

**Lancaster University.
Department of Computing.**

**Designing Motivational User Interfaces:
Can A Balance Between Effective And
Affective User Interface Design Be
Used To Motivate Call Centre
Advisors?**

Nicola Jane Millard, BA (Hons).

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Abstract.

Motivational User Interfaces (MUIs) are graphical user interfaces (GUIs) that are designed with user motivation as a primary goal. Given that what is useful and usable is not necessarily used (Dix, 2001), usability alone is not necessarily sufficient for technology to be accepted.

MUIs were developed specifically for call centres, an industry which suffers high levels of employee burnout and churn. They were designed to reflect the balance between effect (delivering service) and affect (managing emotion).

A study on human computer motivation needs to be grounded in a high level theory of human-human motivation, influence and affect (Reeves and Nass, 1996; Muller et al, 1997; Fogg, 2002). MUIs were designed using a framework of motivators taken from both the psychological literature and user needs. MUI design was based on a framework of five 'C's of motivation: culture, control, content, collaboration and curiosity.

The MUI designs needed to draw upon a toolbox of methods (including field observation, rapid prototyping and futures workshops) that could capture and evaluate both effective and affective elements of design in an environment where users are often inaccessible. This included capturing what motivates users in their job and why they choose to use technologies.

This thesis describes the evolution of the MUI through three case studies. The first MUI was developed as a concept demonstrator for a telecommunications call centre and was positively evaluated by users. The second was created for a high street bank as a design specification for their future call centre vision. The third addressed problems with technology acceptance of a knowledge management system in a telecommunications call centre and illustrated how design could be used to help increase levels of technology acceptance.

These designs demonstrated how MUIs could be used to help motivate call centre advisors and increase technology acceptance.

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Declaration:

I declare that this thesis is my own work and has not been submitted in substantially the same form for the award of a higher degree elsewhere.

My contribution to the design of the Motivational User Interface (MUI) was in the requirements gathering, evaluation and in the definition of the UI functionality and look and feel. Actual implementation of the MUI prototypes was done in collaboration with a Multimedia Director programmer.

Nicola J. Millard, August, 2005.

Table of Contents.

ABSTRACT.....	2
ACKNOWLEDGEMENTS.	4
AUTHOR’S PUBLICATION HISTORY.....	5
DECLARATION:	6
CHAPTER 1: INTRODUCING THE MOTIVATIONAL USER INTERFACE.12	
1.1. WHAT IS A MOTIVATIONAL USER INTERFACE?.....	12
1.2. THESIS OVERVIEW.	15
CHAPTER 2: CONTEXTS: THE CALL CENTRE, THE CALL CENTRE ADVISOR AND THE CUSTOMER.....	17
2.1. WHAT IS A CALL CENTRE? DEFINITION AND CONTEXTS.....	17
2.1.1. <i>Call Centres: A Technology Definition.....</i>	<i>18</i>
2.1.2. <i>Call Centres: A Process Definition.....</i>	<i>20</i>
2.1.3. <i>Call Centres: A People Perspective.....</i>	<i>25</i>
2.2. A BRIEF HISTORY OF CALL CENTRES.	33
2.3. CALL CENTRES: CHALLENGES FOR HUMAN-COMPUTER INTERACTION.	40
2.3.1. <i>The Task Domain.</i>	<i>40</i>
2.3.2. <i>The User Interface Domain.....</i>	<i>45</i>
2.4. SUMMARY AND DISCUSSION.	51
CHAPTER 3: THE PSYCHOLOGY OF MOTIVATION AND THE RATIONALE FOR INCORPORATING MOTIVATION INTO USER INTERFACE DESIGN.....	54
3.1. MOTIVATING INDIVIDUALS: A CRITIQUE OF THE CURRENT CALL CENTRE PARADIGM.	54
3.1.1. <i>Taylorism and Transaction Economics.</i>	<i>54</i>
3.1.2. <i>The Electronic Panopticon: Monitoring, Command and Control.</i>	<i>61</i>
3.2. WHY CONSIDER MOTIVATION IN THE CONTEXT OF TECHNOLOGY?.....	67
3.2.1. <i>Is Usability Sufficient for Technology Acceptance?</i>	<i>67</i>
3.2.2. <i>What Does Motivate People to Accept Technology?</i>	<i>69</i>
3.2.3. <i>Rethinking Usability in Motivational Terms.....</i>	<i>75</i>
3.3. TOWARDS A THEORY OF MOTIVATION FOR THE MUI: A REVIEW OF THE PSYCHOLOGY OF MOTIVATION.	77
3.3.1. <i>Intrinsic verses Extrinsic Motivation.</i>	<i>77</i>
3.4. APPLYING PSYCHOLOGICAL THEORIES OF MOTIVATION TO HCI AND IMPLICATIONS FOR THE MUI.	84
3.4.1. <i>A Model of Motivation for the Motivational User Interface.....</i>	<i>84</i>
3.5. SUMMARY AND DISCUSSION.	103
CHAPTER 4: THE MOTIVATIONAL USER INTERFACE DESIGN METHODOLOGY.	107
4.1. METHODOLOGICAL CHALLENGES FOR MUI DESIGN.	107
4.2. MUI METHOD: REQUIREMENTS CAPTURE AND ANALYSIS.	112
4.2.1. <i>Field Observation.</i>	<i>112</i>

4.2.1. Documenting Field Data: Rich Pictures and Scenarios/Personas.....	118
4.2.3. Supplementing Field Data.	122
4.3. DESIGN.	125
4.3.1. MUI Design Principles: An Overview.	125
4.3.2. Balancing Effect and Affect in Design.	128
4.4. EVALUATION.....	132
4.4.1. Ergonomic quality.....	134
4.4.2. Hedonic Quality.	135
4.5. REFLECTIONS ON THE MUI METHODOLOGY.....	140
CHAPTER 5: FROM POW TO COW: THE PATH FROM GUI TO MUI.	142
5.1. THE GRAPHICAL USER INTERFACE: THE PERSONAL OFFICE WORKSPACE (POW).	142
5.1.1. POW: Initial Rationale.	142
5.1.2. Requirements Capture for the Personal Office Workspace (POW).....	143
5.1.3. Designing the POW Interface.	147
5.1.4. Evaluating POW.	153
5.2. THE RESEARCH MUI.	157
5.2.1. Initial Concepts.....	157
5.2.2. Gathering Motivational Requirements: What Makes Advisors Tick?	160
5.2.3. MUI Design.....	164
5.2.4. Evaluating the MUI.....	180
5.3. FROM POW TO COW: DISCUSSION.....	183
5.3.1. POW: Learning Points.....	183
5.3.2. Learning from the MUI COW Development.....	184
CHAPTER 6: THE BANKING MOTIVATIONAL USER INTERFACE.	190
6.1. REQUIREMENTS CAPTURE.....	191
6.2. MUI DESIGN RATIONALE.	193
6.2.1. Mapping Requirements to the 5 ‘C’s.	193
6.2.2. Learning from Experience: Lessons from the First MUI.....	198
6.2.3. Mapping Motivation to Design.	200
6.3. BUILDING THE PROTOTYPE.	202
6.3.1. The Advisor Space - Offline/Action Mode.	202
6.3.2. The Customer Space - Online/Goal Mode.	210
6.4. LESSONS LEARNED AND DISCUSSION.....	219
6.4.1. Progressing Beyond the Original MUI.....	219
CHAPTER 7: A HOME PAGE IS WHERE THE HEART IS: BALANCING PLEASURE AND EFFICIENCY IN KNOWLEDGE MANAGEMENT INTERFACES FOR CONTACT CENTRES.	226
7.1. BACKGROUND AND CONTEXT FOR DESIGN.	227
7.2. REQUIREMENTS CAPTURE.....	230
7.2.1. Field Data Capture.....	230
7.2.2. Data Analysis.	231
7.3. MOTIVATION AND KNOWLEDGE MANAGEMENT: TOWARDS A KNOWLEDGE MANAGEMENT MUI DESIGN RATIONALE.....	237
7.3.1. Motivation and Knowledge.	237
7.3.2. Technology Acceptance.	238
7.3.3. Emotion and Knowledge Searching.....	240
7.3.4. Knowledge, Emotion and the MUI Motivational Framework.	242

7.4. DESIGNING A MUI FOR KNOWLEDGE MANAGEMENT.	253
7.4.1. <i>The Knowledge Portal.</i>	255
7.4.2. <i>The Home Page.</i>	258
7.4.3. <i>The Knowledge Broker System.</i>	261
7.5. EVALUATING THE INITIAL KMS MUI DESIGNS.....	263
7.5.1. <i>SUMI Questionnaire.</i>	263
7.5.2. <i>Task Completion Study.</i>	263
7.5.3. <i>User Satisfaction and Engagement.</i>	265
7.5.4. <i>Technology Acceptance Study.</i>	268
7.6. DISCUSSION.	270
CHAPTER 8: TOWARDS MOTIVATIONAL MACHINES - DISCUSSION, EVOLUTION AND LESSONS LEARNED.....	276
8.1. COULD MUIS REALLY MOTIVATE?: EXAMINING THE HYPOTHESES.....	276
8.2. WHAT MAKES A GUI A MUI?	280
8.3. THE BUILDING BLOCKS OF A MUI.....	284
8.3.1. <i>Methodological Building Blocks.</i>	284
8.3.2. <i>Culture Building Blocks.</i>	285
8.3.3. <i>Content Building Blocks.</i>	287
8.3.4. <i>Control/ Choice Building Blocks.</i>	290
8.3.5. <i>Collaboration Building Blocks.</i>	291
8.3.6. <i>Curiosity Building Blocks.</i>	292
8.4. TOWARDS MOTIVATIONAL MACHINES: THE FUTURE OF THE MUI.....	293
8.5. WILL MUIS BECOME MAINSTREAM: TO INFINITY AND BEYOND!	296
GLOSSARY OF TERMS AND ACRONYMS.....	302
APPENDICES.....	306
APPENDIX A: PSYCHOLOGICAL THEORIES OF MOTIVATION.	306
APPENDIX B: FACTORS USED IN FIELD OBSERVATION.	323
APPENDIX C: EXAMPLE POW SCRIPTS.....	326
APPENDIX D: EXTRACT FROM FUTURES WORKSHOP FOR BANKING MUI.	328
APPENDIX E: RETAIL BANK MUI SCENARIOS.	332
APPENDIX F: KMS CALL CLASSIFICATION.....	340
APPENDIX G: KNOWLEDGE BROKER SYSTEM SCENARIO.....	341
BIBLIOGRAPHY.....	342

Figures:

FIGURE 1: TYPICAL CALL CENTRE ARCHITECTURE.	19
FIGURE 2: TELECULTURE 1998, HENLEY CENTRE, QUALITATIVE PHASE 1.	27
FIGURE 3: SERVICE-PROFIT CHAIN (HESKETT ET AL, 1997).	30
FIGURE 4: GPO OPERATOR SERVICE CENTRE, NEWHALL STREET, BIRMINGHAM, 1929 (BT ARCHIVES).	33
FIGURE 5: A LARGE, MODERN CUSTOMER CONTACT CENTRE.	36
FIGURE 6: FUTURE CALL CENTRE VISIONS (BT EXACT).	39
FIGURE 7: COMPUTER-HUMAN-HUMAN INTERACTION (STEEL ET AL, 2002).	41
FIGURE 8: TYPICAL CALL FLOW.	42
FIGURE 9: A TYPICAL CALL CENTRE DOS BASED CLIENT.	46
FIGURE 10: A TYPICAL CALL CENTRE FORMS BASED INTERFACE.	47
FIGURE 11: AN EXAMPLE FORMS BASED GUI (COURTESY OF SIEBEL SYSTEMS).	49
FIGURE 12: "THE CAT IN THE BOX" (COURTESY: RINAT BAIBEKOV).	56
FIGURE 13: A TYPICAL CALL CENTRE PERFORMANCE EVALUATION SYSTEM (AMICK AND SMITH, 1992).	62
FIGURE 14: BENTHAM'S PANOPTICON.	63
FIGURE 15: PSYCHOLOGICAL STRESS AND MONITORING (ZACHARY, 1997).	65
FIGURE 16: THE 3 ROLES OF TECHNOLOGY (FOGG, 2002).	70
FIGURE 17: THE TECHNOLOGY ACCEPTANCE MODEL (DAVIS, BAGOZZI AND WARSHAW, 1989).	72
FIGURE 18: THEORY OF PLANNED BEHAVIOUR.	73
FIGURE 19: ERGONOMIC AND HEDONIC QUALITIES FOR TECHNOLOGY ACCEPTANCE (HASSENZAH, BEU AND BURMESTER, 2001).	75
FIGURE 20: THE EXTRINSIC/INTRINSIC MOTIVATION CONTINUUM (MALHOLTRA AND GALLETA, 2003).	82
FIGURE 21: THE MUI DEVELOPMENT LIFECYCLE.	111
FIGURE 22: EXAMPLE SALES CALL CENTRE RICH PICTURE.	121
FIGURE 23: THE PLEASURE BASED DESIGN PYRAMID (JORDAN, 1999).	128
FIGURE 24: SOCIAL, FUNCTIONAL AND AESTHETIC CRITERIA FOR EFFECTIVE AND AFFECTIVE USABILITY.	133
FIGURE 25: THE TELECOMMUNICATIONS CALL CENTRE UNDER STUDY.	143
FIGURE 26: TYPICAL CALL HANDLING PATTERN.	144
FIGURE 27: THE POW INTERFACE.	150
FIGURE 28: POW 'PEEL-OFF' NOTE.	150
FIGURE 29: TWO VIEWS OF THE MUI WINDOW ON THE WORLD.	167
FIGURE 30: MUI SCREEN WITH CLOUDS.	169
FIGURE 31: THREE CUSTOMER CAPSULE MOODS (FROM LEFT TO RIGHT: HAPPY, UNHAPPY AND ANGRY).	169
FIGURE 32: THE CUSTOMER BOOK.	170
FIGURE 33: THE MUI BILL.	170
FIGURE 34: THE COMMUNICATION CUBE - THE CUSTOMER FACE.	171
FIGURE 35: COMMUNICATION CUBE - BUDDY FACES.	172
FIGURE 36: THE TEAM LEADER FACE.	172
FIGURE 37: THE COMMUNICATION CUBE - THE WORLD FACE.	173
FIGURE 38: THE COMMUNICATION CUBE - SCRIPT BUBBLES.	174
FIGURE 39: THE COMMUNICATION CUBE - THE TEAM FACE.	174
FIGURE 40: 'MOODIES'.	175

FIGURE 41: THE DRAGON INTERFACE.....	188
FIGURE 42: GOAL VERSES ACTION MODEL (HASSENZAH, 2000).....	200
FIGURE 43: BANKING MUI ADVISOR SPACE.	203
FIGURE 44: GAMES PAGE WITH ‘TODAY’S DEBATE’, ‘WHO AM I?’ AND ‘LOTTERY SYNDICATE NEWS’.	208
FIGURE 45: ADVISOR’S PERSONALISED ‘NEWS’ PAGE.....	209
FIGURE 46: IVR DIALOGUE BOX.	211
FIGURE 47: CUSTOMER SPACE UI.....	212
FIGURE 48: CUSTOMER HISTORY VIEW.	214
FIGURE 49: CUSTOMER ‘PRODUCTS’ SCREEN WITH BUBBLE DIALOGUES.....	215
FIGURE 50: THE ‘SPLATTY’.	216
FIGURE 51: END DIALOGUE SCREEN.....	219
FIGURE 52: VIEWS OF THE TELECOMMUNICATIONS CALL CENTRE.....	227
FIGURE 53: COMPONENTS OF THE KNOWLEDGE MANAGEMENT SYSTEM (KMS).....	229
FIGURE 54: THE KMS HOME PAGE.	230
FIGURE 55: PHYSICAL LAYOUT OF TEAM SPACE.....	231
FIGURE 56: ELEMENTS CONTRIBUTING TO PERCEIVED CREDIBILITY (SELF, 1996).	239
FIGURE 57: ADAPTIVE CULTURE MODEL (MILLARD, 2001).	242
FIGURE 58: KORT’S LEARNING – AFFECT CIRCLE (KORT ET AL, 2001).	252
FIGURE 59: KNOWLEDGE PORTAL REDESIGN ARCHITECTURE.....	255
FIGURE 60: THE KNOWLEDGE PORTAL.....	256
FIGURE 61: KMS PRODUCT PAGE.	257
FIGURE 62: THE HOME PAGE.....	259
FIGURE 63: DIY PAGE.	260
FIGURE 64: NOTES PAGE.....	260
FIGURE 65: KNOWLEDGE BROKER PAPER PROTOTYPE.	262
FIGURE 66: THE MUI METHOD.	285
FIGURE 67: MASLOW’S HIERARCHY OF NEEDS.....	307
FIGURE 68: ADAMS’ EQUITY MODEL (1963).....	315

Chapter 1: Introducing the Motivational User Interface.

1.1. What is a Motivational User Interface?

Motivational user interfaces (MUIs) evolved as a result of the author's frustration that two of the principal problems with the call centre industry - employee motivation and retention – were being subsumed under the push for the introduction of new, 'sexy' technologies to drive Customer Relationship Management (CRM). These technologies were designed to improve the relationship with the customer through an increased understanding of customer data and, as a result, a differentiated and personalised service. Indeed, CRM has been defined as “any action that retains, recruits or develops a customer” (BT Insight Interactive, 2000), or more specifically as “a fundamental company-wide business strategy to deliver a highly personalised service which exceeds customer expectations and creates and maximises customer life time value” (BT Insight Interactive, 2000). However, more truthfully, it has been defined as “the random deployment of expensive and elaborate technology in a desperate bid to be more exciting than your competitors” (Lethbridge, 2000). To deliver CRM, there needs to be some element of 'relationship' in the customer management. This implies an increased reliance on the human element of the CRM equation, namely the call centre advisor. Technology can be the means but it is not the message.

Customers want prompt, courteous and accurate answers to their problems. They can often find the easy answers to their questions via self-service applications, such as interactive voice services and the internet. This takes many of the mundane and repetitive tasks away from the call centre. The onus is then on call centre advisors to solve complex problems, build relationships and empathise with customers. They must routinely deal with queries about multiple products and services whilst under a regime of monitoring and regulation. They act as a mediator between multiple and disparate electronic knowledge sources, whilst simultaneously attempting to maintain a coherent and empathic conversation with a customer. This requires good technology to ensure that they can find the answers to customer questions. However, it also requires a level of tacit knowledge and consistency of service, which can only be acquired through experience. The Call Centre Association (CCA) reports

that UK call centres, on average, experience staff turnover levels of around 26% per annum (higher relative to other professions). Continuity is difficult to obtain without focus on why turnover is happening and what motivates advisors. Motivation of advisors is always high on the agenda of call centre management. However, their solutions to motivate often serve to do entirely the opposite.

The author had been presenting ideas on motivation in call centres for many years. This tended to get limited support because of the intangible nature of the concepts. Call centre managers were more interested in looking for technological solutions to 'solve the problem', because they were more tangible and visible steps that could be taken. Starting with a technology solution may seem logical, but it is the single biggest cause of the failure of CRM projects (Gartner Group, 2001). Technology is an enabler of good CRM, but it is not the cause of it.

Armed with that knowledge, the author initiated research on how technology could be applied to help call centre motivation. This was partially in the hope that this technology could become a 'Trojan Horse' to inspire call centre decision makers to look at motivation in a different way. This required understanding real drivers of motivation and then translating them into design ideas. Hence, the concept of the Motivational User Interface (MUI) was born.

Motivational User Interfaces (MUIs) are graphical user interfaces (GUIs) that are designed with user motivation as a primary goal. Given that what is useful and usable is not necessarily used (Dix, 2001), usability alone is not necessarily sufficient for technology to be accepted.

There is increasing evidence that people treat computers as social entities that use principles of motivation and influence (Reeves and Nass, 1996). A study on human-computer motivation needs to be grounded in a high level theory of human-human motivation, influence and affect (Muller et al, 1997; Fogg, 2002). MUI design encompasses functionality and usability but also addresses more affective and hedonic factors. This includes capturing what

motivates users in their job, as well as why they choose to use technologies. MUIs are designed using a framework of motivators taken from both the psychological literature and the user's needs. These are the five 'C's of motivation which encompass culture, control, content, collaboration and curiosity (see chapter 3).

Traditional Human-Computer Interaction (HCI) tends to be ill equipped to cope with non-productivity based concepts in a systematic fashion (Muller et al, 1997; DeAngeli et al, 2002). The MUI design process has pulled together methods (based around field observation and rapid prototyping) that can capture and evaluate both effective and affective elements of design in an environment where users are often unavailable for comment or interview.

The initial hypothesis of the MUI was to investigate whether designing systems using both 'emotional usability' (i.e. design that takes into account people's emotions (Logan, 1994)) and traditional usability (emphasizing effectiveness and efficiency) could be used to increase the motivation of teams within call centres. This would be done through incorporating key motivators within the user interface, as identified by the psychology of motivation, and the advisors themselves. This would, ideally, be evidenced through decreased amounts of sickness and staff attrition and more positive evaluation of their job and the technologies that they utilise. In reality, without doing a longitudinal study over a period of a number of months, these factors can be difficult to prove and would also be problematic in terms of isolating the effects of the technology verses the effects of the environment in which it is situated.

It was noted in the MUI studies that call centre advisors, who are often somewhat phobic of technologies, often tend to stick with what they know when new technologies are introduced into the call centre. Interface design for call centres has traditionally looked only at effectiveness and efficiency of knowledge delivery. However, this is not necessarily sufficient for the systems to be used. Constraints on call handling times often leads advisors to use knowledge contained in their head rather than on the systems. They also often lack the time or encouragement to explore the knowledge space whilst between calls. The challenge for interface designers of call centre applications is to support real time problem solving whilst

also providing an enticing interface that supports learning, tacit knowledge sharing and collaboration. Since call centre work has been defined as 'emotional labour' (Hochschild, 1983), design of the interface had to support 'emotional usability' (Logan, 1994). This gave rise to the second hypothesis. That both affective and effective user centred design can be used to increase levels of technology acceptance and usage. This required evaluation of user perceptions of the technology (is it usable?) and whether they think that it is useful (is it used?), plus actual evidence of usage.

Although it is recognised that the MUI alone will not motivate people, this work looks at investigating both effective and affective aspects of design. It addresses both the task and emotional components of the work and applies them in an industrial area where levels of stress, cognitive load and emotional labour are extremely high.

This thesis seeks to investigate and evidence these two aspects to motivation; actual increases in user motivation and increases in technology acceptance. It does this through describing the evolution of three generations of MUIs that have been developed and trialled in banking and telecommunications call centres. This following chapters document the development of three examples of MUIs that were created between 1995 and 2003.

1.2. Thesis Overview.

The general structure of this thesis is as follows:

- *Chapter 2* provides a context for the Motivational User Interface and describes the unique environment of the call centre and the challenges that are presented to the advisors working in them. It considers a taxonomy for call centres which is allied to their business drivers, looks at how they have evolved and examines the kinds of user interfaces that are traditionally used in them.
- *Chapter 3* examines the psychology of motivation in call centres and how this can be fused with user interface design to create a MUI. This describes the 'shallow model' of

motivation (Sloman, 2001) based around five C's: Culture, Content, Collaboration, Control and Curiosity. The implications of allying this psychology with technology are examined.

- *Chapter 4* overviews the methodology for MUI design looking at how data capture, design and evaluation was conducted within operational call centres. This method blends field observation, evolutionary prototyping and both affective and effective evaluation techniques.
- *Chapter 5* details the development of the original MUI prototype for a telecommunications company's customer service line.
- *Chapter 6* provides a case study of the development of a Banking MUI that was created as a future requirements specification for a major high street bank's call centre.
- *Chapter 7* details a longitudinal study of a Knowledge Management MUI. This was developed as a prototype interface to a telecommunications call centre's knowledge management system.
- *Chapter 8* examines whether the MUI is actually motivational and the building blocks of the MUI. It argues whether the MUIs that have been developed have actually impacted on advisor motivation and technology acceptance. Finally, it discusses how the MUI could be developed in the future.

Chapter 2: Contexts: The Call Centre, the Call Centre Advisor and the Customer.

“While business processes, economic pressures and technology all combine to favour the growth of customer service organisations, human factors are beginning to point in the other direction, as both customers and customer service people become less satisfied with the experience”, Vic Hallows, CEO Davox Corporation.

Motivational User Interfaces (MUIs) have been designed specifically for the call centre. As mentioned in chapter 1, the initial motivation for the development of the MUI came out of the author's frustration that call centre management often looked to technology as a panacea for all customer interaction problems rather than looking at some of the more fundamental human issues surrounding employee motivation. The MUI was designed as a technology that would support and enhance call centre advisor motivation (based on sound psychological principles and user needs) as well as helping them effectively deliver service to the customer.

A call centre is unlike a normal office environment and places special demands on the people that work in them. This chapter outlines the specific contexts, challenges and constraints for user interface designers in such an environment. It considers the role of the customer service advisor, the needs of the customer, and the mediating role of the user interface and the technologies of the call centre. The MUI is designed to motivate advisors in their job as well as understand what motivates them to accept technology. This chapter, therefore, places the MUI into its context and considers what a call centre is, why it is that way and what kinds of technologies are typically used currently to support customer interactions.

2.1. What is a Call Centre? Definition and Contexts.

The modern phenomenon that is the call centre (also referred to as a 'contact centre' in some literature) has revolutionised the way that companies interact with customers. Call centre growth globally has been rapid with call centres employing approximately 6% of the workforce in the USA (Roncoroni, 2000) and 2.83% in the UK (ContactBabel, 2003). The rapid growth of the call centre is rooted in economies of scale and increased consistency of customer

handling through centralisation of properties, technologies and processes. There are more people employed in call centres globally than in the car, steel and coal industries combined!

Surprisingly, there seems to be very little academic research available on call centres. Taylor and Bain (1999) suggest that this dearth of research is due to the rapid growth of the call centre phenomenon and also confusion about what actually constitutes a call centre.

“Call Centre” is an umbrella term that can refer to anything from customer reservation centres and help desks to help lines and information lines. They may serve employees within an organisation (e.g. desktop support, building services, payroll), or external customers wanting to contact that organisation. They could be run by that organisation or they could be outsourced to other specialist call centre providers. Call centres are typically set up as large rooms with workstations that include a computer and a telephone (usually linked to a headset). These are connected to a large telecoms switch and one or more supervisor consoles. Calls are placed or received in high volumes for the purpose of sales, service, marketing, technical support or other specialised activities. A call centre can be anything from two people, to a vast warehouse of 3000 people answering phones. A ‘contact centre’ takes the concept further and usually implies that people are responding to multiple media calls (e.g. web call me buttons, text chat, web collaboration/co-browsing and e-mail).

Houlihan (2001) defines call centres as “centralised operations where trained advisors communicate with customers via phone and use purpose built information and communication technologies”. She also notes that they tend to be situated remotely from both customers and the organisations that they serve. However, the definition of a call centre tends to reflect the perspective that the person defining it has on the operation.

2.1.1. Call Centres: A Technology Definition.

From a *technology* perspective, the call centre can be defined as an automatic call distribution (ACD) switch serving a number of telephony turrets (i.e. more than one). This is usually allied with a database, workflow management or customer relationship management (CRM) system.

These serve as knowledge resources that advisors use to record and process calls (see Figure 1).

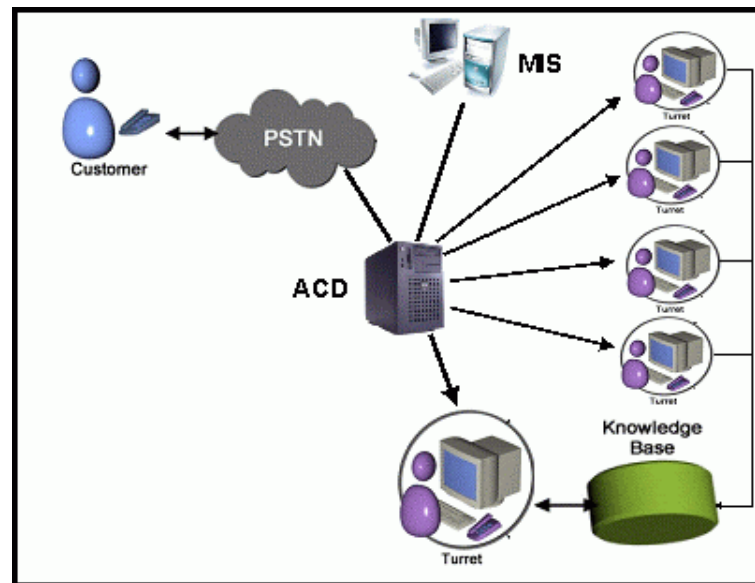


Figure 1: Typical Call Centre Architecture.

The ACD has replaced the traditional central switchboard function. It logs all incoming calls, assigns them to advisors according to call types and advisor skill profiles and distributes calls across multiple centres (if appropriate). This is what Fernie and Metcalf (1998) call “an unstoppable telephonic conveyor belt”. The ACD’s management information system (MIS) has the ability to collect data on individual advisors in terms of calls taken, call length, time available to take calls and time offline. Time offline could include ‘wrap’ time (where they complete any actions as a result of a call) or time when they are simply unavailable to take calls. Electronic wallboards usually allow public display of selected data within the call centre environment (usually the number of calls waiting, percentage of calls answered in a prescribed number of seconds, number of advisors available to take calls etc). The original conception of the ACD was to smooth workflow and permit managers to collect data enabling better prediction of workload and organise better and more efficient use of personnel. However, this data can also be used to pressurise advisors to be more productive. The technology also allows supervisors to listen into calls remotely and assess quality of service.

As Houlihan (2001) says, “the chief characteristic that differentiates call centres from other types of organisations is the use of information technology to frame, monitor and control their work. This is embodied by the ACD”. Taylor & Bain (1999) define a call centre as “a

dedicated operation in which computer-utilising employees receive inbound – or make outbound – telephone calls, with those calls processed and controlled by an automatic call distribution (ACD) system. The call centre is thus characterised by the integration of telephone and computer technologies”.

2.1.2. Call Centres: A Process Definition.

From a *process* perspective, the call centre is often regarded as a centralised body designed to effectively deliver customer service activities across the organisation. In some senses, the call centre fulfils an input-process-output function. In some cases, all three functions are delivered within the call centre (a so-called “one-stop shop”). In other cases the call centre may only act as the channel for input with the processing and output delivered by other parts of the organisation. The underlying rationale for the call centre is efficiency and the predominant model is that of scientific management or Taylorism (Taylor, 1911) and the principles of ‘mass production’ (Batt and Moynihan, 2002). This model makes jobs as specific as possible, confines the scope of work and discourages inter-employee interaction.

The call centre is probably the most controlled and measured business environment in modern society with every aspect of the advisor’s working day, from their talk time with customers to the time they spend away from their desks, under scrutiny courtesy of the ACD. As Zuboff (1988) stated, “computerisation means that the work itself has become transparent. The system means that workers’ behaviour is now almost as visible as their work”.

The strict guidelines that Taylor evolved in his ‘Principles of Scientific Management’ (1911) included elements that govern many of the operational mechanisms of the call centre. This includes:

- Detailed measurement of time and motion through ACD statistics.
- Functional or specialised supervision – usually one supervisor to ten to fifteen advisors who are responsible for monitoring quality and coaching.
- Standardisation of tools and systems – personal files are usually discouraged (although widely used and often concealed covertly in desk drawers).
- Standardisation of work methods – universally applied procedures which are enforced by quality monitoring.

- Separation of planning from execution – scheduling, planning and management are not usually part of the call centre floor.
- Scripting and/or procedural guidance – precise scripting is occasionally used but procedural order is normally implicit through the user interface and associated processes.
- Specific allocation of tasks and large bonuses for successful performance – advisors are assigned skills on the ACD according to their training and answer the calls appropriate to that training (skills based routing). Most call centres use incentives to 'motivate' performance.
- Specific call classifications – calls are funnelled into the centre by previously defined call categories – often most visible within the menus of Interactive Voice Response (IVR) systems. Classifications map to skills allocated to advisors on the ACD.
- A call routing system – the ACD routes the calls to the most appropriate available advisor.

Service delivery has been crafted into an engineering model where tasks have been simplified, services must conform to predetermined design specifications and the production process has been constructed to minimise labour costs (Deery and Kinnie, 2002). 60% of all costs of call centres are personnel; only 10-15% are technology (D'Alessio and Oberbeck, 2002). This is why rationalisation is a priority.

Although call centres tend to adhere to Tayloristic principles, the increased business focus on customers and customer relationship management has also pushed them to acknowledge that efficiency is not all and that customer satisfaction also drives revenue generation. Deery and Kinnie (2002) suggest that the Tayloristic engineering model is limited because:

1. In jobs where employees must exercise judgement to meet customer needs, simple methods of control are inappropriate because employee discretion is required. These jobs require information rather than instructions (Leidner, 1996).
2. Customers care how services are delivered – the attitude and the way in which employees display their feelings towards customers can have an important effect on the perceived quality of the interaction (Ashforth and Humphrey, 1993).
3. The customer provides the uncertainty in the process – they do not necessarily conform to standards and, when they don't, flexibility is required.

The influence of management philosophies such as Total Quality Management (TQM) and the 'service profit chain' (Heskett et al, 1997; Reichheld, 1998; Reichheld and Sasser, 1990; Rust et al, 1995; Zeithami et al, 1996 – see section 2.1.3.) have increased the importance of both customer and employee satisfaction in the call centre model. However, the way that many of these models have been implemented has caused increased levels of control, surveillance and stress (Delbridge and Turnbull, 1992; Kerfoot and Knights, 1995).

This is a symptom of the call centre paradox between rationalisation plus the pursuit of control and the need to be customer oriented (Purcell and Kinnie, 2000; Shire, Holtgrewe and Kerst, 2002; Korczynski, 2002). This produces two conflicting logics within the call centre (Deery and Kinnie, 2002). The first is the need to be cost efficient. This implies increasing the speed of throughput and reducing costs. However, the second fundamentally contradictory position is the desire to be customer oriented which emphasises the need for a quality customer interaction. The need to respond to market conditions and operational strategies means that call centres are subject to a pendulum swing between the need to manage costs and need to be customer oriented (Bowen and Lawler, 1992). Companies are often looking to reduce cost per transaction whilst building better customer relationships (termed 'pseudo relationships' by Zuboff and Maxmin, 2003 and Gutek, 1995).

This dual logic is also reflected through the 'hard' and 'soft' measures used. 'Hard' measures look at call handling times, time to answer and time available to take calls. 'Soft' measures look at customer satisfaction. Spending longer talking to customers works against the aims of effective task completion because this would mean that customers would probably have to wait longer in call queues, which act against efficiency targets. Management seek to control and direct service interactions through training, scripting, call quality monitoring and call steering. This serves to decrease the natural flow of the customer interaction and works against customer orientation. Bureaucracy tends to emphasise task completion since the customer becomes something to 'process' (Jones, 1996; Prottas, 1979). The customer-oriented organisation demands the creation and maintenance of a customer relationship. This means that call centres have to be "expert at managing contradictions" (Purcell and Kinnie, 2000).

This trade off between cost, control and quality produces three general types of call centre (Purcell and Kinnie, 2000; Batt and Moynihan, 2002):

1. A '**Mass production model**' (Batt and Moynihan, 2002; Zuboff and Maxmin, 2003; Korczynski, 2001). (Also referred to 'Transactional and Control/Cost Minimisation' by Purcell and Kinnie, 2000). Mass production is based on a business model adopted from the manufacturing industry. It is based on centralised control, rigorous process definition and employee compliance. A mass production call centres' goal is to maximise throughput, deliver uniformity and minimise costs. This is rooted in a cost, not revenue, based model where little customer value is generated and transactions are generally simple and highly repetitive.

To fulfil their task, mass production call centres use a combination of mechanism and Taylorism to rationalise production. Technology is used to automate production wherever possible. Speed is emphasised and transactions are often scripted. This lowers costs, but also tends to lower customer satisfaction as automation and self-service shift labour costs to consumers and restrict customer choice.

Labour costs are minimised so there is a high utilisation of agency personnel. Jobs are designed to fragment and deskill tasks and eliminate the need for firm specific knowledge. This minimises skill requirements, discretion and time to do tasks by providing detailed functional job specifications and standardising work. Training tends to be minimal, there is little job security and salaries are generally low, with bonuses and commissions used to incentivise higher productivity. With little knowledge residing with the advisor there is a strong need for IT knowledge support. Work tends to be transactional with an emphasis on compliance to standards and processes. There is close monitoring, control and supervision by management. As a result of this, employees tend to experience a degradation in working conditions with increased pacing and volumes of work, routinisation of work practices and increased

stress through high demand and low control (Karasek, 1979). According to a survey in 2005 (Fielding, 2005), 84% of UK call centres fit this model.

2. A '**Mass Customisation Model**' (Batt and Moynihan, 2002, Zuboff and Maxmin, 2003). (Also referred to as a 'Customer Oriented Bureaucracy' by Korczynski (2001) or a 'Branded/Pseudo relationship' by Purcell and Kinnie, 2000). Mass customisation is a customer centric business model based on customer needs, employee autonomy and empowerment. A completely customised and personal experience for every customer is neither cost effective nor likely to deliver the consistency of a branded customer experience. Mass customised call centres aim to deliver effective, high quality, personalised customer experiences using flexible processes, customer knowledge from the various CRM and knowledge systems and a degree of employee autonomy and empowerment. These call centres compete on both quality and price so they tend to work on a pendulum between quality and quantity. The customer interaction tends to have a distinct brand designed into it, which implies a certain element of standardisation, scripting and call monitoring. However, these standardised components can be fused together to form what appears (to the customer) to be an individualised interaction.

Automation is used to minimise costs and ensure advisors are adding value to the interaction. Since the onus is on the advisors to deliver the customised experience, they are expected to be multiskilled and are employed for their attitude rather than their specific product knowledge. These centres often recruit experienced advisors (frequently poaching them from other call centres in their locale). Career paths are limited but job security is higher than in the mass production call centre. There is an ethic where repeat sales are made through the delivery of excellent service with training concentrating on customer service techniques. Cross selling is actively encouraged.

3. A '**Professional Services Model**' (Batt and Moynihan, 2002). (Also referred to 'Relationship Exploiting' by Purcell and Kinnie, 2000). Professional services call centres are generally run for high value customers (usually corporates) and interactions are designed to foster long-term (often individualised) relationships and deliver a quality service. Customers tend to pay premium rates for quality, customised services. Calls are unlikely to be routinised or scripted and call lengths are generally not limited. There is greater emphasis on measuring adherence to quality standards, customer retention and customer satisfaction. Advisors are required to develop unique product knowledge and specific competences in order to maximise customer value. There is an emphasis on training and career progression and retention activities. Advisors are multiskilled and multitasked, have a high degree of discretion and have generous pay, benefits and job security. Technology is used to complement the human advisors.

Studies have shown that the adoption of the mass customisation model has led to better call centre performance (Becker and Gerhart, 1996; Appelbaum et al, 2000; Hutchinson et al, 2000; Fielding, 2005). This hybrid model, which sits between the bureaucratic form of scientific management and the professional services customer and employee centric model, is starting to be increasingly adopted as the most effective call centre model because it seeks to balance efficient task completion *and* the customer relationship. It was this model that the MUI was initially designed to facilitate.

2.1.3. Call Centres: A People Perspective.

From a *people* perspective, call centres provide the human face of the organisation. They should give customers the ability to talk to knowledgeable and friendly advisors who have ample supplies of reassurance, problem solving capabilities, opportunities for relationship building and the ability to inform buying decisions. Belt et al (2002) observed that they present the "personality of the firm to the customer over the telephone".

There seem to be two types of customer; “visionaries” and “people in crisis”. “Visionaries” are looking to develop themselves or their lifestyles and “people in crisis” need a solution to a problem. Both need to be catered for by the call centre.

In creating a customer experience, Seybold (2001) suggests that customers are looking for five things:

- “Don’t waste my time” – time is the new currency; when it has gone nothing can recoup it. Customers will often pay more to ensure that their time is not wasted (Hickman and White, 2003).
- “Remember who I am” – across all channels of contact.
- “Make it easy for me to order and procure service”.
- “Make sure your service delights me”.
- “Customise your products and services for me” – recognise my needs as an individual.

As a customer, purchasing decisions are not usually merely the result of pure logic. Other factors, which have more to do with the heart than the head, come into play (Norman, 2003). Yet, when it comes to designing the customer experience, emotion is only usually a factor in advertising, it is rarely a factor in the way that a company designs its call centre strategy, processes or systems (Shaw and Ivens, 2002). It is this emotional crevasse that often causes the gap between customer expectation (built up by marketing promises and other service expectations) and reality (a result of operational design for efficiency).

In a study by the Henley Centre (Henley Centre, 1998), 9% of customers were reportedly left furious after their telephone calls failed to resolve their problems. Initial findings concluded that there was a large gulf between what the customer expects from customer service and what the service provider thinks the customer expects. Keeping the customer satisfied is more than simply answering the call within three rings. Figure 2 shows the kind of emotions that customers often experience before and after calling a call centre.

The Henley research has also shown that the more complex the customer requirement, the more potential there is for dissatisfying the customer. The call centre seems to be incapable of handling anything but the simplest of enquiries without failing the customers’ expectations

of delivery. This is explained by the prevalence of the 'mass production' model (described in 2.1.2), which seeks to increase standardisation and reduce uncertainty. Zuboff and Maxmin (2003) refer to this as 'shallow support'. Customers are often left disappointed with the trade-off between the cost of service and the service itself.

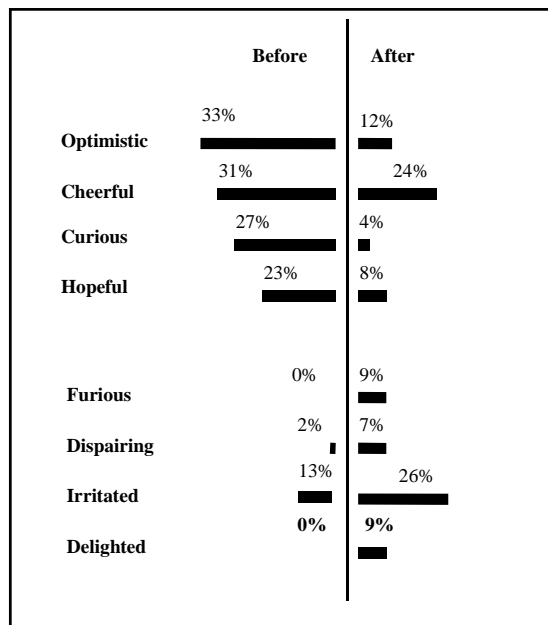


Figure 2: Teleculture 1998, Henley Centre, Qualitative Phase 1.

Call centres are, therefore, involved in the business of emotion. Research by the Industrial Society in 1999 showed that an increase in call volumes, fewer staff and higher expectations are just some of the growing trends contributing to the dramatic increase of 'phone rage'. With consumer anger becoming common, customer expectations being raised by brand messages and advertising and a culture of complaining becoming more ingrained, the scapegoat in the process is often the person facing the customer. As Hughes et al (1998) note after a study of customer facing work, "trying to keep the customer satisfied is a matter of juggling a quite complex and potentially conflicting series of demands". Customer facing people are increasingly saying that they are "cannon fodder", victims of abuse in a system where it is rarely their fault that a problem has occurred and they are helpless to do anything but apologise to the customer for the inconvenience (Leidner, 1996). These jobs involve high levels of demand and low control, which are the classic precursors to stress (Karasek, 1979; Folkman, 1984; Thompson, 1981; Smith et al, 1992).

Karasek's (1979) 'residual strain' model defines stress circumstances as "the magnitude of the load and the individual's degree of freedom of action in the face of a demanding task". According to this model, when an individual receives a signal (stressor) from the environment, psycho-physiological processes provide sufficient potential energy for appropriate action (stress). If appropriate action cannot be taken after this arousal – because actions are restricted by low control over their job, or they have insufficient knowledge to respond – the energy must be dissipated somehow (Henry and Cassel, 1969). Call centre advisors have many demands placed upon them. These include task knowledge, computer literacy and problem solving skills, as well as qualities such as tenaciousness, stress resistance and empathy. However, the discrepancies between these competencies and the latitude they have for decision-making, control and coping with external stressors (e.g. noise, lack of interpersonal communication, measures) accounts for physiological problems, e.g. burnout, illness and staff turnover (Rothe, Metz and Degener, 1999). The Merchants Group's annual survey of call centres in 2000 suggested that the enormous growth of the service industry is burning employees faster than they can be replaced. In the last five years Merchants have reported a 120% increase in unplanned absence.

