light of this, the tiered access depended upon a work around that disrupted people through the evaluation process as it ruptured the work process. I will discuss this more in the evaluation section, however Figure 6 on page 43 shows examples of how the interface adapted according the access privileges the worker had to the system as whole.

Much of the adapting interface strategies were inspired by Howell and her Morphing Waldos. She asked, "Is it reasonable to assume that a single version of a software product can be made to accommodate us all? Probably not, at least not perfectly, but it should be possible to hit a comfort level or create a performance zone for a larger number of users (2001, p. 18)."

Mark Molander provided various techniques for achieving this comfort zone. In his article *Reducing The Interface*, Molander suggested techniques of delivering only a selection of all the possible tools and options to the user at any one time. Of interest was his strategy of filtering the interface depending upon the worker's "roles, responsibilities, and authorization." His second was to "filter down (but not out) the lower used functions from the highest levels of the user interface (2001, p7)."

Filtering based on authorisation played an important part in the intent of the Branding Survival Kit (BSK). When dealing with something as important as your brand you don't want to open any opportunity for a temp or work experience student to alter your letterhead or your fax cover sheet templates.

**Figure 6 Use of Molander's filtering by authorization technique**

These are screen captures of the client's Corporate Store, this is the space where the client's branded material is stored. At the moment the only document saved is a Letterhead. The two screens represent the same environment viewed from two different workers with different levels of privileges; the left view is from a worker with administration access, while the right view is from a worker with general access. Notice they both have different sets of tools to modify the template with. The worker with administrator access had the full set of tools: Open, Get Info, Delete, and Replace. The worker with general access however has only two tools: Open, and Get Info.

Molander's second filtering strategy needed modification in relation to the Branding Survival Kit as this strategy supposes a relatively complex application, and BSK is relatively shallow. Most of those featured on the screen at any point are all pretty much essential, so Molander's idea of filtering based upon scarcely used tools is redundant.

Because BSK was designed to take up as little screen space as possible (so as not to disrupt the work context) the idea of filtering was applied to how the worker would access help functions. With so little space, the placement of tool tips and help needed to be filtered down to sets of obvious cues.

Figure 7 on page 44, shows an example of how this filtering down worked in relation to instances where the worker may have felt they needed more information to support their performance. Figure 8 on page 44, shows another example of this filtering down of support information.

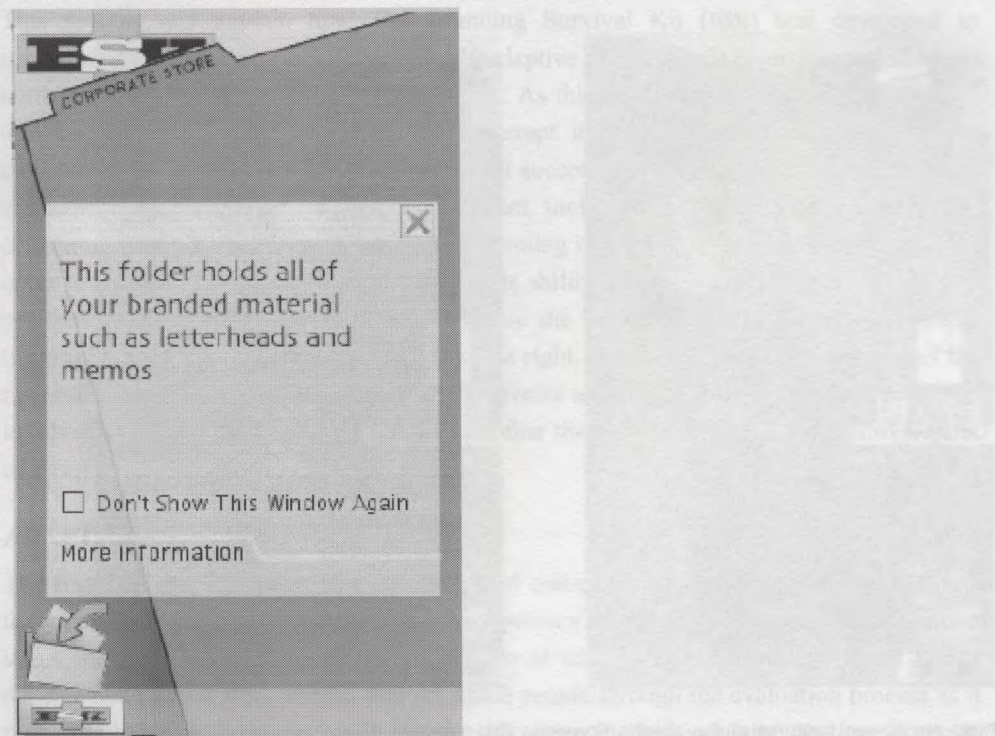
It will be noticed from these screen captures that the visual interface of the Branding Survival Kit does not reflect MS Office style GUIDES, this will be discussed later in the section on *Work Context*.

These filtering tools are very basic, but do index the way a full implementation of the Branding Survival Kit could gather information about the user, and about the context of the performance from as small amount of user interaction and basic systems interrogation techniques.