The advisor's job is more about management of customer disillusionment, than the promotion of the "enchanted myth of customer sovereignty" which has informed customer expectations (Korczynski, 2002). Zuboff and Maxmin (2003) suggest that customers seek more than just products and services, they are looking for 'deep support' rather than 'shallow support'. 'Deep support' is defined as the provision of an ongoing relationship based upon "advocacy, mutual respect, trust and the acute alignment of interests". However, they suggest that this cannot be sustained by most organisations because they are run under the century old principles of 'transaction economics' (i.e. under the mass production model (see 2.1.2)) which cannot sustain the kind of customer experience that a 21st Century customer demands.

The manner in which employees express their feelings towards customers can have an important effect on the perceived quality of that transaction (Peccei and Rosenthal, 1997). This is unsurprising given that research on the role of emotion has shown that even a small

change in emotional state can impact creativity, decision making, problem solving, innovation and willingness to help others (Isen and Baron, 1991; Isen et al, 1997; Isen, 2000). 68% of customers who defected to another organisation did so because of bad service from an individual in that organisation (Ranaweera, 2001). A survey by Detica in 2002 (Braune and Graham-Rack, 2002) found that 72% of customers found the manner of the advisor most important in an interaction. This was ranked as more important than efficiency (68%), accessibility (68%) and staff knowledge (65%).

Therefore call centre advisors are not just expected to execute their physical tasks competently and efficiently and to display knowledge of their organisation's products, procedures or practices, they are also held accountable for the emotions that they display. In the call centre 'emotional labour' (Hochschild, 1983) is a key component of work.

'Emotional labour' is defined as "to induce or suppress feeling in order to sustain the outward countenance that produces the proper state of mind in others...this calls for a co-ordination of mind and feeling" (Taylor and Bain, 1999). As Deery et al (2002) explain, employees are expected to display emotions that comply with certain expression norms or rules of the organisation that help to create a desired 'state of mind' in the customer. In this context, employees are expected to "appear happy, nice and glad to serve the customer in spite of any private misgivings or any different feeling they may have" (Erickson & Wharton 1997). Deery et al (2002) argue that excessive demands on emotional labour may lead to a higher risk of stress, anxiety and emotional exhaustion. Wharton (1993) posits that differences between what employees might really feel towards their customers and what they are expected to display may prove difficult to resolve (what Deery and Kinnie (2002) call 'emotional dissonance'). Deery et al (2002), in their study of call-centre workers, found that greater demands on employees' 'emotional labour' resulted from dealing with a greater number of incidences concerning abusive customers. An increased experience of abusive customers was positively correlated with higher absence levels.

The reason why the focus of the author's initial research work shifted from looking at the feelings and satisfaction of customers with call centres, to looking at the emotional state and motivations of employees, was twofold. Firstly, it was easier to get access to large numbers of call centre employees for the purpose of survey and research than it was to get access to the customers ringing the call centre. Secondly, research on the 'service-profit chain' (Heskett et al, 1997) describe the "satisfaction mirror" in which employee satisfaction is 'reflected' in terms of customer satisfaction. This, in turn, leads to business growth and profitability. The theory is that demotivated and stressed staff are less capable of delivering a sensitive and responsive interaction with the customer, regardless of the quality of the systems that you provide them with. This is not a perfect mirror, since evidence has shown that satisfied employees do not necessarily lead to satisfied customers. Heskett et al (1997) proposed the service-profit chain, in which employee satisfaction and loyalty initiate a chain of performance links between quality, productivity, service value, customer satisfaction and loyalty which in turn drive profit and growth (see Figure 3).

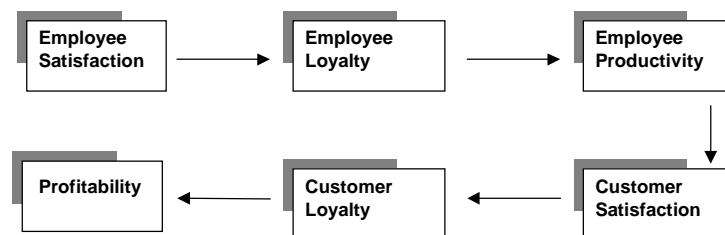


Figure 3: Service-Profit Chain (Heskett et al, 1997).

The author's work in global customer service best practice (Millard, 2001a) uncovered the fact that organisations such as Sears-Roebuck, MCI, SouthWest Airlines, Xerox, Taco Bell, Disney, First Direct, American Express, Virgin Atlantic and USAA all use the service-profit chain as their principal business model. Rucci et al (1998) studied Sears-Roebuck and showed that a 5% increase in employee attitude produced a 1.3% gain in customer impression. This resulted in a 0.5% increase in profit.

So, as call centres increasingly move from being simple enquiry handling centres, automation takes away the boring and mundane transactions through the use of IVR systems and the internet, the people within them become the focus for delivering customer relationship management strategies (Frenkel et al, 1998). However, the contradictions of the 'mass

production' model often mean that both systems and processes act against the advisors providing a good service. One call centre advisor interviewed as part of this research said that: "dealing with customers - some of whom are very rude - I can handle, no problem. The biggest cause of low morale and poor efficiency is the management and the blinkered view they have of the situation. The second biggest problem is the computer systems and procedures employees have to deal with".

Low motivation and frustration cause the notoriously high levels of employee turnover that call centres suffer. In 2002, annual staff churn across UK call centres was running at 25.1% (Incomes Data Services, 2003). This introduces a 'cycle of failure' (Schlesinger and Heskett, 1991) as call centres are forced to adopt more of a mass production model. This is characterised by companies having to recruit less skilled advisors with little knowledge or experience and (because average length of service in UK call centres is 27 months (Incomes Data Services, 2003)) minimal investment in training and poor rewards. This inevitably results in a decline in customer service. This increases the need for a more Tayloristic approach to management with increased measures, surveillance and incentivisation, all introduced in the hope that performance will become more effective (see chapter 3 for an explanation as to why these frequently do not work). The cumulative effect of this contributes to the significant gap between what the customer expects and what they actually get.

The consequence of this service gap is the loss of opportunity to develop the relationship with the customer, the undermining of customer relationship management programmes and the destruction of such relationships as already exist. The ultimate consequence is the loss of business from existing customers who defect, or do not place further business with the company. In addition there is also the loss of potential business from new purchasers who are not being referred by the poorly-serviced existing customers.

The result is that the original aims of the call centre - to increase profit and reduce cost to serve – are being undermined because of the failure to provide an appropriate level of service. Research by the Henley centre (Hickman and White, 2003) shows that fewer than

17% of bank and insurance company customers believed they received a good telephone service from their provider. Only 20% of callers to financial services call centres felt they got the advice they were looking for (Hickman and White, 2003). Thus, while call centres may deliver short-term cost reductions, they may also be damaging long-term business profit because of fundamental flaws in their design. Call centres are there to serve visionaries and people in crisis in a cost effective way.

Technology has a big role to play in helping the call centre deliver a cost effective yet excellent customer experience. A better understanding of the nature of interactions in the call centre needs to be gained so that the technology supports, rather than inhibits, communication. Design can be influenced by the way that knowledge is used, how attitudes towards new technologies are formed, what the advisor is feeling and how motivation and emotion influence technology acceptance. This research looks at the role of the user interface (UI) in this. However, the UI alone will not create conditions for motivation and acceptance to occur. It requires a new approach to organising the call centre, the redevelopment of legacy processes and systems, a revision of management methods and approaches, a rethink of measures of success and approaches to training. As Thompson and Callaghan (2002) state: "Most of the call centre industry has been developed as a way to increase productivity through economies of scale. The organisational mindset, facilitated by innovative technologies has, from the beginning, been used to simplify and routinise tasks and establish tight control and surveillance mechanisms. No matter what technological developments are introduced, unless there is a fundamental shift in the way work is organised, it is unlikely jobs done in customer contact centres of the future are going to require greater skills or be any more rewarding, than much of the call centre work of the present".

2.2. A Brief History of Call Centres.

“The typical call centre operator is young, female and works in a large, open plan office or fabricated building. Although probably full time, she is increasingly likely to be a part-time permanent employee, working complex shift patterns which correspond to the peaks of customer demand. Promotion prospects and career advancement are limited so the attraction of better pay and conditions of another call centre may prove irresistible. In all probability, work consists of an uninterrupted and endless sequence of similar conversations with customers she never meets. She has to concentrate hard on what is being said, jump from page to page on a screen, make sure that the details entered are accurate and that she has said the right things in a pleasant manner. The conversation ends and as she tidies up the loose ends there is another voice in her headset. The pressure is intense because she knows her work is being measured, her speech monitored and it often leaves her mentally, physically and emotionally exhausted”, Taylor and Bain, 1999.

To find out why call centres are the way that they are, one needs to delve into their history.

The first jobs that could be classified as call centre jobs were in the operator service centres that evolved in the early 1900s (see Figure 4). Operator service jobs were considered to be highly skilled. They were complex and varied and required physical manipulation of cords, plus social interaction and diagnostic skills. Trained operators were much sought after by companies and it was considered to be a very prestigious job for women.



Figure 4: GPO Operator Service Centre, Newhall Street, Birmingham, 1929 (BT Archives).

Taylorist principles were introduced to standardise work methods in the 1920s. Human resource policies were introduced to define minimum standards of behaviour for these so-called “weavers of speech”. These were designed to match the characteristics of the upper and upper-middle class demographic who owned telephones. Operators working for the General Post Office (GPO) in the UK were required to pass stringent civil service examinations and undergo rigorous recruitment tests. Operators needed a clear speaking

voice, devoid of any strong accent or dialect, good hearing, accuracy in taking numbers and correct spelling (Southall, 2003). Those who applied were weighed and measured with military precision because of the physical requirements of the job. They needed to be slim enough to fit into cramped workstations (no EU ergonomic regulations in those days!), with arms that were long enough to reach the switch jacks and plug them into the switchboards (Stern, 1997) and be taller than five foot three inches so that they could reach the top of the switchboard (Southall, 2003).

Training was typically an intensive seven weeks and then another four weeks taking supervised calls before spending a year on probation. This included memorising large numbers of codes and phrases as well as absorbing the cardinal points for service delivery. For the GPO, these were accuracy, courtesy, speed, tact and secrecy (Southall, 2003).

Intensive monitoring and discipline were introduced into the centres and accepted by the women who worked in them. One supervisor (described by Southall (2003) as a “female sergeant major”) would stand a short distance behind every six or seven operators (Schacht, 1985; Southall, 2003). Southall (2003) notes that “occasionally a supervisor was seen to prod a telephonist’s shoulder with a pencil” if they considered that the girl was slacking in her duties. Quality monitoring was also in place, with supervisors listening into calls behind the switchboards ensuring that it was up to standard and the correct phrases were being used. They would also hold weekly briefings to update operators on changes in procedures and impress on them the importance of improving the subscriber’s waiting time. Operators were not permitted to speak to each other, could be dismissed for arriving a few minutes late or spending more than their allocated four minutes in the toilet and worked variable shift patterns to cope with fluctuations in telephone demands. They were also required to be unmarried (Stern, 1997) and would lose their civil service status if they continued on after their marriage (Southall, 2003).

However, the operators had a great sense of camaraderie and would often exploit opportunities to secretly communicate with each other via the button used for transmitting

urgent information to all the switchboards, pretending that they were talking to subscribers. If their supervisor had disappeared to monitor calls, they would gently remove and reinsert the plug into the board and listen for the click that would betray the fact that they were being listened to (Southall, 2003).

From the 1930s onwards, operations became increasingly mechanised and once varied jobs were fragmented and deskilled. Strowger exchanges enabled customers to dial their own numbers by the 1950s and the evolution of the networked computer and database meant that monetary transactions could be conducted digitally eliminating more operator jobs. As jobs were reduced, the remaining jobs became less varied and complex. Interactive Voice Response (IVR) introduced during the 1990s further decreased variety and complexity (Kohl, 1993).

Telephone companies experienced dramatic improvements in productivity with operators representing 60% of the workforce in 1920 compared with 44% in 1950, 14% in 1980 and just 4% in 1996. However, rationalisation of the front office has always been difficult because of the uncertainty introduced by the customer. Research in operations management in the 1970s attempted to limit customer variation through standardisation of options (Levitt, 1972; Chase, 1978; Leidner, 1993).

During the mid 1980s, call centres were exploited by larger organisations, which could afford the technological investment, to conduct telephone marketing (or “telemarketing”) activities.

Today’s call centres (see Figure 5) seek to apply industrial production techniques to more complex sales and service interactions in order to increase volumes and reduce call-handling times. Supervisory functions work in a fairly similar way to the 1920s with one supervisor looking after teams of around 10-15 advisors who regularly monitor, coach and cajole their teams to meet their targets (no pencil prodding allowed these days though). However, their job is also about gathering and interpreting statistics and figures that they get from the switch – they no longer have to lurk behind people to see what they are doing. There is also still a

bias towards female employment, with a study by the Call Centre Association (CCA) and Sheffield University in 2002 showing that 69% of customer contact employees and 63% of supervisors are female, as are 54% of call centre managers.

Traditionally task allocation in human factors would argue that the role of IT in the modern call centre is to automate routine and mundane tasks and allow greater space for knowledge work, creative problem solving and relationship building (as suggested by Zuboff, 1988). Instead this time has been filled by a greater intensity of work. Automatic call distribution and routing, computer-telephony integration and IVR have all enabled this to happen. In 2000 the typical telephone operator handled one thousand calls per day with an average call handling time of twenty-one seconds.



Figure 5: A Large, Modern Customer Contact Centre.

As call centres move from simple enquiry handling to value add contact and CRM, the importance of the role of the advisor has grown (Frenkel et al, 1999). Surveillance and compulsion do not guarantee productive performance in terms of relationship building. The dilemma is that demotivated and stressed staff are less capable of sensitive and responsive interaction with the customer (Taylor and Bain, 1999). A process solution to solving the problem of advisor motivation and attrition is to switch from the mass production to the mass customisation model. According to Fielding (2005), this alone would reduce absenteeism and

attrition by 56% and 25% respectively and provide a 40% improvement in the customer experience.

How can the future call centre respond to an increasingly complex and demanding customer base without becoming too expensive to run?

The partial answer is to ensure that the call centre is responding appropriately to customer needs through a number of strategies. These strategies include:

1. **Automate (appropriately).** With 47% of customers saying that they tend to prefer doing simple things online (Hickman and White, 2003), technology should increasingly allow for the simple and repetitive calls coming into to call centres to be handled by automated systems (Millard et al, 2000). Experience has shown that some call centres are experiencing a drop of around 10% of calls per annum. This means that the role of the human customer service advisor is transformed into a relationship builder and sales person, rather than someone processing calls. With calls getting more complex, customers expect to get an advisor who can help them. Technology is good at boring, mundane, repetitive tasks; human beings are not. Humans are good at empathy, relationship building, complex problem solving and creativity; technology is not. Rather than being automated out of the process, the strengths of the human call centre advisor should be utilised to the full. Simple tasks should be automated but automated well because, if they are not, you get 'cost of failure' demand (Seddon, 2000; 2003).

2. **Eliminate 'cost of failure'.** Cost of failure (Seddon, 2000; 2003) comes from people either calling the call centre because something unexpected has happened (e.g. a web page has crashed half way through a booking) or something expected has not happened (e.g. a package hasn't arrived). It has been estimated that up to 70% of calls into call centres represent this kind of demand (Seddon, 2000). Root cause analysis of *why* people are calling can often uncover calls that can be designed out.

3. Retain good advisors. The contradictions of call centre work mean that there is often frustration and low motivation among advisors that, in turn, causes the notoriously high levels of employee turnover that call centres suffer. This introduces a 'cycle of failure' as call centres are forced to recruit less skilled advisors, with little knowledge or experience and (because of churn) there is minimal investment in training, poor rewards and a resulting decline in customer service. Retaining good advisors is around career progression, appropriate rewards, good training programmes and excellent management and infrastructure support.

4. Measure what matters. The call centre is probably the most controlled and measured business environment ever. However, what can be measured is not what necessarily *should* be measured. Does answering the phone ten seconds faster make the customer any happier with a call centre? This is, again, symptomatic of the call centre paradox. 'Hard' measures (e.g. call handling time) are comparatively easy to obtain and tend to preside over 'soft' measures (e.g. customer satisfaction) that are both subjective and less accessible. Average customers and average call times only exist on spreadsheets and an angry or difficult customer on the line is not always the advisor's fault. Hitting individuals with measures that they cannot control is not conducive to increasing motivation but is frequently used by management to increase advisor productivity (thus increasing advisor stress and the likelihood of turnover).

With automation increasingly taking out all the mundane work and cost of failure demand minimised, the future call centre advisor is likely to be taking calls that play to their strengths. However, these calls may be both complex and unusual (i.e. difficult to "average") – so advisors will need to be better trained and use more supportive technologies to help them solve customer problems.

The author's research from 1994 – 2000 looked at how the call centre could respond using appropriate strategies and technologies to the challenges of the future customer. Watching advisors work it was observed that they tended to stretch and move around during the day

despite being attached to their desk by a headset and the need to see information on their PC screen. Initial investigations focused on emerging technologies that could deliver knowledge in the environment whilst not restricting people to the confines of a computer screen. This included the use of ambient interfaces that could be built into work surfaces such as walls, ceilings and table tops (Wisneski et al, 1998) and wireless technologies (such as Bluetooth) for informational and collaborative purposes (see Figure 6).

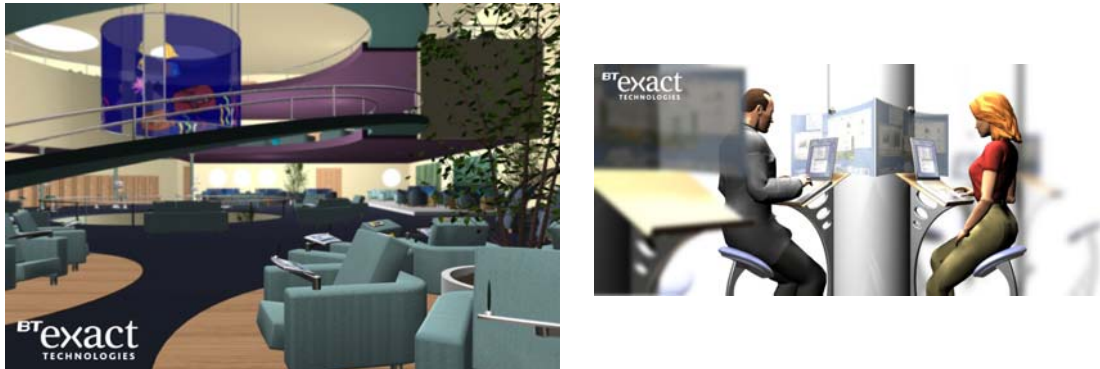


Figure 6: Future Call Centre Visions (BT Exact).

However, interviews with call centre managers revealed that they were far more anxious about issues around recruitment, retention and motivation of staff and allied issues such as training and knowledge management. The question that the research posed was the possibility that innovative user interface design could be used to:

- Reduce systems training times by being intuitive to use.
- Maintain the power and flexibility of access whilst minimising cognitive load through provision of user controlled methods of interaction, rather than having either command line or forms based interfaces.
- Increase user acceptance of the technology by going beyond usability – which is a ‘satisfier’ when present to a ‘dissatisfier’ when absent (Jordan, 1999) – and considering the role of pleasure, experience and aesthetics as well as achieving task goals.
- Support the principles of CRM by encouraging advisors to explore and discover things in the knowledge space.
- Emphasise quality of experience rather than just increasing efficiency through work related task achievement combined with pleasurable experience (Sengers, 2003).
- Take inspiration from games playing and computer games design to create positive affect (Johnson and Wiles (2002); Csikszentmihayi (1975); Callois, 1958), increase collaboration, raise technology acceptance levels through active participation and enjoyment (Davis, Bagozzi and Warshaw, 1992) and tap into the momentum that

games can give in terms of employee involvement, boosting morale, generating a positive working atmosphere and creating enthusiasm (Reynolds, 2003).

- Provide an outlet for advisor stress reduction and increase advisor motivation by exploiting human psychology and emotion theory and fusing it with user interface elements.

This provided the initial rationale for the design of the MUI.

2.3. Call Centres: Challenges for Human-Computer Interaction.

*“The technical nature of call centre work gives rise to the question of the extent to which the technology is appropriate to the requirements of the interaction”
Rieder, Matuschek and Anderson, 2002.*

The challenges for HCI design for call centres are rooted both in the task domain as well as the legacy systems that have set advisor expectations. This section considers the role that the user interface plays in constructing the emerging dialogue between advisor and customer.

2.3.1. The Task Domain.

The development of ACD technology mirrors the growth and sophistication of the call centre infrastructure in terms of the extent to which calls may be steered, activities can be monitored and controlled and telephony can be integrated with the capabilities of the computer.

However, the call centre advisor's window on the world is the user interface. Developing systems that support the telephone interaction between an advisor and their customer presents numerous challenges from the user interface designer's perspective (Millard et al, 1997). To be able to talk to customers, solve problems and develop relationships with customers, advisors need to be equipped with technologies that will help them understand who the customer is, allow them to speak knowledgeably about a complex and often ever expanding set of products and services and negotiate a minefield of legalities, processes and procedures. These user interfaces need to (Millard et al, 1997):

- Present a large amount of complex information;
- Present the right information at the right place at the right time in the right format;
- Provide the call centre advisor with a navigation mechanism that does not distract them from their conversation with the customer;

- Provide a coherent, efficient and effective method for getting information to the customer at their first point of contact.

One of the main roles of the advisor is to serve as an interpreter between the customer and the data held within the system. However, customers don't just call for mediated access to databases but for expert assistance (Muller et al, 1995). Advisors respond to these needs through a mixture of their knowledge of the customer, the customer's context, the company's language, process and services and the structure and content of the support systems. Muller et al (1995) call these 'cultural', 'task', 'semantic' and 'system specific' knowledge respectively. Advisors do mediate but they also use these other types of knowledge to help them refine queries, do expert diagnostics and solve problems. They help customers articulate their needs, collaborate to refine them and help them navigate through complex information spaces. The advisor needs to ask the right questions, interpret the customer's answers and control the conversation.

The majority of all callers don't have the same amount of knowledge or familiarity with the call centre or the company so advisors have to deal with a wide range of knowledge levels. The quality of information gathered during the dialogue is only as good as the collaborative interaction between the customer and the advisor.

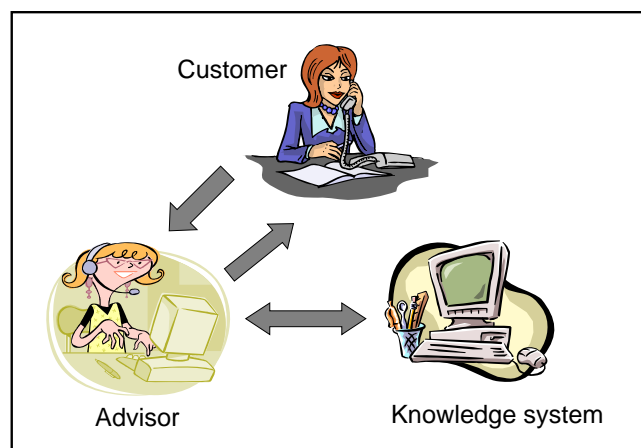


Figure 7: Computer-Human-Human Interaction (Steel et al, 2002)

The intermediary role of the advisor with the system has been termed Computer-Human-Human-Interaction (CHHI – Steel et al, 2002 (see Figure 7)). This presents a whole plethora of socio-technical challenges. The advisor must not only maintain a coherent conversation

with the person on the other end of the phone line, but must also cope with a number of interfaces and interaction styles contained within the (often) multiple databases that they need to get information from. They must also adhere to all their quality procedures (on which they are monitored and incentivised) and control their emotional state.

During the dialogue process with the customer the advisor is constantly managing switches in salience between one stream of interaction and another (Bowers and Martin, 2000). The system is, therefore, a third partner in the dialogue with the customer and can heavily influence both structure and content (Bowers and Martin, 2000; Whalen, 1995). Hughes et al (1998) found that advisors often engage in what they term 'demeanour work'. The advisors keep the flow of interaction going with the customer by describing, as they go, the steps that they are taking. Hughes et al (1998) suggest that this displays their competence to the customer. This flow can be interrupted by the technology since it is typically structured according to the flow of transactions, rather than the flow of the conversation. Advisors need to weave the use of technology into the emerging customer dialogue, making the relevant knowledge and skill visible. Typical calls are structured in the following way (see Figure 8):

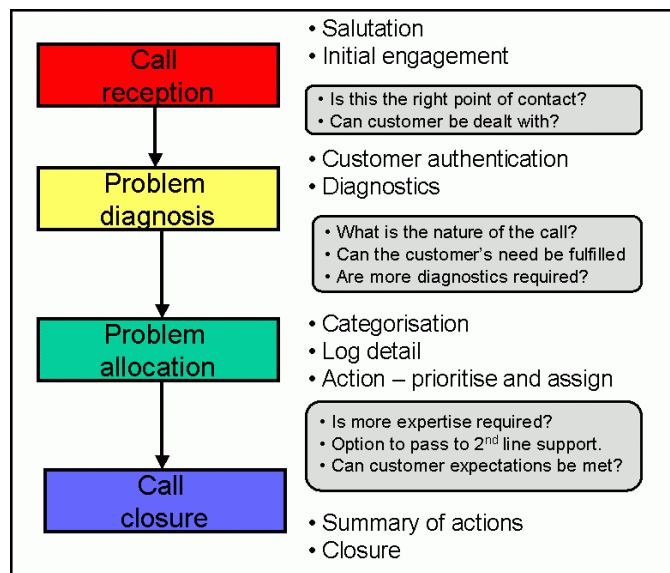


Figure 8: Typical Call Flow.

Call centre user interfaces (particularly forms based interfaces) are generally designed to reinforce this structure to a greater or lesser extent. However, the negative impact to this structured approach is that it can constrain the conversation with the customer.

During **call reception**, it is quite normal for the customer to open with a statement of the reason/purpose of the call (Bowers and Martin, 2000). Advisors use this as a means to verify if the customer has got through to the right number. However, their initial task is to retrieve the customer's record and history from the database. They need to verify the identity of callers by asking them for some means of identification (e.g. a customer number, postcode, PIN number or reference number). To maintain control of the call, advisors often either interrupt the customer or simply wait until they have stated their problem before asking for caller identification.

In order to **understand needs**, the advisor first needs to interpret what the customer is saying. This is not as easy as it sounds since one study on call structures showed that 49% of customers specified a problem rather than requesting a particular service; 17% asked the advisor to do something but did not actually use an explicit service name; 32% explicitly asked for a particular service and 2% talked complete nonsense (Edgington et al, 1999).

To understand customer needs advisors will:

- *Assess what the customer wants.* One can draw parallels between this process of understanding customer needs and the way that people approach problem solving. The advisor and the customer will move through a series of knowledge states as they move towards a goal of needs definition (Newell and Simon, 1972). This is often a process of questioning and confirming requirements with the customer. Solving the problem is ultimately a process of negotiation using the combined knowledge of the customer, the advisor (as a result of training and experience) and assimilation of information from other disparate sources (e.g. physical (i.e. paper notes), multiple databases, memory or consulting with others) into a coherent whole.

As the knowledge of the advisor and the customer will differ, various negotiation and focusing strategies are used to ensure that the interaction proceeds smoothly (Grosz, 1981). Most advisors operate in a "test-operate-test-exit" routine that will allow for a shorter, more economical interaction. Experienced advisors will often use cues from

the language, way of speaking (e.g. hesitation) and terminology used by the customer to understand what level of expertise they have and tailor the questioning strategy accordingly (see Table 1).

	Low caller expertise	High caller expertise
Consequences on dialogue management.	Take control of dialogue and use closed questions (yes or no).	Do not interrupt – wait for a question.
Consequences on questioning strategy	Probably a common or routine problem.	Often a complex problem that is not common or routine.

Table 1: Methods to Assess Appropriate Questioning Strategy (Falzon, 1980).

Many call centres will provide support for the low level of expertise in the form of system prompts and scripts to structure the use of the corporate knowledge. Many of these problems are not complex and quite common. Although the non-systems knowledge of the operator may be incomplete and imprecise, it can be accessed immediately. Therefore, they tend to use that because it requires less effort than finding it in the database. In the event of a more complex problem, corporate knowledge can cover the problem domain in more depth. However, this requires the advisor to access and retrieve this knowledge (see chapter 7). A trade off exists in the amount of time that it takes to access and read information from the corporate knowledge base verses information in the advisor's head. This means that advisor's often bypass the system completely and use their heads, or simply log and push problems to a second line customer contact point possessing more in-depth knowledge. Experience has shown that scripting and prompts are often ignored because of their perceived slowness, their inflexibility and inability to support natural conversation and rapport with the customer.

- *Negotiate a solution.* This involves matching the customer's requirements with a product or service, reformulating it into 'semantic' knowledge (e.g. internal product names) and then into 'systems specific' (appropriate for input into the system) and then confirming with the customer.

Once a customer's needs have been understood, the advisor then executes a more rigid structure of data input that is relevant to **delivering service**. By constraining options into the call centre channel, organisations effectively limit the amount of variation in the system and this is echoed in the options available in the user interface (either in fields on forms or pull down menus). Once the advisor has identified the relevant service, they will then follow a procedural path, usually enforced by the logic of the form and menus on the UI. Since this is a period where the advisor is largely engaged with the system rather than the customer, conversation tends to cease momentarily. This is a learned collaborative behaviour from the customer largely cued from the audible sounds of typing (Bowers and Martin, 2000; Steel, Jones and Apperley, 2002; Steel, 2003).

During **call closure**, the advisor's attention switches back to the customer. There is normally a summary of actions from the advisor (often including empathy and reassurance) before the call comes to a close.

2.3.2. The User Interface Domain.

To support these tasks, user interface design for the call centre has tended to fall into one of three categories (usually depending on how old the centre is):

- A traditional DOS based client interface using command line navigation (for older centres).
- A forms based interface using direct manipulation.
- A forms based graphical user interface (GUI).

2.3.2.1. The DOS Based Interface.



Figure 9: A Typical Call Centre DOS based client.

Command line interfaces (see Figure 9) are powerful, can display large amounts of information and offer flexibility that can better support the unpredictable nature of customer communication. Experienced advisors often exhibit page hopping behaviour as they grab snippets of information about the customers from multiple sources. However, they also require significant amounts of training time. They often use cryptic commands (e.g. 'DCCR' – Display Customer Contact Records; 'DCAD' (Display Customer Account (Address)) which tend to be memorised by rote and relies completely on recall rather than recognition memory. They also assume that advisors have good keyboard skills since slow typing style and errors can negate the advantages of a command line interface. It was not uncommon to find courses on DOS based systems lasting for six weeks. However, considering that the average length of advisor service in some call centres was around twenty-seven months, the course represented about 5% of their career.

Since they rely on recall memory, they have a tendency to increase task cognitive load. 'Cognitive load' is defined as "the amount of mental energy required to process a given amount of information" (Feinberg and Murphy, 2000). In the interaction attention has to shift between two different, but equally important, foci (the customer and the system). Any extraneous cognitive load (e.g. difficulties in UI navigation or visual presentation or emotional outbursts from difficult or angry customers) is likely to have a negative effect on task

completion (Dennis, Bruza and McArthur, 2002). Increased familiarity with the systems interfaces will decrease the amount of cognitive resources required. Ideally, the customer should be unaware of the technology that the advisor is using. However, all too often the conversation is punctuated by comments about the system (e.g. “bear with me – the system is running slowly today”; “hang on, I’m just getting the information back from the system”) as the advisor compensates for system related delays.

Many of the DOS based systems were developed before customers were seen as important to business. While much of the functionality lies within the system, increased automation along with changes in organisational strategy and infrastructure, plus the ever-growing demand for management information, has resulted in the number of external interfaces to these systems increasing. This has a tendency to slow system response times. This, in turn, can negatively impact usability.

2.3.2.2. The Forms Based Interface.

General Information 4.0			
Customer Name	Telephone No.	Dir. Entry	Account No.
MR P N W CHAPMAN	01473643210	ORD	33171633
Address			
345 ROWARTH AVENUE			
KESGRAVE			
IPSWICH			
SUFFOLK			
IP6 12FL			
Customer Type	PERSONAL COMMS		
Line Status	B/W		
Current State	N/A		
Per Second Pricing	NO		
Tele Pref Scheme	No		
Installation Date	19H12/94		
TOS'D Details	No		
Exchange Type	KSG TXDX03		
Conversion Due	No		
CCH Issue	No		
Installation Notes	No		
Faults	No		
Rental Details	Yes		
Discount Plans	ACCOUNT 100000 CA		
Consent	Unknown		

Figure 10: A Typical Call Centre forms based interface.

The solution to problems with the speed, complexity and training overheads implicit in command line interfaces is to use forms based interfaces (see Figure 10). These support a more procedural way of dealing with the call.

In the telecoms company under study in Millard et al (1997), a new forms based interface was designed. This used ‘screen scraping’ middleware to suck relevant data out and support the

customer interaction in a more procedural manner in order to support standard product and service dialogues and structure conversation. Advisors only required a two day course to learn how to use it which saved considerably on the six weeks training previously required for the DOS based interface.

The interface was designed using task observation and process design, allied with a GOMS (Goals, Operators, Methods and Selection rules (Card, Moran and Newell, 1980)) approach to user interface design. GOMS applies well in simple and linear goal-oriented tasks and has been used in the design of a number of call centre interfaces (Gray, John and Atwood, 1992). The interfaces support a logical and procedural framework for customer information and task completion. For example, there would be a specific screen for moving house which would lead the advisor through a series of fields (current address, new address, date of move, services needing to be transferred etc). These would need to be completed before the job could be submitted. The screen was codified using colour with yellow denoting a field that needed input from the advisor and grey fields denoting information that had been obtained from a database and was not able to be overwritten.

This, ultimately, is both the strength and the weakness of the forms based interface. The order of the fields and forms are designed on the basis of a distinctive process for **delivery of service**, which does not necessarily support the flexibility and unpredictability of the customer dialogue. There are potentially a large number of places where the customer can interject new pieces of information, increasing the potential complexity of the user interface significantly. This can also offer penalties in terms of advisor cognitive load.

When the author subsequently evaluated the forms based interface that was introduced into the telecoms call centre organisation, users disliked it because it undermined an unwritten organisational hierarchy that had evolved around the ability to use the DOS based system. The most experienced advisors were the key source of information about the use of the DOS based system. The new system shattered the informal social hierarchy of expertise that was based largely on informational influence (i.e. possession of expertise or knowledge that others

repeatedly needed to draw upon (Raven and Kruglanski, 1970)). By imposing an order within the interface, the browsing behaviour observed within the experienced DOS based advisor population was restricted. From the advisor's perspective this came with perceived penalties with respect to creativity for complex problems and the extent to which they had control of the interaction (Millard et al, 1997).

The new system also required advisor's to pay more attention to the personalised screens so there were longer delays in the interaction as advisors read things. This influenced the pacing of the call (see also Bowers and Martin, 2000) and the degree of technology acceptance among the advisor population. A study conducted by the author three years after the introduction of the forms based interface, found that only 53% of advisors were using it to support calls. However, eight years on, that figure is nearer 98%.

Studies (Adams, Nelson and Todd, 1992; Todd and Benbasat, 1991) have suggested that perceived usefulness may be more important than ease of use – people can overcome the difficulties of use to get the benefits. Usage is influenced by both perceived ease of use and usefulness. This tends to become more stable over time and after exploration, which would explain the increase in use over time of the forms based interface.

2.3.2.3. The Forms Based Graphical User Interface.

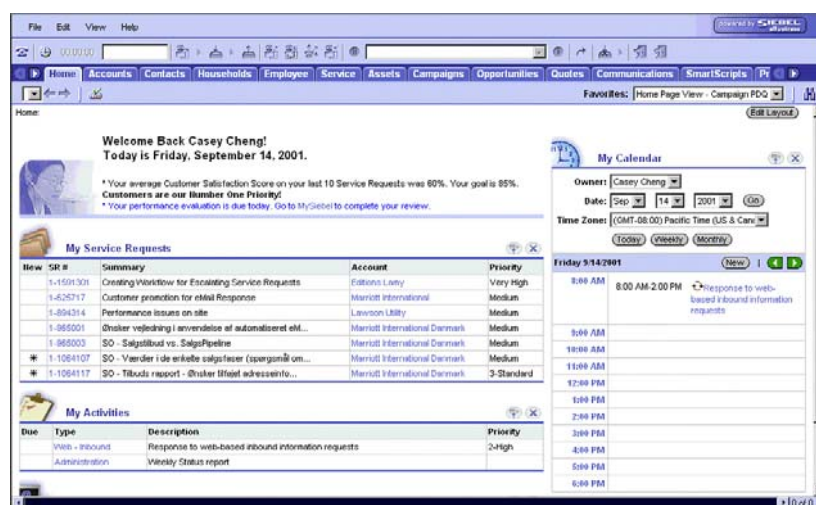


Figure 11: An example forms based GUI (courtesy of Siebel Systems).

Business initiatives such as Customer Relationship Management (CRM) imply the use of increasing amounts of customer information at the point of contact to successfully tailor the dialogue to customer need. CRM interfaces depend on knowledge as their lifeblood. The typical CRM graphical user interface is browser based and incorporates a series of forms based interfaces accessed through a series of tabs and hyperlinks (see Figure 11). Navigation is by pointing and clicking through a series of forms containing various bits of customer information. This allows advisors to browse through the vast amounts of customer data gathered as part of CRM, through forms that are personalised and configured to support the profile of that customer. They are then expected to use this information to better service customer needs, spot opportunities and cross sell. The penalty for this level of flexibility is that many of the current call centre CRM systems solutions use forms based interfaces to present as much information as possible onto multiple windows in fonts that are less than optimal in terms of readability (Mills and Wedon, 1987). User resistance to these applications is often considerable because they are usually neither easy to use or to learn (Hill, 2002; Withers, 2002).

Flexibility and personalisation are two key aspects of these interfaces. CRM implies an interface that goes beyond the subject of the current conversation with the customer and uses data to further develop the relationship. The ordered, procedural nature of a purely forms based interface cannot support this flexibility. Observation of the usage of these interfaces has shown that there is a return to some of the behaviours that were apparent in the DOS based interface (Millard et al, 1997) in that:

- Only comparatively small subsets of the screens were used during call handling and, within the subset, activity was primarily focused on a few key screens.
- Interaction with the database sometimes caused problems with the saving of entries in certain fields. Hence a lot of note-taking activity was required for the advisors to maintain the information they had collected from the customer or their records.
- Information presented on a screen was sometimes needed in conjunction with other screens. This added to the advisor's cognitive load, as they were required to flick backwards and forwards between screens to follow their thoughts about the customer enquiry.

Advisors need to pay more attention to the personalised screens so there are longer delays in the interaction as advisors read things. Pacing of the call is influenced as a result of this (Bowers and Martin, 2000). Whalen (1995) has suggested that the dynamic nature of these GUIs have made it more difficult for the advisor to structure the conversation, since “recommendations from the system have to be folded into the ongoing interaction with customers, a matter requiring some skilled improvisation and extra attentiveness to the behaviour of the system”. In a sense, these GUIs have more in common with the DOS based interface in terms of interaction style and the skills placed on the advisor (see Table 2).

Demands - DOS Based Interface	Demands - Forms Based Interface	Demands - Forms Based GUI
Training intensive	Training time reduced	Training fairly intensive
Non intuitive	More intuitive (form rather than command line)	Forms based but flexible navigation style – impacts on speed.
Problem solving based upon training and experience	Problem solving based on logic of the interface	Problem solving based upon training and experience
No explicit task support	Explicit task support from interface	No explicit task support
Unwritten hierarchy based on ability to use system.	Hierarchy based on effective interaction with customer.	Hierarchy based on ability to use the system and delivering an enhanced customer interaction.

Table 2: DOS verses Forms verses GUI: Demands on the Advisor.

These forms based GUIs have not deskilled the advisors, since they don’t always follow the advice of the system. The advisors tend to use their experience to gauge whether it is appropriate (Randall et al, 1995) and use conversational skills to manage and control the interaction.

2.4. Summary and Discussion.

Call centres are the voice, if not the face, of the organisations that operate them. They play a key role in delivering customer experience and enhancing brands. However, they often have to balance the contradictions between delivering a quality customer service whilst increasing standardisation and consistency, reducing costs and increasing profitability. Call centre management has largely remained unchanged since the early 20th Century. They tend to follow a ‘mass production’ model that often inadvertently causes advisors to mistreat customers. Integration of computing and telephony has served to intensify work whilst

Tayloristic management principles have reduced variation, increased focus on productivity and imposed extrinsic motivation through targets and incentivisation. This has resulted in one of the most regulated and monitored environments in modern industry. The intensity of work (both in terms of task completion and 'emotional labour'), controlling management style and low levels of employee discretion has tended to result in high levels of employee churn. This creates a 'cycle of failure', where less skilled advisors are recruited on lower levels of pay and reward, with less knowledge and less investment in training and development. This tends to act against the delivery of a quality customer experience.

One of the fundamental assumptions of this thesis is that the currently dominant, mass production model of call centre management will start to evolve towards a 'mass customisation' model. This aims to deliver efficiencies in terms of task completion as well as the customer relationship. As basic and mundane tasks are automated, the onus is placed on the customer service advisor to supply knowledge, complex problem solving skills, empathy and reassurance to the customer. However, to do this requires a shift towards the principles of the 'service-profit' chain (delivering service through an increased emphasis on employee satisfaction as well as customer satisfaction). New models of management, measurement and process as well as technology are needed to increase the focus towards empowerment, motivation and retention of good call centre advisors.

The role of the user interface is to mediate and improve both the effectiveness and affective nature of the interaction between the advisor and the customer. CRM implies the use of customer data to enhance the relationship with the customer. It requires getting the right information to the advisor in a timely manner. The MUI needs to support and enable more effective knowledge management and empowerment strategies. It must also address both the task and emotional components of call centre work. It needs to decrease levels of cognitive overload through increasing usability and accessibility of knowledge. It should also help advisors do their job whilst also tapping into what motivates them in an attempt to reduce the current levels of staff turnover. It also needs to increase technology acceptance within a

Chapter 2: Contexts.

largely technologically illiterate advisor population (who are generally employed for their skills in handling people rather than technology).

The next chapter considers the key drivers of motivation both in terms of the advisors' jobs and their willingness to accept new technologies.

Chapter 3: The Psychology of Motivation and the Rationale for Incorporating Motivation into User Interface Design.

It is probably fair to say that human motivation is one of the most mysterious, hotly debated and widely misunderstood aspects of human psychology. However, in order for MUIs to be truly 'motivational', the psychology of human motivation, motivation to work and theories of technology acceptance need to be addressed.

This chapter critiques the current paradigm of motivation that is widely used in call centres as being too simplistic. It then discusses why people choose to accept or reject technologies. Finally, it presents a model of motivation, based on a review of organisational, management and psychological theory, around which MUIs can be designed.

3.1. Motivating Individuals: A Critique of the Current Call Centre Paradigm.

"The fact is that targets don't help us get to where we want to be. Worse, they actually obviate the possibility by making people focus on the wrong things... use measures that relate to purpose, not budget" Seddon (1999).

3.1.1. Taylorism and Transaction Economics.

Since approximately 60% of call centre costs are personnel (D'Alessio and Oberbeck, 2002), conventional finance modelling dictates that these costs need to be minimised by ensuring that all employees are utilised to their maximum. Most call centres are run along the lines of what Zuboff and Maxmin (2003) call "transaction economics". All the performance measures are designed to optimise productivity and minimise costs. This provokes the "management of contradictions" (Purcell and Kinnie, 2000) with the inevitable trade off between quality and cost (see discussion in 2.1.2). Everything that can be measured is measured through the call centre ACD and MIS (see 2.1.1).

Typical measures include:

- Service standards - productivity levels, time to answer call/ respond to e-mail, average handling time, 'wrap' time, time available to take calls, call waiting times and abandon rates.
- Cost per transaction.
- Number of sales/ hits /contacts.
- Customer satisfaction.

These measures are ingrained in call centre culture. Figures such as PCA 15 (Percentage of calls answered in fifteen seconds) are benchmarked and even legislated against as a service standard. With the exception of customer satisfaction, typical service measures are all tangible internal measures of efficiency. They assume that service work can be treated as a production line, with statistics dictating that customers are all the same and their needs can be treated as units to be measured and bonused on. This is an overly simplistic model that is used to drive and motivate customer service people through targets, bonuses and incentives (Seddon, 2003).

This model also assumes that customer service advisors perform efficiently throughout their shift and are measured as if they were automata, processing work in an emotionless manner. Measures do not take into account that customer service is emotional labour (Hochschild, 1983 – see 2.1.3). It is hard to deal with customers on a daily basis. They are endlessly demanding, often difficult and frequently angry. These measures do not account for emotional strain, stress or fluctuations of energy levels during an average shift (as the unpredictable production line in the cartoon in Figure 12 shows – boxes may look the same but their contents, when opened, may need to be handled differently).



Figure 12: “The Cat in the Box” (Courtesy: Rinat Baibekov).

With 68% of customers citing indifference from a staff member as a key motivation for removing their business (Coopers and Lybrand, 1993), these measures fail to cater for the practical needs of the people on the front line. By focussing on targets and measures, the front line often feel pressured to rush. This can lead to errors and, at worse, can encourage advisors to abandon difficult customers to keep their statistics healthy. As Seddon (1999) states, “the fact is that targets don’t help us get to where we want to be. Worse, they actually obviate the possibility by making people focus on the wrong things”. Where measures are introduced it is important that they relate to improving the system not used to judge performance of individuals in the system (Seddon, 1999). It is the improvement of the process that should justify the use of metrics, not their use as techniques for management control (Seddon, 2003).

The rationale for this ‘economic’ or ‘mass production’ (see 2.1.2) theory of motivation can be traced back to the writings of F.W. Taylor (1911). Taylor, who came from a well-to-do Philadelphia family, was a foreman in a Pittsburgh steel mill. He devised a means of detailing a division of labour in time-and-motion studies and a wage system based on performance. Subsequently, it would increase profits for business owners. It would appear to be the “only way to go” in managing and motivating people. However, Taylor’s concept of motivation started and finished with monetary incentives and he believed that the largely uneducated workforce in his mills were inherently lazy. Taylor’s attitudes towards workers were laden with

negative bias and he believed that "in the majority of cases, man deliberately plans to do as little as he safely can".

The predominant model of organisational motivation in use in call centres today is largely based upon these economic theories of motivation, rather than any theories based on either psychological or sociological evidence. The prevailing assumption is that, unless sufficient incentives are given, workers will not work.

Nagin, Rebitzer, Sanders and Taylor (2002) review theories of opportunistic behaviour and found that there are 3 basic forms of behaviour operating in these economic models of motivation:

- **"Rational cheater"** – assumes employees are self-interested actors who continuously probe their environment for opportunities to improve their welfare. Opportunistic behaviours (e.g. cheating) offer the possibility of increasing employee benefit at the expense of the employer or the customer. They will do this if they perceive that the benefits outweigh the costs.
- **"The Conscience Model"** (March, 1994) – opportunistic behaviour must be consistent with the "identity" of the individual. People follow rules or procedures they see as *appropriate* to the situation and their self-perception of how they *should* behave in that situation. If honesty is part of an individual's personal identity then the cost of inappropriate or unethical behaviour is high (echoed in sociological literature on the role of shame and embarrassment as a mechanism of social control (Grasmick and Bursik, 1990; Nagin and Paternoster, 1993)).

The conscience model suggests a different organisational approach to the rational cheater model. Rather than focusing on the expected consequences of opportunistic actions, the management relationship is more about establishing identities that are inconsistent with opportunism. Akerlof (1982) suggests that a high wage encourages employees to behave according to the rules of gift exchange. This implies a sense of

reciprocity and mutual obligation which reduces opportunism. Kreps (1997) discusses the fact that monetary incentives and/or close supervision undermines social identities that result in intrinsic motivation to do a good job. Peer pressure can also play a role in this (Kandel and Lazear (1992); Encinosa et al (2000)). Supervisor expectations can also shape employee behaviour (Livingston, 1969) by altering the self-esteem of their teams. Heavy handed monitoring sends the wrong signals because it implies that management expect people to be opportunistic. Under the conscience model, monitoring may actually increase instances of cheating and skiving (Drago, 1989).

- **“Impulse control” model** (Frank, 1988) – this psychological theory proposes that rewards that bring instant gratification are more attractive than those that do not. This implies that people put inordinately high value on immediate payoffs rather than those that are slightly delayed. Some people are more prone to impulse control problems than others (backed up by many studies from criminology, e.g. Wilson and Herrnstein (1985); Gottfredson and Hirschi (1990); Moffit (1993)).

This model would imply that by increasing the short-term penalties of shirking to offset the immediate gains, opportunistic behaviour would be deterred. The longer-term costs (e.g. job loss) would have little effect on behaviour.

Experiments have shown that a sizeable fraction of people tend to behave according to the rational cheater model (Nagin, Rebitzer, Sanders and Taylor, 2002; Prendergast, 1999; Cappelli and Chauvin, 1992; Landers et al, 1996; Berman, 2000; Encinosa et al, 2000; Lazear, 2000). Employees respond to the reduction in monitoring by quickly becoming more opportunistic, especially those who perceived the employers to be unfair and uncaring. However, a significant fraction did not exploit any of the manipulations in monitoring. The conscience model seems to be operating here because the environment is shaping behaviour. Workers who are inclined towards opportunism cheat when the material advantage of doing so increases. To counteract this, employers impose monitoring and incentives which make cheating unprofitable. The implication of this model is that a decrease

in surveillance will result in an increase in cheating. Since the ultimate penalty is job loss it would also predict that the people least likely to cheat are those for whom the job means the most.

This suggests that monitoring and incentive strategies are needed to regulate the margin of employees who are behaving opportunistically. However, they must also serve to help the employees who are not opportunistically motivated.

However, this approach fails to take into account either the complexity of the task being performed or the effect of peer pressure on group behaviour. Experiments by Zajonc (1965) showed that there is a 'social facilitation effect' that occurs with highly skilled workers who are being monitored. They were shown as being more productive than highly skilled unmonitored workers. Levels of self-efficacy mitigated this effect (Bandura, 1997).

Measures are usually further reinforced by incentivisation. Incentives work on a very basic level of operant conditioning (Skinner, 1974), with reward and lack of reward acting as positive and negative reinforcements to change behaviour. The management of behaviour is based on the tacit belief that people are motivated only by external rewards or by the fear of external punishment. People have been conditioned from an early age to respond to money and status (Kohn, 1999). However, extrinsic rewards (e.g. bonuses) are not the primary reinforcer of basic human needs (Csikszentmihayi, 1975). Extrinsic rewards often devalue the task and the enjoyment of it because it implies that the task is worthless and the justification is the reward. Incentives can rapidly lead to unexpected short-term behaviour modifications. If people start to fail or miss their performance targets, they 'cheat' and do what they need to do to keep the boss happy (Seddon, 2000; 2003). This can act against the customer experience.

Incentives can motivate short term but may distort behaviour if people lose sight of why they are being rewarded (Seddon, 2003). In a call centre where success is measured solely in terms of number of calls answered, it is not uncommon for customer service advisors to repeatedly cut off calls to improve their statistics. This obviously does not achieve the aim of

improving the customer experience but results in a positive reinforcement from the system. The danger is that measures simply reinforce the status quo because exceptions don't figure on the radar. It also directs the innovation and energy of the people on the front line away from the customer and towards playing the system. Incentives may encourage short-term modifications in behaviour but because they are driven extrinsically, they do little to influence the value system of the person. Worse still, people start to focus on the reward itself rather than the reason that the reward was put in place.

Many incentive schemes follow Taylor's (1911) economic model of motivation and start and finish with monetary incentives. However, there is a substantial body of research (Deci, 1971; 1972; 1975; Lepper and Greene, 1978; Hamner and Foster, 1975; Lepper, Greene and Nisbett, 1973; Pinder, 1976; Pritchard et al, 1977; Ryan, Mims and Koestner, 1983; Deci and Ryan, 1985; Frey, 1997; Csikszentmihayi, 1975; Seddon, 2000, 2003; Kohn, 1999) that suggests that, under certain conditions, intrinsic motivation can be diminished by external incentives such as monitoring or performance related pay. This is explained using Deci's cognitive evaluation theory, which argues that the introduction of an extrinsic reward causes a shift from internal to external focus as well, as a shift in feelings of competence and self determination (Deci, 1975). Frey (1997) suggests that management intervention can be seen as either controlling (a command) or informative (a reward). If something external is controlling behaviour (i.e. not self determined), the response is to change something that the person does not have control over, so they reduce their intrinsic motivation. If something external is informative (e.g. positive feedback) and permits autonomy of action then intrinsic motivation is unchanged or increased.

There is also an increasing amount of research that questions the effectiveness of economic incentives as a motivator. Minkler (2002), Deming (1986), Seddon (2000) and Kohn (1999) in their surveys of employee motivation note that there is little empirical evidence to back up the assertion that economic incentives and monitoring actually work as motivators. Critics of the economic approach assert that pay is not a good motivator but it can be a powerful demotivator (Kohn, 1999). Target setting is often a key factor in high levels of employee

dissatisfaction (Bain et al, 2002). Targets are often set, not on scientific grounds, but according to the capabilities of the electronic performance monitoring systems that are in use (Smith et al, 1981). Monitoring against targets often means that task complexity must be reduced to simple, measurable components (Smith et al, 1992). Goodhart's Law (a socioeconomic analogy of Heisenberg's uncertainty principle in quantum mechanics) also maintains that 'when a measure becomes a target, it ceases to be a good measure' since measuring a system usually disturbs it (Hoskin, 1996; Strathern, 1996).

In addition, internal competition can breed when ranking and comparing individuals. This undermines motivation and collaboration amongst people that were, at least at first, working well together (Deming, 1986).

Motivation drivers are also very individual. Taylorism assumes that all employees are motivated by self-interest. This simplistic model of motivation may be the predominant one in the call centre, but this evidence seems to show that the approach is fundamentally flawed. Motivation is a far more individual and complex phenomenon.

3.1.2. The Electronic Panopticon: Monitoring, Command and Control.

The integrated telephony and computing functions of the call centre provide the structure and optimisation of the work to be done (what Taylor and Bain (1999) term "a production line in the head"). Diallers and switch technologies maximise and intensify work for the advisors with gaps between calls reduced (Ferne and Metcalf, 1998). However, the same technology also generates extreme levels of surveillance, monitoring and speed which are manifest in the call centre. It is the use of surveillance control systems taken with the 'mass production' mind set, that is indicative of a cost minimisation, command and control environment. This prompted Wylie (1997) to brand call centres "the dark satanic mills of the late twentieth century" and Garson (1988) to call them "electronic sweatshops".

One of the aspects of an environment driven by economic incentives and the rational cheater paradigm, derived from Taylor's scientific management, is the need for control and inspection.

In the call centre this tends to be represented through targets, scripting, service standards, call recording and management call monitoring. A fairly typical call centre performance evaluation system is shown in Figure 13.

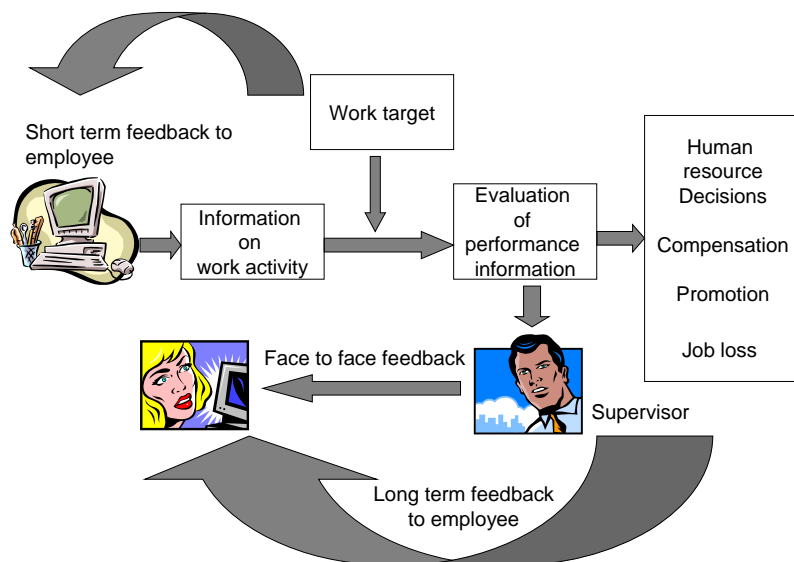


Figure 13: A typical call centre performance evaluation system (Amick and Smith, 1992).

Monitoring consists of two main methods (Holman, Chissick and Totterdell, 2001):

1. Electronic performance monitoring. This involves the automatic and remote collection of quantitative data (e.g., call times, number of sales, call type, time available to take calls). It also permits the continuous monitoring of performance through the MIS. Zuboff (1988) observes that this kind of technology has made the work transparent and that “workers’ behaviour is now almost as visible as their work.” These measures are typically made public through the use of digital wallboard displays throughout the call centre (Lankshear and Mason, 2001; Taylor and Bain, 1999). This is a visible reinforcement of the centrality of targets to the call centre operation (Edwards, 1979; Callaghan and Thompson, 2001).
2. Traditional forms of monitoring. Team leaders or coaches listen into calls. Advisors are assessed against prescribed call protocols that include how the customer should be greeted, adherence to legal and regulatory rules and call ending conventions. This can be conducted remotely (with or without the advisor's knowledge) or side-by-side and tends to be conducted on a regular basis. Certain call centres will record all calls. Feedback, when it comes, tends to be negative (Amick and Smith, 1992).

This continuous cycle of monitoring has prompted comparisons between the call centre and the Foucaultian 'electronic panopticon' (Ferne and Metcalf, 1998; Taylor and Bain, 1999; Lankshear and Mason, 2001; Knights and McCabe, 1998; Macdonald and Sirianni, 1996). Foucault (1977; 1980) drew upon the ideas of 'Bentham's Panopticon' as the perfect form of control through implied surveillance and the capacity to induce self-discipline by exploiting uncertainty (Lankshear and Mason, 2001).

In 1791, the English philosopher and social reformer Jeremy Bentham proposed a new era in penal reform with the publication of his book, 'Panopticon' (literally 'the all seeing place') or 'The Inspection House'. His idea comprised a central observation tower positioned at the hub of a circular building with the surrounding cells potentially subject to observation at all times (see Figure 14). The introduction of uncertainty and fear in the system – where people in the cells do not know when they are being watched – means that people are more inclined to behave themselves all the time because they could be observed at any point.

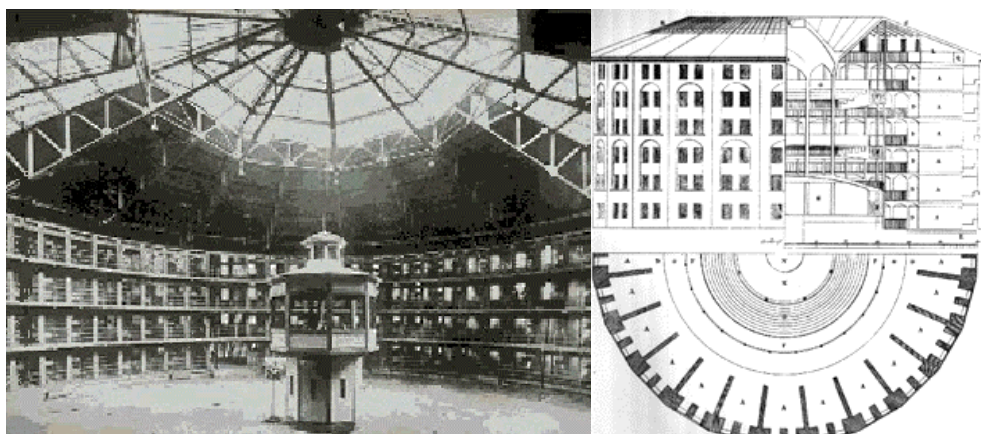


Figure 14: Bentham's Panopticon.

There are a number of criticisms that can be levelled at this panoptic, command and control approach. It tends to assume that advisors are passive and that the power of unionisation and individual motivation has no impact on the call centre operation (Taylor and Bain, 1999, 2000; Lyon, 1994; Thompson and Ackroyd, 1995). Lyon (1994) suggests that "the factory and

the office are neither prison nor asylum, their social architectures never those of the total institution”.

It also assumes that the model is used negatively rather than being used to positively influence the system. The negative implication of monitoring can be interpreted as indicating a lack of trust of the front line since they are potentially under surveillance at all times. Kupfler (1997) suggests that “monitoring behaviour or collecting data projects a disvaluing of the self in question”. Heavy handed monitoring sends the wrong signals because it implies that management expect people to be opportunistic and shirk or cheat (March, 1994). Productivity monitoring can also increase perceptions that quantity is more important than quality (Gallatin, 1989; Shell and Allgeier, 1992). However, surveillance can be used to positively improve the quality of interactions and help guide advisor training and smooth the flow of work to ensure that advisors are neither over nor under burdened (Lankshear and Mason, 2001).

Excessive monitoring may have the opposite effect to that intended. Over long periods it can make employees more stressed and less satisfied (Aiello and Shao, 1993; Smith et al, 1992; Gallatin, 1989).

Higher levels of anxiety brought about by constant monitoring may cause people to devote their cognitive resources to dealing with that anxiety rather than focusing on providing a quality customer service (Kuhl, 1992). Schleifer (1990) reviewed the literature on electronic performance monitoring and stress and concluded that there appeared to be a theoretical basis and some empirical evidence which supports the premise that electronic monitoring techniques can alter basic job dimensions (e.g. increased workload and reduced job control). This is likely to produce stress (as predicted by Karasek’s (1979) job strain model). Monitoring may also reduce opportunities for employees to socialise at work. Aiello (1993), Amick and Celentano (1991) and Amick and Smith (1992) found that increased feelings of social isolation and the resulting loss of social support tended to increase stress. Zachary (1997) compared depression, tension, fatigue and anxiety across monitored and non-monitored environments (see Figure 15) and found that monitored subjects suffered more across all dimensions.

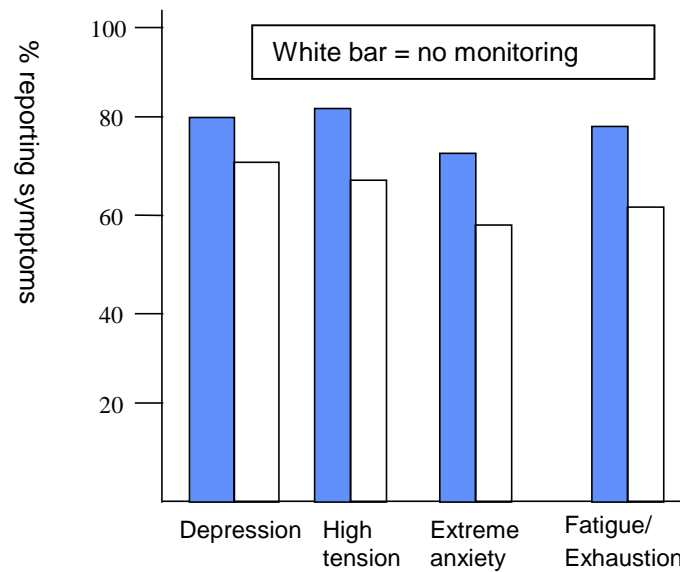


Figure 15: Psychological stress and monitoring (Zachary, 1997)

This monitoring can also act to decrease job satisfaction. A number of studies (Turner and Karasek, 1984; Smith et al, 1992; DiTecco et al, 1992; Cahill and Landsbergis, 1989; Grant and Higgins, 1989; Irving et al, 1986) have shown that monitoring technology can have both direct and indirect effects on employee stress and health. This can impact on employee satisfaction (which, from the evidence of the service-profit chain (Heskett et al, 1997), can also influence customer satisfaction and profitability).

Monitoring an increasingly complex set of tasks in the call centre could, theoretically, decrease performance. There is evidence that people are better at learning new things, being creative and doing intellectual tasks when not under close scrutiny – ‘the social inhibition effect’ (Kohn, 1992; Johnson et al, 1981; Workie, 1974; Goldman et al, 1997). This is the opposite of the ‘social facilitation effect’ (Zajonc, 1965; Bond and Titus, 1983; Aiello and Svec, 1993), which found that highly skilled workers who were monitored were more productive than highly skilled unmonitored workers. The converse was found with low skilled workers. For tasks that are well learned and do not require acquisition of new skills or novel responses, working around others (especially outsiders (e.g. managers) who are thought to be judging work) seems to enhance performance. In this case, paradoxically, managing productivity can undermine productivity.

The act of measuring internal factors forces managers to look at output rather than results. Management by control encourages people to look inwards at their structure rather than outwards to the customer (Seddon 2000; 2003; Zuboff and Maxmin, 2003). Success becomes the ability to meet the targets rather than meeting customers needs. This changes the nature of employee evaluation, since electronic monitoring technology allows employers to monitor the production output of their employees (Zuboff, 1988). Employers frequently set production standards in an attempt to encourage their employees to produce more in shorter amounts of time. Targets are generally set based upon averages and aspirations rather than on an individual and realistic basis. Performance standards often make quality employees feel negatively about their job and cause them to be demotivated to strive to achieve greater things. When employees who are not meeting standards (often due to factors not under their control – e.g. unusual customer demand or systems problems) receive negative feedback, they are likely to find their jobs less fulfilling and more stressful.

The implications for MUI design are that simplistic models of motivation – i.e. simply replicating the call centre wallboards, showing the number and duration of calls or even the accumulation of bonus for an individual – will only work on a purely extrinsic level. This is unlikely to be sufficient to produce the long-term behavioural effects and influence aspects such as employee motivation, retention and, ultimately, customer satisfaction (Seddon, 2000, 2003; Kohn, 1999). The other point of interest is looking at the resulting stresses that can be caused by monitoring, lack of control or system problems. These factors also contribute to increased levels of absenteeism and turnover and, in worst cases, can affect the customer experience due to the resulting physiological responses causing elevated levels of adrenaline and other neurochemicals coursing through the advisor's body. This can result in diminished abilities with respect to attention (Kitayama and Niedenthal, 1994), memory retention (Kahneman, 1973), learning (Lewis and Williams, 1989), thinking creatively (Isen et al, 1987) and polite social interaction (Goleman, 1995).

Extrinsic and Tayloristic models of motivation seem to work only in the short term and are too simplistic to adopt as a model for the MUI. Therefore, the first step in the design of the MUI

was to understand the fundamentals of motivation and assess whether elements of motivational psychology could be harnessed in the design of the call centre interface.

3.2. Why Consider Motivation in the Context of Technology?

“It will become important for most people designing end-user computing products to understand how principles of motivation and influence can be designed into interactive experiences with computers. As end-user computing matures, understanding this may become as important as understanding usability”, Zimbardo (cited in Fogg, 2002).

The previous section considered how the underlying assumptions of human motivation are often too simplistic. However, the MUI's objective is not just to motivate people to do their job, it is also designed to help motivate call centre advisors to accept and use the technologies that are available to them. It is acknowledged that technology alone cannot motivate since the context and culture of usage will also be instrumental. However, MUIs could help facilitate motivation in environments where the management style and measures support a culture of motivation. The implication is that organisational culture and practices may also need to change when a MUI is implemented.

3.2.1. Is Usability Sufficient for Technology Acceptance?

Motivation needs to be considered in the context of technology for one major reason. It is becoming increasingly apparent that usability is no longer sufficient for user adoption of technology (Jordan, 1997, 2000; Glass, 1997). Ease of use has become expected so usability no longer serves as a satisfier by itself. It is, however, a dissatisfier if absent (Green and Jordan, 2002).

Usability is defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use” (ISO Standard 9241). This includes:

- Effectiveness – the accuracy and completeness of goal achievement.
- Efficiency – the resources expended in relation to accuracy and completeness.
- Satisfaction - the comfort and acceptability of system.

Satisfaction addresses user feelings but tends, in this context, to be used more as a measure of perceptions of effectiveness and efficiency. These may not be the only satisfiers for the user. Even if systems increase performance, people are not always willing to use them (Nickerson, 1981).

Reflecting the functional heritage of the usability profession, most usability methods tend to focus on enabling users to accomplish particular tasks, without wanting to have to expend unnecessary effort or endure any physical or mental discomfort (Jordan, 1997). Methods emphasise analysis of context of usage, user involvement throughout the process, early prototyping and objective evaluation.

However, in characterising users in terms of task and/or cognitive parameters, HCI methods have largely ignored the rationale for technology use and the holistic nature of the user-system experience (including user emotions, attitudes and motivations). Ease of use is a necessary but not always sufficient condition for system use (Mathieson, 1991; Barki and Hartwick, 1989). Contrary to usability, users sometimes use difficult products because they find them intriguing, playful, challenging, surprising or memorable and they enjoy the experience (Overbeeke et al, 2003). If systems are not used, they are unlikely to make an impact or a return on investment (Trice and Treacy, 1988). This lack of return on investment can call into doubt the value of HCI and user centred design (Lindgaard and Millard, 2002).

It has been suggested that the focus of human computer interaction needs to shift from a perspective of ease of use to a perspective of 'joy of use' (Hassenzahl et al, 2001; Glass, 1997). Usability is often treated separately from aesthetics which means that what often happens is that we get "products which look good at first sight but frustrate as soon as we start interacting with them" (Overbeeke et al, 2003). Overbeeke et al (2003) call for a shift from 'beautiful interaction' to 'engaging interaction' by bringing together 'contexts for experience' and 'aesthetics of interaction'.

This focus on the emotional side of computing is a growing area of research, not only with regard to the significance of computers that can recognise and express emotions, what Picard (2000) terms “affective computing”, but also in terms of computers and interfaces that aim to engender positive affective states in the user, termed “affective design” (Johnson and Wiles, 2002). This research encompasses traditional user needs analysis, emotional design (Swanson, 1987; Thompson et al, 1991; Jordan, 1997, 2000; Norman, 2004) and user experience design (Lazzero and Keeker, 2004; Shneiderman, 2002).

3.2.2. What Does Motivate People to Accept Technology?

“Most systems that aren’t accepted fail because organisational, psychological and behavioural issues are not considered in design”, Wexler (2001).

In terms of technology acceptance, Dix (2001) has stated that, in order for a system to fulfil its function, it must be:

- Useful – It needs to do what the users need (i.e. functionality) otherwise user motivation will be significantly compromised.
- Usable – The users can do things easily and effectively (i.e. usability).
- Used – The users actually do start and continue to use the product. This includes acceptance within an organisation, perceived usefulness, desirability and marketing so users know it’s there and want to use it, etc.

Although usefulness and usability are positively correlated, making a product more usable does not necessarily ensure that it is used (Nielsen and Levy, 1994).

Reeves and Nass (1996) have asserted that people often respond socially to computers. They argue that human machine interaction has the same (or similar) rules as human-human interaction. This implies that the same methods that are used in social and cognitive science to evaluate human-human relationships can also be applied to human-computer relationships (Nass, Steuer and Tauber, 1994). These findings mean that designers can use human analogies and leverage pre-existing knowledge from psychology and social science relating to social and interpersonal relationships (Reeves and Nass, 1996). This is not an opportunity to build human-like machines but to address and acknowledge the user’s emotional, as well as functional, needs in an interaction (Picard and Klein, 2001).

Given that human-human interaction can incorporate elements of persuasion and motivation, Reeves and Nass's (1996) work suggests that technology could be designed in ways that can help users become motivated. Fogg (2002) suggests that IT can act as a 'persuasive technology'. His "captology" (computers as persuasive technologies) theory proposes that interactive technologies can operate to change opinions, attitudes and values and to affect the behaviour of people. He suggests that computers can do this in three ways depending on whether they are perceived as a tool, a medium or a social actor (see Figure 16):

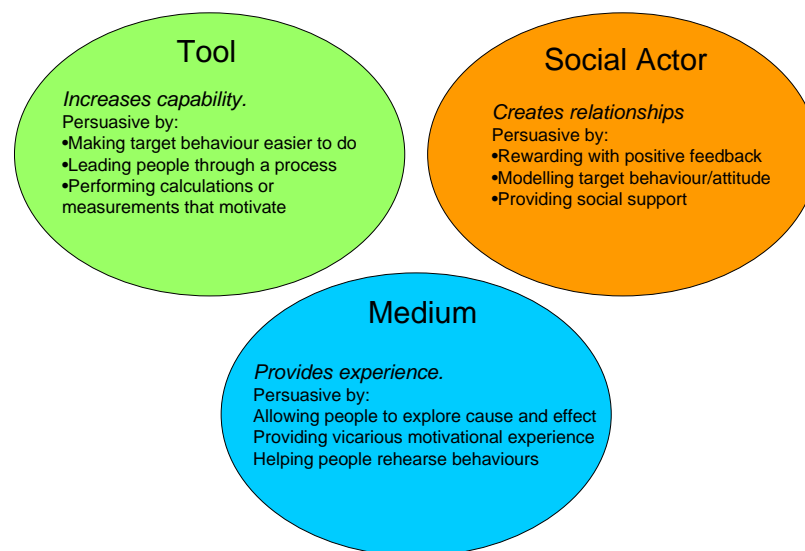


Figure 16: The 3 roles of technology (Fogg, 2002).

The implications of this for the MUI are that:

- As a tool, the MUI needs to enhance the customer service advisor's capabilities to serve the customer by helping them navigate through the vast amounts of knowledge on customer, product and process.
- As a medium, the MUI needs to be a vehicle for motivational behaviours and allow exploration of the knowledge space without fear of punishment but providing feedback on progress.
- As a social actor, the MUI needs to support the more social and collaborative aspects of work.

However, the MUI can serve all three functions at different times during the course of the advisor's day. This suggests subtle differences in design approaches to support these three different modes of working.

Functionality and usability are elements that can be designed into technology and can be interpreted as the system's 'intended character' (Hassenzahl, 2000). The intended character includes product attributes that are designed to reduce cognitive complexity and trigger particular strategies for handling the system through comparison with other systems, expectations, familiarity etc. From the user perspective, perception of systems features creates an 'apparent product character' consisting of both pragmatic and hedonic characteristics. This then leads to a judgement about the product's appeal and the resulting emotional and behavioural consequences are then moderated by the specific usage situation. In this way, the user's emotional response to the technology's apparent character and context is often the determinant of whether the system is actually used (Swanson, 1987; Thompson et al, 1991).

Venkatesh (2000) suggest that there are a number of variables that affect how users perceive the ease of use of specific systems:

- Computer self-efficacy (internal control) – users' general confidence level in using new computer systems.
- Facilitating conditions (external control) – influencing factors of IT speed and accuracy and the degree to which peers have embraced the new technology.
- Intrinsic motivation/ computer playfulness – usage of computers outside work for enjoyable and personal tasks tends to increase technology acceptance.
- Emotion or level of computer anxiety – general concern about ability to use IT systems.
- Objective usability – does it help the individual to do their job better?
- Perceived enjoyment – degree of user satisfaction with the system.

Venkatesh (2000) found that only 'objective usability' and 'perceived enjoyment' influenced acceptance over time. The other variables determine initial perceived ease of use.

Social psychology has shown that behaviour is best predicted from a person's attitude towards the desired behaviour (e.g. using the computer system) rather than the attitude towards the technology itself (Fishbein and Ajzen, 1975).

The most extensive research into motivation and usage is in the field of technology acceptance and, in particular, the work of Davis, Bagozzi and Warshaw (1989). They evolved the technology acceptance model that posited that perceived ease of use (i.e. "the degree to which the user expects the target system to be free of effort" (Davis et al, 1989)) would influence the perceived usefulness.

These, in turn, predict the attitude towards the use of the system. Attitude ("the user's evaluation of the desirability of the use of the system" (Davis et al, 1989)) and usefulness (i.e. the user's "subjective probability that using a specific application system will increase his or her job performance" (Davis et al, 1989)) will influence the intention to use the system. Intention to use predicts actual use (see Figure 17).

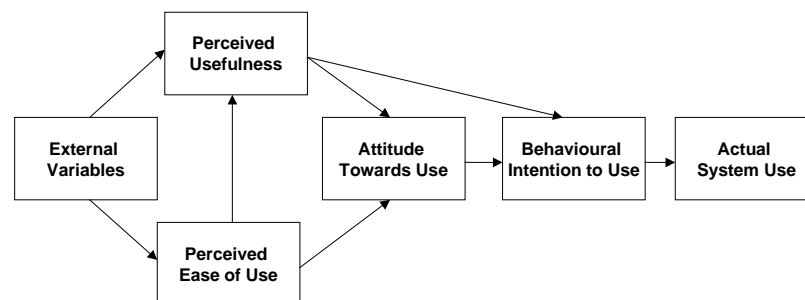


Figure 17: The Technology Acceptance Model (Davis, Bagozzi and Warshaw,1989).

The theory of planned behaviour provides a greater degree of detail underlying this model and can also provide a model for technology adoption (Yeaman, 1988; Mathieson, 1991 and Davis et al, 1989 – see Figure 18).

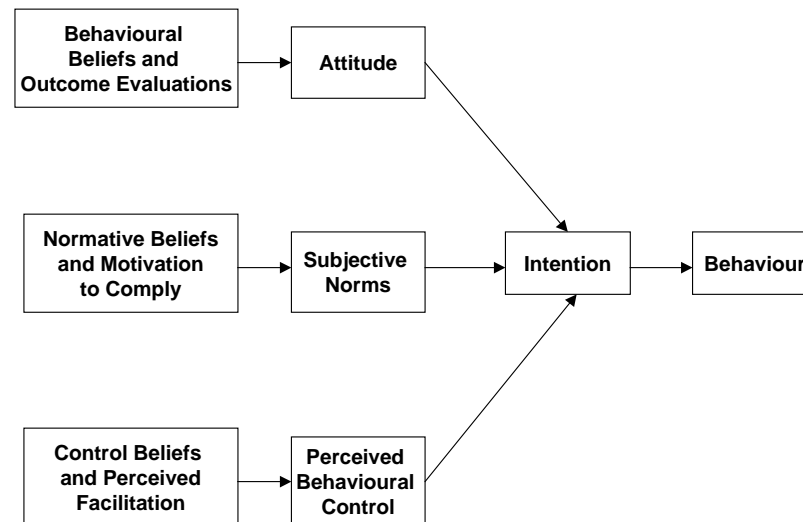


Figure 18: Theory of Planned Behaviour.

This theory suggests that behaviour is determined by the intention to perform the behaviour.

Intention is predicted by:

- Attitude towards use of the technology – individual’s perception of whether the technology will be useful and help them to do their job.
- Subjective Norms – individual’s perception of social pressure to perform the behaviour. Usually with respect to “referent others” – people or groups whose beliefs are important to the individual.
- Perceived Behavioural Control – individual’s perception of control over the performance of the behaviour – availability of resources, skills and opportunities.

Underpinning these are beliefs. A ‘Normative Belief’ is about perceptions of group compliance towards the desired behaviour. ‘Motivation to Comply’ is the extent to which the individual *wants* to comply. A ‘Control Belief’ is a perception of the availability of skills, resources and opportunities in a given situation. ‘Perceived Facilitation’ is the assessment of the importance of these resources to the achievement of outcomes.

For example, if a call centre advisor has a new system, one potential outcome is improved customer service. The behavioural belief is the extent to which the advisor believes that using the system *will* actually improve customer service. The associated outcome evaluation

depends on how important the individual believes improving customer service is. Behavioural beliefs are multiplied with outcome evaluations. They will have the greatest impact on attitude if the advisor believed that the system would improve customer service *and* that they believe that customer service improvements are important.

If the advisor felt that other advisors would support the use of the system (normative belief) and the advisor valued the beliefs of the others (motivation to comply) they would be more likely to use it. If the advisor felt their colleagues supported system use, but they didn't care about other's opinions, then the intention to use the system would not be influenced.

Nickerson (1981) suggests that there are other reasons why systems are not used. These include:

- General resistance to change.
- Feeling that using a computer is beneath one's status.
- Fear that introduction of a system will deskill the user.
- A feeling that the system is too difficult to master.
- Replacing well-known procedures.
- The threat of obsolescence or devaluation of hard won skills.

The introduction of a new system will inevitably change the nature of tasks, the job and the individual's perception of their job and its value. Margulies (1980) has emphasised the importance of considering job satisfaction in technology implementation programmes, especially if the system is perceived as deskilling a job. People who have acquired specialised knowledge over many years may feel threatened since their knowledge may become obsolete. This was the reason that the forms based interface described in 2.3.2.2 was rejected (despite being classed as usable), since it had undermined the unwritten hierarchy which was based upon the expertise in the use of the old command line system. This resulted in the new system only being used 36% of the time on calls even three years after implementation.

3.2.3. Rethinking Usability in Motivational Terms.

Technology acceptance theories point towards the notion that technology should address both usability and affective needs. Logan (1994) has re-examined and expanded the definition of usability, proposing that usability has two elements: behavioural and emotional:

- *Behavioural* usability, addresses user needs as defined by the more traditional HCI approach. Specifically, it “refers to the ability to complete some functional or goal directed task within a reasonable time” (Logan, 1994)
- *Emotional* usability refers to “the degree to which a product is desirable or serves needs beyond the traditional functional objective” (Logan, 1994).

However, Logan provides no model about whether and how behavioural and emotional usability influence each other.

Hassenzahl, Beu and Burmester (2001) echo Logan's model but examine the relationship between behavioural usability (what they term ‘ergonomic quality’) and emotional usability (termed ‘hedonic quality’) – see Figure 19.

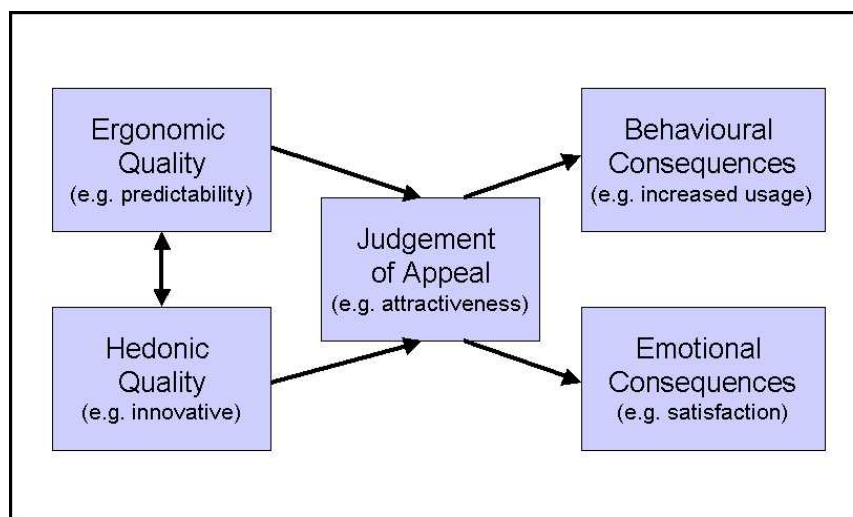


Figure 19: Ergonomic and Hedonic Qualities for Technology Acceptance (Hassenzahl, Beu and Burmester, 2001).

Ergonomic qualities encompass the more traditional qualities of usability (Hassenzahl, Beu and Burmester, 2001) and emphasises the user need to achieve goals. Hassenzahl, Beu and Burmester (2001) suggest that this reflects the user need for security and control (hygiene

factors in motivation terms (Herzberg, 1959) – i.e. they do not lead to higher levels of motivation but their absence leads to dissatisfaction).

Hedonic qualities are defined as task unrelated aspects of design. Hassenzahl, Beu and Burmester (2001) suggest “extremely usable but tedious software might be as appealing to a user as an extremely unusable but thrilling one”. In the light of the observation by Reeves and Nass (1996) that people respond socially to computers, negative feelings towards systems can alter trust, co-operation and good faith on the part of the user. Humans are affective beings, motivated to action by a complex system of emotions, drives, needs and environmental conditioning (e.g. Myers, 1989). The hedonic qualities of the system are a result of the user’s emotional and cognitive appraisal of the software (Ortony, Clore and Collins, 1988).

Hedonic qualities have two components to them:

1. An inward quality – this is largely concerned with the user’s intrinsic motivation. This includes an individual’s personal development and growth (Hassenzahl, Beu and Burmester, 2001), the need for novelty and change and the need to balance stimulation and boredom (Berlyne, 1969; Csikzentmihalyi, 1975). It has been suggested that usability heuristics (e.g. Nielsen, 1994) and ‘joy of use’ are fundamentally incompatible since the former demands consistency and simplicity and the latter requires surprise and a certain amount of challenge and complexity (Carroll and Thomas, 1988; Desurvire et al, 2004).
2. An outward quality – this is largely concerned with the user’s extrinsic motivators, including social and environmental aspects. Technology and technology usage is a social artefact and usage can reflect a social hierarchy or a state of importance (Leventhal et al, 1983). By simplifying user interfaces, users may consider their job as being deskilled or de-professionalised (as evidenced in the transition between the DOS and forms based system described in 2.3.2.2).

Hassenzahl, Beu and Burmester (2001) suggest that the resulting appeal and attitude towards the system is a result of the relative importance that users place on ergonomic versus hedonic qualities. This is likely to be the result of a cognitive averaging process (as suggested by Information Integration Theory (Dougherty and Shanteau, 1999)).

Muller et al (1997) question whether productivity and efficiency should be the central values of HCI. The traditional approach fails to account for other, more emotional, aspects of human work. The MUI cannot address aspects of motivation that are the remit of job design. However, the MUI does need to reinforce and facilitate elements of motivation that are already in the call centre environment and introduce new elements which will serve to increase motivation both to use the technology and to improve the advisor's way of working.

3.3. Towards a Theory of Motivation for the MUI: A Review of the Psychology of Motivation.

Section 3.1. critiqued the motivators used within the call centre. However, it did not provide any suggestions of how motivational psychology could be used effectively to actually motivate advisors. The media equation (Reeves and Nass, 1996) points towards the fact that psychological theories of motivation could be applied to the MUI to enhance both task motivation and technology acceptance. To this end, the following section provides a review of the motivational literature and posits a 'shallow model' of motivation (i.e. one not based on deep levels of cognition (Sloman, 2001)) upon which the MUI can be developed. A review of the psychological theories upon which this is based can be found in appendix A.

3.3.1. Intrinsic versus Extrinsic Motivation.

Theories such as the service-profit chain imply that motivated employees are the key to achieving both customer satisfaction (Heskett et al, 1997) and organisational effectiveness (Smith, 1993). Facilitating acceptance of technology encompasses aspects such as usability, intrinsic motivation and perceived usefulness (Davis, Bagozzi and Warshaw, 1992) plus fun (Hassenzahl et al, 2000) and emotional engagement (Venkatesh, 2000). However, to

understand usage, it is necessary to understand the motivation of the user and how they decide to use a system or not (Mathieson, 1991). There is increasing evidence that people tend to respond to computers as social entities using principles of motivation and influence (Reeves and Nass, 1996; Fogg, 2002; Nass, Fogg and Moon, 1996). Therefore, a study on human computer motivation needs to be grounded in a high level theory of human-human motivation, influence and affect (as suggested by Muller et al, 1997 and Fogg, 2002). Motivation is a complex topic due, in part, to the fact that what motivates employees changes constantly (Bowen & Radhakrishna, 1991). For example, research suggests that as employees' income increases, money becomes less of a motivator (Kovach, 1987). In addition, most UK organisations express dissatisfaction with their appraisal schemes since they fail to actually motivate people and often cause increased levels of demotivation (Meyer, Kay and French, 1965; Pearce and Porter, 1986).

The dictionary definition of motivation describes it as:

- An act that provides direction or an external incentive.
- An internal, psychological call to action toward a desired goal.
- A stimulus that provokes action.
- Having a purpose and direction to stimulate behaviour.

The psychological literature provides further definitions:

- "The psychological process that gives behaviour purpose and direction" (Kreitner, 1995);
- "A predisposition to behave in a purposive manner to achieve specific, unmet needs" (Buford, Bedeian, & Lindner, 1995);
- "An internal drive to satisfy an unsatisfied need" (Higgins, 1994);
- "The will to achieve" (Buford, Bedeian, & Lindner, 1995).

Motivation implies behavioural consequences occurring due to either intrinsically directed motives (internal drivers) or extrinsically directed (from external needs/stimuli or external incentives/drivers).

Questioning call centre advisors about their work, one can find evidence of both intrinsically motivated and extrinsically motivated activities. This is a pattern typical of any complex

pattern of behaviour (Brandtzaeg, Folstad and Heim, 2003). Even the most boring tasks may include elements of intrinsically motivated activities. Similarly, enjoyable tasks can incorporate extrinsically motivated elements.