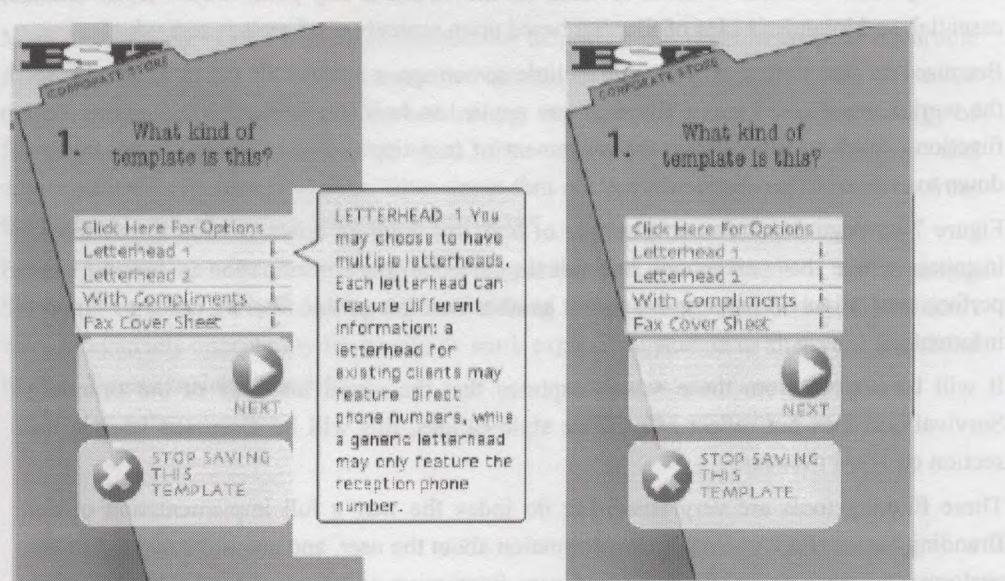
THE INFORMATION OF THE FOUR PRINCIPLES

Figure 7 Use of Molander's filtering by common usage technique



This is the Corporate Store (cs) environment. To begin to orient the worker to this environment a 'stickies' help note appears introducing the cs. This note appears every time the worker enters the cs, this device may either remain helpful, or quickly become a nuisance. The worker is given the option of de-activating this orienting message. Or alternatively, some workers (as defined through diversity modelling), may find that there is not enough information present on the 'Sticky', so they have the option to access more information through the "More Information" tab. This tab will cause the 'Sticky' to expand to reveal a text box. This will feature a more comprehensive description of the cs and options within.

Figure 8 Another se of Molander's filtering by common usage technique



This is the view of the first screen of the tagging process. Due to the limited amount of screen space available, information cues needed to be employed to allow the user know were more information was available if needed. Knowing where to access this information is important in relation to the TAGGING process, especially for the first few times a worker performs it, as the textual support and cues are relatively limited. What is the difference between a letterhead 1 and a letterhead 2? Where can I find the information to help support my decision?



DIVERSITY MODELLING

The Branding Survival Kit diversity model personas were roughly based upon people the author actually knew from the community and small business sectors. These initial archetypes were subsequently fleshed out following Pulsinelli & Roubie’s suggestion that personas should be “given a complete identity, including a name, image, skill set, motivations, and performance goals, and a telltale quote in an effort to make the cast member a unique and concrete individual (Pulsinelli & Roubie, 2001, p.22).” Thus the personas that detailed in Table 7 below were developed.

Table 8

	MILLIE YOUTH WORKER (YOUTH HEALTH)	SHIELIA SECRETARY (NURSING AGENCY)	TOBY AGED CARE WORKER
CHARACTERISTICS	<ul style="list-style-type: none"><li>• Driven and passionate</li><li>• Computer savvy</li><li>• Gets frustrated when people don’t keep up with her</li></ul>	<ul style="list-style-type: none"><li>• Chatty and personable</li><li>• Close to retiring but worried she’ll get lonely</li></ul>	<ul style="list-style-type: none"><li>• Passionate and over worked</li><li>• Ex-service and very patriotic.</li><li>• Loves movies about horses</li></ul>
WANTS/NEEDS	<ul style="list-style-type: none"><li>• To get work done quickly</li><li>• Portable networks, Bluetooth, GPS, etc</li></ul>	<ul style="list-style-type: none"><li>• Wants to get work done easily, not too big on tech</li><li>• Needs as much analog workflow as possible</li><li>• Tried to get the nurses to help her out with the computer</li></ul>	<ul style="list-style-type: none"><li>• needs to get stuff done all at once, as he is out + about all day</li></ul>
HINDERANCES	<ul style="list-style-type: none"><li>• Gets frustrated, when forced to work at slow pace</li><li>• She can get opinionated and stubborn</li></ul>	<ul style="list-style-type: none"><li>• gets distracted + chatty</li></ul>	<ul style="list-style-type: none"><li>• anything that requires too much thinking</li></ul>
QUOTE	“If the world wasn’t so stupid, I might actually get stuff done”	“I love work, get to have a natter with the girls, catch up with gossip”	“Miss the old pencil and paper. They were far more effective ways of getting work done.”

In keeping with Cooper (1999) and Dickelman (2001), it was Millie, Shelia, and Toby who had the final say on all design decisions. Though, as discovered through the evaluation stage, perhaps not enough imagination was expended on them as their computer literacy slowly increased the longer the development process progressed.



KNOWLEDGE MANAGEMENT

As Howell and Molander heavily influenced the implementation of adaptive interface strategies, O’Gorman and Malcolm heavily inspired the techniques incorporating knowledge management within BSK.

As mentioned earlier in this paper, the first two principles that form the developed principles are primarily concerned with imagining the worker, and it is these last two that are used to imagine the context the performance occurs under.

The key knowledge management tool implemented within the Branding Survival Kit was a strategic decision support system (SDSS). This SDSS was intended to help the worker through the process of TAGGING a piece of newly defined branded material (new letterhead, fax cover sheet) with metadata.

The focus of this process was to concentrate on the relationship between the worker and the piece of material just created; to begin to understand its importance as a corporate asset. The focus wasn’t intended to be on the actual mechanics of file management; where do you want to save this template, where do you want the back up saved, have you considered naming conventions and back-compatibility, etc. The Branding Survival Kit automated the entire file management side of the process, all that the worker knows is that 1) it’s saved in My Corporate Store folder inside BSK, and that 2) they have spent some time considering it’s value to the organization.

The TAGGING involves addressing the following five questions, with the following options as set answers. In hindsight, a majority of these questions require relatively specialised knowledge to be able to answer confidently. The questions and options/answers should have been field-tested before incorporating them in the final version. Gery spoke of the importance in writing clearly in performance support, and emphasised that text should be rigorously tested (cited in Dickelman, 1999).

Table 9

1) WHAT KIND OF TEMPLATE IS THIS?	2) IN WHAT CONTEXT SHOULD BE TEMPLATE BE USED?
<ul style="list-style-type: none"><li>• Letterhead 1</li><li>• Letterhead 2</li><li>• Fax Cover Sheet</li><li>• With Compliments</li></ul>	<ul style="list-style-type: none"><li>• Use Everywhere</li><li>• For Customers Only</li><li>• Funding Bodies Only</li><li>• Use In House Only</li></ul>
3) HOW WOULD YOU DESCRIBE THE STYLE OF THIS TEMPLATE?	4) DOES THIS TEMPLATE HAVE A SPECIFIC STATUS?
<ul style="list-style-type: none"><li>• Formal</li><li>• Informal</li><li>• Playful</li><li>• Contemporary</li></ul>	<ul style="list-style-type: none"><li>• Standard</li><li>• Evaluative</li><li>• Temporary</li><li>• Special</li></ul>
5) Any Further Comments about this template?	

- Text box for the workers to enter their own comments

Miller wrote that, “A decision support system can enable an employee to take the appropriate or required action without the need to fully understand or recall the rules that



govern the decision making process. The employee need only know the current set of conditions.”

O’Gorman was very interested in the systems within an organization that either impede or encourage all forms of knowledge transmission. He advocates the power of all knowledge, but specifically that of ‘black’, informal, and inexpressible knowledge (2001). They are powerful because they represent solutions to the realities on-the-ground, and if they were able to be captured and formalised would result in great performance results. He posed that the ‘obvious solution is to implement a system to capture, control, approve and encourage this informal knowledge flow ... The obvious solution is to implement a system to facilitate the propagation of this knowledge in a relevant and timely way.” I believe the Strategic Decision Support system within the Branding Survival Kit goes some way to achieving this.

The meta tags are envisions to be an advantage over the longer term than the shorter, as they are a way of capturing and distributing the three types of knowledges KM is concerned with; explicit, tacit/black, and inexpressible.

Ultimately the Branding Survival Kit is imagined to be a very complex nexus of PS and KM principles. For example administrators will be allowed to either write their own questions and answer-options into the TAGGING fields, or to drag-and-drop questions and answers answer-options from a WYSIWYG environment. This potential step is an attempt to address Malcom’s advocacy of developing performance support that is “addressing the dynamic, mutable nature of knowledge so that our PS systems adapt to changing business conditions and performer’s process innovations more rapidly than with typical software releases. We need to be *anticipating* knowledge, not just capturing it. We need to be building environmental *sensors* and *predictors* into our systems (cited in Dickelman, 1999, p6).” Complimenting this holistic approach is Raybould who says, “performance support is the infrastructure of for KM. Performance centred design transforms knowledge into performance by creating an interface to the knowledge base. Unfortunately there are many KM efforts that lack a Performance-centred interface, thus there is no means of turning knowledge into performance.” He then goes on to cite an example very similar to BSK, “Examples include the many document management efforts labeled KM. Making documents available electronically does not improve performance. Performance support systems design emphasizes how to display knowledge but often overlooks how to capture and maintain it (cited in Dickelman, 1999, p5).”

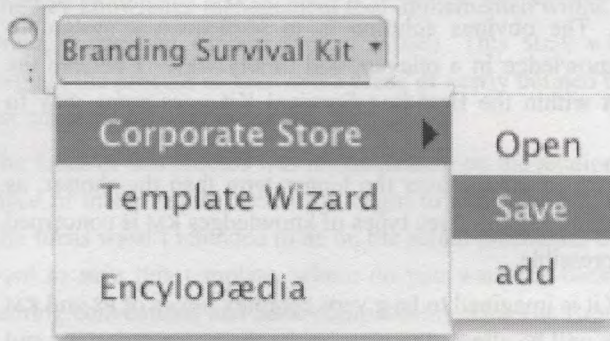
## WORK CONTEXT

Through the build phase of the Branding Survival Kit an obvious truth unravelled; the wrong development tools were chosen. The uncovered principle of maintaining work context is very clear. When developing an application for an unspecified client in an unspecified work environment the developer needs to look at the nature of the task, just what is this EPSS aimed to do? In this case the task is brand management, a task intended to be performed hand-in-hand with MS Office. In order to lessen the cognitive load on the worker when introducing a new piece of software the designer should adapt all of the visual and interactive cues from the existing system. Referring to Piaget’s process of adaptation, the needs and functions of an EPSS should be easily assimilated by the worker. Huber validates this when he said that, “every EPSS expert stresses the importance of designing user interfaces that reflect their current working conditions”. Huber advises, “... an interface should be comprised of common worker language and intuitive metaphors that reflect the way workers think of their work or tasks (cited in Dickelman, 2001.p. 31).”

Once the development begun It soon became obvious that the development tools chosen were the wrong ones.

The unearthed principles were still nascent and when the development began on the Branding Survival Kit, they had not been allowed time to mature. From the initial understanding of *maintaining the work context*, BSK was designed to be a small external application to be launched from MS Word through a macro based Add-In (see fig Figure 9).

**Figure 9 The MS Word macro that launches the Branding Survival Kit**



This is the Macro entry to the Branding Survival Kit. Through this macro the worker can launch the three the Branding Survival Kit environments.