- **Extrinsic motivation:**

Extrinsic motivation is defined as performing an activity because it is seen to be important in achieving results which are separate from the activity itself, e.g. improved job performance, pay or promotions (Vroom, 1964; Lawler and Porter, 1967). Nearly all employment situations have some extrinsic incentives (e.g. salary, fear of job loss, performance related rewards).

Extrinsic rewards are, by nature, either scarce or expensive. So, once you have some, you have to get more to motivate and a vicious circle is created. As Csikszentmihayi (1975) observed “the more a person complies with extrinsically rewarded roles, the less that person enjoys the task and the more extrinsic rewards they need. The only way to break that cycle is to make that role more enjoyable”.

Extrinsic motivation is rooted in Skinner's (1974) theory of operant conditioning. This states those employees' behaviours leading to positive outcomes will be repeated and behaviours leading to negative outcomes will not be repeated. This theory, which still dominates modern organisational thinking, has managers positively reinforcing employee behaviours (through rewards) that lead to positive outcomes and vice versa with negative outcomes (through punishment). It is intriguing that Skinner's theories were entirely based on the behaviour of rats and pigeons under experimental conditions rather than human beings in work environments.

- **Intrinsic motivation:**

Intrinsic motivation is defined as performing an activity for no apparent reinforcement other than the performance of the activity itself (Berlyne, 1966; DeCharms, 1968; White, 1959). Deci and Ryan (1985) suggest that some people have a work ethic and choose to do good

work for its own sake. Frey (1997) suggests that people may have high intrinsic work motivation because:

1. The task is interesting. People doing boring, repetitive tasks (like many call centre advisors) tend to have low intrinsic work motivation and use the monetary reward as a rationale for going to work. However, once their income has risen above a level where they deem that they can live comfortably, they look for more meaning in their work and look for feelings of competence and self-determination (Maslow, 1970).
2. Personal relationships are involved which heighten feelings of recognition, trust and loyalty. Competition tends to destroy this.
3. They have some degree of influence or control over the way that they work. Supervision requirements decrease as employee involvement increases (Gordon, 1994).

Festinger's (1957) theory of cognitive dissonance posited that there is a tendency for individuals to seek consistency among their cognitions (i.e. beliefs, opinions). When there is an inconsistency between attitudes or behaviors (dissonance), something must change to eliminate the dissonance. In the case of a discrepancy between attitudes and behavior, it is most likely that the attitude will change to accommodate the behavior. Cognitive dissonance theory would, therefore, predict that external rewards should decrease intrinsic motivation, affect people's perception of why they work and their attitude towards the work. External rewards given for an intrinsically motivating task means that the person will perceive a shift in the locus of control to an external source (De Charms, 1968). In this way intrinsic motivation can be diminished by external incentives such as monitoring or performance related pay (Deci, 1971).

Frey (1997) suggests that an intervention can be seen as either controlling (a command) or informative (a reward). If something external is controlling behaviour (i.e. not self determined), the response is to change something that the person does have control over

which results in them reducing their intrinsic motivation. If something external is informative (e.g. positive feedback) then intrinsic motivation is either unchanged or increased.

There are also rational/emotional explanations for the decrease in intrinsic motivation in the presence of extrinsic incentives (Kreps, 1997; Deci, 1971). If an employee undertakes a task without the spur of some extrinsic motivators then the rational explanation is that they are enjoying the task since they are not being compelled to do it (Kreps, 1997). If extrinsic incentives are put in place then the efforts tend to be attributed to the incentive not the task and the enjoyment of the task diminishes (Deci, 1971; Kreps, 1997). Hence, money effectively “buys off” the intrinsic motivation for the activity. In his experiments Deci (1971) found that other external rewards, such as verbal reinforcement and feedback, seemed to increase intrinsic motivation when compared with subjects rewarded with monetary incentives.

There appears to be a dark area between extrinsic and intrinsic incentives where extrinsic motivation such as peer pressure can create “fuzzy” intrinsic motivators (Malholtra and Galleta, 2003). Guilt (an internal pressure) and shame (an external pressure) act as social sanctions affecting behaviour. If a company succeeds in instilling loyalty and team spirit in its workers, then external sanctions for non-performance are less necessary because intrinsic costs are incurred in the form of guilt.

Malholtra and Galleta (2003) seek to explain these “dark” areas by suggesting that extrinsic and intrinsic motivation are not opposites but are based on a continuum based upon the employee’s perceived locus of causality (PLOC), i.e. their perceived extent of control /self determination (Deci, 1975; Deci and Ryan, 1985; Rigby et al, 1992; Ryan and Connell, 1989 – see Figure 20).

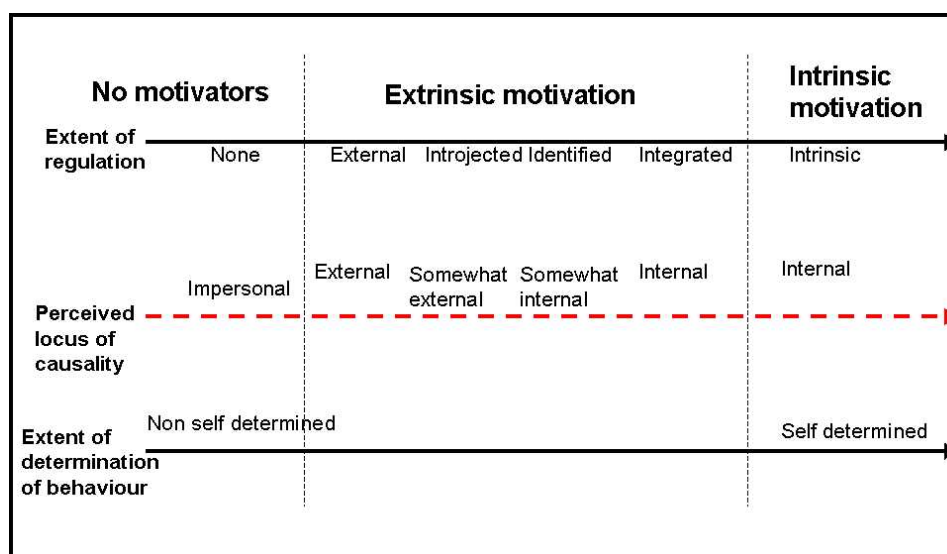


Figure 20: The Extrinsic/Intrinsic Motivation Continuum (Malholtra and Galleta, 2003).

According to self-determination theory there are five types of regulation with respect to motivation (Richard and Deci, 2000):

1. Intrinsic motivation (Internal perceived locus of causality (PLOC)) – “The inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore and to learn”. This is the inherent satisfaction in carrying out the behaviour, e.g. a sense of satisfaction resulting from contribution.
2. External regulation (External PLOC) – “Such behaviours are performed to satisfy an external demand or reward contingency”. This involves avoiding punishment and following rules, e.g. sharing to do well on a performance evaluation.
3. Introjected regulation (somewhat external PLOC) – “Introjection involves taking in a regulation but not fully accepting it as one’s own. It is a relatively controlled form of regulation in which behaviours are performed to avoid guilt or anxiety or to attain ego enhancement such as pride”. This is based on self approval/disapproval and that of others, e.g. feeling guilt about non contribution.
4. Identified regulation (somewhat internal PLOC) – “A valuing of a behavioural goal or regulation where the action is accepted or owned as personally important”. This is based on self valued goals or issues of personal importance, e.g. feeling good about making a contribution.

5. Integrated regulation (internal PLOC) – “When identified regulations are fully assimilated to the self, which means that they have been evaluated and brought into congruence with one’s other values and needs”.

Introjection, identification and integration are extrinsic regulatory styles in that they are concerned with the outcomes/consequences of engaging in the behaviour but are internalised to the individual.

The consequences of feeling controlled are the same whether the PLOC is internal or external in the case of external, introjection, identification, identification and integration regulation. This explains why many public online communities work (via intrinsic motivation, interest and enjoyment) whilst formalised and organisationally endorsed communities fail to, even with incentives in place.

This presents a big challenge to the MUI. It needs to foster intrinsic motivation through allowing the user to have a high degree of control over the interaction with both the system and the customer, yet should not be perceived as a management control tool. The MUI needs to reflect any relevant extrinsic measures, such as performance data from the ACD. These can help the advisor determine how well they and their team are doing in the wider, holistic context of the call centre. However, they should not be used as a tool for panoptic scrutiny. It needs to be accepted by the front line but must also be endorsed by higher level management in order for it to be developed, tested and implemented in the call centre environment.

Work is always, by its nature, somewhat extrinsically motivated. However, the conventional measures and reward systems in place can sometimes cause more demotivation than motivation. The MUI requires a model of motivation that moves away from these conventional motivational systems and looks at what *really* motivates people at work.

However, the literature search has shown that motivation is an extremely complex area. Deriving an exact model of motivation and cognition would be a thesis in itself! For the

purposes of the MUI, a 'shallow model' of motivation (Sloman, 2001), i.e. one that does not map to cognitive processes, needed to be derived.

3.4. Applying Psychological Theories of Motivation to HCI and Implications for the MUI.

3.4.1. A Model of Motivation for the Motivational User Interface.

The original development of the MUI was done from a cursory review of received wisdom on human motivational theory (e.g. Kohn, 1999) and the drivers for motivation articulated by the advisors. From this, high-level motivational drivers were derived. These were then used as the 'shallow model' (Sloman, 2001) of motivation upon which design could be based.

The initial list of motivators for the MUI incorporated seven 'C's of motivation:

1. Culture.
2. Content.
3. Control (or choice).
4. Collaboration.
5. Curiosity.
6. Competition.
7. Challenge.

However, 'competition' and 'challenge', although recognised as motivators, were discounted from the list of 'C's for a number of reasons.

'**Challenge**' is identified as a motivator by Malone (1981;1983), Malone and Lepper (1987), White (1959), Piaget (1951) and Csikszentmihalyi (1975, 1979). Much of this research has been in the context of leisure activities (with the exception of Piaget, who explores learning). The fundamental distinction between technology as a toy verses a tool is that the challenge goals are diametrically opposite. Challenge involves acquisition of skills and practice of them. A good tool is designed to achieve goals that are already present in the external task and, as such, it need not provide a goal. Since the outcome of the external task is already uncertain, the tool should be reliable, efficient and invisible. A good game should be difficult to play to

increase challenge but easy as possible to use. This helps explain why users of complex computer systems often take an almost perverse pleasure in mastering tools that are extremely difficult to master. If they are treating the system as a toy rather than a tool, the difficulty increases the challenge and the pleasure of using the system. In the context of the call centre, the system is regarded (for the most part) to be a tool rather than a toy. This implies that the challenge should not be in the UI but should reside largely in the design of the job (Karasek, 1979; Karasek and Theorell, 1990). Factors around task content, which are related to challenge, are included in the 'content' and 'curiosity' aspects of the motivation model.

'Competition' is identified by Callois (1958), Malone and Lepper (1987) and Csikszentmihalyi (1975) as a factor contributing to intrinsically rewarding activities. Again, much of this research has been in the context of leisure activities or computer games where short-term motivators and high levels of intrinsic motivation are common. In a business context it is acknowledged to be a powerful motivator but is also criticised by Deming (1986), Seddon (2000), Frey (1997), Pfeffer and Sutton (1999) and Kohn (1992; 1999) as being counter to co-operation.

Competition in the form of performance awards, recognition and league tables are common practice in the call centre environment but are not included explicitly as part of the model for motivation for the MUI.

Deming (1986) and Seddon (2000; 2003) emphasise that forced rankings and other merit ratings breed internal competition and are bad management because they undermine motivation and breed contempt among people that were, at least at first, doing a good job. Competition inhibits learning and creativity because attention is focussed on what others are doing. People compare themselves with both leaders and peers and tend not to share ideas because doing so could disadvantage them. With no motivation to help others succeed, the organisation ultimately loses because success is defined by relative standing, not how the whole enterprise fares. It also creates barriers to the efficient sharing of information and skills

since individual competition often encourages people to hoard knowledge (Pfeffer and Sutton, 1999; Kohn, 1999).

Pfeffer and Sutton (1999) suggest that game playing is not a good analogy for business since routine physical work, such as sport, is not novel intellectual work, such as serving customers. People are better at learning new things, being creative and doing intellectual tasks when not under close scrutiny. The social facilitation effect (Zajonc, 1965; Bond and Titus, 1983; Aiello and Svec, 1993) predicts that working around others, especially outsiders who are thought to be judging work, enhances performance for tasks that are well learned and do not require acquisition of new skills or novel responses. However, some conditions lead to worse performance (social inhibition effect (Kohn, 1992; Johnson et al, 1981; Workie, 1974; Goldman et al, 1997)) by inhibiting learning and creativity and minimising risk taking. Competition is likely to be most useful with tasks where there is little interdependence and not much learning. When even modest levels of learning are required and some interdependence exists, individual incentives and internal competition tend to discourage knowledge sharing, co-operation and mutual assistance (Pfeffer and Sutton, 1999). In call centres that are taking ever more challenging and atypical calls as part of an holistic and highly interdependent service chain, competition may be more damaging to motivation than a virtue.

With challenge and competition ruled out as long term motivators, the MUI was left with a framework of five C's for motivation: culture, content, control (or choice), collaboration and curiosity. It was only during the research and literature survey for this thesis that the theoretical foundations for these C's were confirmed (see appendix A for the full review of motivational psychology).

3.4.1.1. Culture.

"Motivation at work may actually have more to do with how tasks are designed and managed than with the personal dispositions of the people who do them", Hackman and Oldham, 1980.

Culture creates the basic conditions under which intrinsic motivation can take place. However, this factor is largely the remit of job design plus management and organisational style, which are factors outside the scope of human-computer interaction (and the topic of much of the job

design literature). The MUI design assumes that what Herzberg (1959) calls 'hygiene factors' or the lower parts of the Maslow (1970) triangle of needs (physical comfort and security) are in place as part of the organisational culture since these are pre-requisites for higher levels of motivation to occur (see appendix A).

What is of importance to the MUI is the criticality that the role of management has on creating the climate and culture under which people can become motivated (Reynolds, 2003; Holman, 2002; Deery et al, 2002). Best practice research (Millard, 2000, 2001, 2004), found that the most effective customer service organisations have a flatter management hierarchy and have a management style that is dynamic, risk taking, passionate and people centric rather than command and control and measures driven (echoing McGregor's (1960) Y and X theories).

Command and control management style, using centralised decision making, policy deployment and process tends to reinforce the image of the call centre advisor as a second class citizen, as can bonus structures and measure sets (Seddon, 2003). It is the responsibility of the organisation to ensure that the infrastructure is there to support people doing what is actually a very difficult and demanding job.

Management can also be very influential in terms of role modelling behaviours and establishing organisational attitudes to both work and to technology (Davis, 1989; Klein and Sorra, 1996). A supportive manager has been found to have a significant positive effect on employee well-being in call centres (Holman, 2002). Management can also influence technology acceptance through what Malholtra and Galletta (2003) call 'commitment by identification'. This behaviour is primarily a result of employee's need for acceptance and recognition by peers and managers (Herzberg, 1959; Maslow, 1970; McClelland, 1975; Covey, 1994; Hackman and Oldman, 1980; Roethlisberger and Dickson, 1939).

The implication for MUI design is that the management should be visible and available on the system. The MUI can provide a means for management to communicate to the call centre advisor (providing feedback, recognition, coaching and support) and vice versa. Given that

management must support both effective and affective needs of the advisor, the MUI should support an affective dimension and provide advisors with a means to express such emotions to their managers (if they choose to) rather than repress them. However, the MUI should not be viewed as a management tool for control.

3.4.1.2. Content.

People who regard their job as important are profoundly committed to what they do. Motivation is typically highest when a job offers an opportunity to learn new skills, to experience some variation in tasks and to acquire and demonstrate competence (Herzberg, 1987). Different people prefer different levels of challenge and a variable balance between predictability and novelty (Csikszentmihalyi, 1975). Workers should have some knowledge of the results of what they are doing, experience responsibility for these results and see the work as valuable. In order to display competence they also need to have the knowledge to support them in their job.

In a survey of call centre work by Millard and Kebbell (1999), variety of work was a big factor in an advisor's intention to quit. Call centre work can be both highly routine and non-challenging with advisors interviewed as part of a focus group that was run stating:

- "It can be monotonous – I could do with more stimulation".
- "The worst part of the job is the repetition".
- "Sometimes you feel like battery hens".
- "It is very boring – I hate it here but it pays the mortgage".

Repetitive call centre jobs where enquiries are frequently the same and the responses are scripted are largely devoid of interest. Demand in terms of variation and challenge are an important part of enjoyment and are an essential aspect of good job design (Karasek, 1979; Karasek and Theorell, 1990) rather than directly addressable by the user interface. Ironically, these are the very things that Taylorist principles seek to minimise. As Herzberg (1987) stated "if you want people motivated to do a good job, give them a good job to do". Call centre jobs need to be reassessed to see if more job variety can be introduced. This may involve acknowledging that the task itself may not be fun, offering a meaningful rationale as to

why it should be done and giving people as much choice as possible as to how the job is done (Csikszentmihalyi, 1978).

The one element that consistently occurs as a pleasure in call centre jobs is the sense of satisfaction reported in helping people. Comments in a focus group that the author ran in a financial services call centre included:

- "I like getting recognition from the customer".
- "I like talking to people".
- "I like solving problems".
- "It's really good when you can help people out".

Korczynski (2001) suggests that the creation of genuine, rather than pseudo, relationships spur advisors on to go beyond policies and procedures.

Most of the theories of motivation acknowledge that people need feedback (Hackman and Oldham, 1980; Csikszentmihalyi, 1975), assurance that they are performing a significant role (Hackman and Oldham, 1980) and recognition for their achievements (Herzberg, 1959; Maslow, 1970; McClelland, 1975; Covey, 1994; McGregor, 1960; Roethlisberger and Dickson, 1939). They also want to achieve advancement and growth through learning and development (Herzberg, 1959; Maslow, 1970; Covey, 1994).

Feedback about success tends to increase intrinsic motivation or self reported enjoyment (Holbrook et al, 1984; Deci and Ryan, 1985). This effect works as long as the feedback is informational rather than controlling (Deci and Ryan, 1985; Pittman et al, 1980; Ryan et al, 1983). Research has shown that feedback also needs to be both accurate and timely (Amick and Smith, 1992; Holman, 2002; Chalykoff and Kochan, 1989; Frenkel et al, 1998) in order for it to have a positive effect on employee wellbeing (e.g. higher contentment and enthusiasm, job satisfaction, lower levels of anxiety, depression and emotional exhaustion). Timely feedback can also potentially enhance learning (Kluger and DeNisi, 1996). In a study of call centres, DiTocco et al (1992) found that advisors indicated that the practice of taking them off

the phone to provide feedback concerning a call came too long after a call for them to remember it and benefit from the interaction.

The MUI, therefore, needs to provide a mechanism for rapid access to knowledge and timely feedback for the advisors. Fogg and Nass (1997) showed that users respond to praise and criticism from computers in the same way that they respond to similar feedback from humans. Research has also found that employees prefer receiving feedback via the computer rather than directly from their manager (Earley, 1988; Ang and Cummings, 1994; Kluger and Adler, 1993). Earley (1988) posited that this was because they had more control over the computer than was the case in a face-to-face leadership assessment and that they could also have more influence over work control as a result (Smith and Amick, 1989). However, Weisband and Atwater (1999) found that there tended to be greater objectivity but less sensitivity and tact in handling feedback over electronic means, especially since there is no visual feedback from the recipient (Sproull and Kiesler, 1991).

3.4.1.3. Control/Choice.

Control is a basic human tendency (DeCharms, 1968). People are most likely to become enthusiastic about what they are doing when they are free to make decisions about the way that they do it. The Tayloristic or Theory X model of reward and punishment tends to take away autonomy. Humans want to be the originator of their own destiny rather than a pawn to external forces. The *perception* of control rather than *actual* control is important (Zimbardo, 1969). It is hardly surprising, then, that nearly every psychological model of motivation emphasises the importance of the perceived locus of control on an individual's motivation (Hackman and Oldham, 1980; Karasek, 1979; Vroom, 1964), level of engagement (Csikszentmihalyi, 1975) and acceptance of technology (Hauge-Nilsen and Flyte, 2002).

Call centres vary in the amount of control and discretion that they give advisors (see 2.1.2). Individuals in call centres often suffer high level of demand and a low level of perceived control over key aspects of their job including pace of work, target setting (Taylor et al, 2002; Di Tecco et al, 1992; Batt, 1999) and emotional behaviour (Hochschild, 1983). These are, according to Karasek's demand-control model (Karasek and Theorell, 1990), precursors to

stress, burnout (Singh, 2000; Deery et al, 2002) and emotional dissonance (Hochschild, 1983; Maslach, 1982). These can negatively affect levels of intrinsic work motivation (Frey, 1997).

High job control is positively associated with job satisfaction (Batt and Appelbaum, 1995), increased sales and customer service quality (Batt, 1999) and the ability to adapt to new technology. Low job control, low variety and excessive job demands can cause job related stress and turnover (Millard and Kebbell, 1999). Holman (2002) found that job control had a positive association with well-being, i.e. low anxiety and depression, plus high extrinsic and intrinsic job satisfaction. Advisor control over *how* they talk to customers and *how* they do their work task is more important than control over *when* they take calls.

In user interface terms the element of control comes primarily as a result of personalisation. Personalisation is an example of users having decision-making authority over technology. Blom (2000) suggests that personalisation can have two possible social motivations. The first is facilitating work through providing access to information content, e.g. bookmarking. This is important as the amount of information available to the user exceeds the capability to process it. This includes accommodating work goals, e.g. Mackey (1991) found that the ability to get rid of annoyances or speed processes up were triggers for customising software. Individual differences in work styles will also need to be accommodated. This includes coping with special needs and preferences (e.g. Reeves and Nass' (1996) work on personality and user preference in terms of dialogue style). The second aspect is the fulfilment of social requirements. This includes eliciting an emotional response (Scheiberg, 1990), expressing membership of a particular group or social identity (Brandtzaeg et al, 2003; Goffman, 1959) or expressing individuality (Csikszentmihalyi, 1991). Hassenzahl (2003) suggests that "only products which provide at least some opportunities for being related to the self are likely to be truly and stably appreciated".

Earley (1988), Sainfort (1990) and Malone (1981) found that some element of control over the UI can increase employee performance and motivation. Malone and Lepper (1987) suggest that interfaces should promote feelings of self-determination and control on the part of the

user. Choice has been shown to increase intrinsic motivation (Nuttin, 1973; Zuckerman et al, 1978) and has been used powerfully in games when people are allowed to select between alternatives and personalise. However, Malone and Lepper (1987) found that just providing a wide range of choices does not necessarily increase motivation since more choices can frustrate rather than motivate.

3.4.1.4. Collaboration.

In terms of the pains of call centre work, the high levels of customer empathy felt by advisors makes it all the more difficult to handle customer abuse:

- “One nasty call can ruin your day”.
- “Irate callers can really affect you – people can be very rude over the phone”.
- “We can become ‘phone fodder’ for customers – taking abuse for other people’s mistakes”.
- “Abusive calls are very hard to take personally”.

The reaction to the stresses of these elements of the job is to utilise teamworking to provide what Korczynski (2001) calls “communities of coping” (negating the isolating nature of call centre work).

84% of advisors in a call centre survey that the author conducted reported that they felt that they were part of a work team and a later focus group reinforced this:

- “We have great camaraderie – we need it to combat the stress”.
- “Everyone is in the same boat so we can understand and support each other”.
- “You can talk about anything – it helps to get things off your chest”.

Teamwork and the feeling of belonging is one of the most significant factors in job satisfaction. Mayo’s (Roethlisberger and Dickson, 1939) study of motivation concluded with the statement that, “work is a social activity”. This is expressed in motivation theories such as social influence (Kelman, 1958), facilitation (Zajonc, 1965; Aiello, 2001), support (Coch and French, 1948; Amick and Smith, 1992), acceptance (Maslow, 1970), affiliation (McClelland, 1975), identity (Hackman and Oldham, 1980), cohesion (Cartwright and Zander, 1960; Karasek and Theorell, 1990), comparison (Festinger, 1954; Suls, Martin and Wheeler, 2002), conformity (Turner, 1991; McGarty et al, 1997; Turner et al, 1987; Asch, 1952; 1956; 1991), learning

(Bandura, 1986; 1997), perceived equity (Adams, 1963), pleasure (Tiger, 1992; Jordan, 2000) and co-operation (Csikszentmihalyi, 1975). Work without social integration (use of the 'mass production' approach) does not improve productivity (Batt, 1999). Deming (1986) based his systems thinking philosophy on the idea of collaboration stating that "the power of every worker should be harnessed to improve the way business is conducted".

Increased group cohesion through collaboration often produces results that are beneficial to both the individual and the organisation. This includes reduction of turnover (Van Zelst, 1952), greater job satisfaction (Janssens and Nuttin, 1976; Manning and Fullerton, 1988; Van Zelst, 1952), lower stress (Manning and Fullerton, 1988) and a more positive outlook on life (Janssens and Nuttin, 1976). However, increases in group cohesion have been shown to have both positive and negative effects on productivity (Guzzo and Shea, 1992). There are three sources of group cohesiveness (Aiello and Kolb, 1995; Festinger, 1950; Anderson, 1975; Back, 1951; Tziner, 1982; Zaccaro, 1991):

1. Task based – group participation helps achieve desired goals.
2. Socio-emotional – group participation is based upon mutual liking and desire to affiliate.
3. Prestige based – attraction is to status conferred by group membership.

In the call centre, group cohesion is largely based upon the first and second sources. High task based cohesiveness groups tend to outperform non-cohesive groups. However, high socio-emotional cohesiveness tends to be less productive than low because of the higher level of interaction that occurs between group members during work time (Zaccaro, 1991). However, by increasing the visibility of team goal achievement, productivity can be increased (Tziner, 1982). Stress is lower in these groups because of the effects of receiving social and emotional support (Manning and Fullerton, 1988; LaRocco et al, 1980; Karasek and Theorell, 1990). They also provide outlets for expressing tension (Cobb, 1976; Cohen and Wills, 1985; House et al, 1988).

There appear to be two aspects to collaboration. The first is about the individual's identity and the second is about where that individual locates him or herself in the social landscape

through comparison and then adoption of behaviours that reflect that location. This echoes social identity theory (Ashforth and Mael, 1989; Tajfel and Turner, 1985), which identifies self as a combination of personal identity (idiosyncratic characteristics, e.g. traits, abilities) and social identity (group affiliations, e.g. role, company, religion etc.) This is a means of ordering the social environment and locating people within it. The MUI needs to be a means for conveying individual identity (Hassenzahl, 2000) through identification of both personal and social identity.

The social nature of work is a key motivator and satisfier in the call centre environment (Frenkel et al, 1998; 1999; Deery and Kinnie, 2002). Turkel (1972) found that people talk about their work in terms of relationships, intrigues, conflicts, gossip, friendships and camaraderie rather than simply in terms of salary and monetary reward. Jurgensen (1978) found that there was a discrepancy between the estimation of the importance of financial reward to others verses the importance of financial reward to the individual. This misconception underlies conventional reward systems (Kohn, 1999).

Call centres often exploit the organisational framework supporting team identity and cohesion by giving teams names. However, the isolating nature of call centre work means that advisors can find it difficult to interact as a team during periods where they are taking calls. Social support mechanisms often form serendipitously as groups of advisors rally to the support of others. Collocated advisors are frequently observed monitoring calls in their surrounding environment whilst on a call themselves and interjecting help, sympathy and advice when they deem it appropriate (also observed by Heath and Luff, 1992 in their study of London Underground controllers and Dugdale et al, 2000 in Ambulance control centres). Verbal interaction is highly dependent on whether someone is on a call or not and communication involves knowing whether another advisor is interruptible. This often causes a complex pattern of movements wherein advisors stand up (still tethered to their desk by their phone cord), observe to see if colleagues are talking on the phone, try and catch their eye, confirm they are not on a call and then ask their question.

Some call centres taking extremely distressing calls, such as the counselling service The Samaritans, have formalised the social support process by implementing a 'buddy' system where advisors work in pairs and provide support to each other.

Deutsch and Gerard (1955) suggest that groups influence motivation through two processes relating to social influence. They are motivated to seek emotional support and positive regards from others ('normative influence'). They are also motivated to reduce subjective uncertainty about themselves and the world around them ('informational influence').

'Normative influence' works through dependence on social approval and acceptance based on pressure to comply (Abrams and Hogg, 1990) with respect to a reference group and referent power (Raven and Kruglanski, 1970). This tends to arise when there are extrinsic influences such as coercive power (power to criticize, punish) or reward power (affection, praise or material wealth (Raven and Kruglanski, 1970)). Since the group are subject to extrinsic influences, this often creates public compliance rather than private acceptance of the group's attitudes, opinions, beliefs or behaviours (Kelman, 1958; Kiesler and Kiesler, 1969).

'Informational influence' is based around the individual's need to have valid and valued knowledge about reality (Asch, 1952; Deutsch and Gerard, 1955; Kelley, 1967). Groups with similar internalised knowledge, attitudes and beliefs are able to share knowledge and reduce subjective uncertainty. Social comparisons are conducted (Festinger, 1954) and judgements are based on expert power (possession of knowledge that others repeatedly need to draw upon) or the informational power of others (possession of a specific piece of knowledge that is in demand - Raven and Kruglanski, 1970).

One aspect of group cohesion is evidenced in a "gallows humour" that evolves within call centre teams to defuse emotion, relieve boredom and increase social cohesion (Blythe and Hassenzahl, 2003; Taylor and Bain, 2003; Noon and Blyton, 1997; Collinson, 1988; Goodman, 1992; Gorkin, 1990). This can include derogatory comments about difficult customers. For example, one call centre observed as part of a study had a regular crank

caller and the running joke was around who would get him that day! Laughter allows release of the inevitable tension of everyday living (Grumet, 1989). The sharing of laughter reflects tolerance, acceptance, and sympathy toward others (Mindess, 1971). Many authors speculate that laughter was originally a vocal sign to other members of the group that they could relax in safety after a perceived threat was vanquished or turned out to be non-threatening (Hayworth, 1928; Ramachandran, 1998). The ability of humour to build a sense of community in the workplace has been demonstrated (Hampes, 1992; Meyer, 1997). Understanding humour presupposes a shared context and this shared context can be reinforced within many groups by the use of humour (Zilberg, 1995).

Shifting the focus of the design of the user interface from rationality, logic and efficiency to maintaining team and customer relationships requires consideration of peripheral attributes, such as humour (DeAngeli et al, 2002). In terms of traditional design, these were typically considered wasteful ("fluff around the edges" according to some!!) However, humour can be used to improve the experience, helping to relieve the tension that is often associated with a demanding task.

Studies of groupware (Grudin, 1989; 1994; Grudin and Palen, 1995) and Computer Supported Cooperative Work (CSCW - see Bannon, 1993; Schmidt and Bannon, 1992) offer evidence that IT systems can help support and sustain cohesive work teams (e.g. Schafer et al, 2003). They can support collaborative activities by providing support for explicit communication and mutual knowledge (Pavard et al, 1990) and mutual beliefs (Dugdale et al, 2000), which are derived by implicit verbal communication or observed behaviour. Call centre teams are not necessarily collocated (many call centres use hot desking and some even have people working remotely from home). The MUI needs to provide support in terms of aspects such as:

- Distributed cognition (acknowledging that knowledge can reside in other artefacts and people as well as systems (Hutchins, 1995; Ackerman and Halverson, 2000; Halverson, 2001)),
- Shared workspaces (common information spaces supporting sharing of work materials (Schmidt and Bannon, 1992)),

- Co-ordination mechanisms (supporting the process of coordinating who is doing what, when, where, how and why (Carstensen and Sorensen, 1996; Schmidt and Bannon, 1992)),
- Support for mutual awareness (awareness of where others are located and what they are currently doing (Dix and Beale, 1996; Rodden, 1994; Simone et al, 1994)) and team presence (Nowak and Biocca, 2003; Smith et al, 1976).

There is a paucity of literature relating to groupware or CSCW and call centres (with the exception of Dugdale et al, 2000, Ackerman and Halverson, 2000 and Halverson, 2001). However, the collaborative aspect of the MUI needs to provide a mechanism to help teams establish both individual and team identities, facilitate online help and support and maintain group cohesion.

For groupware to be entirely effective and for collaboration to occur, the call centre management needs to support and recognise teamworking (Palen and Grudin, 2001). The most powerful business model for this is 'self managed teams' because it is not centred on the individual and focuses on what a group does together (Batt, 1999; Perry, 1978; Cotton, 1993; Cohan and Bailey, 1997). This way of working exploits social influence theories of motivation (Turner, 1991; Zajonc, 2001; Festinger, 1954; Suls, Martin and Wheeler, 2002; Turner, 1991; McGarty et al, 1997; Turner et al, 1987; Aiello and Svec, 1993; Bandura, 1986; Bandura, 1997). Batt (1999) compared a self-managed team approach with TQM (total quality management) and mass production approaches (see 2.1.2) and found that, of the three organisational approaches, the self-managed team approach was the only one that showed an ability to increase sales and quality of customer service.

The self-managed team approach expands employee's roles to include not only enough latitude to handle customer problems but to set work goals and organize around those goals. Self-managed teams must be self-regulating, clearly organised separately from other groups and receiving compensation and other benefits based on group success. Management exert a strategic and guiding approach but the employees are in the driving seat. However, a study by Godard (2001) has shown that, although these practices can increase intrinsic rewards, they can also increase stress, thus increasing the need for team support.

In this approach, team members must also be interdependent which points towards a systems thinking approach to call centre design (e.g. Seddon, 2003). When the call centre is understood as a system, the potential for improving performance becomes clearer (Seddon, 2003). For the whole work of the group to be accomplished, workers must rely on each other to perform a part of the work. This harnesses employee ingenuity towards contributing, learning and improving, rather than engaging their ingenuity against the system. All performance is subject to variation (due to the nature of the call and the customer plus factors external to the call centre) and front line managers need to look at the causes of variation. Causes identified that are within the team's control can be actioned by the team. Those beyond the team's control should be actioned by the manager. Under systems thinking, management's focus changes from managing people - ensuring that people do as they 'should' - to managing the system - understanding and improving how well the work flows, end to end, to fulfil the customers' demands.

Call centres employing this kind of approach are likely to benefit from the collaborative aspect of the MUI.

3.4.1.5. Curiosity.

Humans possess a natural curiosity about ourselves and our environment (Kohn, 1999). We search for and overcome challenges, attempt to acquire and master skills and gain competences in complex tasks to promote self-efficacy (Bandura, 1997). This is tied in with the human need for advancement and growth (Herzberg, 1959) and learning (Covey, 1994). However, there is also evidence that if people are also enjoying their job they are more likely to deliver a good customer experience (Heskett et al, 1997; 2003). Feigleson (1988) claims that employees who have fun at work are less likely to be late or absent and job attrition, motivation and productivity improve.

Malone (1981) suggests that one of the most important aspects of intrinsically motivating environments is the degree to which they can continue to arouse and then satisfy our

curiosity. Curiosity is the most direct intrinsic motivation for learning and requires an optimal level of informational complexity (Berlyne, 1960, 1965; Piaget, 1952) or an optimal level of incongruity from current knowledge (Piaget, 1951, 1952; Kagan, 1974; Hunt, 1965). This echoes Csikszentmihalyi's (1975) notion that pleasure and enjoyment at work is a balance between boredom and anxiety and Karasek's (1979) theory that challenge needs to be matched with individual skills and control.

According to Turner and Karasek (1984), arousal level at work is primarily a function of task demands (work load verses time) but can also be affected by general stimulation in the environment (e.g. noise) and the individual's emotional state. Performance effectiveness is related to arousal by a 'U' shaped curve where ineffective responses occur at either extreme of the curve. Difficult tasks may only be achievable only at a low arousal level but simpler tasks may benefit from high arousal. Neither too little nor too much arousal is optimal for effective performance.

Both Tayloristic organisation design and traditional usability emphasise the optimisation of performance of well-defined tasks. Unpredictability and challenge may partially be in conflict with the principles of both Taylorism and traditional usability (Hassenzahl et al, 2000). Unpredictability diminishes efficiency and increases arousal and cognitive load because constant searches and concentration is required to detect these infrequent activities (Brandtzaeg et al, 2003). However, a certain degree of unpredictability, variation and surprise has been deemed necessary for the experience of fun (Davenport et al, 1998; Skelly, 1995). The act of minimising variation can make something boring (low arousal) and tends to act against good job design (Karasek, 1979; Karasek and Theorell, 1990), curiosity (Brandtzaeg et al, 2003), fun (Carroll and Thomas, 1988) and the opportunity for 'flow' (Csikszentmihalyi, 1975).

In terms of motivators for work, there is always an extrinsic form of motivation in that people receive a salary for what they do. There is often a taboo, particularly in Western cultures, against labelling work as 'hard fun' (Jensen, 1999). However, to compound the contradictions

of the call centre, 'pseudo' fun is often encouraged to break up routine with themed competitions, dress up days and activity days. These intend to involve employees, built team spirit, change attitudes, boost morale, generate a positive working atmosphere and create enthusiasm. However, as Peterson (1999) stated "If you want a motivated workforce you must look beyond the parties and prizes".

Technology in a work context is labelled as a tool and not a toy, so design for enjoyment, fun and curiosity tend to be subsumed by efficiency. This treatise is often used for the design of leisure software such as computer games, but is normally rejected on the basis of the motivational differences between software as tool and software as toy. Hollnagel (1999) argues that effectiveness and efficiency could be compromised if productivity software is designed from games principles and, as a result, fun *should not* be applied to work systems. Games also have different goals (Lazzero and Keeker, 2004 – see Table 3):

Productivity	Games
Task Completion	Entertainment
Eliminate errors	Fun to beat obstacles
External reward	Intrinsic reward
Outcome based rewards	Process is its own reward
Assumes technology needs to be humanised	Assumes humans need to be challenged.
Intuitive	New things to learn
Reduce workload	Increase workload

Table 3: Productivity verses games software goals (Lazzero and Keeker, 2004).

However, theories of technology acceptance include positive affect. For example, Davis et al (1992), found that perceived fun is linked with increased usage intention when the system is already perceived as useful (fun had no effect on usage intention if the system was not perceived as useful). Igbaria, Schiffman and Wieckowski (1994) found that perceived fun had a stronger effect on user satisfaction than perceived usefulness. User satisfaction had a clear effect on system usage. They found that enhancing perceived fun will lead to longer time

spent using the software, which may lead to a better understanding and/or more productive use of the system. Carroll and Thomas (1988) found that features that don't necessarily increase user efficiency and effectiveness could stimulate fun and enjoyment and increase usage.

The MUI cannot be so inefficient that call handling times are compromised since that would tend to discourage usage. However, it does need to encourage curiosity, learning, engagement, sociability and exploration (Preece et al, 1999) in order for advisors to be equipped to better serve the customer. Carroll (1987) suggests that the differences between work and play should not prevent mutual learning about user interfaces between computer games and productivity software. Both need to motivate users to learn from mistakes and provide exploratory environments that encourage experimentation and engage the user. Lazzeri and Keeker (2004) also suggest that games also have common GUI elements (e.g. menus, dialogue boxes, text entry, mouse control) and are subject to human perceptual, cognitive and memory limits.

The majority of literature on productivity software has focussed on functionality and performance. Usability metrics have focussed on things such as keystroke analysis and target acquisition. The emphasis has been on the reduction of negative affect rather than the promotion of positive affect (Johnson and Wiles, 2002). Games have to be designed to promote positive affect because if they don't, they won't be used. The user's primary motivation when playing a game is positive affect and it is not in a productivity application. Games do this by providing the user with a secondary task or goal (e.g. save the princess, win the championship). Productivity software is designed to facilitate the user's achievement of the pre-existing task or goal (in this case, satisfy customer needs). The primary motivation is to achieve that goal and the desire to achieve a positive affect is often secondary (Johnson and Wiles, 2002).

However, the call centre advisor's job is to promote positive affect and create a customer experience. This needs to be reflected in the design of the interface with the emphasis not

just on usability but also on user experience (Laurel, 1993). However, design for fun and curiosity involves including elements of unpredictability, aesthetic and humour to make them interesting, novel and surprising (Hassenzahl et al, 2000). Conventional human-computer interaction theories ignore factors relating to exploration, control, pleasure, curiosity and enjoyment (Overbeeke et al, 2000; Jordan, 1997; Glass, 1997).

An exploratory environment where the user gets feedback on actions, is informed of progress and achievements and is not worried about making mistakes, is a world where a user will explore and learn (Carroll, 1987).

Computer games are a particularly good example of environments designed to promote curiosity. Aligned with Logan's (1994) definition of 'emotional usability', games seek to motivate user interaction and exploration by being engaging and fostering a sense of discovery. Enjoyment can be derived when there is a conflict between what you know, and what you want to know (cognitive conflict – Piaget, 1974; Gagne, 1985). Cognitive Conflict stretches our desire to know and do more and it is the challenge needed to achieve what Csikszentmihalyi (1975) calls 'flow'.

Malone and Lepper (1987) also look at ways in which games encourage users to be curious. They distinguish between sensory curiosity and cognitive curiosity:

- *Sensory curiosity* involves the attention attracting value of changes in light sound or other sensory stimuli of an environment. These can be used as decoration, to enhance fantasy, as a reward or as icons rather than use words or numbers.
- *Cognitive curiosity* can be thought of as a desire to bring greater form to one's knowledge structures – a quest for completeness, consistency and economy. The way to engage curiosity is to present just enough information to make it seem that there is more to know.

Uncertainty of outcome is a source for curiosity (Weiner, 1980; Berlyne, 1965). In the case of the MUI, the uncertainty largely resides in the task rather than in the interface but elements of uncertainty can be built in to encourage non task focussed interest whilst offline. Through eliminating the fear of doing anything too wrong within the UI, users are free to experiment,

explore (Logan, 1994) and engage in active learning (learn by doing). Kort et al (2001) found that people who are affected positively are more likely to be motivated to be curious and puzzled about a new topic of interest. This can be facilitated through a pleasurable and safe learning environment.

These characteristics can be both consistent and contradictory to usability principles. However, the need to satisfy the cognitive elements may not satisfy emotional needs (Malone and Lepper, 1987). Contradictory to usability conventions is that the system should be novel and surprising to use in order to foster a sense of curiosity. However it must do this without shattering the consistency of interaction.

3.5. Summary and Discussion.

This chapter goes to the theoretical heart of the MUI. It considered what motivates people in their job, as opposed to the (often flawed) assumptions that often demotivate as much as they motivate. Motivation is a very complex and individual concept. The Tayloristic model of motivation generally employed in call centres, based around incentives and rewards, naïvely believes that “what gets measured gets done”. However, these measures are mainly internal cost based measures that assume that calls are standardised, customers are all the same and advisors always work at optimal efficiency (despite the ravages of ‘emotional labour’ (Hochschild, 1983)). The Panoptic, ‘Theory X’ style of management presupposes that without monitoring people cheat. However, monitoring can increase stress and decrease advisor performance and job satisfaction. Adding incentives against target achievement can result in people starting to focus on the reward rather than the reason for it.

Taylorist styles of motivation seem to be too naïve and inflexible to the demands of the customer and the needs of the advisor. Since incentives, targets and rewards can act as demotivators as well as motivators, the theoretical model for motivation for the MUI needs to lie in more fundamental human psychology. Since Reeves and Nass (1996) assert that people respond to machines in social ways, the psychology of motivation in human-computer interaction can mirror that of human-human interaction.

The MUI needed to address motivation in two contexts:

- What motivates people in their jobs? What causes them to lose their enthusiasm and what facets of their job do they enjoy? How can people move from being purely extrinsically motivated (which implies an external locus of control) to intrinsically motivated (doing the job because they enjoy it)?
- What motivates people to use technologies? Technology acceptance research found that aspects such as motivation, perception and attitude towards technology and their job influence whether advisors use it. Given that usability is no longer a guarantee of actual use, how can designers move from ease of use to 'joy of use' (Hassenzahl et al, 2001; Glass, 1997) in a context where technology is a tool and not a toy.

A theoretical framework was derived from evidence from call centres as well as a review of the management, psychology and sociology literature. This was originally based around seven 'C's of motivation (see 3.4.1). However, competition was ruled out as a good long-term motivator for the MUI. Work is not sport, people tend to look at rewards rather than reasons for them and competition tends to act against co-operation. Similarly, challenge was ruled out since challenge should lie in the task, not the tool.