But as my understanding of the principles evolved and the development became increasingly more complex, it became clear that this macro strategy was not sufficient to satisfy the work context principle. At this point two key issues began to materialise, issues that would impact the evaluation phase.

Firstly, being developed with Macromedia's Director, the average Branding Survival Kit projector was over 4Mb, which caused a considerable lag from the time from when the worker launched it from Word. Now with a developed understanding of the *maintaining the work context* principle, it is obvious that whole application should have had been coded from Visual Basics for Applications (VBA).

A VBA based application would of solved the second *work context* related predicament. This concerns the determining of the target operating system. The Branding Survival Kit began as an OS 9 application, and the visual design was targeted to the OS 9 GUI. For various reason the development moved to WindowsMe, and through converting the GUI elements to the Windows style guides some elements were forgotten, leading to the development of application conforming to no standards.

But these criticisms made lets discuss the strategies that did work.

Miller wrote of the way small tweaks to a worker's existing software can provide substantial performance opportunities, "making some minor changes to an employee's existing software environment. This may involve using 1) the macros or templates of the existing software, or 2) add-in programs the enables one to automate tasks or display performance information." Or even, "You can also use the program to launch another program (1996)." It was upon these strategies that the macro approach was decided upon for launching BSK and allowing it to interact and share information with MS Word.

Some experts within the PS community consider these tweaks advocated by Miller as performance generating adjustments, not full-blown EPSS in their own right, or worse as "Band Aid solutions". But Miller reminds those critics that "they can sometimes be a very quick and extremely cost effective method for substantially improving employee

performance. They can also provide a way of testing ideas and learning about an EPSS, before committing to the development of a more expensive and comprehensive system.”

## SUMMARY

The key research question asks, “Can the *PERFORMANCE ZONE* be imagined?” The developed four principles offer a theoretical yes now an evolution plan needed to be developed to find evidence of a *PERFORMANCE ZONE* within the Branding Survival Kit.



## Chapter 6

## EVALUATION

The caveats concerning the development tool impacted heavily upon the evaluation results of the Branding Survival Kit, and led to an interesting resolution of the research questions. These resolutions will be discussed later in this chapter when the evaluation findings are presented.

For the moment the results need to be foregrounded by a discussion the evaluation plan; how a methodology was developed and how tools were designed to detect the presence of a PERFORMANCE ZONE. The evaluation plan included no attempt at testing. Being a prototype, technical problems are to be expected and were factored in to the evaluation. In general terms an evaluation is concerned “with the overall design requirements of the navigation, interface, instruction and content of the product for the client and the end user (Luca, 1997, p119).”

Though accounting for these elements listed by Luca, this evaluation was designed specifically to look for the evidence of the PERFORMANCE ZONE with the EPSS.

### SUBJECTS

There were only five participants in the evaluation, sourced from small business workers, and workers or volunteers from the community sector.

At the beginning of each evaluation session the subjects were asked general questions about their organization in three key categories. Firstly of their core business operations, supplementary and peripheral operations, secondly about the size of their organization and the employee make up, and finally about their organization’s attitude to their brand and the extent of their collateral and branded material. An example of this form is in Appendix 2.

This information was asked for in general terms as some of the participants had some confidentiality issues they were sensitive about.

### THE EVALUATIONS

Most of the evaluations occurred situated within in worker’s actual work environment. This is to attempt to place the evaluations within the work context to aid in the authenticity of the process.

The form of the evaluations involved giving the user a simple task to perform. The wording of this task is as follows:

Your organization has introduced a new piece of software to help manage its brand more efficiently. This piece of software (Branding Survival Kit (BSK)) offers 1) a centralised place to save branded material such as letterheads and fax cover sheets, and 2) a set of templates for your organization to modify and customise.

Your task is to use BSK to open a letterhead template, customise it, and then to save it as your organization’s new letterhead.

As the subject worked on the task I would take notes in instruments I developed, and ask questions, and seek clarification on why they are making the choices they were.

## HOW THE TOOLS WERE DESIGNED

The tools are designed to test for a high order representation of each of slight's principles within the subject. For example, was the subject able to establish the goal clearly, identify clear options and step, and use the adaptive interface to find more information when it was needed. These representations were evidenced through the actions and behaviour of the subject.

The tools were developed to test most of Slight's dimensions from two slightly different perspectives, were a tool is establish to be the principle tool for *dimension A*, and the secondary tool for *dimension B*. Some tools are repeated for several dimensions.

The Table 9 on page 53 offers a condensed list of the tools used to measure lists each of Slight's principles.

## THE RESULTS

The results were inconsistent, with many of the subjects evidencing a big-picture understanding of the software by being able to identify the scope and the rationale of the task, but in relation to the actual performing (like interpreting the navigation and interpreting interface conventions), most were left largely confused.

Below is a discussion of the results, addressed through the Coach, Guide, Librarian, and Helpdesk metaphors. Following this discussion a summary of the results is offered where the research question are addressed, did imaging occur?

### COACH

- Aids Goal Establishment
- Structures Work Process
- Structures Progress Through Logic

The Branding Survival Kit proved to be an inconsistent coach. At the beginning of each session almost all participants seemed to understand the business implications of the successful execution of the task. But shortly after, once the task was under way, they had trouble interpreting the visual and interface cues. Often heard was the phrase, "things don't look right", "Oh, I though *x* would happen when I did *y*". This was the direct realisation of the fears founded in the development stage. Many of the cues were so different from those present in MS Office that many users had a problems establishing what to do once BSK launched.

This dysphoria is especially evident in the tagging processes (See Figure 10, p.54) When confronted with the first tagging screen many were perplexed and found it difficult to define just what to do. But after successfully setting the first tag, they understood the rationale behind it and were able to complete the rest very purposefully. They even appeared to be performing, they were engaging with the tagging options carefully considering best choice. Some participants grew frustrated when they were not able to find the information they needed to support their choices. This will be discussed under Helpdesk.



Table 10

**COACHING****Aids Goal Establishment**

PRINCIPLE	Interpreting the Macro
SECONDARY	Interpreting the 'Stickies'

**Structures work process**

PRINCIPLE	Tagging the template process
SECONDARY	Interpreting the 'Stickies'

**Structures progress through logic**

PRINCIPLE	Tag Comprehension
SECONDARY	Branding Questions

**GUIDE****Evidence of progress**

PRINCIPLE	How Far Are We?
SECONDARY	What's Next

**Provides obvious options and steps**

PRINCIPLE	What's next
SECONDARY	Error Count 1

**Offers contextual feedback**

PRINCIPLE	More Information
SECONDARY	What's next

**LIBRARIAN****BUSINESS KNOWLEDGE**

PRINCIPLE	Brand Questions
SECONDARY	–

**EMBEDDED KNOWLEDGE**

PRINCIPLE	What's Next
SECONDARY	Brand Questions

**HELPDESK****Alternate views**

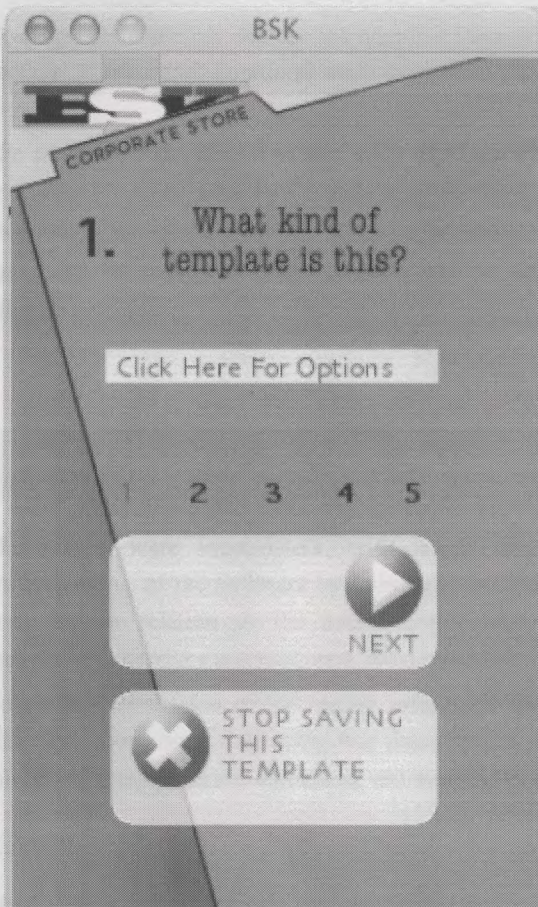
PRINCIPLE	Error count
SECONDARY	–

**Alternate knowledge search**

PRINCIPLE	Depth of Information
SECONDARY	More Information



Figure 10 The tagging process



## GUIDE

- Evidence of Progress
- Provides Obvious Options and Steps
- Provides Contextual Feedback

A common pattern identified through the evaluation is that, initially the participants were confused by the user interface, but as they became accustomed to the conventions imposed by the application a shift from confusion to performance could be clearly mapped. Those with initial problems with the interface were soon able to find the support they needed like help or additional information within the interface. But surprisingly some had trouble finding these cues, and one participant got so flustered the evaluation had to be finished early. One of the areas identified as being confusing is that once a blank template has been chosen from the Template Wizard and the participant has it open and is customising it in MS Word, they are tempted to save the template through the traditional File>Save... menu method instead of through the BSK macro bar. Saving through this method completely bypasses BSK, and allows the participant to save to any disk they want. This is exactly what BSK designed to stop. This would be easily addressed through code where when the File>Save... method is activated a VB script interrogates the active document to establish it's source, if it originated from the Wizard Template Folder the script will launch BSK to allow the customised Template to be safely saved and archived according to the BSK rules. can the save, and instead launch BSK.



## LIBRARIAN

- Incorporates Business Knowledge
- Evidences Embedded Knowledge

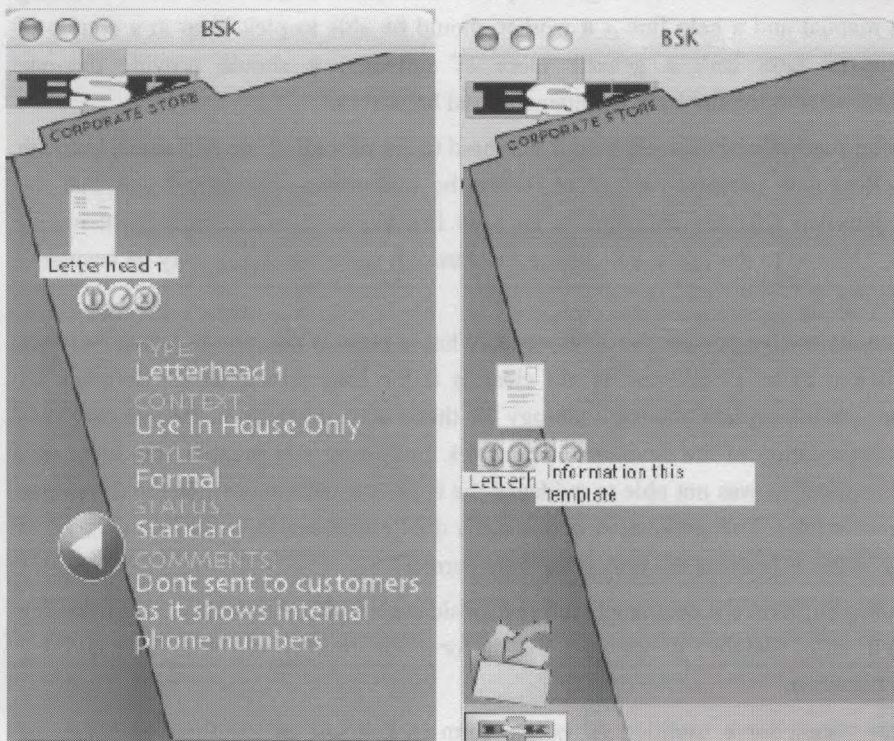
As mentioned Coaching, within most of the participants, there was a general recognition of the importance of the rationale behind the Branding Survival Kit. Many were very forward in discussing how a system similar to BSK would be helpful in their organization.