The remaining five 'C's were:

- Culture – an overriding factor for motivation that is driven by factors such as management style and processes and procedures.
- Content – summed up by Herzberg (1987) who stated that "if you want people to do a good job, give them a good job to do". Csikszentmihayi (1975) posited that people needed to exist in a state that was between boredom and anxiety for optimal performance. Content is about giving timely feedback, assurance that individuals are performing a valuable task well, acknowledgement and recognition.
- Control – in jobs where there is high demand and low control, the classic result is stress (Karasek, 1979). Control is about the promotion of self-determination and the perception of control (especially at the user interface).

- Collaboration – Teamwork and a feeling of belonging can increase motivation, decrease turnover, increase job satisfaction, and influence productivity (negatively as well as positively). There is evidence that the socially isolating nature of the call centre often causes the formation of serendipitous ‘communities of coping’ (Korczynski, 2001) where advisors provide each other with both emotional and informational support.
- Curiosity – existence in a state between boredom and anxiety requires people to face and overcome challenges, acquire skills and competences and progress. People need an optimal level of informational complexity and incongruity from their current knowledge in order to learn. By minimising unpredictability and challenge (as practised in both Taylorism and conventional usability), jobs can become boring. Introduction of unpredictability, challenge, fun and even pleasure in the design of both jobs and technologies can stimulate motivation.

These five ‘C’s can be integrated into user interface design to support both the effective and affective aspects of the advisor’s task in the following ways (see Table 4).

Motivators.	User Interface Design Implications.
Culture	<ul style="list-style-type: none"> ○ Management and peer feedback, recognition, coaching and support. ○ Visibility and availability of management/coaching support on the system. ○ Ability to provide feedback (both effective and affective) upwards to management. ○ Should not be used as a tool for management control.
Content	<ul style="list-style-type: none"> ○ Accurate and timely feedback on actions. ○ Availability of knowledge at the right time, in the right place, in the right format.
Control	<ul style="list-style-type: none"> ○ Ability to express individuality, e.g. social identity or membership of a particular group/team. ○ Ability to personalise and customise the interface, e.g. bookmarking, wallpapers. ○ Accommodating common individual goals through speed keys.

Collaboration	<ul style="list-style-type: none">○ Formation of virtual 'communities of support' to support and sustain work teams.○ Providing support for explicit communication, mutual knowledge and mutual beliefs.○ Supporting distributed cognition, shared workspaces, mutual awareness/team presence and coordination.
Curiosity	<ul style="list-style-type: none">○ Provision of an exploratory environment where the user gets feedback on actions, is informed of progress and achievements and is not worried about making mistakes.○ Eliminating the fear of doing anything too wrong within the UI and encouraging experimentation, exploration and engagement in active learning (learning by doing).○ The system should be novel and surprising to use in order to foster a sense of curiosity, yet should do this without shattering the consistency of interaction.

Table 4: The 5 'C's and Their Implication for the Design of Motivational User Interfaces.

The success of the MUI is highly dependent on elements of the 5 'C's existing outside the technology, since much of the remit for motivation sits outside the user interface. Technology alone is unlikely to facilitate a fully motivated workforce. The implication is that, for the MUI to succeed, it must be accompanied by changes in organisational culture and practices.

Chapters 5, 6 and 7 explore how the five 'C's have been put into practical use in the development of a series of MUIs.

Chapter 4: The Motivational User Interface Design Methodology.

“New methods should facilitate exchange between the people who experience products, interfaces, systems and spaces and the people who design for experiencing”, Sanders 1999.

The underlying methodological framework for MUI development evolved as each of the MUIs was constructed. Since the MUI needs to be functional and usable as well as affective, many of the methods are rooted in traditional GUI design. However, the methodological approach was often dictated by the constraints of the call centre environment (described in chapter 2). It also needed to consider the advisor task and their affective state, since these both have a bearing on motivation (discussed in chapter 3). The following chapter outlines the broad approach taken for developing Motivational User Interfaces. Chapter 5, 6 and 7 explore the application (and variations) of these methods in the practical development of MUIs.

4.1. Methodological Challenges for MUI Design.

Most traditional human factors design and evaluation methods are only concerned with user efficiency and effectiveness. Human-Computer Interaction tends to be ill equipped to cope with non-productivity based concepts in a systematic fashion (Muller et al, 1997). Factors such as knowledge, engagement, motivation, acceptance, retention and speed of learning are not on the radar of a traditional HCI method. DeAngeli et al (2002) suggest that user centred design needs new methods and techniques in order to encompass these factors. Formal or structured methods in both HCI and software engineering tend to focus on the decomposition of a problem with respect to functions and data requirements ('functional requirements'). These approaches imposes certain limitations on understanding human situations and needs (Mogensen, 1994; Crabtree, 2003; Taylor, Bontoft and Flyte, 2002) and result in structured requirements that often exclude the 'socio-technical' needs that are critical for understanding the user and gaining technology acceptance. A paradigm shift has started in user centred design methods from formal mathematical definitions to socio-technical investigations (Floyd, 1987) and from the individual to the work setting (Grudin, 1990).

The previous chapter outlined an approach to the Motivational User Interface that starts with motivational psychology and encompasses both traditional and emotional usability. Following the suggestion by Overbeeke et al (2003) that “user centred design” should be interpreted as “design which shows respect for people as a whole”, the MUI approach needs to take into account the “the holy trinity of interaction” (Overbeeke et al, 2002):

1. Cognitive – knowing.
2. Perceptual-motor – doing.
3. Emotional – feeling.

The MUI design must also incorporate:

- User control and participation with appropriate challenges.
- Variation and multiple opportunities for action.
- Social opportunities in terms of co-activity and social cohesion, giving people the feeling that they are part of a group and that they are able to participate in socially rewarding activities.

However, the affective elements of design should not get in the way of the task at hand (Norman, 2002). This suggests that when concentrated effort is required, design should emphasise function and minimise irrelevances, i.e. traditional user centred design. However, when the situation is more positive and relaxed, pleasurable design will increase positive affect, broadening creativity and increasing tolerance of minor problems. As Norman (2002) states “attractive things work better”.

Users have no concept of what a MUI looks like. Therefore, abstract methods for design that cannot be mutually understood by both users and designers are inappropriate. MUI designs need to be grounded in the day-to-day activities of the call centre advisor but also support the five C’s of motivation (described in chapter 3).

The methods used for the design of MUIs need to facilitate:

- Capture of the key advisors tasks to be supported.
- Capture of the key socio technical elements that contribute to advisor motivation.

- A common language to communicate designs between advisors, design team and technical teams in order to bridge everyone's conceptual models of the system (Norman, 1986).
- Concrete ways of expressing design ideas and testing them in operational (i.e. non laboratory) contexts.
- Creativity in design.
- The ability to evaluate both effective and affective elements of design.

Crabtree (2003) criticises structured methods as misrepresenting everyday work by constraining actions into an input-process-output structure and ignoring the people centric and collaborative aspects. Although traditional methods such as task analysis (Preece et al, 1999) or GOMS (Card, Moran and Newell, 1983) apply well in simple and linear goal-oriented tasks, they are less effective in modelling creative, non-linear or multimedia tasks (DeAngeli et al, 2002). GOMS, in particular, has been used in the design of call centre/operator workstation interfaces (e.g. Gray et al, 1992; Ryder et al, 1998) but these designs have focused on making tasks more efficient rather than more engaging. The nearest method to gauge aspects such as engagement from the traditional human factors toolbox is via user satisfaction, which is referenced in traditional evaluation methods such as the Software Usability Measurement Inventory (SUMI – Kirakowski and Corbett, 1993). However, hedonic and emotional elements of design are largely ignored in this method.

The MUI approach is rooted in the practicalities of an industrial call centre context. Motivation is situated in the real world contexts of the environment for which the system has been developed. Both Thomas and Kellogg (1989) and Crabtree (2003) critique traditional HCI's lack of 'ecological validity' and the cognitive science approach that emphasises scientific rigour under controlled laboratory conditions. Far from being developed and tested in a laboratory, MUIs have been subject to the design constraints evident in the majority of industrial systems development projects. Timescales are short, access to users uncertain and user samples are often less than statistically representative. No single method can be used to capture, specify and evaluate data for MUI design. The MUI methods need to be opportunistic, flexible and fast. These demands are the reason why many of the traditional methods are often left to "languish in academic closets" (Sutcliffe, 1992).

The principal constraint when considering user centred design methods for MUIs is the nature of the call centre environment itself. Given that advisors are rostered with respect to the predicted volumes of calls, taking them offline to interview them is difficult. Taking advisors off the call centre floor and running focus groups or interviews is only usually possible if several months' notice is given to the call centre's resourcing department. This will also require a high level of management approval since non-utilised resources cost the call centre money. Advisors who are bonused on levels of utilisation will also need to have their performance figures adjusted for any offline time or risk being penalised for helping the design team. If this is not done, then the level of co-operation that the design team gets is likely to be low.

Given that interventional design is difficult under these circumstances, user centred designers of call centre systems have to resort to less disruptive methods for design. Talking to advisors whilst they are online taking calls means that customers will continuously interrupt dialogues between designers and advisors. This can work well since advisors are always keen and willing to explain and analyse their actions during calls (plus, they are used to doing this during sessions with their coaches and managers). The problem with this approach is that, at times of high volume, any kind of interactive design intervention is impossible since calls will be coming in with little chance for subsequent investigation of actions.

Completely non-disruptive methods usually form the bulk of data capture within the call centre environment. Field observation methods, such as ethnography, can heavily influence design. More 'guerrilla' style tactics such as setting up a small evaluation facility in rest areas and coffee rooms can also prove useful since advisors are available to engage in conversation without interruption.

One of the other significant considerations with respect to data collection is the fact that the design sample should ideally be representative of the overall user base. Experience has shown that the best way of achieving a representative data sample is to pre-brief the call centre manager with a sample profile of the kind of advisors that are required for the study.

Depending on the length of time in the centre (usually no longer than 5 days), the brief highlights factors such as advisor age, sex, experience level and skill set (e.g. service, sales, repair, billing etc).

Given the criticism of 'scientific' HCI (e.g. Crabtree, 2003; DeAngeli et al, 2002) and the difficulty of measuring affect, the MUI methods seek to uncover insights that contribute to effective design rather than producing meaningless statistics or being a slave to the constraints of formal methods or programming languages (Madsen et al, 1993). Shneiderman's (2002) examination of the demands of what he terms "the new computing" (i.e. user focused rather than technology focussed) suggests methods are required that produce results that "are not numbers but understanding, not percentages but insights". As a result, the methods selected for the MUI design are designed to understand the problem domain and produce insightful data for design and evaluation rather than abstracting away from the operational context in which the system is to function. One can question the value of traditional methods and evaluation techniques since most of them analyse the present system rather than anticipating future needs (Fulton, 2002).

To this end, the author looked to build a toolbox of techniques for MUI development that included (see Figure 21):

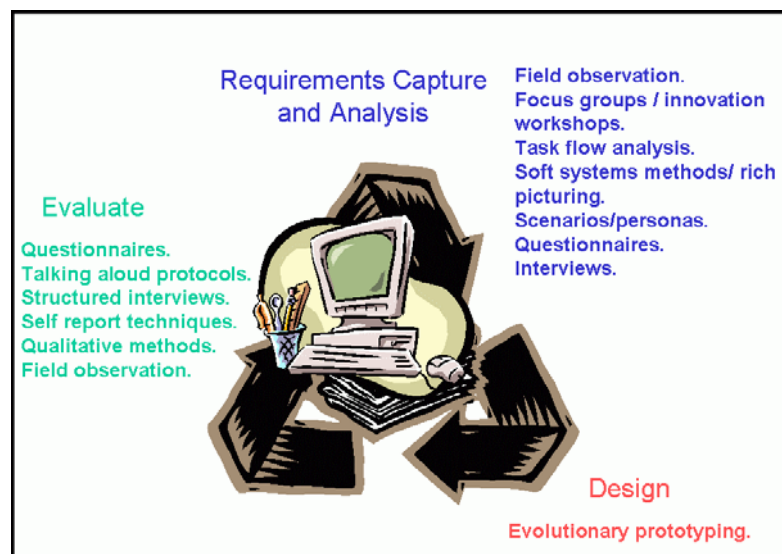


Figure 21: The MUI Development Lifecycle.

The following sections discuss the methods/techniques, their application and the rationale for their selection. The approaches utilised for each case study reported in chapters 5, 6 and 7 are very similar so, rather than reiterating the method for each case, this chapter provides a broad-brush outline of the method and the rationale behind it. Any variations or additions to this approach will be documented within each chapter as part of individual case studies.

4.2. MUI Method: Requirements Capture and Analysis.

4.2.1. Field Observation.

“A major source of failure is the narrow, optimisation of a design that doesn’t take sufficient account of contextual factors”, Stuart K. Card.

4.2.1.1. Rationale for Field Observation as a Core MUI Method.

Field observation techniques, such as ethnography and participant observation, can provide systems designers with a “real world, real time social perspective on work” (Crabtree, 2003). These methods enable designers to “to carry out the detailed observation of activities within their natural setting” (Blythin, Rouncefield and Hughes, 1997) in order to build an appreciation of “what is really the problem” and what is required to resolve these problems (Hughes et al, 1992). They do this through a series of observations, in situ, that identify and focus on patterns and sequences of work from a temporal perspective.

The rationale for using the results of field observation in systems design includes (Rose, Shneiderman and Plaisant, 1995):

- Systems should be designed to support the work environment.
- Users are best qualified to determine how to improve their work.
- How users perceive a system is critical to its success.
- Opinions from all users (experts/novices/ supervisors/ workers) are equally valid.

These techniques can also be used to evaluate prototype designs in context (e.g. Hughes et al, 1999). This differs from conventional data collection approaches such as questionnaires, interviews and focus groups because it captures what users *actually* do, rather than what they

say that they do, or what is documented in procedural documentation (the 'say-do' dichotomy (Miller,1998)). Assumptions are often made as to how tasks are performed on the basis of rules and procedures (Suchman and Trigg, 1995), whereas these are often guidelines around which self-organising informal structures of action are created (Suchman, 1989). There is a difference between 'formal' models of organisation and the 'informal organisation' of the workplace (Dalton, 1959). Most users actually find it hard to articulate what they do during their working day in sufficient detail to inform design and are often so culturally situated in their actions that they don't see that they are worthy of mention. Skilled actions are often intuitive rather than rational and are, therefore, often beyond verbal articulation. In fact, part of becoming skilled at an activity involves glossing over the ways in which we actually perform these activities (Csikszentmihayi, 1975). Hughes et al (1999) note that performing work tasks tend to involve a range of tacit skills and local knowledge. These may only become visible in circumstances of failure and customer complaint. Field observation can help make visible practices, procedures and assumptions that people rely on in accomplishing their routine, everyday activities.

From a motivational perspective, the virtue of field observation is to allow the design team to uncover some of the more affective aspects of call centre emotional labour. They allows what Fineman (2000) calls "a fortuitous blend of distance and reflexive closeness".

Field observation techniques are not systems development or design methods. They are techniques concerned with concrete current situational detail so abstracting elements out into future design can be difficult (Button and Dourish, 1996; Grudin and Grintner, 1995). They can also be regarded as being subjective on the part of the observer and only provides a snapshot of work in time and space (Taylor, Bontoft and Flyte, 2002). This means that they cannot easily cope with highly volatile environments (Anderson, 1997).

There has been much debate about how the rich output of data from field observation techniques can be translated into the precise input required by systems designers (e.g. Viller and Sommerville, 1998; 1999). However, it could be argued that few requirements methods

can claim to directly inspire design. Field observation techniques may not provide design answers, but they can act as a checklist for design decisions.

It has been suggested that the role of field observation techniques, such as ethnography, is not to give form to potential design solutions but to ‘impart’ knowledge (Plowman et al, 1995), identify key issues for effective design and sensitise designers to the sociality of work (e.g. Heath and Luff, 1992; Hughes et al, 1994; Bowers et al, 1996). Understanding how people organise their current activities can provide ideas about how technology could be designed to facilitate and improve current practices and systems. It can also capture practices and assumptions that would need to change should new technology be introduced. These techniques can, therefore, produce a “more empathic user design” (Jevnaker, 2002) by uncovering socio-technical dependencies between human work, sociability and technology. However, they also permit designers to examine different user viewpoints in contextual detail and provides an analytical understanding of users, their actions and the resulting actions of others (Sommerville et al, 1992). These insights can feed in to more formal methods of design (Suchman, 1987). The viewpoint centred approach feeds well into soft systems and scenario based methods (Maxwell and Millard, 1999).

The minimally intrusive approach of field observation makes it one of the few methods that can be utilised extensively in call centres because it causes little disruption to the operation (e.g. Houlihan, 2001, 2002; Taylor and Bain, 1999, 2003; Lankshear and Mason, 2001).

However, from a MUI perspective, they capture a rich data set encompassing both effective and affective dimensions of work. The challenges of the advisor-customer dialogue, the systems interaction, team member interaction and emotional labour are all captured in context.

4.2.1.2. The Practicalities of Field Observation in the Call Centre.

There are two primary requirements for field methods in the call centre. They must be minimally disruptive and also need to facilitate rapid capture of data (given that time in the call centre is often short). The approach taken with the MUI is a 'quick and dirty' variation on ethnography (what Anderson (1992) calls 'motivated looking'). This involves an accelerated narrowing of focus using both key stakeholders to advise and common guidelines for observation (see appendix B). The study usually begins with an overview of the call centre operation by the centre manager or host. This allows the designer to understand how big the centre is, how many teams are involved, how many people are in teams and whether they are collocated, team functions, advisor skills, physical layout, call volumes, performance measures, customer types and systems used.

A number of data capture techniques are utilised according to circumstances and a number of observers are used. Increasing the number of people also inevitably allows a greater amount of data collection in a shorter period of time.

Studies need to start with an extensive pre-brief exercise with the call centre management team explaining what the field team require and what the objectives of the study are. This can ensure that there are few onsite delays due to misunderstandings. Experience has shown that supplying managers with a set of briefing packs can make it easier for team leaders to brief advisors as to what the design team are doing. If possible, the objectives of the study and what is to be done with the data should be reiterated with each individual when members of the design team sit with them. Sometimes, observations may also be made with other advisors who may not have been part of the original study brief (Hammersley and Atkinson, 1995). These are frequently people who offer to cover advisors who were being observed as they take a break, or can just be people who look as if they are doing something interesting that may inform design. These can be useful in that they are not necessarily subject to management selection biases.

The next step is to conduct a high-level observation exercise and listen in to live calls. Generally, the initial stages of observation are spent getting familiar with call routines, processes and patterns of systems interaction. To ensure minimal disruption to the advisor, any questioning is restricted to the time (if any) between calls. The observations can be richer if the designer can sit with advisors with various levels of skills and knowledge to capture individual variations in work patterns. It is often rewarding to observe not only an experienced advisor, but also to an advisor who is still learning the process. Novices are on a learning curve comparable to that of the designer and also take less for granted. Knowing the range of user experience can give designers an insight into the user base that is being designed for and any recruitment or training implications.

Observers must ensure that they are taking accurate field notes throughout, since these are the major source of data, given the difficulties of getting permission to use video or recording equipment into a call centre (due to the confidentiality of customer data). Field notes can include a number of elements including narrative observations of occurrences, sketches and diagrams of physical objects such as screens, desks and floor plans, verbatim utterances and user idiosyncrasies.

More appropriate to the level of detail and timescales involved in MUI development is to indulge in post-hoc thinking aloud protocols (Ericsson and Simon, 1980; Kato, 1986) either with the advisors (if possible) or with their coaches or line managers. This involves talking through transactions that have been noted in some detail and establishing the rationale for observed actions. Thinking aloud is one of the most direct methods to gain information about participant's internal states (Ericsson and Simon, 1980) and provides qualitative information about how users perceive, interpret and understand the systems and tasks that they are conducting. However, this method can only recreate transactional evidence rather than emotional, since any emotional data is likely to be influenced by a post-event rationalisation process. It also relies upon the user's recall of what they were thinking some time ago (Ericsson and Simon, 1980; Karat, 1997).

Relatively early on in the process of 'quick and dirty' ethnography, there needs to be a decision as to where the attention for more detailed data capture needs to be directed. Frequency of task performance usually guides focus. However, other factors such as complexity and value of the customer interaction can also dictate priority for lower level observations (see appendix B for examples of observations).

4.2.1.3. Validating Field Data.

The 'quick and dirty' ethnographic approach to field data capture provides a non-disruptive approach whilst giving the design team the ability to gather a huge amount of contextual data.

Its strengths as a method include the fact that it provides a huge amount of rich data, delays focusing and moving into solution mode, gives a rich context rather than a concentrated view on the use of a particular system and provides the ability to capture both effective and affective data in context (Maxwell and Millard, 1999). Its primary strength is as a different analytical frame of reference which eliminates biases that can result from a purely systems or cognitive approach to design and can produce fresh insights that may not have been captured with other methods.

Some of these strengths also give rise to the weaknesses of the method (Maxwell and Millard, 1999). It is easy to become overwhelmed in detail and it becomes difficult to articulate the richness of data captured. There is no apparent theoretical structure underpinning the observation process. In practice, experienced ethnographers do seem to have a theoretical framework in their heads but this is not often clearly documented. Many of the observations are irrelevant to the systems design process. It is also rooted, inevitably, in observations of the present rather than predictions of the future.

Questions of validity in qualitative research do not follow the same logic as in quantitative research. In the ethnographic tradition, the criterion for analysis is an understanding of the social world that corresponds closely with the social world itself. The effort in analysis is not generalising from cases to populations, but towards generalising from cases to theoretical

populations (Pettinari and Heath, 1988). In other words, the analysis needs to be congruent, verifiable and representative in the setting (i.e. the call centre) rather than generalisable to the population in general. This suits the MUI design since MUIs are built in a bespoke manner to suit a specific user population. The data captured during field observation can be used to spot themes and patterns of action that can then be used to verify and test subsequent designs. This 'constant comparative method' (Silverman, 1993) ensures that the observations accurately reflect the environment.

4.2.1. Documenting Field Data: Rich Pictures and Scenarios/Personas.

4.2.2.1. Combining Personas and Scenarios.

The challenge after a field study is to document the vast amounts of detailed data output without falling into what Macdonald and Jordan (1998) term a 'communications gap' in terms of conveying the results to a number of diverse parties (customers, users, designers, programmers etc). A 'lingua franca' for design needs to be evolved (Erickson, 2000; Crabtree, 2003; Eason, 1995).

Storytelling and narratives are the closest thing to a lingua franca available to designers. Field studies capture narratives of day-to-day activities well. Stories can convey some of the critical detail captured in the field (including causal, emotional, motivational, moral and ethical concerns) without abstracting them from the context in which they were observed.

Storytelling can be accomplished using a number of different media. One common way is to use video to document activities (e.g. Heath et al, 1993; Heath and Luff, 1992; Luff, Heath and Jirotko, 2000; Jirotko, 1998; Suchman and Trigg, 1995). Video based ethnography can be used to capture both detailed customer dialogue and actions (down to keystroke level on the systems). It can then be edited and shown to the design team and to customers to illustrate requirements in context. Although video is a valuable field tool, it has not been used here because of the restrictions and red tape governing the use of video equipment in call centres (usually clearance is required from both management and unions and customer details or screens need to be obscured due to data protection rules). Another reason that video was not

used as part of the MUI method is that, although it is capable of reducing researcher observation time in the field, it tends to increase the time needed to analyse the results by more than the development timescales would generally allow (Millen, 2000).

The narrative medium of choice for the MUI is to construct written scenarios using a set of personas.

Personas have been historically used as a technique for market research and have been adopted as part of the systems design process (e.g. Cooper, 1999; Dawson et al, 2004). A persona represents an archetypal user, usually an amalgam of viewpoints, demographic information and behaviours that have been captured during the course of the field study. As Wotke (2003) states, “we don’t so much ‘make up’ our personas as discover them as a by product of the investigation process. We do, however, make up their names and personal details”. A cast of personas are designed to allow the designers and customers of the system to have “real empathy for the user” (Wotke, 2003). Personas have names, families, jobs, ages, educational qualifications, emotions and motivations for carrying out certain relevant tasks. This behavioural data is contextualised using a task scenario (Dawson et al, 2004) taken from actual incidents observed in the field data. A scenario is a personalised story that features characters, events, systems and environments (Preece et al, 1999). It is a description of an individual going about their daily activities and using specific systems to achieve specific outcomes under specified circumstances over a defined period of time (Nielsen, 1995). This provides a context for design and relates disparate tasks together, as well as providing a description of the key motivators involved in doing the tasks (Rubin, 1994). Scenarios are presented in a linear format, telling the story of an advisor’s genuine ‘day in the life of’ experiences (DILo – Van Helvert and Fowler, 2003). See appendices E and G for examples of scenarios developed for the case studies in chapters 6 and 7.

There have been criticisms of the use of both scenarios and personas in HCI, with Nielsen (2002) accusing personas of being little more than stereotypes who act as little more than motiveless functionaries subsumed by the technology being developed. Erickson (1995)

believes that scenarios have not been respected as a design tool because they are subjective, ambiguous and particular rather meeting the classic requirements of a scientific method, i.e. objective, generalisable and repeatable. In Erickson's opinion this is why scenarios are good design tools since design is not necessarily based upon certainties. This is backed up by studies on design such as Cooper (1999) and Djajadiningrat et al (2000) who have demonstrated the value of scenarios and personas in the creation of design insight.

4.2.1.2. Constructing the Scenarios and Personas.

The first step in constructing the scenarios and personas is to consolidate the field data and start to pick out stories and personalities that are of relevance for design. The best way to do this is to assemble the field team and start to compare and combine notes and experiences.

Rather than attempting to amalgamate data, the easiest way to combine and select potential scenarios initially is to understand a 'rich picture' of the situation. Pictorial scenarios are used to represent key users and tasks (Millen, 2000). Maxwell and Millard (1999) noted the complementary nature of a field observation/ ethnographic approach and the Soft Systems Method (SSM - Checkland and Scholes, 1990) in that they both offer ways of approaching the complexities of a real world problem.

SSM offers a way of structuring some of the outputs of the field study whilst preserving any observations relating to social or political aspects of the situation. It also allows the design team to incorporate multiple viewpoints. SSM also models the situation at different levels of detail. This could help integrate the top-down deductive model required for design, with the bottom-up detailed field observations.

The rich picturing technique within SSM can be used to produce an expression of a complex problem situation, without the need for specialist technical notation. Rich pictures can be used to represent both subjective and objective elements of the problem space. The technique allows the design team to explore various viewpoints, tasks, data flows, systems,

tools, functions, conflicts, emotions, incidents, measures and relationships (see Figure 22).

The rich picture encompasses:

- The structure of a problem situation. These are generally slow to change and may include organisational boundaries, team structures and infrastructure.
- The elements of the process. This includes the various viewpoints, users, systems and processes that serve to carry out the work.
- The environment. This includes elements of influence in the system as a whole.

In the example rich picture in Figure 22, the contexts, systems and processes for creating a call centre telemarketing campaign are shown. The call centre advisor is influenced by multiple viewpoints holistically across the organisation. This allows the scenarios to be constructed with consideration of various customer types and advisor types, interactions between the advisor and the customer, plus the interaction between the advisor and the system (Carroll, 1995). This documents actual evidence observed in the field and allows the design team to identify a number of scenarios that look promising to take into design. It also permits the design team to validate details with the various viewpoints in the system. By consensus, the key personas and scenarios are chosen to take forward into design.

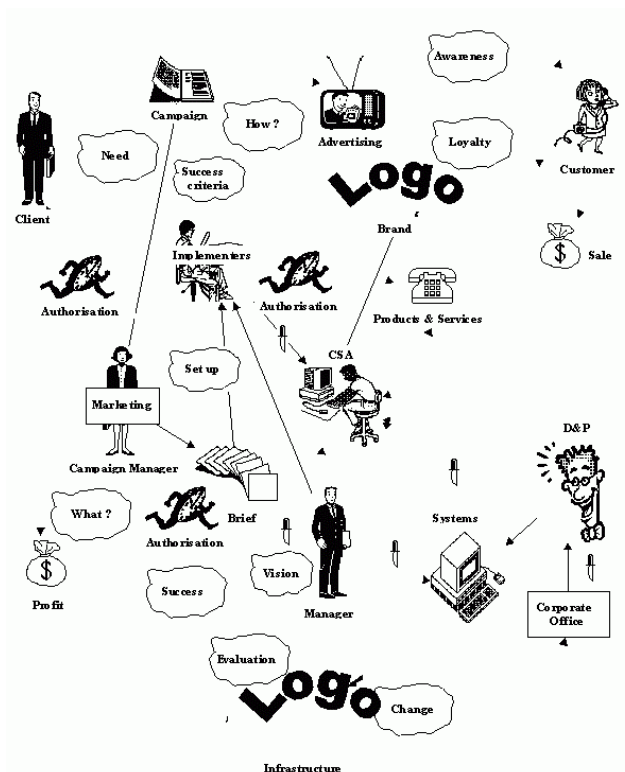


Figure 22: Example Sales Call Centre Rich Picture.

4.2.3. Supplementing Field Data.

Field observation alone is not a panacea for requirements capture and analysis for the MUI. Supplementing field data to investigate less observable behaviours and attitudes is desirable if circumstances allow. These tools and techniques include:

4.2.3.1. Focus group/ innovation workshops.

Field data capture only analyses current practice rather than inventing the future (Button and Dourish, 1996; Grudin and Grintner, 1995). Focus groups and innovation workshops can be used to engage call centre people of all levels. However, these can be difficult to run due to impact of withdrawing significant resources away from the call centre floor. In groups of 6-8 people, usually drawn from a cross section of specialisms and experience areas, these workshops allow them firstly to express problems with current ways of working, what they like and dislike. Once they have got the problems of the current operation out of their system, they are asked to think more 'subjectively' rather than operationally about future systems in a 'futures workshop' (e.g. Fulton, 2002; Millard, Tracey and Lynch, 1998).

These workshops usually include a 'stimulation session' from the design team. This is designed to get operational people out of the day-to-day routine and into thinking about possible future ways of working. This may include general trends from best practice or snippets from the scenarios that have been developed so far.

The session is then split into syndicate sessions of 3-4 people who are asked to come up with ideas for future systems and motivation mechanisms and present them back to the plenary group. Output from these workshops can be further scenarios, paper prototypes of systems or roleplays (e.g. Fulton, 2002; Millard, Tracey and Lynch, 1998). By harnessing the practical knowledge of the advisors and managers, ideas can be tried out in context, whilst the design team can explore and evaluate ideas in partnership with those who could be using the future system. See appendix D for an example extract from a futures workshop run as part of the case study in chapter 6.

4.2.3.2. Task Flow Analysis.

This is a more traditional feature of a human factors' requirements toolkit (see Diaper and Stanton, 2004). Task analysis provides a functional decomposition of how people do their jobs. Tasks can be split into subtasks and further decomposed into sub-subtasks that give an idea of linear and logical ordering. Task analysis can provide an indication of the functionality required on the user interface at each stage of the user's task, including menu options and field order. Tasks can be allocated to both the user and to the system to provide an idea of both job and systems design. A sense of task flow 'as is' can be captured through field observation, expert interviews, training manuals and also analysis of any existing procedural documentation.

Task flow analysis can provide an optimal route for effectively completing a task. However, this may not be the way that every user completes the task and allowances need to be made, in terms of the flexibility of the user interface, with respect to other routes to task completion. It also does not take any affective elements of the task into account.

4.2.3.3. Questionnaires.

Questionnaires can be used to extract some of the less observable elements within the environment. They can be effective if the advisors are given time and incentive enough to actually fill them in. The main uses for questionnaires in the MUI requirements process are to extract information from advisors on their motivational drivers. They can also gain data about attitudes and satisfaction with the current systems that are used in the call centre. The major problem with questionnaires is that they provide a subjective evaluation of interfaces that is often greatly influenced by the type of questions asked and the way in which the questions are phrased (Chignell, 1990). This is why they are used here to supplement other methods rather than acting as a panacea for data capture.

Rather than administering a bespoke questionnaire, the widely used generic usability evaluation questionnaire, Software Usability Measurement Inventory (SUMI - Kirakowski and

Corbett, 1993) has been adopted as a tool for the MUI. This is a 50 question paper-based questionnaire in which users score each item on a three-point scale (i.e., agree, undecided, disagree). The questionnaire is designed to measure scales of:

1. **Affect** – this is largely gauged through user satisfaction but gives a general measure relating to the user's emotional feelings towards the software (e.g. warm, happy).
2. **Efficiency** - the extent to which the system enables the task to be completed in a timely, effective and efficient way.
3. **Learnability** – whether the user feels that it is relatively straightforward to become familiar with the system.
4. **Helpfulness** – the perception that the system helps users through the task.
5. **Control** – whether the user feels that the software is under their control and provides consistent feedback.

This gives a general usability 'score' for the system and can provide comparative before and after data during both the requirements and evaluation stages.

4.2.3.4. Interviews.

One-to-one interviews can gain overview knowledge about the way that the call centre works. They can also get more detail about ways of working. Interviews have the advantage of being able to capture interesting issues as and when they occur and allow the design team to probe areas of interest more deeply. They can be effective in eliciting information about user feelings, preferences and attitudes and can reveal problems that are not necessarily directly observable.

The difficulty with interviews is that they often provide the team with the 'official version' of operations rather than the way that the centre actually works. This is not necessarily a problem since field observation data should capture the actual modes of operation. Contradictions and variations between official and actual versions can provide insights into what it takes to get work done on a practical level.

4.3. Design.

“We continue to see the prospect of a decade of research analysis of usability possibly failing to provide the leverage it could on designing systems people will really want to use by ignoring what could be a very potent determination of subjective judgements of usability – fun”, Carroll and Thomas, 1988.

4.3.1. MUI Design Principles: An Overview.

Dorst (2004) suggests that, in terms of motivational factors, design should aspire to the self-esteem and individual self-realisation levels of Maslow's (1970) hierarchy of needs. It should allow the user to acquire a sense of self-identity and achievement through use. Creating a design that provides both effective and affective support is, therefore, vital for the success of the MUI.

Individual MUI designs have been tailored specifically to the user needs captured during the requirements process. Specific design rationale for each of the three MUIs is, therefore, documented in detail in the case studies in each of the following chapters (5, 6 and 7).

In designing a MUI the following factors need to be considered (Garratt, 2003). They are (from abstract to concrete):

- The strategy – what is the MUI there to achieve? This includes looking at how it fits with the culture, environment and demands of the target call centre.
- The scope – this includes both the effective and affective functionality. What tasks should it support? What elements of motivation should it support? (Including how it supports the five C's detailed in chapter 3).
- The structure – how the MUI is organised, including the interaction design and the information architecture.
- The skeleton – the structure in terms of the user interface, the information design and the navigation.
- The surface – this involves the visual design, branding and user experience elements.

Going from this abstract to concrete in design ultimately requires a “creative leap” that cannot be formalised into any step-by-step method (Brooks, 1975; Davis, 1996; Graham, 2004). Indeed both Crabtree (2003) and Twidale et al (1993) critique the fact that formal and structured design methods tend to act against creative design strategies. Dorst (2004)

suggests that design is a process of exploring a problem space and producing solutions in parallel.

Rather than continuing with the abstraction in design practiced by many of the traditional software engineering methods (Button and Sharrock, 1994), the MUI design method rapidly makes things concrete through evolutionary prototyping (Bally et al, 1977; Naumann and Jenkins, 1982).

By producing scenarios from the output of field data, a means for mutual understanding of the design space is established (Erickson, 1996; Sacks, 1992) and the problem with handling the richness of the observational data and translating them into design ideas is also partially solved (Carroll, 1995). Scenarios also provide a context for design. However, these ideas, although descriptive, are still intangible. Twidale et al (1979) note that structured methods have provided very little support for this creative transition. Evolutionary prototyping offers an approach that allows the designers to innovate, yet creates something tangible that users can sanity check.

Evolutionary prototyping allows designers to follow the 'deliver – measure – adjust' eternal circle advocated by Deming (1986). The advantages of this method for the MUI are that:

- It provides a common, non-abstract point of reference for communication between users and designers (Graham, 1989; Lichter et al, 1993).
- It provides a mechanism for realising and expressing the scenarios that have been generated. As Kyng (1995) comments, "use scenarios don't make sense in themselves but are understood through prototypes realising them".
- Both ease of use and motivation to use are not simply attributes of a product alone but attributes of interaction with the product in a context of use (Karat, 1997). Prototyping allows validation of ideas in the context of the actual work of the end user (Crabtree, 2003) rather than in an artificial environment such as a laboratory.

Prototyping from scenarios begins with a relatively simple model of the system. Frequently these initial prototype options are explored on paper with both the design team and, where possible and/or appropriate, with users. This often involves storyboarding, a technique taken

from the film industry, which enables the design team to sketch designs that support elements of the scenarios. This permits an inexpensive, low technology approach that allows the design team to investigate a number of design options and validate them with both designers and users. This is important since there is no single optimum design solution to any problem and designers are often forced to form a compromise between a number of alternative designs.

As designs become more concrete, a concept multimedia prototype is built (usually in a tool such as Macromedia Director) and iterated with increasing levels of functionality and increasingly detailed levels of structure, skeleton and surface detail. Both developers and users can then test the iterations of the prototype with the real-world work scenarios. Users are asked to run through scenarios whilst using the prototype. The design team can then evaluate the design with users (see 4.4 for more detail on evaluation). Using this method, the designer and user can quickly pick up errors in design, identify areas that need development and capture usability problems.

During the prototyping process it is not just the system that is iterated and refined. The designers can start to iterate and evolve the scenarios to reflect the influence of the future design on the current scenario. In this way, the prototype is delivered with a set of contextual scenarios that can be used to help users explore the prototype or provide a 'script' to anyone wishing to demonstrate the prototype system to it's fullest. This again, ensures that the designs are not abstracted away from context and documents the process contributing to the overall design rationale (Lee and Lai, 1991). It also recognises that, once designs become more concrete, the users often come up with ideas and uses for the system that were never anticipated in the original brief. Carroll and Rosson (1991) term this phenomenon the 'task-artefact' cycle in that it makes explicit the consequences of design for the user.

4.3.2. Balancing Effect and Affect in Design.

MUIs aim to address user needs that go beyond the practical and into the domain of affective design. However, usability principles cannot be ignored because they are prerequisites for the higher level motivational needs. Jordan (1999) has linked the development of human factors to Maslow's hierarchy of needs, with the implicit notion that the attainment of one level leads inevitably and quickly to a desire for the next (see Figure 23). Usability has moved from being a 'satisfier' when present to a 'dissatisfier' when absent. A product which obstructs the path to goal achievement by having an incomprehensible interface is neither usable or a pleasure to use. Pleasure does not subsume usability, nor does usability alone generate pleasure. There is no rule that everyone wants an aesthetic experience when achieving a goal and there are no rules as to what a suitable experience might be. The implication for the design of the MUI is to decide when to separate out the aesthetic from the functional. A fun or enjoyable interface may not be appropriate for a fair proportion of the time of the advisor's interaction. Aesthetic may also exist in the task (the "beautiful call" (Alferoff and Knights, 2002)) rather than the interface.

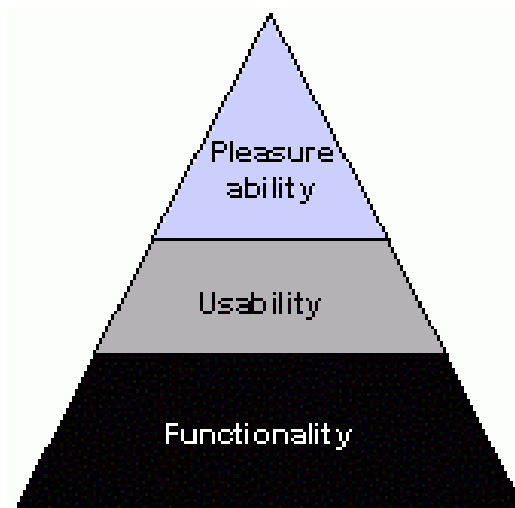


Figure 23: The pleasure based design pyramid (Jordan, 1999).

The MUI needs to encompass at least the first two of these three levels:

Level 1: Functionality.

If a product does not provide appropriate functionality to support the user's task, it is unlikely to be used in the first place. The designers need a thorough understanding of the product's intended use and the context and environment in which it will be used.

Level 2: Usability.

Appropriate functionality is a prerequisite of usability, however, it does not guarantee usability. For this, the designer needs to understand and apply the principles of ergonomic design. These principles are well established in the usability tradition. International standards such as ISO 9241 (ergonomic requirements for office work with visual display terminals (VDTs)) document guidelines for displays, colours, menus, text sizes and form designs. In addition, there are a plethora of design rules and heuristics that have been published by the likes of Shneiderman (1998), Nielsen (1994) and Norman (1998) that detail usability do's and don'ts. These aren't quite a scientific framework but are a good start.

In order for the MUI to address affective needs, basic ergonomic design principles must first be in place. The MUI needs to be:

- Consistent - allowing users to apply previously learned knowledge to new tasks. Applications need to be consistent, both within themselves and consistent with one another. Although MUIs are not necessarily like other productivity applications, they must be consistent with expectations drawn from either the real world, or games applications. Multimedia and colour can be used to support consistency (Jones, 1998).
- Stable - users expect the interface to remain stable unless they change it. The difference between traditional GUIs and MUIs, however, is that violation of this rule is permitted, as long as user control is maintained. By allowing the UI to

encompass elements of autonomy, surprise and novelty it can increase engagement through promotion of curiosity.

- Intuitive – by utilising real world metaphors, knowledge can be transferred between the real world and the world of the interface, thus giving the UI an intuitive quality.
- Aesthetic - as all elements on the screen potentially compete for the user's attention, and a cluttered, unorganised environment will not optimise memory load. The MUI design should resist the temptation, as in many CRM applications, to put everything about the customer on the screen in multiple windows and minute fonts. By understanding what knowledge people need and at what level in their task, the MUI needs to play to the limitations of human short-term memory and cognitive load and provide guidance on the path(s) that the advisor can take. A visual aesthetic for design should not overwhelm functionality (Green and Jordan, 2002) and a balance needs to be reached between emotional and traditional usability.
- Feedback sensitive - users need to see visible cause-and-effect relationships between their actions and the objects on the screen. This increases the user's sense of control and, used constructively, can increase self-efficacy.

Level 3: Pleasurability.

To some extent, users expect usability and it is only a dissatisfier if it is not present (Jordan, 2000). Software that brings not only functional benefits but meets the emotional and expectation needs of the user is more likely to be used (Jordan, 2000; Dix, 2001). Contrary to Shneiderman's (2004) assertions that pleasurability can be gained through inclusion of so-called fun features such as "alluring metaphors, compelling content, attractive graphics, appealing animations and satisfying sounds", design for pleasure can be much more subtle than this (Carroll, 2004).

Methods for pleasurable design are far less well established than those for usability since the discipline is still relatively new. Hassenzahl (2004) suggests that the

commonly held belief that pleasurable design puts passion, desire and seduction above reason is misguided. Emotional design needs to tap into both cognition *and* emotion. Pleasure can also be ephemeral and personal. Areas such as emotion, pleasure, fun and engagement are not well understood. This raises the question as to whether these qualities can be deliberately designed (Hassenzahl, 2004; McCarthy and Wright, 2004). Hassenzahl (2004) suggests that designers can shape pleasurable experiences but cannot determine them through design. Norman (2003) suggests that the design needs to be 'reflective' of culture, experiences, individual idiosyncrasies and learned behaviours. This, he suggests, is where the discipline of design comes into play. However, developing design heuristics for pleasurable design is difficult because it can be rooted in an individual designer's cultural heritage and preferences and the way in which the user interprets these designs. McCarthy and Wright (2004) suggest that users actively construct experiences using six sense-making processes:

- Anticipation – expectation based on prior experience.
- Connecting – making sense of the situation.
- Interpretation – working out what is going on and how they feel about it.
- Reflection – examining and evaluating an interaction.
- Appropriation – working out how new experiences fit into prior experiences.
- Recounting – telling others about experience and making sense of it through storytelling.

Just like pleasure, motivation is both individual and rooted in context. It is almost impossible to prescribe a method for MUI design. This is why the design rationale for each MUI design is detailed within each chapter's case study, rather than outlined here as a generic design model.

The general framework for motivation has been set down within the five C's described in chapter 3 – culture, content, collaboration, curiosity and control. These provide general anchors for design, since they are relatively stable, but the fulfilment of motivational needs can only be achieved as part of a particular usage situation (which is why scenario based design can be most effective here).