One of the key features of the Branding Survival Kit was the attempt to deliver captured business information (through the meta tags) to a worker at the point-of-need. In the design of this system there was a very deliberate strategy of delivering this as graphically as possible and was surprised that most of the participants were more interested in textual ways of accessing this information.

A simple suggestion was to set the information as tool tip content (See Figure 11, p. 62), others suggested feeding the tags into a searchable database where they can be filtered through string queries.

These preferred methods of access should have been anticipated through the diversity models. But in hindsight the personas developed for BSK may have been developed in recognition of the needs of actual users, but in the recognition of known programming skill limitations.

**Figure 11 Accessing the meta data tags**



## HELPDESK

- Automates Tasks
- Provides Alternative Views
- Provides Alternative Knowledge Search

The verdict on the Branding Survival Kit in the role of help desk is also inconsistent.

The automation of the file management and the sharing of information between BSK and Word was successful in that the subjects never asked exactly where the template was to be saved. They knew that it was being saved inside the BSK application somewhere, and that was all they seemed to care about. This was a positive, as has been repeated several times already a goal of the Branding Survival Kit to reinforce the importance of the brand, not of file management.

Many participants felt that the Branding Survival Kit suffered for not being dynamic and adaptable enough. Many participants wanted a data rich search functions, and found the visual metaphor of BSK as not providing enough information.

This too was something that should have been anticipated through the diversity models, but perhaps, again, they were invented in mind of the author's programming skills.

## SUMMARY

"If there is disagreement on design decisions, my rule is 'Let the personas decide' (Dickelman, 2001, p32)." If this is true I should sack my diversity models.

The key thing learnt about my suite of principles is that if one element (e.g. work context) is not present or represented well, day one support will not be achieved.

The application functioned well as a generic piece of software where – with a short training session, a manual and a help line – a worker should be able to pick it up in a couple of weeks. But an EPSS isn't a generic piece of software; it should provide day-one performance without require training, manuals, and helpdesks.

Directly after the evaluations were held it was hard to see past all of the criticisms, but with time to reflect new perspectives sprout. What the evaluations established was that the Branding Survival Kit was deficient as an EPSS because a PERFORMANCE ZONE wasn't generated. This led to the initial conclusion the research questions could only be answered in the negative.

But later an alternative perspective developed. What is clear is that the Branding Survival Kit is deficient as an EPSS, what is not clear is if the four principles are deficient by association. Let me explain, the methodology the thesis was premised on the eventual EPSS being a substantiation of the developed principles. Following this premise, the logic said that if the application was not able to evidence the PERFORMANCE ZONE then the developed principles were false. The application in this study didn't evidence the PERFORMANCE ZONE. But what if it this is because the principles were correct?

The Branding Survival Kit evaluated well (in consideration of some residual programming problems) in all of Sleight's dimensions, except for those strongly related to the imagining of the *work context*.

A common reason for a tradition PZ not to form is that one of the three attributes of performance – performer, task, support – is not defined strongly enough. Why can't the same hold true for it's simulacrum? What if a reason for an imagined PZ not to perform well is that one of the four strategies of imagining – adaptive interface, diversity modelling, knowledge management, and work context – is not imagined strongly enough? What if the strategies developed under most of the principles worked well and aided in generating performance results. But on principle, *work context* in this case, suffered from poorly implemented strategies. The inability of this one principle to be imagined accurately is akin

to one of the traditional attributes of the PZ not being defined well enough. If the nature of the worker is not defined a traditional PZ will not form, similarly, if work context is not imagined the PZ simulacrum will not form.

So in conclusion, what is the answer to the research questions? On first appearances it's a clear no, but after reflection it's a big don't know. A lot of compelling evidence in favour of the developed principles have been forwarded and cannot be easily dismissed by the failure off the Branding Survival Kit. What is obvious though, is that that more research needs to be done.



## Chapter 7

## CONCLUSION

The purpose of this thesis has been to propose a system by which the access deficit between the traditional *integrated EPSS* and the newer consumer model can be addressed. It is recognised that the *consumer EPSS* doesn't enjoy the same access to the attributes of the performance zone.

In an attempt to address this situation this thesis proposes the ability of *imagining* the PERFORMANCE ZONE. The developers of the *consumer EPSS* can't clearly define it, so how can principles be developed to imagine it. This thesis outlined the process of defining the principles that are proposed at imagining the PERFORMANCE ZONE. These principles are 1) Adaptive Interface, 2) Diversity Modelling, 3) Knowledge Management, 4) Work Context.

The test of these principles was their substantiation in an EPSS, but as was detailed, this substantiation was not successful. This lack of success cannot necessarily be taken as evidence of the invalidity of the proposed principles, but instead, can pose another question. Was the failure of the Branding Survival Kit to imagine a PERFORMANCE ZONE a result of it not being able to imagine the working context, as a traditional EPSS would fail to create the performance zone if it wasn't able to quantify the one of its attributes?



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# APPENDIX 1

The participant component of the evaluation tools

## PARTICIPANT CONSENT

This evaluation is intended to be anonymous, but I do need some general detail about your organization to help to background my study. Please answer the following questions in general and open terms.