MUI designs need to strike a balance between affective and effective design in order to support functional, usability and pleasurable levels of need. This can sometimes produce conflicting design ideas. For example, the MUI needs to support curiosity but it should not overdo elements playing to sensory curiosity because it violates basic usability principles (e.g. Nielsen, 2000). Users can get annoyed and frustrated with interfaces that are overloaded with text and graphics, making it difficult to locate the desired information and slow to access. In the world of computer games, Herz (1997) argues that graphically minimal games such as Pac Man were actually more engaging than more recent games with richer levels of graphic detail. Novel multimedia can draw attention and increase cortical arousal but rapid changes in short sequences can confuse the brain (Reeves and Nass, 2000). Inclusion of aesthetically pleasing elements will not necessarily guarantee more enjoyment or learning (Jones, 1998).

Through prototyping the MUI, the designers are able to determine with the users whether the balance between affect and effect has been met.

4.4. Evaluation.

Evaluation is the process of measuring and testing the MUI with respect to a number of success criteria. Evaluation meets the 'measure-adjust' element of prototyping, reflecting Deming's (1986) eternal circle. The key to a successful evaluation exercise is consideration of the key measures that can be used to gauge success. This is important because measures can very easily blinker designers into ignoring all but the variables selected (Fulton, 2002).

Chapter 3 explored the notion that usability alone is not necessarily sufficient for a system to be used (Jordan, 1997, 2000; Glass, 1997). The MUI is not simply designed to be usable. It is designed to encourage usage and to provide a tool through which advisors can become more motivated. To evaluate the MUI, therefore, necessitates going beyond simply evaluating whether it is usable and seeing whether it is used and meets motivational needs (as suggested by the five 'Cs' detailed in chapter 3). This involves evaluating all aspects of what

Overbeeke et al (2002) term the 'holy trinity of interaction' - knowing, doing and feeling. These require mixture of both objective and subjective measurement techniques since the variables are multifaceted and can encompass social, functional and aesthetic qualities.

De Angeli et al (2002) suggest that the following variables are all factors that need to be considered in terms of user evaluation (see Figure 24):

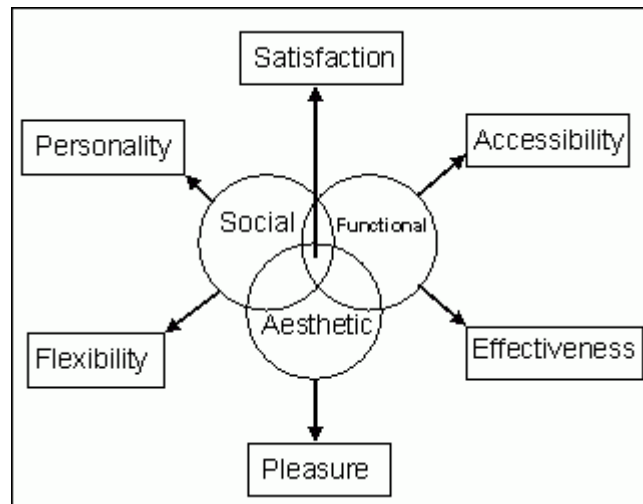


Figure 24: Social, functional and aesthetic criteria for effective and affective usability.

De Angeli et al (2002) propose that factors that need to be considered in terms of evaluating a systems' success include:

- Accessibility – the effort required to interact with the system, including ease of communication and accessibility.
- Effectiveness – rather than just measuring error rates, evaluating the effectiveness of creating and maintaining a relationship.
- Pleasurability – how much the user enjoys using the system.
- Flexibility – considering both adaptability (whether it is personalised to the user) and adaptiveness (how it modifies behaviour with respect to user actions).
- Personality – what traits/ consistent character the user attributes to the system.

These ideas complement Hassenzahl, Beu and Burmester's (2001) model of technology acceptance in that they acknowledge the role of both affect and effect as criteria for evaluation. However, they take the model further to include the behavioural and emotional consequences of the system's design. Hassenzahl, Beu and Burmester (2001) include:

- Ergonomic quality (the equivalent of 'functional' criteria) – It is usable? Does it support the task context that it is designed to facilitate? This ensures that the design is effective with respect to the task at hand.
- Hedonic quality (encompassing 'aesthetic' criteria) – what qualities and contextual elements contribute to positive aspects of user experience? Does it meet people's motivational needs? (e.g. the five C's of motivation). This provides opportunities to design to preserve or enhance positive aspects of the MUI and design out negative.
- Judgement of appeal (including the 'social' aspects) – do users find it pleasurable to use?
- Behavioural consequences – is it used in an operational context?
- Emotional consequences – does it increase advisor motivation?

Given that the MUI is not simply looking at the qualities of design but also the consequences of it, a toolkit that can measure these diverse elements needed to be derived in order to evaluate the success of the MUI.

Many of the tools used for gathering requirements (and described in section 4.2.) are also useful for evaluation. The nature of the prototyping approach means that the relationship between requirements and evaluation is close, as one often inevitable feeds into the other as the iterative process runs its course.

4.4.1. Ergonomic quality.

Most conventional user interface evaluation methods provide designers with an instrument to measure usability objectively. To measure usability, one must first define what it is. The ISO Standard 9241 defines usability as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”.

Field methods for ergonomic usability evaluation can collect both objective performance measures (i.e. can the users effectively perform tasks using the system) and subjective user preference measures (satisfaction with the system – e.g. Nielsen and Levy, 1994).

Usability testing of the MUI typically involves getting a cross section of potential users of the system to:

- Run through a pre-defined set of tasks taken from the scenarios that are supported by the prototype MUI. Using a co-operative evaluation technique (Wright and Monk, 1991) combined with a cognitive walkthrough (Lewis et al, 1990; Polson et al, 1992; Wharton et al, 1994; Lewis and Wharton, 1997), advisors were then allowed to explore the interface whilst a member of the design team sat alongside providing guidance, when required, and probing the advisor's thoughts, feelings and expectations as they completed the task.
- Explore the prototype without a set agenda and observe usage using observational techniques such as situated evaluation or contextual inquiry (Beyer and Holtzblatt, 1998).
- Observe a demonstration or walk through of the system.

The **structured interview** technique works well if it follows a walk through or demonstration of the prototype. This can be conducted in a group situation that is useful where there is little chance to do extensive testing with individuals. Standard questions allow comparisons to be made between groups. However, any comments that occur outside the standard questioning should not be ignored.

As with requirements capture, **questionnaires** such as the Software Usability Measurement Inventory (SUMI – Kirakowski and Corbett, 1993) can also be used (see 4.2.3.3) to evaluate the ergonomic quality of an interface.

4.4.2. Hedonic Quality.

Although user satisfaction is part of traditional usability methods, assessment of affective qualities is not well served. Aspects such as pleasure of use, hedonic quality and humour do not necessarily reduce learning times, performance times and error rates. However, Jordan (2000) posits that positive affect can increase product use since users will spend more time interacting with a system and are more likely to retain information and gain knowledge about usage.

Often initial reactions to systems are more powerful on the emotional rather than the cognitive side (Lipkus and Hollands, 1999). This can override cognitive/logical representations of a situation. Cognitive interpretations last longer (Leventhal et al, 1983) and are more memorable so are more likely to appear as a post hoc rationalisation on instruments such as questionnaires and interviews. This skews results in terms of accessing true user emotional reactions. Co-operative evaluation techniques and cognitive walkthroughs are also unsatisfactory instruments for accessing user emotions since it is often difficult for users to articulate emotional states (Wensveen, Overbeeke & Djajadiningrat, 2000).

Given these issues with conventional evaluation techniques, new methods are required to assess how users experience and enjoy using products, interfaces and systems (Sanders, 1999; Mandryk, 2004). Genuine emotional reactions are difficult to access in a laboratory environment and also cannot be faked, so hedonic aspects of the MUI need to be assessed in the context of genuine tasks and conditions.

There are a number of techniques that have been emerging as methods to access user's emotional states. These include:

- Physiological feedback, e.g. biometrics (Picard, 2000),
- Qualitative methods, e.g. diaries/journals, facial expressions (Ekman, 1992, 1999), body language/gesture (e.g. Kapoor, Mota and Picard, 2001; Reynolds and Picard, 2001),
- Self report techniques, e.g. semantic differentials (Osgood, Suci and Tannenbaum, 1957), free labelling methods (Philippot, 1993), Kansei (Nagamachi, 1989), non verbal assessments (e.g. SAM (Lang, 1980), EmoCards and PrEmo (Desmet et al, 2001).

4.4.2.1. Physiological Feedback.

The easiest way to assess whether the user is having an emotional reaction, without the bias of higher level processing and verbalisation, is to directly measure changes in body chemistry and neurology. These are triggered by the amygdala, the primitive part of the brain, at the time of an emotional response. This relation between physiological signals and emotional arousal/valence is established in psychophysiology (Levenson, 1988). This argues that the activation of the autonomic nervous system changes while emotions are elicited.

These changes can be measured using sensors to detect signals such as:

- Blood Volume Pressure (BVP) – the amount of blood that the heart is pumping around the body. This is highly influenced by multiple stimuli and varies widely by subject.
- Electrocardiogram (ECG) – how fast the heart is beating. This is also highly influenced by multiple stimuli and varies widely by subject.
- Galvanic Skin Response (GSR) – an increase in conductivity of the skin. This is a general measure of arousal that measures ‘microsweating’ on the skin. This too is highly influenced by multiple stimuli and varies widely by subject.
- Skin temperature – temperature can reduce as part of a fear reaction as blood flows to muscles rather than to the skin as part of a ‘fight or flight’ response.
- Electromyography (EMG) – signals from changes in muscular tension or relaxation. The levator (either side of the nose), corrugator (inside of the eyebrows) and zygomatic (main cheek) muscles on the face are particularly effective and have been charted by Ekman (1999) as part of his facial action coding system.
- Respiratory rate – how heavily the subject is breathing.
- Pupillary response – dilation of the pupil is influenced with positive emotions and interest. This can also be affected by light conditions and drugs.
- Electroencephalograms (EEG) – variation in activity patterns in different parts of the brain that indicate states of arousal.
- Vocal patterns - speech rate, pitch, intensity and quality.

Sloman (2001) calls these ‘shallow’ models of emotion because they do not attempt to present a plausible model of human emotion linked with cognitive theories. He suggests that a shallow model is sufficient for applications such as user interface design, but would not be sufficient for emotional theories applied to artificial intelligence. The MUI, therefore, does not require any deeper level of emotional theory so physiological measures seem an appropriate option.

Reynolds and Picard (2004) extol the use of body sensors to detect physiological signals because “one of the problems with using switches is that the required active effort on the part of the individual, which distracts them from the first task at hand”.

Affective devices can be active or passive. Passive sensors (cameras, microphones etc) are considered to be more intrusive than active (wearable sensors) because users can feel that these are an invasion of privacy and a loss of control (Reynolds and Picard, 2004).

However, there are a number of practical problems with administering psychophysiological measures. It is difficult to associate a particular emotional state with any measure of arousal. Therefore, it is also difficult to associate arousal with a particular aspect of the task or the interface and is prone to influences that lie outside the person or their environment. Wensveen, Overbeeke and Djajadiningrat (2000) suggest that physiological data is an unreliable source of emotional data. This is largely because the emotional response may not be as a direct consequence of using the system, but could be triggered by other environmental factors (including those external to the work place). In addition, there are huge individual differences so large data sets are generally required to start to detect individual affective patterns.

Psychophysiological measures (GSR, BVP and respiration) have been used in call centres as part of an intelligent advisor assistant to assess stress and adjust advisor's workloads (Andersson et al, 2001). This study found a huge individual variation in individuals' responses to stress factors which depended on people's subjective perception of events. As a result they also introduced a subjective self report element to the process based around Maslach's burnout index (Maslach et al, 1996)

Sensors tend to be invasive with the most popular physiological device, the Procomp, requiring sensors to be attached to the user's skin. The call centre unions rapidly rejected an initial proposal for use of such devices as part of the MUI project. This was despite the fact that the design team assured them that measures would not be used by management and that advisors were free to remove sensors at any point during the experiment. Researchers have devised devices that detect physiological data less invasively such as the emotion mouse (Ark, Dryer, Lu, 2000), the galvactivator glove (Picard and Scheirer, 2001), expression glasses (Scheirer, Fernandez and Picard, 1999), affective jewellery (Scheirer and Picard,

2000), pressure sensing keyboard (Reynolds and Picard, 2004) and posture sensing chair (Kapoor, Picard and Ivanov, 2004). These devices, especially the emotion mouse, are still being considered for use with future MUIs.

4.4.2.2. Qualitative Methods.

Wensveen, Overbeeke & Djajadiningrat (2000) argue that, since people express and communicate their emotions through behaviour, this behaviour is a source of direct information about the emotions. They posit that observation of behaviour can be the most reliable way of assessing user's emotional reactions at the time of systems usage.

One possible way of eliciting emotions was to get advisors to complete a diary of their feelings for a month. However, the time constraints of call centre work made this impractical. This led to the decision to return to observational techniques to capture non-verbal behaviours that would provide clues to users' emotional states as they interacted with the system (Wensveen, Overbeeke & Djajadiningrat, 2000). The behaviours noted were the more obvious indicators of particular positive and negative emotions, termed 'affectemes' by Axelrod and Hone (2004). These can be recognised and quantified during an analysis. The design team were then able to approximately assess the user's emotional state and engagement as they interacted with the MUI prototype. These were correlated with verbal reports that were obtained during the prototype walkthrough.

4.4.2.3. Self Report Techniques.

To supplement psychophysiological and observational data, another option for evaluation is to use self-report techniques since, according to Moon and Kim (1997) "the most convenient measure of emotion is the self report given by the person experiencing the emotion".

There are 3 types of self-report measures of emotions:

- Differential emotions scale (DES) – measures intensity of an elicited emotion
- Semantic Differential (SD) scale (e.g. Osgood, Suci and Tannenbaum, 1957) – this pairs polar emotion terms and measures the intensity and direction of an emotion.
- Free labelling method (Philippot, 1993) – this is where people jot down feelings at the time of the experiment.

Both Moon and Kim's (1997) Emotive Interface Engineering method and Nagamachi's (1989) Kansei Engineering technique are based upon semantic differentials. These methods determine the primary dimensions of emotion space (polar adjectives) and develop a self-report questionnaire that can be administered to advisors after they have seen or interacted with the MUI prototype. Analysis of this questionnaire can then allow designers to establish the interaction between the interface design and the user's emotional reactions.

4.5. Reflections on the MUI Methodology.

This chapter serves as a summary of the MUI approach to requirements, design and evaluation based around the central concepts of field observation (based on a 'quick and dirty' form of ethnography) and evolutionary prototyping.

The methodology needed to encompass the cognitive, perceptual-motor and emotional aspects of the advisors' interactions. These methods had to overcome the practical challenges of working in an environment where timescales were short, access to users was limited (and subject to endless interruption) and scientifically controlled experimentation was difficult, if not impossible. To this end, the emphasis tended to be:

- For requirements capture – minimally disruptive, field observation techniques were key to data capture due to the difficulties in accessing call centre advisors' time. These were supplemented, where possible, with futures workshops, questionnaires, thinking aloud protocols and interviews.
- For analysis – creation of a lingua franca to express the rich data from requirements capture, using rich picturing and personas and scenarios.
- For design – evolutionary prototyping using a multimedia animation package to make the concept of the MUI more concrete.
- For evaluation – due to the problems in getting call centre advisors' time, many of the evaluation techniques involved opportunistic 'guerrilla' style tactics, such as setting up evaluation facilities in the advisors' break room or coffee area. Success of the MUI prototypes were evaluated in a number of ways:

- Were they usable? Using standard usability methods such as questionnaires, structured interviews, cooperative evaluations and cognitive walkthroughs.
- Were they pleasurable? Using affective self report (using semantic differentials) and observation of affective behaviours during evaluation. Psychophysical measures were ruled out due to the invasive nature of the sensors, the objections of the unions and the unreliability of results.
- Were they used? Using evidence of actual usage in the call centre using minimally disruptive field observation techniques.

The MUI case studies described in the next three chapters approximately follow this methodological approach but are largely driven by the practical constraints of doing research in a busy operational environment rather than a controlled one such as a laboratory. Application of these methods are implicit in the case study descriptions but more detailed descriptions of what actually was done reside within the next three chapters.

Chapter 5: From POW to COW: The Path from GUI to MUI.

“There are many designers who cannot distinguish prettiness from usefulness... To be truly beautiful, wondrous and pleasurable, the product has to fulfil a useful function, work well and be usable and understandable”, Norman (2002).

This chapter presents the evolution of the original prototype Personal Office Workspace (POW) that evolved from a graphical user interface supporting call centre advisors into the first prototype Motivational User Interface (MUI).

5.1. The Graphical User Interface: The Personal Office Workspace (POW).

5.1.1. POW: Initial Rationale.

The notion of the Motivational User Interface (MUI) arose from a collaborative research project between British Telecommunications PLC (BT) and Bournemouth University, which involved the author plus Drs Linda Hole and Simon Crowle. The initial piece of research was commissioned in 1995 to investigate the application of graphical user interfaces (GUIs) to call centre applications. Call centre turnover was typically high at that time. Systems development was moving from the complex, command line driven ‘green screen’ customer service database to a more guided interaction, facilitated by a forms based front end to the database (see 2.3.2). The rationale for this was to increase ease of use and reduce training commitments whilst reducing cognitive overload. Motivation was, at this time, a secondary consideration for the research.

The research looked at the possibility of designing a two or three-dimensional ‘advisor desktop’ GUI to support the advisor tasks (see 2.3.1), provide an intuitive but flexible navigation style and decrease training and cognitive load further. A prototype system, the Personal Office Workspace (POW), was evolved to provoke discussion among the systems design community about the viability of introducing such interfaces into operational call centre environments. Discussion about its development was reported in Millard et al (1997). POW was designed to take the call centre away from the DOS and forms based interfaces and see

if a graphical user interface could be used to support advisors' tasks. Although it is a GUI not a MUI, it is included here as context as to how and why the MUI evolved.

The research team was given access to a call centre in the South of England dealing with incoming calls on a wide range of topics relating to their telecommunication services (see Figure 25).



Figure 25: The Telecommunications Call Centre under study.

The study followed the general MUI method described in chapter 4:

1. Observation of the advisors working with the original command line interface system and identification of a set of key scenarios (see 4.2.1 and 4.2.2).
2. Task analysis and questionnaires relating to both the original DOS based interface and the POW interface (see 4.2.3.2 and 4.2.3.3).
3. Evolutionary prototyping of the graphical user interface (see 4.3.1).
4. Evaluation of the new prototype using a co-operative evaluation technique combined with a cognitive walkthrough (see 4.4.1).

5.1.2. Requirements Capture for the Personal Office Workspace (POW).

5.1.2.1. Initial Field Observation.

The field data capture phase of the study involved passive observation of the advisors whilst they took calls from the general service enquiry line. This involved listening to calls and noting actions performed as a result of these conversations. This provided a contextual view of the advisor's day, including a view of database navigation. The study was based on a

sample observation of 365 calls between 11 advisors. During the call, the advisors followed the typical call-handling pattern described in 2.3.1 – see Figure 26.

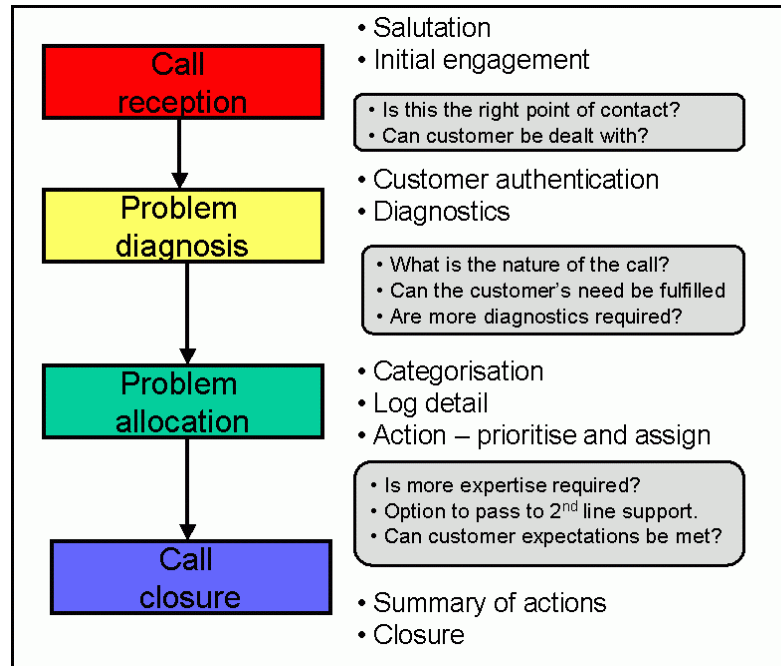


Figure 26: Typical Call Handling Pattern.

The initial observations provided a snapshot of calls and patterns within call handling. Data was captured largely using observational techniques but some calls were audio recorded to facilitate subsequent analysis. The data captured included the purpose of the customer's call, actions performed by the advisor (including browsing the database, writing notes or using other knowledge sources), categorisation of the call, sequences of database command codes used and the key fields required to fulfil the customer need.

From the initial observations, four call scenarios were identified that were both frequently performed and relatively complex in terms of informational requirements. These were:

1. Welcome and customer validation – this task ensures that the customer on the line has the authority to perform actions on the account and is required before any further dialogue can take place. This involves taking the customer's account number, name and postcode and validating these against the listed database entry.
2. Billing enquiries – e.g. "I don't understand this charge on my bill – can you tell me what it is?", "I've paid my bill; don't cut me off".
3. Features enquiries – e.g. "Can I change my 'Friends and Family' numbers?", "can I put call barring onto this phone?"
4. Moving house – e.g. "I'm moving down the road, can I keep my phone number?".

Calls falling outside these categories were excluded from further analysis, as were any short calls within the four categories that involved little or no subsequent action. As a result, two hundred and sixty calls were analysed as part of the study and thirty calls were translated into a detailed task flow analysis. Screen dumps of a selection of the command line system's screens were collected to form the task flows and were allied with the dialogue flows that had been captured on audio tape.

5.1.2.2. Task Analysis.

It was found that within each scenario, 83% of advisor activity was focused on a central sixteen typical actions. Only comparatively small subsets of database screens seemed to be used during call handling, and, within this subset, activity was primarily focused on a few key screens. Movement between these screens did not follow the prescribed menu-driven route. The experienced advisors had learnt the three-letter commands needed to access the area of the database they required. Interaction with the database in this fashion sometimes caused problems with the saving of entries in certain fields. Hence, a lot of note-taking activity was required for the advisors to retain the information they had collected from the customer or their records. Since advisors do not have sufficient cognitive resources to commit these customer details to memory, paper serves as an external medium to store this temporary information (Dix et al, 2003). The advisors rarely used the system menus or help facilities; when they forgot how to access areas of the database, they relied on one another for help.

Information presented on one screen was sometimes needed in conjunction with other screens. This added to the users' cognitive load, as they were required to flick backwards and forwards between screens to follow their thoughts about the customer enquiry. Accessing the database via this interface meant that a disproportionate number of actions were required to complete each task.

The reliance upon typed input made the use of the system error prone, as the advisors attempted to work at a speed that enabled them to meet their call handling targets. The

advisors did not always work in the manner required by the system. Hence they had to undertake significant amounts of note taking, as parameters were lost from screen to screen. During a call, the advisors browsed the database to gain an understanding of the customer's circumstances as they were speaking, holding information from the various locations in their working memory.

The task analysis provided a crude map of the human-computer interaction but it didn't reveal much about the advisor's mental model of the system or how items on the screen were supporting the achievement of a task. The problem was not around what screens were accessed, but what particular details on the screen were used. The advisor did not necessarily articulate what they were utilising on screen during the dialogue and it was not possible to elicit verbal protocols concurrent with the call.

5.1.2.3. Questionnaire.

The passive observation approach was chosen because it would not disrupt the advisors' natural work patterns. However, it made it difficult to elicit the views of the advisor population during the period of data collection. To remedy that, a bipolar, nine-point questionnaire was administered to a sample of thirty advisors to ascertain their overall impression of the usability of the database. 43% of the questionnaires were subsequently returned for analysis.

Advisors who returned the questionnaire suggested that the command line interface was 'easier' rather than more 'difficult' to use. This could be explained by the fact that the user population under study were all experienced advisors rather than novice or intermediate users. Competence in the job was reliant on effective and efficient use of the system so, although the system required a high level of skill, the advisors were experienced enough for usage to have become second nature.

Although the advisors found the database adequate for their jobs, they felt that the system was sometimes a hindrance to them being able to do the job to the best of their abilities. The

single largest area of concern was the speed of interaction required to meet their call handling time, which was targeted at two hundred and forty seconds per telephone call.

Many advisors enjoyed their jobs and took a pride in successfully and efficiently dealing with the customer enquiries and problems. They viewed themselves as the mediator between the customer and the database. They mastered the interface on the customer's behalf.

Being the biggest non-military database in Europe at the time, the system provided a large proportion of the information that the advisors would ever need. However, this information often lay on multiple, dispersed screens. The command line interface relied heavily upon fast and accurate typing. When performed well, interaction with the system was powerful, flexible and user controlled. Experienced advisors felt that they could access the information held within the database with speed and efficiency. However, this interface made a heavy demand on the advisor's long-term memory to recall the three-letter screen commands, which is why advisors perceived that the system was difficult to learn and to remember.

5.1.3. Designing the POW Interface.

5.1.3.1. Design Rationale: Command Line versus Direct Manipulation.

The next stage of development was to prototype the POW. The design team decided to take a craft approach, relying on the four scenarios captured during the field study to guide decisions (see appendix C). Lansdale, Scrivener and Woodcock (1996) comment that in HCI, disciplines such as task analysis or cognitive psychology are insufficiently developed to prescribe exactly how design should proceed in any given situation. Wallace and Anderson (1993) suggest there is a need to synthesise the sources of interface design quality, namely talent from the craft approach and principles from the cognitive engineering approach.

The subsequent design was a result of addressing some important HCI issues that are problematic in DOS based interfaces. This included reviewing advisors' tasks within the four scenarios that had been chosen and selecting appropriate GUI metaphors and interaction styles.

Specific problems to be addressed were maintaining the power and flexibility of access offered by the command line interface, whilst offering the advisors control and flexibility in their work. This included removing the need to continuously toggle between screens through amalgamating information onto one screen (without overloading that one screen). Data entries needed to be saved when moving from one screen to another, thus partially negating the need for hand written notes. However, advisors also stated that this was not the only reason that they made notes, since “paper never crashes” (unlike the database).

In order to maintain the powerful interaction with the database that was provided via the command line interface, a graphical, direct manipulation interface was chosen.

The advantages of a direct manipulation interface are around ease of learning and remembering, feedback, context and flexibility (Mayhew, 1992). It builds on existing mental models, so is relatively easy to learn. Since ‘what you see is what you get’ (WYSIWYG), the user can focus on the semantics of the task rather than that of the system. Actions are flexible, less error prone (since there is less need for typing and the ability to visually check actions), easily reversible and exploit visual-spatial cues, which are subject to quicker cognitive processing than semantic cues.

However, direct manipulation can be more difficult to use for some task types and can be more inefficient. In addition, meaningful icons can be difficult to design, less self-explanatory and also consume more screen acreage.

Just as the command line dialogue enabled the advisors to travel anywhere in the database, so the graphical interface needed to provide direct access to all of the stored data, via objects on the screen. It needed to offer easily reversible actions, instant, visual feedback and exploit the use of visual-spatial cues, to utilise recognition rather than recall memory.

5.1.3.2. Look and Feel.

The interface was designed as a three dimensional representation of an advisor's physical desktop, or cubicle. This housed a variety of objects that advisors need to perform call handling tasks and was enclosed by 'walls' which advisors could personalise with pictures, notes etc. The desktop is a standard and familiar metaphor (dating back to the original Mac desktop interface of the 1980s with its wastebasket and folders) that users know and expect in a work context (Sawyer and Mariani, 1995).

This graphical 'ad hoc' manipulation interface (Kappel and Min Tjoa, 1992) enables the advisor to act on familiar desktop objects within the virtual environment to carry out a task. By using direct manipulation interface metaphors to access/process information, POW allows its users to concentrate on *what* they are doing rather than *how* they are doing it (Weller and Hartson, 1992).

The provision of a GUI shifted some of the advisors' cognitive load to their perceptual system. Rather than keeping the task requirements within their working memory, the advisors could get visual cues from the objects on the screen to remind them which procedures they had completed. The declarative actions, using semantic memory, in the command line dialogue were replaced with procedural actions, using episodic memory, in the direct manipulation dialogue (Anderson, 1980). Wright and Lickorish (1994) observed that in any complex task that makes many demands on memory processes, people select procedures that result in fewest additional demands on their working memory.

The principal way of doing this was to provide metaphors on the desktop (see Figure 27) representing different categories of information. POW objects were taken from real-world metaphors that both customer and advisor were familiar with and that encapsulated information in a recognisable format. This meant that advisors no longer needed to recall where data resided on the system and the three letter command codes to navigate to the required screen. This was done through provision of a number of 'books' that could be used to provide pages of information simultaneously on the same screen without needing to toggle

between screens. The book metaphor was prevalent in UI design at the time. Card, Robinson and York (1996) also explored this concept in their WebBook system that was used to effectively manage multiple information sources using 3D and perspective.

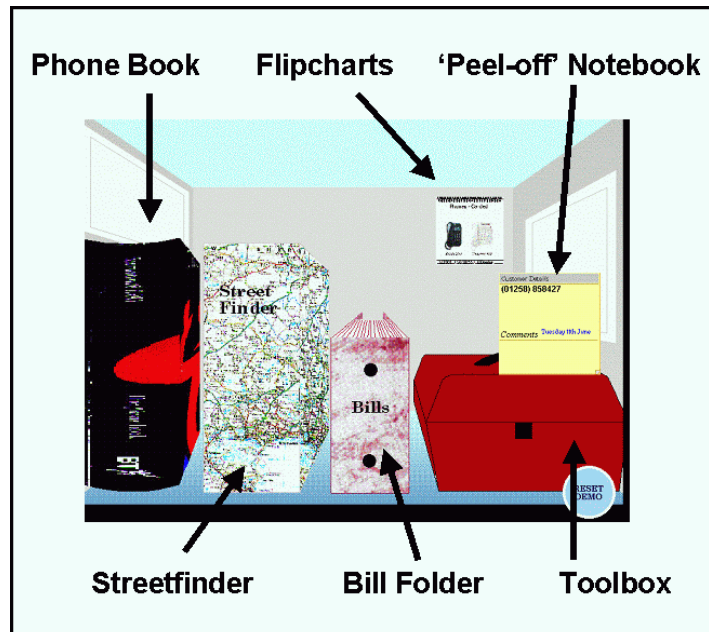


Figure 27: The POW Interface.

Dix et al (2003) suggest that the book metaphor exploits the largely unconscious models of search. The 'books' on POW were designed to offer 'affordances' (Norman, 1988) informing the advisors about their potential behaviour. These consisted of:

- A **Peel-Off Notebook** representing a notes and comments function. 'Peel-off notes' took the role of information holders, directly transferring the concept of 'post-it' notes into the digital world (see Figure 28 below).

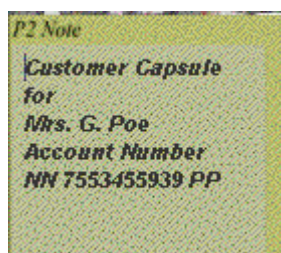


Figure 28: POW 'Peel-Off' Note.

- Data could be manipulated by the use of these peel-off notes, which could be written on and dragged to a file to instigate a search for the customer record. They could

then be peeled off record A and dragged to record B to effect an update of the customer records and written on and stuck onto a customer's page to annotate the customer record.

- The **Phonebook** that contains residential and business customer numbers. On taking a call, the customer's caller line identity (CLI) could be matched with the data entry for the customer's phone number in the database and the associated details could then be automatically presented to the advisor. In cases where the CLI did not retrieve the correct record, the advisor could then search for the entry either by typing the number onto a peel-off note and dragging and dropping it onto the phonebook, or by using an A-Z search facility on the customer's surname represented by tabs at the corner of the pages.
- A **Streetfinder** containing details of customer premises represented as an atlas. To access the customer's current property details, the advisor could drag a peel-off note containing customer details, postcode or address onto the Streetfinder. In the case of a property move, the customer's name and account details could be peeled off the old premises page and stuck onto the new property.
- A **Bill File** contained copies of issued phone bills. During billing enquiries it was noted that the customer often had queries about specific bill entries that were described in terms of their physical location on the paper bill – e.g. “the number about ten lines down on the third page”. The problem was that the advisor only had access to a non-paginated list of bill lines and had no common visual referents with the customer. The emergent dialogue was then one of verbal negotiation (e.g. “can you give me the full number that you are querying, starting with the area code, and I'll try and find it on the system?”) and continuous confirmation with the customer.

The bill file contained exact replicas of the paper bills that were sent to customers. The advisor gained access to the customer bill by typing the customer details onto a peel-off note and dragging it to the bill file. The bill file could also be opened from the phonebook by dragging the customer account number from the customer summary to the bill file cover.

By presenting a facsimile of the bill on the interface, both customer and advisor had a common point of reference that changed the nature of the dialogue. This element was incorporated into the design of a new forms based interface that was implemented in the call centre. It was found, in a separate study conducted by the author, to smooth out the dialogue between advisor and customer. This had the added benefit of making the dialogue more efficient because there was less need for the negotiation phase between advisor and customer. This reduced call handling times by, on average, two seconds (which can add up to a significant saving when considered in the context of this organisation which had 16,000 people taking 2.3 million calls per day). The author has also observed this occurring during multimedia transactions with customers, where advisors and customers share web pages (also called 'co-browsing').

- **A flipchart** of information about telephony products and services. This contained a representation of products and services that could be offered to customers. It could be searched and viewed by dragging it forward on the desktop and flipping the pages using tabs on the page corners. Entries matched the content of the customer website so that the advisors could see what the customer could see. The flip chart gave an initial overview of the product or service and could then provide further details through a hyperlink at the bottom of the page. To purchase a product or service, the item could be dragged and dropped onto the Streetfinder where it was associated with the customer's premises since it was a service to be delivered to that address.
- **A Toolbox** to represent services offered by the telephone engineers.

These 'books' of information provided pages of data on the same screen without the advisors having to change screens or refresh screens. The advisors' knowledge or intuition about the contents of these 'books' would reduce the need to hold the numerous command codes in their memories.

Data was shown to be stored 'within' the objects. This was designed to be consistent with the advisor's conception of information storage and retrieval with these objects in everyday life.

5.1.4. Evaluating POW.

The POW prototype was designed with a selection of call handling scenarios in mind (see 5.1.1). It was developed using the multimedia tool, Macromedia Director. The design was based upon the four call handling scenarios and incorporated a small amount of data to enable some manipulation to take place. The prototype interface was produced in two formats:

- An animation to demonstrate the call handling scenarios.
- An interactive version that allowed advisors to directly manipulate objects.

To evaluate the interface, the design team took the prototype back to the call centre to test it with a new group of twenty customer advisors and assess their initial reactions.

The animation was demonstrated at a team manager's meeting as part of a briefing about the prototype and the need to evaluate it with a selection of advisors. This group session elicited a positive first impression from managers, who are often former advisors.

As a result of the session with managers, the design team were given permission to take advisors off line for a short period of time and set the prototype up in the call centre's training room. Individual interviews were conducted to obtain detailed views from users who were of varied experience. The interviews were used to establish the advisor's previous computer experience, interpretations of the system metaphor, expectations of the interactive objects displayed on screen and reactions and comments regarding system design.

Prior to seeing POW for the first time, the advisors were encouraged to focus their thoughts on the DOS based customer service database interface that they currently used by means of a brief questionnaire. The questionnaire presented strengths and weaknesses of the command language dialogue style (Mayhew, 1992) and elicited the advisors' judgements of how their system measured up against these criteria. This was an attempt to highlight the power of the command language interface, so that the advisors might take a more critical view of the direct manipulation interface, rather than being influenced by its novelty.

The interviews were then administered to establish the advisor's general attitude towards computers, their interpretation of the system metaphor, their expectations of the interactive objects on the interface and their reactions and comments regarding the design of the system.

The questionnaire data confirmed some of findings from the first group of advisors:

- There was overall *disagreement* that the DOS based interface to the customer service database was fast and efficient, flexible, offered screens that were consistent in appearance, allowed the users to customise the screens or to enter multiple commands, trapped errors or allowed the users to undo any erroneous actions.
- There was a 50/50 divide of opinion that the DOS based interface was easy to learn, enabled them to enter and exit the screens as they wished and offered screens that were well designed.
- There was overall *agreement* that the DOS based interface was clear and easy to understand, used the keyboard as a satisfactory input device, allowed access to customer information, allowed the user to check input before it was actioned and provided a useful 'Help' facility.

From the open-ended questions it was apparent that the best aspect of the command line system was the sense of power the advisors experienced by having the ability to access information directly and by being familiar with the system. The worst aspects were both design and performance related. The customer service database was considered to be slow, cumbersome, unreliable, complex, inflexible, unclear and suffered from a lack of prompts with respect to navigation. Some advisors felt the system relied too heavily on jargon, and the information provided on-screen was difficult to understand or use. The most common mistakes that they encountered were due to typing errors, incorrect input and general systems errors. However, there was a general feeling that "practice makes anything tolerable".

The advisors suggested that the design of the command line system could be improved by less typing, reordering of the information with an emphasis on keeping the relevant information together and having direct access to that information, an error correction facility, fewer screens, having a list of customer options, having the ability to page back and forward without having to save information and increasing the speed between frequently used screens.

The interview data was organised into a set of keywords or phrases describing:

- a) Initial advisor reaction to aspects of the system;
- b) In-depth comments on aspects of the system;
- c) Features advisors would like to see added to/changed in the system;
- d) How the advisors would handle the four call scenarios with the system.

It was interesting to note the wide variety of abilities amongst the advisors. Those who had gained previous experience with direct manipulation system metaphors were more capable of grasping the concepts behind the interface and expressing their expectations of the system. Those with no previous computer experience, and/or who had used the command line system for many years, appeared to try to interpret the new system in terms of the mental model that they applied to the command line system. However, almost without exception the reception to the new system was positive and very encouraging. Verbatim comments included:

- "I'm impressed...it seems quicker".
- "Good...brilliant".
- "The best bit is the bill...excellent!"
- "Quick...efficient...good...straightforward".
- "Good...interesting".
- "Making sales is quick and very straightforward".
- "The tools are in front of you...good...quick".
- "Makes jobs easier".
- "Better than the system that we've got at the moment".
- "Simple".

65% of the advisors recognised the whole environment to be a representation of an office or a room. Others broke the scenario down into smaller components such as a filing cabinet, or a shelf of books. Some of the more literal minded described it as an 'integrated database' or '3D outlines' (of books).

35% of the advisors guessed that the 'peel-off-note' was something to do with accessing the customer's details; 25% of advisors thought it to be a page from one of the books, a diary or a piece of paper; 30% could not identify it; 10% could not actively use the system (mainly

because a mouse was not a standard peripheral in the call centre at the time and people did not know how to use it) so they only gave comments.

During the task analysis, for each scenario, advisors were able to correctly manipulate the bill file 95% of the time, the streetfinder 75% of the time and the phonebook 25% of the time. 90% of users also investigated the functionality of the flip chart. The advisor's interpretation of the screen objects was generally good with expectations, for the most part, matching the functionality that the objects provided. The bill file was evaluated particularly positively since one of the major problems that advisors found with billing queries was that the billing information that they saw bore little resemblance to that in front of the customer. Advisors did expect there to be more information contained within the books.

The prototype caused one or two interaction difficulties. Some of the experienced users of the old direct manipulation interface were more reluctant to accept the POW interface. The precision required to close books and manipulate some of the objects meant that some advisors said that it "would take a bit of getting used to" and one said "I can't see anything that would sway me towards using this". However, the most experienced direct manipulation advisors were able to rapidly learn and accommodate the new concepts presented by the POW interface. They were also able to provide an accurate interpretation of task performance within five minutes of using the system.

During the scenario evaluation, advisors were asked how they would expect to use the objects on screen. Some advisors were able to elaborate on how they would use the information from each object within the context of a) the scenario and b) the system as a whole. Others could only identify which objects they would use to achieve their goal. All advisors had little or no difficulty in proposing a solution to the call handling scenarios using the system, which suggests that they had become engaged in the POW environment (Weller and Hartson, 1992).

Discussions with advisors during and after using the system revealed areas that needed development and individual differences in working practice. For example, they had difficulties in the moving house procedure using the 'Streetfinder'.

However, one of the most interesting aspects of the evaluation process was the frequency of active and innovative thinking from advisors who often suggested new features that would help with their work. For example, one advisor suggested including more spatial information on customers' addresses through the use of ordinance survey maps.

The POW experience suggested that direct manipulation GUIs could be appropriately deployed within a call centre environment. It also established a development approach for call centre UI design that was based around field observation and rapid prototyping. Advisor skill levels seemed to be based upon the ability to use a complex DOS based system rather than serve the customer. To reduce the high levels of cognitive load involved with interacting with both a system and a customer simultaneously, the GUI introduced visual feedback mechanisms and visual spatial cues that exploited recognition rather than recall memory. Other familiar affordances, such as a book metaphor and a common visual reference of a bill, were employed to facilitate a less complex interaction.

POW is not a MUI. It is a GUI that is very reflective of the era in which it was created (circa 1995). However, it established the initial building blocks that were to become the foundations upon which the first MUI was built.

5.2. The Research MUI.

5.2.1. Initial Concepts.

The positive reaction of the advisors to POW as an 'empowering environment' (Weller and Hartson, 1992) started a chain of thought relating to the possibility of releasing the advisors from the stress of call centre work by designing interfaces that helped them become motivated in their job.

The initial step of the research was to look and see if it would be possible to use the interface to help the advisors to *enjoy* their customer handling work. This was especially in the light of Norman's (1986) appointment of enjoyment as his second goal for cognitive engineering. If the advisors find themselves perceiving their use of the computer system as both *useful* and *fun* (Igbaria, Schiffman and Wieckowski, 1994), then their call handling behaviour should also change to produce a better level of interaction with their customers.

However, with the high levels of turnover in the call centre environment and the apparent low levels of motivation, the research challenge shifted from enjoyment to motivation. The initial idea for the Motivational User Interface was to take the POW environment and adapt it to incorporate elements of fun and motivation.

The initial conceptual designs of the MUI were evolved between the author and Linda Hole of Bournemouth University during a conference session that wasn't attracting their full attention! The initial ideas revolved around the fact that computer games seemed to offer some interesting insights into design. Games interfaces can be as frustrating and complex to use as business ones, yet people who gain mastery over them derive much fun and enjoyment from their achievements. The obvious difference, established in chapter 3, is that the motivation between work and play is the difference between the extrinsic incentives of work (e.g. getting paid) verses the intrinsic delights of game playing (e.g. deriving enjoyment). However, this is not a valid reason for dismissing the use of games design techniques from business systems. Even Shneiderman, who has been less than supportive of integrating non-task focused elements into business systems, has relented more recently stating that it is acceptable as long as "the fun aspects do not interfere with goal attainment" (Shneiderman, 2002).

In order to be used (i.e. be saleable), games must be usable from the outset. They should not require reference to user manuals or training material. Call centre systems should reflect this, especially considering the fact that the high levels of turnover means that there is a reluctance to invest in significant amounts of advisor systems training.

Call centre systems that support CRM applications also need to simply convey the story of the customer's interactions with a company to the advisor, so that they can tailor the interaction. There is a sense of narrative inherent in the task. Authors such as Laurel (1998) and Murray (1998) have drawn parallels between games interfaces and narrative forms such as films and theatre. This can be extended to CRM interfaces. Each call into a call centre can be seen as a discrete chapter of an ongoing book of a customer relationship. These chapters each have a cast of characters and associated emotions and activities. There are often significant patterns and themes to these relationships (what Laurel (1993), inspired by Aristotle's writings on dramatics, calls a 'melody'). This is a language of interaction that is often dictated by the conventions of the company and a sense of role-play as advisors control and steer the pattern of interaction with a customer. Actors may either perform to script or act against it to create dramatic tension. The interface may also play a distinct character role within the interaction (Reeves and Nass, 1996).

Spurred on by these initial ideas (plus more research money), it was decided to revisit the same call centre in the South of England and, rather than focus on task, focus on what motivated the advisors and assess whether elements within the interface could be used to facilitate this. The initial 3D metaphor flow in POW was to be extended to encompass a more games like environment.