Remember the purpose of this evaluation is to test the software, not you! So don't be afraid by the task, and don't think that you are doing anything wrong.

1. What general term best describes the organizations you belong to?
  - a. Small Business
  - b. Community Organization
  - c. Other
2. What is the main operational practice of your organization? (Youth advocacy, lawn mowing, accounting?)  
.....  
.....  
.....
3. How many workers does your organization employ?
  - a. Fulltime workers
  - b. Part time workers
  - c. Casuals
  - d. Field Placement/ Interns
4. Please date this form here to authenticate this evaluation session:

## THE TASK SCENARIO

Your organization has introduced a new piece of software to help manage its brand more efficiently. This piece of software (Branding Survival Kit) offers 1) a centralised place to save branded material such as letterheads and fax cover sheets, and 2) a set of templates for your organization to modify and customise.

**Your task is to use Branding Survival Kit to open a letterhead template, customise it, and then save it as your organization's new letterhead.**

## INTERPRETING THE MACRO

This macro (below) found within MS Word will be your first contact with the Branding Survival Kit (BSK). By looking at the structure and the way it is labelled can you predict what BSK will do?

1) What do you think the following labels are referring to?

Your Corporate Store: .....

.....

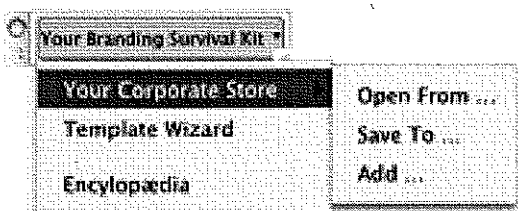
Template Wizard: .....

.....

Encyclopædia: .....

.....

2) Try to match the options to the rights to the labels on the left.



- a) Find a document from the hard drive, floppy, or zip disk and save it to your Corporate Store.
- b) Save the current (active) document to your Corporate Store.
- c) Open an existing file from your Corporate Store
- d) Create a brand new template
- e) Save the current (active) document to the template Wizard.
- f) Search the meaning of a word or term.

# APPENDIX 2

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The evaluator component of the evaluation tools



# BSK EVALUATION

Read the task scenario to the subject, and make sure they understand what is being asked of them.

## 1) Branding Tasks (part 1)

Do this while MS Word is booting. I want to gauge the user's organization's value of brand material.

F ☐ Does your organization have a consistent letterhead?

☐ Yes ☐ No

☐ Why: \_\_\_\_\_

F ☐ Does your organization have other collateral material?

☐ Yes ☐ No

☐ Logo ☐ w/ comps ☐ fax cover sheet ☐ Media Release ☐ invoices

☐ Other: \_\_\_\_\_

F ☐ What software does your organization use for word processing?

☐ MS Word ☐ MS Works ☐ AppleWorks/Claris ☐ Other: \_\_\_\_\_

F ☐ What software does your organization use for design tasks?

☐ MS Word ☐ MS Works ☐ AppleWorks/Claris ☐ Publisher

☐ PageMaker ☐ Quark ☐ InDesign ☐ Other: \_\_\_\_\_

## 2) Interpreting the Macro

MS Word should be launched, open up the BSK macro and show it to the user.

A ☐ Ask subject to verbally map out the macro

☐ What does each option mean?

☐ What do you expect each option to do?

DON'T SELECT ANY OF THE OPTIONS YET!

☐ Give the subject the *Evaluating the Macro 1.1* exercise.

E ☐ Ask the subject to repeat the task to me.

E ☐ Then ask them to choose the macro option they think will allow them to move to the next step.

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

G ☐ Any reaction to the application booting?

(Were they expecting an external app to open? Any comments about how long it takes to boot? Other?)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

☐ Preferred form of feedback

a) "BSK is launching"

b) \_\_\_\_\_

c) \_\_\_\_\_

### 3) Inside the Blank Template Archive

Hopefully BSK has launched, and the user will see the app for the first time.

- ☐ Ask the subject to repeat the task.
- ☐ Ask the subject what they would do next to complete the task.

Answer: \_\_\_\_\_

- ☐ Could they close the help window?
- ☐ Scan Icons      ☐ Scan labels ☐ Look for help ☐ Look for menus ☐ Look for instructions
- ☐ Other: \_\_\_\_\_

- E/I** ☐ Ask the subject how they came to their conclusions.

- ☐ Icon Placement    ☐ Icon Shape    ☐ Familiar icons  
☐ Scan labels    ☐ Look for help    ☐ Tool Tips    ☐ Look for menus    ☐ Look for further instructions  
☐ Other: \_\_\_\_\_

- I ☐ Where would the subject get more information?

**“If you needed more information to support your decision on what to do next, how would you go about finding it?”**

- ☐ Click Stuff randomly (and hope for the best)   ☐ Carefully read the labels  
☐ Look for familiar icons (making inferences)   ☐ Look for a help facility   ☐ Tool Tips  
☐ Other: \_\_\_\_\_

- E** ☐ Ask the subject to continue (according to their judgement)

- H** ☐ How many attempts does it take for the user to choose right?

- ☐ Hopefully they would have had cottoned on to the fact there's a bunch of templates to choose from, perhaps even the more adventurous have looked into the info tags to decide which letter head they should use. With any luck a letterhead will be chosen, BSK will quit and Word re-focus.

- G ☐ Any reaction to Word focusing booting? (Were they expecting to exit within BSK?)

*(The following section contains handwritten notes and signatures.)*

- ☐ Preferred form of feedback
- d) "BSK is closing"
- e) \_\_\_\_\_
- f) \_\_\_\_\_

### 3) Designing Inside MS Word

Get the subject to customise the chosen letterhead with their business' details. This should be done quickly; it is not an emphasis of the evaluation. I want them to do the Word stuff quickly, and then pick up as they need to save it back to bsk.

☐ Once they have completed the letterhead ask them to restate the task.

E ☐ Ask the subject what they would do next to complete the task.

Answer: \_\_\_\_\_

\_\_\_\_\_

☐ Restating Task      ☐ understands BSK's purpose ☐

Other: \_\_\_\_\_

\_\_\_\_\_

E/I ☐ Ask the subject how they came to their conclusions.

☐ Restating task

☐ Understanding BSK's

☐ Remembers from the begining

Other: \_\_\_\_\_

\_\_\_\_\_

I ☐ Where would the subject get more information?

"If you needed more information to support your decision on what to do next, how would you go about finding it?"

☐ Go to MS Word's Help

☐ Go to the BSK macro looking for a help option

☐ Just save file to regular place on the HD ☐ Panic, close and quit Word

Other: \_\_\_\_\_

\_\_\_\_\_

E ☐ Ask the subject to continue (according to their judgement)

H ☐ How many attempts does it take for the user to choose right?

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

E/I ☐ Notes on subject trying to work out what to do next

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

#### 4) Saving a Modified Template

If all goes right bsk will relaunch in the Save As mode, and the user will have to come to terms with the tagging process.

E ☐ Ask the subject what they would do next to complete the task.

Answer: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

E/I ☐ Ask the subject how they came to their conclusions.

☐ Reading the provided Instructions ☐ Understanding BSK

☐ Other: \_\_\_\_\_  
\_\_\_\_\_

I ☐ Where would the subject get more information?

“If you needed more information to support your decision on what to do next, how would you go about finding it?”

☐ Go to MS Word’s Help

☐ Search for hidden info

☐ Search for BSK help

☐ Ask a colleague for help

☐ Other: \_\_\_\_\_  
\_\_\_\_\_

E ☐ Ask the subject to continue (according to their judgement)

H ☐ How many attempts does it take for the user to choose right?

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

E/I ☐ Notes on subject trying to work out what to do next

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## 5) Tagging a Modified Template

B ☐ Notes on subject tagging the 1<sup>st</sup> tag:

---

---

---

B ☐ Notes on subject tagging the 2<sup>nd</sup> tag:

---

---

---

B ☐ Notes on subject tagging the 3<sup>rd</sup> tag:

---

---

---

B ☐ Notes on subject tagging the 4<sup>th</sup> tag:

---

---

---

B ☐ Notes on subject tagging the 5<sup>th</sup> tag:

---

---

---

B ☐ Notes on subject tagging in general:

---

---

---

B ☐ "How Strongly do you feel you were supported through the tagging process?"

1 — 2 — 3 — 4 — 5

B ☐ "If good/bad, what helped/hindered?"

☐ Icons ☐ Labels ☐ Placement ☐ Workflow ☐ Feedback

☐ Other: \_\_\_\_\_

B ☐ "How Strongly do you feel that the steps were broken into the right size?"

1 — 2 — 3 — 4 — 5

B ☐ "If strongly agree/disagree, what do you think would be the appropriate size steps?"

---

---

B ☐ "How strongly do you agree that the tagging process should occur as one form on one screen?" (Show example)

1 — 2 — 3 — 4 — 5

B ☐ "Why?"

---

---

## 6) Viewing the saved template

If all goes well, the user would of saved a tagged template and will be taken to the My Temps area.

☐ "Where are we now, and what do you see?"

\_\_\_\_\_

☐ "Can you find the tags you just attached?"

Answer: \_\_\_\_\_

☐ Could they close the help window?

☐ Scan Icons      ☐ Scan labels ☐ Look for help ☐ Look for menus ☐ Look for instructions

☐ Other: \_\_\_\_\_

E/I ☐ Ask the subject how they came to their conclusions.

☐ Icon Placement ☐ Icon Shape ☐ Familiar icons

☐ Scan labels ☐ Look for help ☐ Tool Tips ☐ Look for menus ☐ Look for further instructions

☐ Other: \_\_\_\_\_

I ☐ Where would the subject get more information?

"If you needed more information to support your decision on what to do next, how would you go about finding it?"

☐ Click Stuff randomly (and hope for the best) ☐ Carefully read the labels

☐ Look for familiar icons (making inferences) ☐ Look for a help facility ☐ Tool Tips

☐ Other: \_\_\_\_\_

☐ "Can you open the template as though you were to write a letter?"

Answer: \_\_\_\_\_

☐ Could they close the help window?

☐ Scan Icons      ☐ Scan labels ☐ Look for help ☐ Look for menus ☐ Look for instructions

☐ Other: \_\_\_\_\_

E/I ☐ Ask the subject how they came to their conclusions.

☐ Icon Placement ☐ Icon Shape ☐ Familiar icons

☐ Scan labels ☐ Look for help ☐ Tool Tips ☐ Look for menus ☐ Look for further instructions

☐ Other: \_\_\_\_\_

I ☐ Where would the subject get more information?

"If you needed more information to support your decision on what to do next, how would you go about finding it?"

☐ Click Stuff randomly (and hope for the best) ☐ Carefully read the labels

☐ Look for familiar icons (making inferences) ☐ Look for a help facility ☐ Tool Tips

☐ Other: \_\_\_\_\_

### 8) Branding Quiz (part 2)

By now the task is over, I can quit our of Word, and test how adaptable BSK is to the user's workflow, or able to positively influence it.

F ☐ "How strongly to you agree that BSK would be able to be incorporated into your organization's workflow?"

1 — 2 — 3 — 4 — 5

F ☐ "Why?"

---

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---

☐ Too Fiddly

☐ Not Necessary

☐ Don't see it as important

☐ Wrong software

☐ Sees value in brand collateral

☐

☐

☐