The Motivational User Interface project aimed to:

- Discover what motivates customer service advisors to achieve their targets;
- Investigate if the interface could enhance their selling capabilities;
- Ascertain how the advisors might benefit from the interface;
- Determine how the interface could be used to help motivate the advisors.

Since the target call centre was the same as that in the POW study, no further task analysis work was conducted. As with POW, the study followed the general MUI method described in chapter 4:

1. Gathering key motivational requirements through questionnaire, observation and interview (see 4.2.3.3, 4.2.1.2 and 4.2.3.4 respectively).

2. Evolutionary prototyping of the graphical user interface (see 4.3).
3. Evaluation of the prototype using a co-operative evaluation technique combined with a cognitive walkthrough and interviews with an opportunistic sample of advisors in their refreshment room (see 4.4.1).

5.2.2. Gathering Motivational Requirements: What Makes Advisors Tick?

5.2.2.1. Motivation Elicitation.

In MUI design the advisor's emotional and motivational attitude is as important as task. The first step in designing the first MUI was, therefore, to look at capturing the underlying intrinsic and extrinsic motivators in the life of the advisors in the call centre. Motivational data was elicited from the advisors through a combination of field observation, interviews and administration of an attitude questionnaire. An initial ranking exercise was conducted in a focus group with advisors to find out what they found good and bad about their current way of working. This identified and then ranked a number of items relating to their expectations of their day-to-day job. From this came an initial picture of beliefs and motivators (in order of ranked importance):

- What the customer wants from the company is:
 1. To get their problem sorted with a single phone call.
 2. A pleasant interaction.
 3. Plenty of time to talk.
 4. Knowledgeable advisors.
 5. To procure products and service.
- What the company wants from the advisors:
 1. To minimise call handling time.
 2. To provide customer satisfaction by skilfully solving problems (including selling products and services).
 3. To provide a good customer experience.
 4. To be a good team member.
- The best aspects of the advisors' job:
 1. Teamworking.
 2. Talking to customers.
 3. Job security.
 4. Satisfaction from problem solving.
 5. Training and recognition.
- What feedback the advisors receive about their performance:
 1. Appreciation from other team members.

2. Customer feedback.
3. Bonuses.
4. Team prizes.
5. Call stats.

This illustrated some of the contradictions and pleasures of call centre work that were examined in chapter 2. The company used extrinsic incentives and performance measures to gauge success. The advisors used more intrinsic motivators such as job achievement and pride in customer care skills, feedback via customer/team appreciation. The expectations of the customer and the company were in opposition to each other. Advisors felt that the company wanted them to be efficient problem solvers, use good interaction skills and promote company loyalty. Advisors valued people's appreciation more than the extrinsic motivators put in place by the company. The advisors at this particular centre felt that they were well paid in terms of market rates so satisfaction with monetary reward was not necessarily a key motivational factor. However, team factors come out strongly as a factor in job satisfaction. They also ranked talking to customers as a key motivational factor and explained that customers provided them with both the challenge and enjoyment that kept them coming to the call centre in the morning.

A questionnaire was designed by Linda Hole to provide a more detailed picture of motivation. This was nicknamed 'blankety-blank' because it consisted of sentences that contained blank spaces for advisors to fill in their views, e.g. "At the beginning of my shift I feel _____"; "When angry customers call I want to _____".

This aimed to elicit advisor's individual views about their day-to-day work, their customers, their team and themselves.

The initial questionnaire that was piloted resulted in disappointingly low return rates (less than 2%) and was too small a sample to allow the team to gain any statistically significant data. Discussions with the call centre management revealed that advisors were very reluctant to undertake pen and paper exercises. This is partially because they had to do these in their

breaks or free time since they were on calls for the remainder of the time and had no time to fill in questionnaires. Another aspect that may have been problematic is that the questionnaire was seeking to elicit emotional data about aspects of their job that are often difficult to verbalise (Reijneveld et al, 2003; Desmet, 2003).

As a result, Linda reworked the questionnaire to include more focused questions with an easier means of completion. The questions were derived from those in the 'blankety blank' questionnaire, modified using the results of the few returns, and focused more on eliciting:

- Beliefs about their work, e.g. "I think that I work best at the beginning of my shift".
- Theories about customers, e.g. "Often, customers want to have their problems solved instantly".
- Theories about other team members, e.g. "I believe discussing my work with others helps me to do my job better".
- Beliefs about themselves, e.g. "During telephone calls I am always able to keep the conversation going".
- Beliefs about selling, e.g. "Selling products/services is only sometimes a useful part of my work".

Statements were made about these issues and advisors were asked to rank their reaction along a 5-point scale from 'strongly disagree' to 'strongly agree'. The advisors were also asked to express their reactions on a bipolar scale between opposing views to statements concerning:

- Feelings about their day-to-day work activities, e.g. At the end of my shift I feel: relieved/dismayed; fresh/exhausted.
- Feelings about their customers, e.g. "When an angry or aggressive customer calls, I want to cheer/swear; get rid of them/pass them on.

Given the reaction to the previous questionnaire, this questionnaire was administered to an opportunist sample of advisors by leaving a pile of fifty questionnaires and a post box in the call centre coffee area. In addition, an extrinsic form of motivation was put in place through the chance to win fifty pounds worth of book tokens for filling the questionnaire in. 54% of the questionnaires were returned for analysis.

5.2.2.2. Motivational Requirements Analysis.

The results of the questionnaire complemented observational data that had already been gathered by the team. The high return rate of the questionnaire allowed the team to construct a representative picture of the call centre advisors' state of mind.

According to the attitude scales, the modal responses indicated that:

- Advisors believed that their workloads were unpredictable and uneven throughout the day.
- Advisors believed that their work performance remained constant through the day.
- Advisors agreed strongly that customers want their problems to be solved as quickly as possible and believe that customers volunteer all the information that they need to solve these problems.
- Advisors strongly agreed that teamworking is an important aspect of their job and that discussing their work in the team helps them to do their job better.
- All the advisors who responded thought that they were good advisors but they could always improve. They were divided over whether they could effectively engage the customer in conversation at all times.
- Advisors believed that selling the benefits of a product or service to a customer was the way to more effectively sell. They predominantly saw selling as part of their role as a problem solver.
- At the beginning of a shift, advisors felt alert and positive. At the middle of the shift they were reasonably stimulated, relaxed but glad to take a break. At the end of a shift, they were relieved, tired, satisfied and very pleased to go home.
- When dealing with customers, advisors tried their hardest to help people, even when they were angry or aggressive, sarcastic or rude. They tried to remain calm, despite sometimes feeling otherwise. They felt good if they feel were able to help, especially if the customer was awkward or had a difficult query.

The main issues concerning the extrinsic motivators applied by the company was that money was not identified as a key driver. The complexities of the bonus schemes (a mixture of individual and team incentives) meant that people could not easily gauge how much they were earning in addition to basic salary. Call handling time (eight calls per hour) was a primary driver of call handling behaviour. There were a number of motivational initiatives encouraging team feedback, inter call centre competition and higher levels of call quality.

Advisors believed that there was a need to improve the customer interactions and they could achieve more if some barriers (process, culture and systems) were removed. They identified a problem with scripted dialogue because it was monotonous and seemed incongruous when introduced into a natural conversation flow. In order to raise customer satisfaction with the call, the advisors felt that they needed to have more information about customers, products and services.

The advisors seemed to value the intrinsic motivations inherent in their job, including both customer and team contact and the satisfaction derived from dealing with difficult problems or customers. The extrinsic motivators in the call centre, which included customer talk time, quality measures relating to the style and substance of the interaction and sales, were not raised as major motivators for the advisors. That is not to say that the extrinsic motivators were not effective, but they did not exploit the full potential of the advisors or the team. To motivate the advisors in their work, a good mixture of extrinsic and intrinsic motivators were required. Addressing this problem meant identifying those aspects of the advisor's work which they valued most and turning them from 'invisible' aspects of the job into concrete components of the working environment.

5.2.3. MUI Design.

5.2.3.1. Design Rationale.

Due to the positive evaluation given for POW and the time and budget limitations in the study, it was decided to base the MUI on the POW desktop design. The metaphor of the POW remained but with a wider view of the office and an increased awareness of the team. This was a move from a personal office workspace to a Cooperative Office Workspace (a COW). The research project rejoiced in the name of MUI COW (Motivational User Interfaces for Cooperative Office Workspaces).

The analysis uncovered invisible motivators that advisors identified as being key to their job.

These included:

- **An awareness of time.** Advisors are very attuned to time, since it is one of the things that governs their lives. Call handling times, time to answer, time in not ready, shift times and break times are all factors inherent in their day-to-day lives. This needed to be reflected through cues in the interface. The interface needed to help the advisors to be more efficient by providing appropriate support for the task. This included effective presentation and easy access of information on the screen.
- **An awareness of workload.** Digital wallboards showing call queues and call handling statistics (e.g. percentage of calls answered in x number of seconds) are a key part of the call centre environment. The prominent position of these meant that they give a real time indication of how the call centre is coping with call volumes. The wallboards serve as a source of extrinsic motivation by reinforcing the centrality of target attainment (Taylor et al, 2002; Bain et al, 2002; Edwards, 1979; Callaghan and Thompson, 2001). Taylor et al (2002) call this “a subtle and personalised form of pressure”. Houlihan (2001) comments “these are used partly for information and partly to act as a psychological speed up to advisors and managers who can see at a glance overhead whether work pace needs to increase and what ‘mood’ callers are likely to be in when they do get through”. Advisors in one call centre claimed that the wallboards were irrelevant to them. This was until the author removed the boards for a few days. The advisors started to complain that they felt as if they were “acting blind” in that they no longer had any concept of customer demand during the day. This experiment indicated that advisors used the wallboards to gauge how busy the call centre is and to regulate their behaviour accordingly. A study by Alferoff and Knights (2002) confirmed this observation. If the centre is busy, there is an “all hands to the pumps” attitude where advisors will keep offline work to a minimum, try and make customer dialogues as efficient as possible and even regulate their breaks accordingly.
- **An awareness of team.** Teamworking was identified as very important and, typically, team identity within the call centre was very strong. Most teams were co-located.

However, the naturally isolating nature of call centre work meant that advisors did not collaborate as much as they could. Visibility of the manager was also regarded as critically important since they often set the cultural tone of the team.

- **A way of capturing the feelings of customers and advisors.** Ultimately the call centre is in the business of emotional labour (Hochschild, 1983). The frustrations expressed by both customers and advisors needed to be captured in the user interface. In terms of the customer and customer relationship management, the customer's emotional state may influence the nature of the dialogue. Success in the advisor's eyes was associated with the effectiveness of the interaction in terms of solving the customer problem and ensuring that they are satisfied. Converting an angry customer to a happy one was a significant achievement that needed to be acknowledged by the interface (and call centre management). In the case of 'emotional dissonance' (Deery and Kinnie, 2002; Deery et al, 2002; Wharton, 1993; Erickson and Wharton, 1997), advisors may want to vent their emotions and the interface also needed to capture and facilitate this.

In addition, the motivational user interface needed to reflect some of the five 'C's of motivation (see 3.4.1) identified in the analysis of motivational psychology and technology acceptance.

5.2.3.2. Building the Prototype.

As with its predecessor POW, ideas for the MUI design were prototyped in Macromedia Director and coded using Lingo, a basic object based scripting language plus 3D graphics created using Lightwave 3D. The central tenet of the UI design was to support the functioning of independent objects that encapsulate their own customer data, interface and event methods (Crowle, 2003). Such objects could then dynamically change their appearance and behaviour according to their state and interactions with the user, other objects and the system.

All the objects represented graphically had their own methods for drawing themselves and displaying the appropriate information to the user. These could change dynamically as the user changed the object's state, e.g. opening a closed phone book.

- **The Window on the World.**

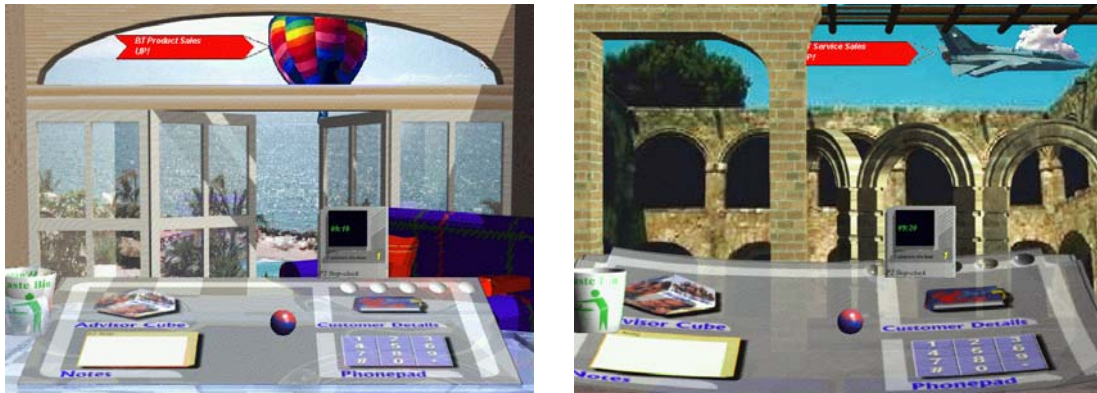


Figure 29: Two Views of the MUI Window on the World.

The POW metaphor of the office cubicle with desk, books and tools remained for the MUI. However, rather than having a fully enclosed capsule, the interface provided a ‘window on the world’ (see Figure 29). This was designed to offer the advisor a personalised panoramic view from their office cubicle. The prototype allowed advisors to choose from a view from a tropical beach hut or a Roman coliseum and would also allow them to travel to other views by means of transport via a jet fighter or a hot air balloon (building on a familiar travel metaphor). These transport devices also drag banners featuring today’s headline messages, e.g. the current company share price (which was the most accessed page on the company intranet at the time). The object oriented structure of the MUI design meant that appearance of objects was determined by context (Crowle, 2003). Different objects may appear in different forms if the user selected a different background, e.g. the jet verses the balloon. This was achieved by associating a Lingo script with a bitmap stored in the memory.

This design contributed to *curiosity* inspired motivation factors (in particular, sensory curiosity) through an element of what Malone (1981) terms “a fantasy inducing environment”, i.e. one that evokes mental images of things that are not present in the physical environment. Fantasy derives much of its appeal from satisfaction of emotional needs and, therefore, is likely

to appeal on a very individual and personalised level (an aspect of 'pleasure based design', see 4.3.2).

The personalisation factor also plays to the *control* aspect of motivation. Wallpapers are not uncommon in Windows applications but call centre policies often restrict the use of these to 'corporate' wallpapers only (usually a choice of fairly bland greys or pastel shades incorporating a logo). From the advisor perspective, providing even a small element of personalisation on the interface is giving them an element of control in what is otherwise a highly externally controlled and regulated environment. Earley (1988) and Sainfort (1990) found that some element of control over the UI increased employee performance and motivation. Public display of wallpapers or skins provides advisors with a visual statement of individual or group identity (Blom, 2000).

The advisors cited awareness of time as a motivational factor so the window included a clock, a call counter tracking the number of calls an advisor has taken (for reference only, not as a measure of performance) and darkening colours in the sky as the advisor's shift draws to a close.

- **The Call/ The Customer Capsule.**

Unlike the POW interface, the key trigger of a call coming into the call centre drives the MUI. Call handling queues, rather than being displayed in statistical form on wallboards, were represented in a more 'ambient' rather than a statistical format as clouds in the sky (see Figure 30), exploiting the background processing capabilities of users (Wisneski et al, 1998). Advisors need a sense of how busy they are. What is required is simply a sense of how much demand the call centre is under on a minute-by-minute basis (cited by advisors as a motivational factor and also playing to the curiosity aspect of motivational psychology). Once users have knowledge of the content and symbolic representation convention (Winn, 1993), this graphical device can be used to reduce cognitive load via what Scaife and Rogers (1996) call 'computational offloading' – i.e. the extent to which graphical representations reduce the amount of cognitive effort required to interpret the data (e.g. Hicks, 2001).

The cloud metaphor was designed to reduce the cognitive effort on the part of the advisor whilst enhancing the window on the world metaphor and adding an aesthetic, yet changing, element to it that was linked to real time events.



Figure 30: MUI Screen with Clouds.

Taking a call requires the advisor to click on the cloud, which then releases a 'customer capsule'. This is a self-contained representation of the customer as he/she is connected on the telephone line (using caller line identity details from the ACD). By dropping the capsule onto the 'egg cups' on the desk, the colour of the customer capsule changes according to the last recorded temperament of the customer (either happy, unhappy, angry or neutral - see Figure 31). This informs the advisor about what kind of experience the customer has had with recent contacts. This may or may not have a bearing on the emerging dialogue but provides the advisor with more information which they can use to control the call.



Figure 31: Three Customer Capsule Moods (from left to right: happy, unhappy and angry).

The customer capsule can then be used to drag and drop onto other objects on the interface.

- **Customer book.**

The customer book is an amalgamation of the three books from the POW interface (see Figure 32), namely the 'Phonebook' (now the 'summary' and 'issues' pages), the 'Streetfinder' (now 'property') and the 'Bill file' (now 'bills') plus the toolbox (now 'booking').

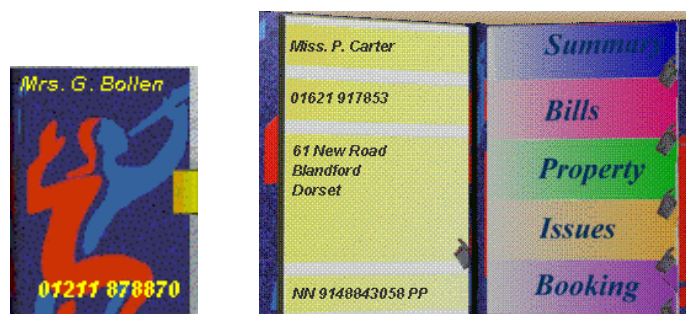


Figure 32: The Customer Book.

Now, the advisor may flick between the various pages in the book by using the index on the right hand page, rather than having to open and close separate books, which caused some navigation problems in the POW evaluation. Various fields of information from the customer book can be peeled off as an individual note, edited and attached or sent to other objects.

The idea of the bill facsimile is kept, as in POW (see 5.1.3.2), except that the bill unfolds as a continuous object rather than having to click to turn pages (see Figure 33).

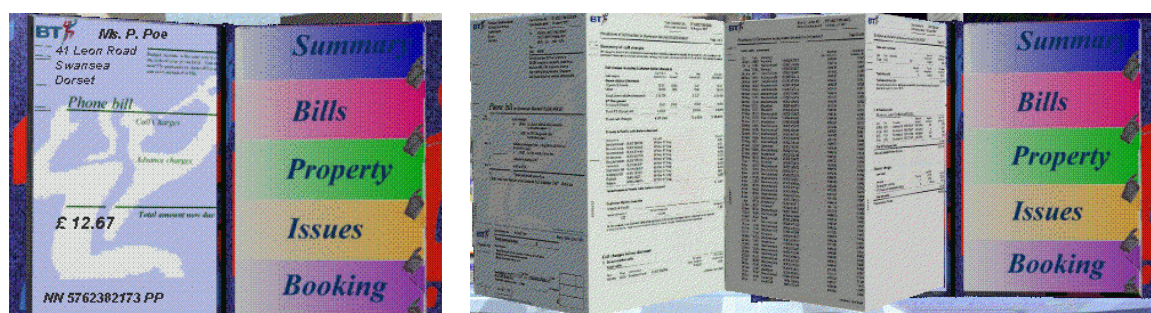


Figure 33: The MUI Bill.

- **Advisor Communication Cube.**

The cube was designed to present a number of faces for various advisor functions. The cube can be spun to view its six faces by clicking on the far right corner of the current face. The main virtue of the cube representation is that it can provide access to six views whilst taking up minimal screen acreage (Thomas et al, 1999). The concept of spinning the cube around to see different faces maps to a real world metaphor of a cube, so allows for an intuitive interaction.

The six faces feature:

- **The Customer face.** Displays the name and details of the customer that the advisor is dealing with at that moment in time. This can be used as a prompt or can be shared with 'buddies' (see Figure 34).

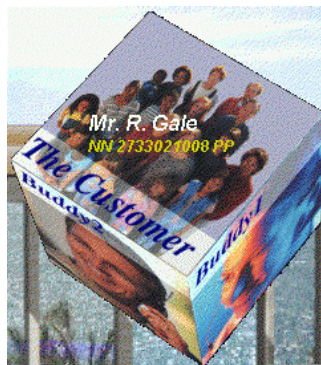


Figure 34: The Communication Cube - The Customer Face.

- **Buddy Faces.** Each cube has two faces that are direct links to two other team members currently on-line. If advisors have a problem or need advice or support they can choose a buddy (two are available here) from their team, their centre or elsewhere in the advisor pool with similar skill sets. Advisors emphasised the motivational value of team working and collaboration in their environment and the literature suggests that co-worker and supervisory support act as a buffer to stress (Cordes and Dougherty, 1993; Maslach, 1982). A sense of 'social presence' can be fostered via the interface providing access to similar others (Short et al, 1976). This device enables them to overcome the isolating factor of the dialogue between themselves and the customer and the problems with verbal

communication with their colleagues. Notes from the notebook can be electronically transferred via the mailboxes as means of requesting information or help and advice. Dragging and dropping the customer capsule onto the mailbox may also transfer the call (via Computer-Telephony Integration (CTI)).

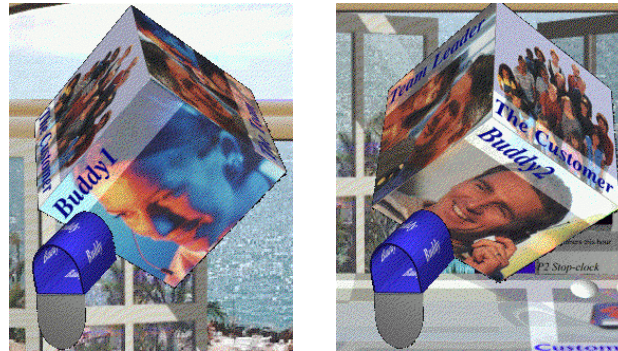


Figure 35: Communication Cube - Buddy Faces.

- **The Team Leader Face.** Leadership is key to the formation of the culture for motivation in the call centre (Ridderstrale and Nordstrom, 2000; Coutu, 2000; Menzies, 1997; Macauley, 2000; Schneider and Bowen, 1993; Batt, 1999). Team leaders, although they often enforce organisational rules and norms within the call centre, also act as a supportive function (Lee and Ashforth, 1990). This is key to the reduction of emotional exhaustion (Deery, Iverson and Walsh, 2002). The team leader face (see Figure 36) enables advisors that are having a problem or having a bad day to communicate directly with their team leader using the mailbox and notepad method used in the buddy system. The advisor can also pass the call to the team leader in the same way.



Figure 36: The Team Leader Face.

- **The World Face.** The world face (see Figure 37) provides a link to product and service information available on the intranet. It also provides a gateway for advisors to pass on marketing information to the marketing database by dragging and dropping a note into the MARK mailbox. (MARK was the underlying marketing database application in this call centre).

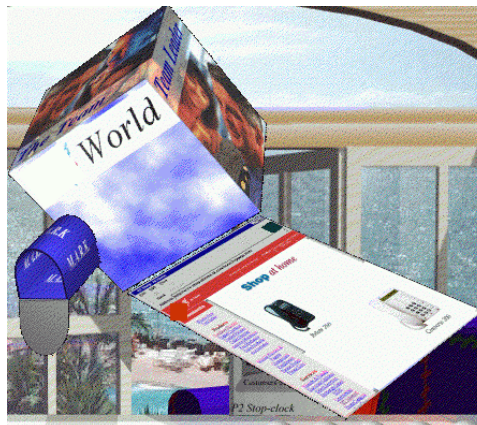


Figure 37: The Communication Cube - The World Face.

Both advisors and customers universally despise scripting because it tends to constrain natural conversation. However, regulation often means that certain things about products and services need to be precisely worded. The author's previous experiences with designing dialogues proved that flexible, bullet point driven scripts tend to achieve a more natural mode of conversation. To support this as well as provide an audit trail for dialogues, the MUI presented a number of script bubbles (see Figure 38) that may be 'popped', as if with a pin (in any order), once the point has been covered with the customer. This provides the advisor with more control over the call.

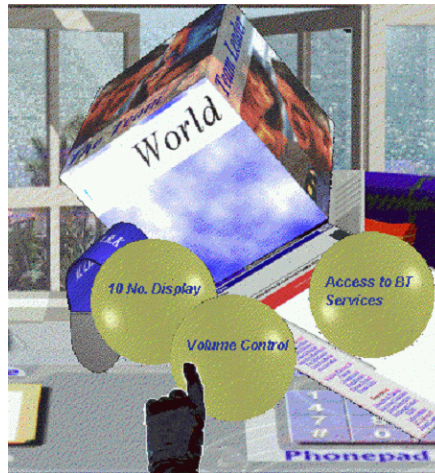


Figure 38: The Communication Cube - Script bubbles.

- **The Team Face.** This launches a 'pull down blind' that shows current team statistics and charts call centre progress (see Figure 39). This can be used to celebrate and acknowledge success by call centre management, e.g. achieving number one team status results in a firework display in the pull down window. This may motivate those who use statistical performance to help them and can produce short-term behavioural changes through competition. However, those who have no interest in tracking statistical progress may roll it up by clicking on the pull cord. This reflects the fact that statistics do not motivate everyone.



Figure 39: The Communication Cube - The Team Face.

- **The Note Pad.** This fulfils the same function as the 'peel-off' notes in the POW demo. Notes are activated by dragging and dropping the customer capsule over them.

- **The Phone Book.** The phone book provides a quick dial function for outbound customer call back. The customer can be called using details from the capsule object by dragging and dropping the customer capsule over the book (via CTI).
- **The 'Moodie'.** The 'moodie' was designed as a reaction to a difficult customer where advisors are experiencing moments of emotional dissonance (Wharton, 1993; Abraham, 1998; Hochschild, 1983; Morris and Feldman, 1996) after completion of a call. After initial (politically incorrect) discussions around the use of a gun to shoot customers, the design team and the advisors settled on a more animated way of expressing frustration. The advisor could use the mouse to physically throw the customer capsule in the waste bin. This action releases a 'moodie', an animated stick figure that struts up and down the screen with an exaggerated stride and body inclination. This posture is designed to express a certain amount of frustration (see Figure 40). Reeves and Nass (1996) found that users of a system could attribute 'personality' even to something as basic as a stick man.

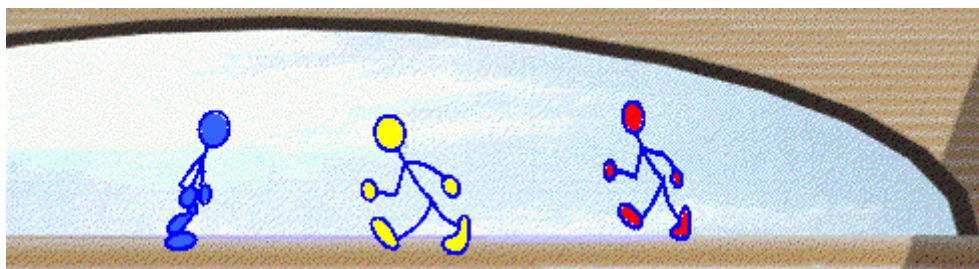


Figure 40: 'Moodies'.

Advisors may be feeling 'undesired' emotions that they cannot express to the customer (Sturdy and Fineman, 2001). However, they may feel the need to release these emotions in some way. This was usually observed in the call centre in the form of (unseen) gestures to the customer during or after the call or, if time permitted before the next call, comments to advisors in their vicinity.

Frustration and anger can be a vicious circle because advisors have to deal with both the source of their frustration (usually either the customer or feelings of helplessness relating to company process and policy), but also the emotional reaction itself. This is an aversive

state that people tend to try and avoid or escape and is positively linked with emotional exhaustion and job dissatisfaction (Abraham, 1998). It is argued that advisors are affected more by emotional dissonance than by emotional labour (Ashforth and Humphrey, 1993; Morris and Feldman, 1996).

Klein et al (2002) and Klein and Picard (2001) found that allowing the system to actively acknowledge and support user frustration and anger helped the user's ability to manage and recover from negative emotional states. This could be a kind of symbolic game (Freud, 1950) that people invent in an attempt to actively repeat traumatic activities that have been experienced passively. This allows a kind of belated emotional mastery over the event. Reynolds and Picard (2001) suggest that "user interface widgets", e.g. a 'frustrometer' or thumbs up/down, can be used to actively express user frustration through direct user manipulation. The computer then needs to respond in a socially appropriate manner (Picard and Klein, 2001; Reeves and Nass, 1996). However, Picard and Klein (2001) also posit that, although emotional support is social in nature, these needs can be met by non-human elements (as suggested by virtual beings such as cyberpets).

The moodie is an example of an 'affective widget' that can be unleashed by the physical action of throwing the customer capsule into the waste bin. This physical expression of emotion is akin to the kind of reaction that may have occurred in the physical world (i.e. throwing paper in a bin). It seeks to emulate the essence of that physical experience in a virtual space (e.g. Dix, 2003) whilst tying it to the task (i.e. the call) via the customer capsule. Users have described this as "throwing the customer in the bin" and describe a visceral, feeling of "naughtiness mixed with triumph".

Wensveen et al (2000) have supported the use of physical action to express emotion rather than the more common use of physiological data (Picard, 2000). Since people express and communicate their emotions through behaviour, this behaviour is a source of direct information about the emotions. It also does not require any direct physical intervention or expensive hardware as with physiological data capture techniques. The

disadvantages are that it cannot communicate the severity of the incident (Reynolds and Picard, 2001) and it does require the user to actively apply effort (Reynolds and Picard, 2001)

The author's attempts at applying physiological measurement techniques in the call centre were quickly vetoed by the unions as being too invasive so this was an alternative, non-invasive way of emotional expression. In addition, physiological data capture techniques are frequently criticised for detecting an emotional reaction without knowing exactly what the cause of the emotion was (Wensveen, Overbeeke and Djajadiningrat, 2000). It could be argued that the moodie is designed to express stress and frustration and its usage does not distract from the task at hand because its task is solely to mediate and relieve stress *after* a distressing or difficult call.

The resulting moodie can be used as non-linguistic, visual indication of state of mind as well as a humorous and slightly subversive outlet to relieve stress (Taylor and Bain, 2003; Noon and Blyton, 1997). There seems to be very little research on the design of applications to support informal communication or task related "messaging around" which is often needed to relieve the pressures of the workplace (Makela et al, 2000; Abramis, 1990). Research on humour itself suggests that it can often be the result of opposing (or incongruent) emotions (Joubert's Ambivalence Theory (1980); Hazlitt, 1890; Koestler, 1964; Minsky, 1984) or can be used as a release mechanism after a stressful incident (e.g. Spencer, 1860). Laughter can be used to fulfil a number of functions. However, the popular claim that it releases endorphins (e.g. Bond, 1998; Braverman, 1993; Brooks, 1999; Hulse, 1994; Lea, 1998; Nyhout, 1998; Rapaport and Gibson, 1993) enjoys no scientific support whatsoever. However, it has been shown to have a positive effect on the immune system (Burns, 1996), which has an impact on levels of sickness among employees. Many authors have speculated that laughter was originally a vocal sign to other members of the group that they could relax in safety after a perceived threat was vanquished or turned out to be non-threatening (e.g. Hayworth, 1928; Ramachandran, 1998). The ability of humour to build a sense of community in the workplace has been

demonstrated (Meyer, 1997; Hampes, 1992). Understanding humour presupposes a shared context and this shared context can be reinforced within many groups by the use of humour (Zilberg, 1995).

The workplace is different from other places in two ways. There is a task to be done and that task has been assigned to, rather than selected by, those who are undertaking it. Because of the task focus, there is somewhat less tolerance in a workplace for “distractions” like humour.

Most of the writing on humour in the workplace is not research at all but discussion on the virtues of using humour and tips on how to do it. Braverman (1993) claims that humour at work can add to the bottom line. Goodman (1992) and Gorkin (1990) write that humour can relieve tension, enhance relationships and motivate people. Feigleson (1989) claims that employees who have fun at work are less likely to be late or absent and job turnover improves while motivation and productivity climb.

Morkes, Kernal and Nass (1998) found that humour, where used appropriately on an interface, did not result in task distraction and could add to likeability and acceptance. However, Reeves and Nass (1996) warn against adding additional cognitive load to the advisor by drawing attention to an animation and taking concentration from the task at hand. Moodies can, therefore, be deleted, shared or stored by the advisors at any point.

One point of discussion about the moodie is around how long it remains effective. There are opposing views about the effect of novelty on humour. On one hand, Descartes' (1649) theory of surprise in humour would posit that multiple uses of the moodie would mean that its novelty would soon wear off. However, whilst surprise is a ubiquitous quality in jokes (especially in the punch line of a joke) it does not seem essential, based around the enduring quality of comedy routines (van Thriel and Ruch, 1993; Nilsen, 1990). Assuming the former is true, the moodie may need to incorporate some element of

unpredictability, e.g. not always having a stick man as a response to throwing the call into the bin.

Moodies can also be used to paint a picture of an advisor's day. Macdonald and Sirianni (1996) point out that the advisor's daily work experience is "often one of a series of minor complaints assuming major proportions for the customer". Suppression of these feelings can then cause stress problems for the advisor (Hochschild, 1983; Frenkel et al, 1998; Wharton, 1993). If the advisor has had a tough day, they can choose to send moodies to their buddies or to their manager. This is a similar device to the 'affective awareness GUI widgets' that have been used by Garcia et al (1999) to support emotional awareness in computer supported collaborative work.

Self-disclosure and privacy could also be an issue here (Howard et al, 2004). This is especially since stress at work is still somewhat stigmatised (according to interviews conducted by the author). To facilitate this, the advisor is in control of who sees the moodie. They can choose to reveal their emotional state to their buddies or to their manager. This allows users to control what sort of emotional data is collected on them rather than invading their privacy (Reynolds and Picard, 2001) and prevents emotional data from becoming another element of panoptical observation. They are also only likely to use this as a channel of communication where they perceive there to be a benefit to them (Picard and Klein, 2001). Earley (1988) found that the extent that the employee has control over the type of performance data collected and presented, the greater the impact on employee motivation and performance. By sending a moodie, advisors can trigger a more social dimension for emotional support (Picard and Klein, 2001) via supervisory and co-worker empathy. This can act as an important buffer to stress (Cordes and Dougherty, 1993; Maslach, 1982) and can allow them to feel that they have someone there for them even if they are not physically near (Nowak and Biocca, 2003; Howard et al, 2004). Team manager support is essential as a social resource for advisors to cope with the demands of their job (Coch and French, 1948). Managers can review the advisor's day and offer counselling and advice based on emotional data as well as 'objective' statistical call data.

Statistics make it look as if there is such a thing as an average call or an average customer (Zuboff, 1988). Smith et al (1981; 1986) posited that this emotional distancing through computer mediated monitoring tended to produce a more coercive, stricter, number counting supervisory style rather than a more helpful, less performance oriented supervisory approach.

In terms of this form of emotional self-report, there is an argument that self-rating of stress is too subjective to be of use and that self-ratings can be over inflated and inaccurate, particularly via electronic communication (Weisband and Atwater, 1999). This is why the data needs to be interpreted by a team manager who knows the individual and can use the emotional information in constructive ways. Rather than just using statistics that may not paint a true picture of the advisors' day, this provides an "information enriched environment" (Amick and Smith, 1992) allowing the use of job and social resources to manage job demands and reduce stress.

Fundamental to this is the assumption that the management culture of the call centre is not one of fear since, as Pfeffer and Sutton (1999) say, "fear causes people to cheat, conceal the truth, focus on the short term and focus on the individual". This would not be conducive to moodie usage.

5.2.4. Evaluating the MUI.

The MUI prototype was initially demonstrated to the call centre team leaders in their team meeting. They received the prototype very positively. This was an important first step since without management buy-in, the MUI was unlikely to succeed.

However, due to the pressures of call volumes, the team were unable to run a formal or controlled evaluation session for the MUI with advisors offline. Instead, the team went for an opportunistic sample of advisors who were taking breaks in the refreshment room. This resulted in a sample of thirty advisors who approached the design team in their break time for a five-minute walk through of the prototype. One of the research team was responsible for

guiding the advisors through the concepts. A second researcher was responsible for making notes and probing advisors for their reactions throughout the demonstration. One could critique the validity of this opportunistic sample since the advisors self selected through expressing interest in seeing the demonstration and were, as a result, less likely to express disinterest in such a system.

Advisor comments (including any verbalised emotional reactions) were elicited as the demonstration proceeded and were recorded. The feedback was favourable, along the lines of its predecessor, and was overwhelmingly positive. The functionality supporting the advisor's task was received positively with the unfolding customer bill meriting the most frequently praised piece of functionality.

Advisors especially appreciated the design since it was influenced by their direct experiences. There were comments such as "it is great that you really understand our experiences" and "this really seems to work on our level". This emphasised the value that field observation and the user centred approach provided to the process. They liked the fact that the interface was colourful ("we usually only get the choice of grey, grey or grey"), simple and interesting. However, there were some comments that the interface was "too busy".

Specific comments on the interface objects are detailed below:

On the Window on the World:

- "The scenery is therapeutic!" Liked the idea of being able to 'look out' at something rather than 'looking in' on a desktop.
- They liked the ability and freedom to personalise.
- Advisors wanted a closer link between the interface and rewards, e.g. the ability to move to another level (like a computer game).
- They wanted the clock to reflect break times and show scheduled hours.
- They wanted personal statistics beyond simply number of calls handled to be shown on the clock face.
- Advisors thought that the clouds should contain "silver linings" with messages of encouragement.

On 'moodies':

Moodies seemed to catch everyone's imagination, with advisors expressing enjoyment at the possibility of gaining some kind of therapeutic revenge on awkward customers. It was felt that the emotional content of calls was generally ignored and that the moodie gave an outlet for these emotions. The advisors were able to anthropomorphise the moodie and empathise with its attitude. This is consistent with research evidence that people are hardwired to respond socially to cues in virtual characters that suggest that they have intentionality (Reeves and Nass, 1996; Nowak and Biocca, 2003).

In terms of the MUI's objective of provoking discussion, the moodie was the single most discussed aspect of the prototype. Feelings towards it tended to fall into the extreme positive or negative positions.

Positive comments from the evaluation included:

- "I want one, now!"
- Advisors observed that they are a "bit like executive toys".
- They suggested that they could provide therapy with the ability to do things such as shoot them with a gun.
- They would like a team moodie display to gauge if the team were having a bad day.
- They could use them to communicate back to resourcing to indicate that they are on a tricky call and put them on an easier queue.

Negative comments were generally from managers, rather than advisors. Discussions were largely about the political correctness of throwing customers in the waste bin rather than the emotional function of the moodie. This indicated that people were actually associating the moodie on screen with the customer on the line, despite the fact that neither are actually linked in the real world.

Longitudinal evaluation beyond this was not possible since the prototype was never used as part of the operational environment. Advisors were generally positive about both the effective and affective elements that were incorporated into the MUI

On the basis of the user evaluation that was conducted, the MUI seems to meet Overbeeke et al's (2003) criteria for 'a beautiful interaction' in that:

1. It functioned as it was supposed to.
2. It resonated with the needs, interests and skills (perceptual, motor, cognitive and emotional) of the user.
3. It fitted the general context of use.
4. It provided a rich interaction style.
5. It allowed users to create their own story and rituals of usage (Djajadiningrat et al, 2002).

5.3. From POW to COW: Discussion.

At the time of development of both the POW and MUI prototypes (circa 1995/96), there were very few GUIs in call centres and command line systems were the prevalent interaction style. POW was designed to provoke discussion around the applicability of GUI environments to call centre environments.

5.3.1. POW: Learning Points.

The experience of designing the POW prototype paved the way for the initial MUI development. Learning included:

- The GUI shifted cognitive load to the visual system and tapped into metaphors such as books to provide an unconscious indicator of search and data storage. This led to a more intuitive interaction style and less need for extensive systems training.
- The challenges of the call centre environment did not facilitate the usage of disruptive methods such as workshops, questionnaires and interviews to capture requirements and evaluate the MUI. These were only possible if management endorsed the study and sufficient notice was given that rotas could be changed to accommodate withdrawal of advisors from the call centre floor. However, it was also noted that

advisors' targets needed to be adjusted as a result of the time lost in order to gain cooperation. Minimally disruptive methods such as field observation became the primary means of data capture.

- Management buy-in and support was essential for the success of the study.
- Prototyping worked effectively as both a means for testing and evaluating ideas and provoking discussion.
- Due to the high levels of skill and training required for the original DOS based interface, new, simpler interfaces were often met with some resistance. This was because the unwritten hierarchy in the call centre was based on the advisors' ability to use the DOS based system. Introducing a less challenging interface undermined the established culture and was perceived to be deskilling the job.

5.3.2. Learning from the MUI COW Development.

The MUI refined the POW look and feel whilst shifting the emphasis for design to building in motivators that the advisors identified as important to their job rather than those advocated by the traditional Taylorist perspective of call centre management. It was also designed to investigate whether interfaces could incorporate more affective components that were appropriate for the call centre environment.

Learning points from this initial MUI development were:

- The evaluation of the MUI indicated that a good understanding of the user's motivational drivers could be reflected in the design of the UI. This was reflected in comments from the evaluation such as "it is great that you really understand our experiences" and "this really seems to work on our level" (see 5.2.4).
- Endorsing the evidence found within the psychological literature (see chapter 3), advisors were found to be motivated by (from evidence gathered in the motivation questionnaire described in 5.2.2):
 - Solving problems and helping customers– they needed access to more information about customers, products and services to facilitate more informed solutions to customer needs (content based motivation).

- Being able to be themselves with customers and having latitude in decision making to ensure that they were able to help (control based motivation).
- The people working in their team and around them in 'communities of coping' (collaboration based motivation).
- The ability to learn, develop and progress (curiosity based motivation).
- Good management support and recognition (culture based motivation).
- They were not motivated by:
 - The incentives, bonuses and targets that had been imposed on them.
 - Scripted dialogues.
 - The pressures of constant management surveillance.
- MUI designs needed to provide advisors with an awareness of:
 - Time.
 - The customer.
 - Workload.
 - Team.
 - Feelings/frustrations.

These motivational and functional needs were reflected in design (see 5.2.3.2) through:

- The window on the world - giving them an awareness of time and workload, allowing them control through the possibility of personalisation and sensory curiosity through the choice of backdrop.
- The customer capsule – giving them fast access to major pieces of customer information within one click using the 'customer book', mutual awareness through the customer bill (contributing to motivation by making their dialogue with the customer more efficient through providing a common point of reference) and an awareness of the customer's previously recorded emotional state (using 'customer capsule moods').
- The advisor communication cube – allowing the advisors to form virtual communities of coping through the buddy system and access to the team leader and the ability to follow flexible scripting via 'script bubbles'.
- The 'moodie' – giving advisors the ability to vent 'unscripted' emotions as a result of a difficult call and allow them to paint a more emotive picture of their day to managers that was over and above the statistical data that is currently available from the ACD MIS.
- One major criticism of direct manipulation GUIs, which is hard to defend, is the time penalty that can be incurred by use of an exclusively graphical rather than command line interface. This time penalty can be more pronounced with a more experienced advisor. Both the POW and the MUI COW prototypes attempted to incorporate some

of the best elements of the command line system whilst making the system more intuitive to use through the use of more real world metaphors on the interface. However, they would have benefited from shortcut and hot keys for more experienced users in order to mitigate any time penalties as a result of direct manipulation.

- What was not proven with POW or the MUI was the ability to handle the high complexity, high volume amounts of customer data that typically occur in an operational call centre environment. When dealing with low-level, less frequently accessed information, the command line interface is often more powerful and the GUI metaphor may not be appropriate. The effects of user experience on navigation and the practicality of a mouse driven user interface over keyboard driven were also not part of the initial study.
- An exclusively graphical environment with animation can decrease effective interaction (especially amongst experienced advisors). Employing animated images can distract the user, interrupt flow and increase cognitive load (Nielsen, 1999; Reeves and Nass, 2000; Blythe and Hassenzahl, 2003). However, it can also increase engagement with the technology through positive affect and attitude towards the technology. Whether this resulted in increased motivation or usage could not be tested in this study but the technology acceptance literature would point towards an increased inclination to use the technology. These design decisions could also be justified in that the prototype was never intended for long-term operational use and that the elements of hedonic (rather than exclusively ergonomic) design were under test for acceptance.
- Field observation showed that advisors seemed to have different motivational needs whilst they were engaged in online and offline functions. Whilst online, advisors want an efficient dialogue with the customer but whilst offline the emphasis is more around learning and team building. Future MUIs needed to reflect this distinction and balance effect and affect in their design.

The transition from POW to the MUI started the author down the path of considering affective as well as effective considerations in design. There could be criticisms levelled at the MUI

design. The interface could be regarded as somewhat “cheesy” to an expert eye. However, it was designed to convey a very different look and feel to a conventional business application circa 1995 (more akin to a computer game) and was felt to be appropriate for a largely female, non-technologically literate user population. A similar interface prototyped for a technical field engineering population was dismissed as being “too noddy”. This illustrates the importance of understanding the user when designing the MUI look and feel.

In terms of an industrial research project, the MUI was deemed a success since it provoked (sometimes heated) discussion among call centre managers, IT people and advisors themselves about the appropriateness of GUIs in call centres, the role of emotion and affective design and also how technology could better support motivation. It also led to a number of further developments (two of which are described in chapters 6 and 7) as well as inspiring the design of future call centre applications.

The facsimile of the customer bill was incorporated into the forms based system that can (at the time of writing) still be seen in the call centre. The idea of flexible scripting using bubbles was incorporated into a telesales system and was widely praised by the advisors for allowing them to have a more naturalistic conversation with customers. The idea of the street finder and moving house was incorporated into a drag and drop metaphor in a system called DRAGON (see Figure 41). This was designed by the author to support advisors taking telecoms related calls for small to medium size businesses. It enabled advisors to move products and services from one set of premises to another (a complex operation involving 8 different transactions on the command line interface), by simply selecting from a list and dragging from one premise listing to another. This system was successfully used until it was recently replaced by a new, off the shelf system.

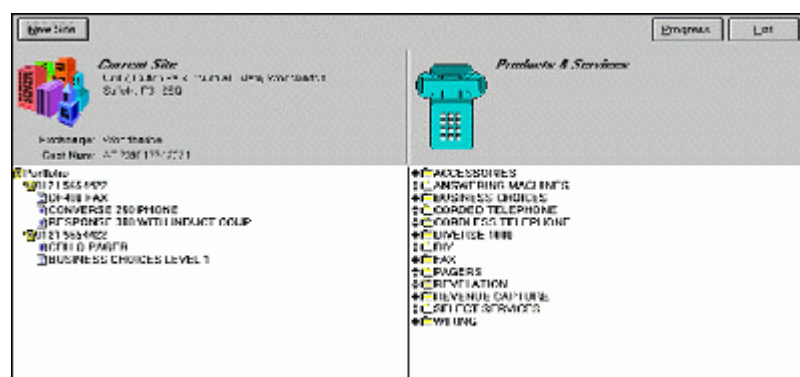


Figure 41: The DRAGON interface.

From a more academic perspective, the hypotheses that the MUI could (a) increase advisor motivation or (b) increase acceptance of the system could not be definitively proven. Empirical evidence was difficult to obtain because the MUI was never used operationally over time and, therefore, its effectiveness could not be measured. However, both the motivational and technology acceptance literature generally supported the MUI design rationale, which is why this thesis does not end here!

In terms of motivation, the MUI provided design elements which supported all the 5 'C's of motivation identified in chapter 3 (see Table 5).

The advisors evaluated the resulting prototype positively. It was noted that the language used to evaluate and discuss the MUI tended to be more emotive than would be expected in a conventional UI evaluation. This was particularly evident when talking about elements such as the moodie. Users observed both ergonomic (task based) and hedonic (emotional) qualities (Hassenzahl, Beu and Burmester, 2001). The positive perception of the interface, supported by a general agreement that it would be useful also indicated (from the technology acceptance literature – see 3.2.2) that it was likely to be *used* if it had been implemented. The elements that *were* operationalised (e.g. the bill facsimile and the script bubbles) were both evaluated positively by advisors and actually used operationally. However, their function was largely targeted to increase effectiveness rather than affect, so motivational influences could not be studied in these cases.

Motivators.	MUI COW Design Rationale.
Culture	<ul style="list-style-type: none"> o 'Communicator cube' includes a direct link to line management via the 'team leader' face and a network of 'buddies' who can help problem solving or provide emotional support. o Ability to put context around call handling statistics by sending 'moodies' to line management. o Current team statistics and call centre statistics can be accessed via the 'pull down blind' on the 'team face'.
Content	<ul style="list-style-type: none"> o Effective presentation of information on screen, based on task, e.g. phone book quick dial. o Ability to access records about the customer both in terms of content and their emotional state (via customer mood capsule). o Awareness of time via the clock and the changing colours in the sky within the 'window on the world'. o Customer information captured within the 'customer capsule'. o Access to product and service information via the 'world face'. o Ability to note take via the 'peel-off' note.
Control	<ul style="list-style-type: none"> o Use of ambient information (clouds in the sky) so advisors can assess how busy the call centre is and regulate their work. o Ability to vent emotions via 'moodies'. o Personalisation of the interface via the 'window on the world'. o Customisation of information relevant to job role and interest (e.g. share price changes). o Use of script bubbles rather than fixed scripts.
Collaboration	<ul style="list-style-type: none"> o Awareness of team via a 'buddy system' as part of the Communicator Cube. o Use of the bill facsimile as a common point of reference between the advisor and customer.

Table 5: Mapping the Five 'C's to MUI COW Design.

The initial MUI clearly exerted its influence on subsequent systems designs. This could easily have been the end of the story. However, the prototype demonstrator was shown over a number of years at both academic and industrial conferences and events and a number of papers on the MUI were published (Millard et al, 1997; Millard et al, 1998; Millard et al, 1999; Millard et al, 2000). The MUI's aim to stimulate debate was well and truly met. However, a client with an eye on the future rescued it from the limbo of being simply "an interesting academic exercise" and allowed the author to develop the MUI concept further.

Chapter 6: The Banking Motivational User Interface.

*“Design is not about the smile on the product, it's about the smile in the user's heart”,
Overbeeke et al, 2000.*

The initial MUI prototype (described in chapter 5) captured the imagination of a major high street bank and the author was asked to pull together a team to build another MUI. The objective was to create another prototype that could stimulate the development of the bank's future customer experience strategy, as part of a future call centre showcase. This was a commercially sponsored project, which meant that longitudinal evaluation was not part of the project's scope.

The lessons learned from the previous MUI dictated elements of the new MUI approach. These included:

- Non-disruptive field techniques for data capture seemed to work well in the call centre environment.
- Management buy-in was essential for the project's success.
- A graphical environment can be used as a basis for shifting cognitive load to the visual channel, although superfluous animated elements could potentially increase cognitive load.
- A games-like environment tended to be evaluated positively by advisors.
- A purely direct manipulation environment tended to reduce efficient interaction and there was a need to have short cuts built in for advisors.
- There were very different requirements between pleasure and efficiency depending on whether advisors were online with a customer or performing offline tasks.
- Advisors need to have access to information about time, the customer, their workload and their team.
- Emotional widgets needed to be incorporated into the interface to reflect both the mood of the advisor and the customer.

The previous MUI also served to verify and support the 5C's of motivation through:

- Putting emotional context around the statistics (culture).
- Including coaching and management as part of the customer contact process (culture).
- Allowing rapid and easy access to knowledge about the customer (content).
- Permitting personalisation and customisation of the interface (control).
- Allowing advisors to collaborate and form communities of coping (collaboration).

- Building a novel environment to stimulate both sensory and cognitive curiosity (curiosity).

These elements were to be built upon in the banking MUI. Although this MUI was also intended as a prototype to stimulate and inspire design, look and feel had to reflect the bank's current brand and operational design style.

6.1. Requirements Capture.

The call centre, located in the bank's headquarters in the West of England, was developing a series of strategic future visions which would act as prototypes to help the company form its call centre strategy in five years time. The client asked the author to develop a prototype MUI specifically to fit the current operational requirements and also to provide scenarios that would place the MUI into a possible future context.

The basic principles of the MUI would remain in that the interface would support the five 'C's of motivation. However, the look and feel needed to be substantially rethought since the original MUI had been put together as a concept prototype, rather than as something that could potentially be used as a specification for a real system.

The call centre management allowed the author, plus two research assistants, to conduct a three-day requirements exercise during February 2003 comprising:

1. A field study of the call centre operation across both inbound and outbound sales and service, plus team managers.
2. Two futures workshops where operational people considered how their workplace could change in five years time.
3. Thirteen focus groups, with up to six advisors drawn from across the call centre looking specifically at their key motivators, plus any problems with current ways of working, as well as what they like and dislike about their job.

The data from these would form the basis for the rationale for the new MUI design (see appendix D for a sample of notes from the focus groups).

The call centre was located in three distinct rooms on the same floor of the headquarters building. The smallest room was reserved for the outbound sales team because they were “noisier than the rest of the call centre”. The other rooms were a mixture of sales and service advisors. The centre operated on the principles of ‘hot desking’ where advisors have no fixed seats but simply chose a free desk when they arrived for their shift. This meant that teams were not necessarily co-located or even in the same room. Team managers cited this as a particular problem. They could see that advisors were logged on from their data on the ACD, but did not know where they were physically located.

The field study involved the observation of a sample of one hundred and fifty calls between four advisors across inbound and outbound sales and service. Calls, once again, followed the ‘call reception – understand needs – deliver service – close call’ call-handling pattern described in 2.3.1.

From the initial observations, three regular call handling activities and a number of common transactions were identified. These were:

- **Welcome and customer validation.** This task ensured that the customer on the line had the authority to perform actions on the account. This is required before any further dialogue can take place. This involved taking the customer’s account number and password, then validating these against the listed database entry.
- **Initial daily information session.** This involves advisors spending some initial time at the beginning of their shift reading any relevant briefing material that might be useful for the shift ahead. If they don’t have time to read this up front, they read material when they can in any quiet period between calls. Much of this was in the process of migrating from paper to the company intranet and e-mail systems.
- **Browsing customer information.** This allowed advisors access to full customer histories and contacts so that they could more easily build up a picture of the customer and tailor the interaction accordingly.

- **Regular customer transactions** were:
 - Balance check – customers ringing to check their current balance and recent transactions.
 - Bill payment – customers requesting automatic transfer of funds to pay bills to specified companies or individuals.
 - Balance transfer – customers requesting transfer of funds to other accounts listed in their name.
 - Address change – customers requesting to change their address or personal details.
 - Interest rates – customers inquiring about the latest bank interest rates.
 - Mortgage application – customers wishing to make an enquiry about a mortgage (this resulted in an appointment with a specialist mortgage advisor within the centre – these advisors held formal mortgage advice qualifications).
 - Loan application – customers wanting to apply for a loan.

The future workshops indicated that the more mundane activities such as balance checks/transfers, interest rates and bill payments were starting to shift to automated self-service systems, leaving advisors free to conduct the higher value activities such as mortgages and loans.

6.2. MUI Design Rationale.

With the data from the three days of requirements capture, the design rationale for the new MUI could be formed.

6.2.1. Mapping Requirements to the 5 'C's.

The first part of the analysis process was to identify the key aspects of motivation that emerged from the three requirements exercises. These were then mapped to the 5'C's of motivation:

- **Culture.**

As is typical in most of the call centres under study, young, female workers dominated. 71% of the population was female. 44% of them were under 30 (88% under 40). Males comprised only 29% of the call centre population but 84% of the men were under 30. Staff turnover was

around 15% per annum (lower than the call centre average in the UK) and no temporary or contract staff were used.

Generally the culture was relaxed and people felt that they worked hard and played hard. The centre ran with a very flexible working style. Advisors had the ability to choose to work from home or on flexible shift patterns to accommodate their particular lifestyle. These were negotiated within the teams. The hot desking initiative meant that advisors had no fixed desk space but were able to choose desks that were free when they came into work. Break times were also flexible. This incorporated the unpredictability of the call stack into the practicalities of taking regular Display Screen Equipment (DSE) breaks, as required by EU guidelines.

Reward and recognition was a point of debate. Advisors said that they would like more local reward and recognition schemes rather than formalised or grand gestures ("just saying 'thank you' is sometimes enough!"). They also wanted more open and constructive feedback rather than just negative feedback. Advisors wanted to be treated like adults rather than children and trusted to do their job, rather to be punished for the few that did not pull their weight. They also wanted recognition for personal development because "not everyone can be a high flyer". Targets needed to be appropriate to the job, rather than simply talk times and sales leads. These needed to be set individually then agreed with their manager.

The stress of the job had to be recognised and stress relief and relaxation needed to be allowed by management. Advisors did not want to feel as if they were being constantly watched, but wanted to be able to get management support when they needed it.

Employees could work towards formal banking qualifications to allow them to deliver specialist services such as mortgage and financial advice.

- **Content.**

One of the main pleasures reported by advisors was the sense of satisfaction in helping people. They liked to be able to feel that they had achieved something at the end of the day

and had made a difference. Advisors thrived on being able to talk to customers. 90% said that this was why they got out of bed in the morning. They also enjoyed solving customers' problems. Comments included:

- "I like getting recognition from the customer".
- "I like talking to people".
- "I like solving problems".
- "It's really good when you can help people out".

They enjoyed getting closure and having end-to-end responsibilities rather than having to continuously hand off to other people and other departments. They wanted accountability for what they did. They also wanted access to complete customer histories and to have the ability to use information on the internet and intranet more effectively. Knowledge management support tools needed to provide up-to-date product, service and process information. They also wanted to have instant feedback on quality monitoring. If feedback is not instant, problems are likely to continue for a while since the longer the delay between action and feedback, the weaker the shift in behaviours.

The major source of dissatisfaction was the highly routine and non-challenging nature of some of the work:

- "It can be monotonous – I could do with more stimulation".
- "Repetition is the worse part of the job".
- "It can be boring but it pays the mortgage".

Time was a key factor in terms of the day-to-day demands of the job. This included the time intensive demands of logging into up to eight different customer systems (including the telephony system) and using up to eight different passwords with multiple timeouts occurring during the day, as well as the requirement to log off and log on at break and lunch times. They also needed time to read and digest news, product and market information that helped them talk to customers. During their shifts they wanted an awareness of how busy the centre had become. This could then allow them to manage their own time more effectively.

Advisors wanted the ability to work on contacts other than telephone when their voice was not quite up to talking all day. They already had “99% days” where advisors with voice problems were able to do administration tasks.

- **Collaboration.**

Teams were small (around 8-10 people) and there was a sense of team spirit and a friendly team atmosphere. There was an awareness of who was in the team and team news, despite the fact that teams were rarely co-located due to the policy of hot desking. They believed that co-location would improve team identification. There was a strong consensus amongst advisors that the people they worked with were good and they used peer support to provide “communities of coping”, despite the isolating nature of the work. Team building was enhanced by team games and events both inside and outside working hours (“fun shouldn’t be banned!”). 88% of those questioned reported that they felt that they were part of a work team:

- “We have great camaraderie – we need it to combat the stress”.
- “Everyone is in the same boat so we can understand and support each other”.
- “You can talk about anything – it helps to get things off your chest”.
- They liked being able to talk to their team. This provided a mechanism for tacit knowledge sharing and led to a greater sense of team working. “I like my job because I like the people I work with”.

Communication of feedback both upwards and downwards comprised team meetings, events and knowledge sharing sessions. Team meetings were arranged in a shift friendly way and minuted to ensure that non-attendees could see what was discussed. Both advisors and managers believed people would feel more appreciated and listened to if there was more upward feedback to management.

It was felt that collaboration with customers and advisors could be enhanced if both parties shared the same visual reference.

- **Choice/ Control.**

Advisors had choice and control over the type of work, workstyle and work load that they undertook. This could be planned and executed at their own discretion. Desk space was not personalised (due to hot desking) but this was cited as a desirable attribute for advisors. Since space was at a premium in an ever-growing centre, advisors suggested that desk sharing rather than hot desking would give people a bit more personal space and help to co-locate teams together.

Advisors wanted to have the choice to take multimedia calls; not just telephony but e-mail and video advisor calls (where an advisor can be video conferenced in to high street branches to give specialist advice). Since “taking calls all the time can be boring”, advisors wanted the ability to choose voice, e-mail or video contacts according to personal preference, training, aptitude and how they are feeling.

They wanted to retain the ability to be themselves whilst talking to the customer, rather than having to be heavily scripted. On occasions, where scripting was required (usually for regulatory reasons), scripts needed to be flexible enough not to constrain the advisor or bore the customer, but still ensure regulatory compliance.

The ability to provide proactive feedback to improve both systems and processes would improve advisors’ perception of control and increase their involvement. The advisors also wanted to have outlets to relieve the stresses of the job.

- **Curiosity.**

Talking to customers can be extremely challenging. Advisors wanted to progress in their jobs. Career progression could take place both within the call centre but also via secondment opportunities outside the call centre and through job swapping. Team development was via buddy systems, job swaps, qualifications and secondments. Training and development opportunities were actively encouraged.

By having a mixture of expertise in teams and building local experts, people were able to learn new skills on the job. It could take a number of years to acquire the breadth and depth of knowledge to do the job well. This recognised that different people are good at different things and allowed the team the flexibility to bring teamwork into transactions. This also meant that everyone could contribute to team success by bringing their different skills to the area. Advisors believed that team leaders should be encouraged to work operationally so that they did not lose touch with the demands of the job.

6.2.2. Learning from Experience: Lessons from the First MUI.

The previous MUI was built as a concept demonstrator. It was designed, firstly, to prove the concept was appropriate for the call centre environment and, secondly, to provoke discussion about the acceptability of such interfaces. However, to move the MUI forward, the design had to be rethought in terms of the practicalities of implementation. This prototype was to serve as a source for discussion, but would also be used as a blueprint for future systems development, so more practical constraints needed to be taken into account.

The previous MUI experience indicated that the graphical interface needed to provide better management and navigation through complex knowledge spaces. The first MUI was criticised for the time penalties that could be incurred through navigation via a purely graphical environment. Given that time is critical in call centre environments, accelerators, hot keys and/or short cuts needed to be incorporated into the design.

The other factor under consideration was to do with the nature of the advisor's tasks. During the day they had two explicitly different roles depending on whether they were online with a customer (where they were maintaining a dialogue, solving problems and controlling the call) or conducting offline tasks (where they were often browsing through knowledge sources or communicating with their team or manager). These involve very different task drivers; one emphasising efficiency and customer focus and the other emphasising discovery and learning.

Blythe and Hassenzahl (2003) suggest that repetitive and routine work based tasks and technologies might be made fun through design, but non-routine and creative work must absorb rather than distract if they are to be enjoyable. Interacting with customers could be seen as repetitive and routine in terms of content. However, in reality, there is no such thing as an average customer or an average interaction. With mundane tasks being increasingly pushed towards automated self-service applications, the advisor's challenge lies in the (often complex) interactions with customers. This may involve both non-routine and creative responses. Superfluous design in this space can distract rather than aid concentration and absorption in the task. This may explain why 'social interfaces' such as Microsoft's Clippy are so unpopular with users (Shneiderman, 2002) since they often disrupt the flow of a creative task.

This suggested that the MUI needed to reflect two modes of operation (Hassenzahl, 2000 – see Figure 42):

1. Online / Goal mode. This mode is where task goals determine actions. The emphasis in this mode is on effectiveness and efficiency. During a call, the advisor is focused on solving customer problems. Fairly low emotional arousal is preferred since any increase is likely to prove detrimental to the advisor's capacity to problem solve. Anything that prevents achievement of these goals will result in frustration (including usability problems or over elaborate designs). The implication for UI design in this mode is simplicity with optimal support for the achievement of tasks (Hassenzahl et al's (2001) ergonomic qualities). The task goal is central to the design.
2. Offline / Action mode. This is where the context of action determines goals. Offline work in the call centre often involves catching up with internal briefings and communications, updating skills or performing administrative work. Although 'offline' work is only officially around 20% of an advisors' day (they are expected to be 'online' taking calls for 80% of their time), there is a significant amount (estimated at an additional 10%) of what could be termed 'fuzzy offline' time where advisors are either between calls or waiting for customers to retrieve or verify information. In this mode

effectiveness and efficiency are less important and playfulness and spontaneous action is frequently experienced along with high arousal. If arousal decreases, people are liable to get bored. This implies a more emotional approach to UI design to encourage advisors to explore and play (Hassenzahl et al's (2001) hedonic qualities).

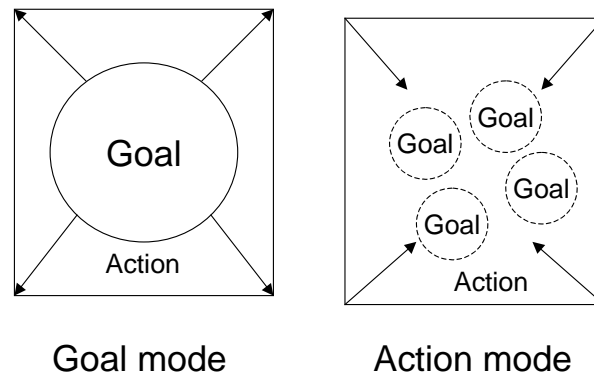


Figure 42: Goal versus Action Model (Hassenzahl, 2000).

6.2.3. Mapping Motivation to Design.

Looking at these motivational requirements, it was then possible to assess how they could be mapped to design. Design also needed to incorporate functional, usable and pleasurable components. As with the previous MUI, many of the content, choice and curiosity aspects of motivation were to do with the design of the job. If advisors are empowered sufficiently that they gain a feeling of achievement and closure with customers, are able to feedback and influence the ways that systems and processes work and are given the flexibility of work style in terms of choosing where and when they work, they are likely to be more motivated. Career paths and the ability to progress are also important contributors.

However, aspects that could be addressed by the interface included:

- **Culture.**
 - Bringing together virtual views of teams for the advisors so that they have an awareness of who is in their team, who is actually logged on at any one time and who is taking a call. Some element of time awareness was also required to allow advisors to manage their breaks and shift patterns.

- Making reward and recognition more public – including manager “thank yous”. Coaching feedback needed to be more instantaneous.
- Incorporating targets within the MUI design so that advisors can track their progress against them.
- Incorporating stress relief into design so that managers can manage the effects of stress on their advisors.
- Encouraging an element of play within the environment.
- An awareness of the skills and qualifications of the advisors.
- **Content.**
 - Access to complete customer histories and product and service information on the intranet needed to be presented in a way that does not result in cognitive overload.
 - The amount of time spent logging in and out of multiple systems was not inconsiderable (around 1% of every working day). Devising a single password for logon to all systems meant that less time and hassle was required for the process of logging on in the morning. Linking the MUI with the telephony system using Computer-Telephony Integration (CTI) also simplifies the log on process. The time saved can be reallocated to reading and team building activities.
 - The ability to gather and personalise online ‘news’. This allows advisors to only receive information that they need to do their job. By building a personalised knowledge portal, advisors can browse key pieces of information without the need to look to see if it is relevant to them.
 - Linking management information systems into public or personalised information displays. In this way advisors can see how busy the centre is and more effectively manage their time.
 - Allowing managers to provide instant feedback to advisors during or after calls when performing quality monitoring.
- **Collaboration.**
 - Bringing teams together in a virtual environment where there is an awareness of team, availability and an ability to instantly communicate and collaborate with team members.
 - Providing team specific information on the team’s knowledge portal.
 - Incorporating team-building games into the design.
- **Choice/ Control.**
 - Giving advisors the ability to choose multi-media contacts other than telephony (i.e. e-mail or video). This can be done on a skills based routing basis (i.e. ensuring that they have received appropriate training for the relevant media).
 - The ability for advisors to choose and personalise their own knowledge space and team personality.
 - Providing an outlet for expressing feelings of stress.

- **Curiosity.**
 - Allowing team members to have an increased awareness of individual expertise and allowing for more collaboration and knowledge sharing within teams.
 - Encouraging advisors to explore knowledge about both the company and the customer.

6.3. Building the Prototype.

Before prototyping began, three 'day in the life of' (DILo) scenarios were constructed for a service advisor, a sales advisor and a manager in the call centre. These were based upon the futures workshops, other data gathered during the requirements phase and the analysis of the 5 'C's. Examples of these scenarios can be found in appendix E. These were used to contextualise the design of the MUI.

To support the distinction between the online/goal mode and the offline/action mode, two distinct sets of screens were designed.

6.3.1. The Advisor Space - Offline/Action Mode.

Whilst offline, the emphasis for advisors was on team working, information gathering and exploration, rather than speed and efficiency. This mode needed to encourage choice, collaboration and curiosity motivators through a customised and pleasurable user space. Look and feel was, as in the previous MUI, inspired by computer games rather than conventional business systems design.

- **Logging on.**

The first task that advisors had to do when they arrived for their shift was to log on to a maximum of eight different systems at any one time. These systems had different user names and passwords, different timeouts after inactivity and also had to be logged off during advisor breaks (with the advisor having to log back on again after their break).

The first aspect of the new MUI was to provide a multiple security logon using one user name and password. In the real system this would capture the user password and log the users onto multiple systems. A user id, biometrics sensor or smart card could be used at this point.

This was designed to save advisors valuable time that can be spent reading news material or team building. It also removes a series of tasks that are considered a chore by the advisors. This gives an early positive perception in terms of functionality (perceived usefulness) and usability (perceived ease of use) to draw the user into the system. This should, according to Davis, Bagozzi and Warshaw (1989), increase technology acceptance (see 3.2.2).

- **Advisor team space.**



Figure 43: Banking MUI Advisor Space.

The screen in Figure 43 is the one that "Tracey", the advisor, would see when she first logs on at the beginning of her shift. It is a games-like, graphical environment that gives her access to functions and tasks that she can perform whilst in 'offline' mode. This includes:

1. Telephony status. This indicates whether the advisor is online or offline. This also increases efficiency and decreases cognitive load since advisors would previously

have to remember a series of codes representing status and type them into their telephony turret to set their status on the ACD.

2. Team representation and status (dot colour shows if they are currently on a call or not (red means on a call, white means they are not)). Name and character icon pops up in the team member character box on the right of the dial as the mouse goes over each of the dots. This enables advisors to see who in the team is on the telephone. This provides them with a view of workload and team activity.
3. Operations dashboard. The dashboard indicates team and individual talk times. It also contains a clock. This replaces the cloudy sky ambient interface in the original MUI with a more traditional, quantitative visualisation based on a dashboard metaphor. This gives advisors a sense of time as well as their individual and team progress towards externally imposed targets.
4. Header information for customer details. This is blank whilst in offline mode.
7. Common general-purpose functions. Each screen button is mapped to a 'function' key or a left click on the mouse. (This is primarily used for online functions where efficiency is key).
8. Area for dynamic (pushed) messages and alerts. This is an opportunity for management to push timely messages of encouragement or information, either to individual advisors or as a broadcast. This is a device for communicating the culture and brand to advisors, as well as a tool for coaching and management support.
9. Team member icon. This is chosen by the advisor to represent their team persona. This will be in colour if the advisor is logged on or in black and white if they are not, giving a sense of team presence.
10. Advisor team space. This is the advisor's offline space, designed to encourage browsing, discovery and team interaction.
11. Advisor name and link to personal profile page. This element allows advisors to establish their team identity.
12. Navigation panel for advisor space. This allows fast access to the 'news' and 'games' areas in the team space.

13. Manager reward and recognition marker. This is a device for managers to publicly or privately recognise significant contributions within the team.
14. Advisor group messaging system indicator – if the advisor has a message waiting then their personal envelope will be red. They can send messages to others by clicking on their envelopes. This emphasises the need for team communication and collaboration but goes beyond the 'buddy' system in the original MUI.

The basic screen was designed to echo the widescreen ratio normally used in motion pictures. The main part of the narrative action, with respect to the advisor and the customer, was designed to take place in the central area of the interface. The choice of a cinematic metaphor was indicative of the fact that the customer interaction with the advisor is an element in the 'story' of the customer's relationship with the company. This echoes the ideas that authors such as Laurel (1993) and Murray (1998) have articulated around interfaces as a narrative form, where action and characters are brought together. The design echoed the advisors' need for access to complete customer histories as an element of enhancing their job *content*. Similarly, there is an element of narrative form in the advisor's day with other members of their team representing a cast of characters, with traits and skills, and incoming briefings, news and updates providing elements of action.

- **Team Representation and Status.**

Teams are generally created to encourage a sense of collaborative identity (Deery, Iverson and Walsh, 2002; Taylor, 1998; Taylor and Bain, 1999). They also provide a basis for social activity. If teams are organised into self-managed or semi-autonomous work groups, the ability to solve problems can become part of the team's strength. This, in turn, can increase self-reported effectiveness (Gladstein, 1984), quality, sales revenues (Batt, 1999) and even faster adoption and use of technology (Batt and Moynihan, 2002).

Individual workers closest to the point of production often have the tacit knowledge to solve problems (Batt and Moynihan, 2002). Increased advisor discretion should allow them to solve these issues and improve processes, as well as contributing to motivation via increased *control* and *content*. Organisation of work into self-managed or semi autonomous work groups leads to better performance because workers with interdependent tasks can solve problems

collectively (e.g. Gladstein, 1984; Batt, 1999; Hinsz et al, 1997). Theories of group knowledge transfer and group memory consider how performance gains can be made if individual group members know the domains of others. This is especially effective if they are then able to access/utilise that information for the benefit of the group (Hinsz et al, 1997). This has been explained as a model of shared cognition (e.g. Cannon-Bowers et al, 1993) or a process of knowledge contribution, with each team member contributing their unique expertise to the group gestalt (e.g. Stasser, 1992). A study by Batt and Moynihan (2002) found that lower employee involvement strategies resulted in more than twice the employee turnover rates (21%) and half the sales growth (16%) than those that adopted a high involvement strategy (9% quit rates and 36.8% sales).

This could be explained by a number of possible theories of group knowledge, which includes team mental models (Cannon-Bowers et al, 1993; Klimoski and Mohammed, 1994; Matthieu et al, 2000), group information sharing theory (Stasser and Titus, 1985) and transactive memory theories (Wegner, 1987; Liang et al, 1995).

Batt and Moynihan's (2002) study of call centre knowledge sharing found that objective call quality increased, as did perceptions of innovative problem solving and customer service advisor learning. They also found negligible impact on call handling time, which implies that knowledge sharing does not significantly interfere with productivity. Job satisfaction was also found to be an outcome of knowledge sharing. The primary value of team based work design is to provide an opportunity structure for employees to improve their skills and abilities – thus contributing to the *curiosity* component of motivation.

In this call centre, teams were not necessarily co-located so there is little sense of *physically* being in a team, apart from at monthly team meetings. *Collaboration* is a key motivator identified as part of the motivational literature review (see chapter 3) and echoed by the advisors themselves. Thakara (2000) suggests that providing users with a sense of community is important to designing a good user experience. The MUI was, therefore, designed to provide advisors with an awareness of who is in their team and what they are doing, in order to facilitate group knowledge transfer and promote a sense of social presence

(Short et al, 1976; Nowak and Biocca, 2003). This was designed as an enhancement of the 'buddy system' in the original MUI. Much of the motivational element of this could be explained by social facilitation effect (Zajonc, 1965) where it is more rewarding and motivating to do things in the presence (albeit virtual) of others because of the increased effects of arousal. Being part of a community also promotes social cohesion. This contributes to motivation to participate in group activities (Cartwright and Zander, 1960). Being part of a group with high levels of social cohesion is positively related to well-being (Sonnentag, 1996) in terms of people getting cognitive stimulation through attention of others, social comparison, emotional support and sympathy (Hogg and Abrams, 1993).

Team members are able to choose their public persona from a selection of character icons (9 on Figure 43). This device was taken from a number of computer games where players can choose the player icon that they most identify with. It allows the advisor to have an element of *choice* and *control* over the technology (Brandtzaeg et al, 2003) as well as adding an element of self-expression of social identity (Goffman, 1971), fantasy (Lepper and Malone, 1987) and fun (Csikszentmihalyi, 1991) to the team space. This element of personalisation was designed to act in a similar way to the selection of background in the original MUI in that it provides advisors with the ability to publicly display either an individual or group identity (Blom, 2000).

Icons that are greyed out indicate that an advisor is not logged on. Advisors can also see who is on a customer call by looking at the dots on the dialler (2). This provides advisors with a sense of team presence via what Schafer et al (2003) call 'symbolic activities', i.e. contextual information about where a user is, who they are and what they are currently doing.

Each advisor has a link (11) under their icon that takes them to that advisor's personal web page. This includes a real picture of them, a brief resume of their skills and their interests.

Advisors have a group messaging system (14), indicated by an envelope, which allows them to instant message each other at any time. This is a similar mechanism to the buddy system in the original MUI.

The navigation tabs on the left of the screen (12) provide the advisors with the means to navigate between the team space and 'games' and 'news'.

The 'games' tab takes advisors to a page (see Figure 44) where they can take part in games that emphasise team collaboration and are designed to encourage as well as increase interactions between team members on a more informal basis. These are games that take little effort and can be done between calls, e.g. a daily debate, a 'guess who I am' game and news on the team lottery syndicate.



Figure 44: Games Page with 'Today's Debate', 'Who am I?' and 'Lottery Syndicate News'.

The 'News' tab provides advisors with access to a personalised news portal (see Figure 45). Based on their job profile, skill set, team, interests and location, it builds a number of dynamic links to information on the intranet. This was designed to replace the paper briefings that currently exist in the call centre. Some of the author's previous work on acceptance of

intranet pages in call centres had found that increased personal relevance improved the likelihood of people looking at the pages. This could be a result of exploiting the element of *curiosity* or surprise with respect to variation (Skelly, 1995). These news links include items relevant to the company (e.g. updates on mortgage offerings), their location (e.g. the restaurant menu and local events) and their team (e.g. Catherine's wedding photos).

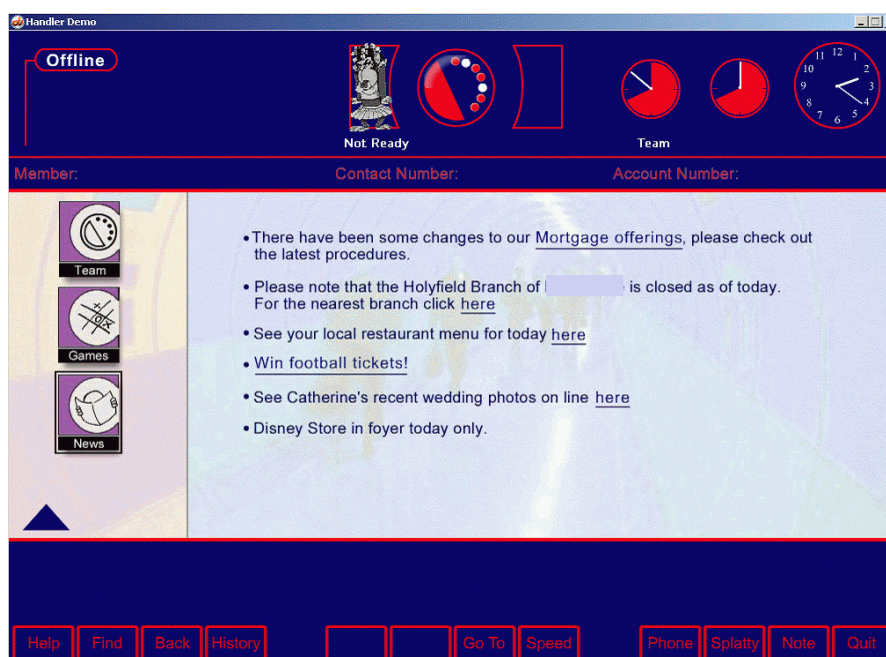


Figure 45: Advisor's personalised 'News' page.

○ **Operations Dashboard.**

The operations dashboard provides advisors with the means to assess how they are performing against a number of the call centre targets. The gauges to the right of the top area indicate the actual time and also talk time. The scope of the figures could be team or centre based. The purpose is to ensure the advisor has a sense of being part of a larger work unit, rather than a lone operator, as well as reflecting their own personal targets. For those who are more goal directed in their motivation, these aspects can provide a tangible feeling of achievement.

○ **Area for dynamic (pushed) messages and alerts.**

Pushed text in the lower area of the screen can be about group and centre activities, including game winners, visitor announcements and personal encouragement messages. During offline

activities, managers can push messages about things such as interest rate changes that advisors need to know about, as they are customer affecting.

- **Manager reward and recognition marker.**

During the requirements phase, the advisors pointed out that local management gestures such as “a simple thank you” would be appreciated. In the team space, the team manager can convey thanks to team members for their work through comments and stars that can be made public to the team (13). These can support an element of the *culture* of achievement and adds to an individual's sense of self-esteem.

6.3.2. The Customer Space - Online/Goal Mode.

The emphasis whilst online is on solving customer problems and understanding the customer's requirements, based upon their history and current behaviours. Although the advisor needs to display empathy and customer service skills to the customer, they also need to balance that with the eternal push for efficiency in the call centre environment. Whereas the offline mode was concerned with what Murray (1998) calls ‘orienteering’ through a knowledge space, the online mode is more akin to jet piloting. In terms of the interface design, pleasure is subsumed by speed and efficiency. This mode provides advisors with an efficient and usable interface that gives them the *content* that helps them solve customer's problems effectively. Design adheres more closely with traditional principles of usability. Graphics that are irrelevant to the task at hand are kept to a minimum to prevent a split attention effect (Chandler and Swaller, 1991) that can increase cognitive load (one of the potential problems with the original MUI).

To go online, Tracey needs to click on her icon on the right of the “dialler” at the top of the screen. This turns it from black and white to colour (this colour change will also be reflected within the team space so that the rest of the team knows that Tracey is now online and ready to take calls). This is linked via Computer-Telephony Integration (CTI) to the advisor's individual telephony turret. This logs Tracey into the relevant queues on the switch, based on Tracey's skills profile. This was designed after the field study observed advisors having to continuously tap sets of numeric codes into their telephony turret, to indicate their readiness to

take calls. A CTI solution makes this process more simplistic and gives advisors even less to remember in terms of PINs and passwords.

Once the advisor is ready to take calls, they can be provided with the option to tap into the different media offered by the 'universal queue' that would notionally exist within the bank's call centre operation (this would include telephony, e-mail and video). The scenario developed as part of the prototype has the advisor choosing to take a customer's telephone call.

To ensure call centre advisors are employed on 'value add' calls where human intelligence, empathy and ingenuity are fully utilised, the scenario has the customer coming through an automated 'triage' system. This is usually embodied by an IVR (Interactive Voice Response) system, which should direct them to the appropriate contact point for their particular need.

The MUI allows the advisor to see whether the customer has successfully negotiated the IVR system. In this case a dialogue box will show the callers details (see Figure 46) and their account number. If they are uncertain of any details, advisors can also preview the customer's history prior to taking the call. This gives them more opportunity to maintain *control* over the customer dialogue.

If the customer is unsuccessful in negotiating the IVR, the dialogue box will indicate the navigation options that the customer has chosen. In this case the advisor will need to go through a customer validation procedure with the customer before they can proceed. However, they will also be forewarned that the customer has potentially had a difficult and possibly frustrating experience with the IVR and may be angry or irritated when they come on the line.

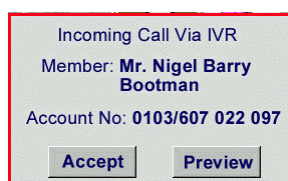


Figure 46: IVR dialogue box.

Once a call has been accepted, the central ‘narrative’ area of the interface changes from the view of the advisor team space to a ‘customer space’. This is populated by data from the CRM database and includes a view of the customer’s contact history, their details, any banking products that they have (including current and deposit accounts, loans and mortgages) and, where possible, details of any products that they are known to have with other banks.

The screen comprises:

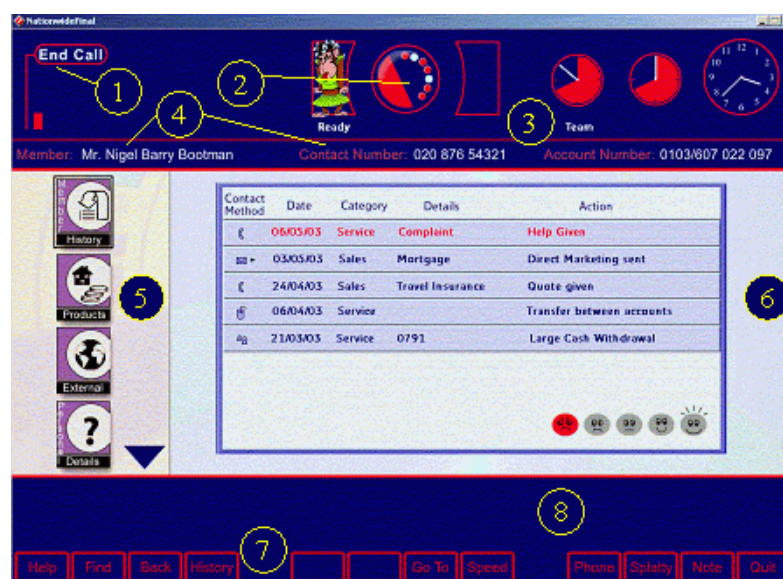


Figure 47: Customer Space UI.

1. Telephony status. The vertical orange bar represents length of call and number of transfer steps from the customer perspective, so advisors can be prepared for the backlash that often ensues if the customer has been on hold or passed around. This addressed two of the common customer hates that were identified in a consumer survey conducted by the author (the top three being: on hold, being passed around and IVR systems).
2. Team representation and status (dot colour shows if advisors are currently on a call or not (red means on a call, white means they are not). Name and character pops up in the character box on the right of the dial as the mouse goes over the dot. The ‘orange segment’ within the dial can be used to quickly navigate between the customer and advisor team space. This allows advisors to seek advice from peers

(through a group mail system) or transfer calls to other members of the team if they feel that others can better serve the customer's needs.

3. Operations dashboard - team and individual talk times plus a clock.
4. Header information for the area below – this is designed to reduce advisor cognitive load by showing common data items rather than having to commit them to memory, e.g. customer name, account number and contact number. Not all fields are always filled in.
5. Navigation panel for 6 – tabs to navigate through aspects of the customer's history.
6. Customer narrative space.
7. Common general-purpose functions. These are the short cuts and speed keys than can accelerate advisors through common tasks. Each screen button is mapped to a function key or a left click on the mouse.
8. Area for dynamic (pushed) messages and alerts

○ **Customer Narrative Space (6).**

Advisors expressed a desire to see details of a customer's previous contact history so that they could start to build up a fuller picture of customers' needs than could be ascertained during a short dialogue with them. When the 'history' tab is selected, previous contacts are displayed according to contact method (e.g. phone, letter, e-transaction or face-to-face), date, channel category (e.g. sales, service), brief details and any actions performed as a result of the call (see Figure 48). In addition to this conventional data, this MUI retains the 'customer capsule mood indicator' idea from the previous MUI (see 5.2.3.2) and associates a customer emotion to each call (where appropriate). This allows advisors to understand the customer's emotional history as well as their previous functional transactions. Rather than display detailed histories on one screen (commonly found in a typical CRM GUI), the interaction style is hierarchical. The advisor can click on the individual entries to view further detail.

Contact Method	Date	Category	Details	Action
☎	06/05/03	Service	Complaint	Help Given
✉ ▶	03/05/03	Sales	Mortgage	Direct Marketing sent
☎	24/04/03	Sales	Travel Insurance	Quote given
📄	06/04/03	Service		Transfer between accounts
👤	21/03/03	Service	0791	Large Cash Withdrawal



Figure 48: Customer History View.

The 'products' tab simply lists the products that the customer currently owns (see Figure 49). Should the customer have a query about these products, the 'i' tag against the product will provide script bubbles (previously used in the initial MUI – see 5.2.3.2) to provide advisors with product FAQs which can be 'burst' when they have been read out to customers (providing an audit trail on regulated products – although calls are also invariably recorded for legal and regulatory purposes in this environment).

The 'external' tab displays similar data, where it is available, on competitor products that the customer is believed to have. This is based on their profile and anything that they may have told the bank (taken from the bank's market intelligence database).

Finally, the advisor has a view on basic customer 'details' which paints a pen picture of the customer in terms of age and demographic.

Speed and simplicity of interaction is of the essence in this process of building a picture of the customer. The customer narrative area has been designed to ensure that advisors are not overloaded with data, but are also within one click of any of the major information that they may require to help the customer. The design is deliberately more conventional than the previous MUI to enable them to efficiently execute their goal of solving the customer's problem. This should help *content-based* motivation.

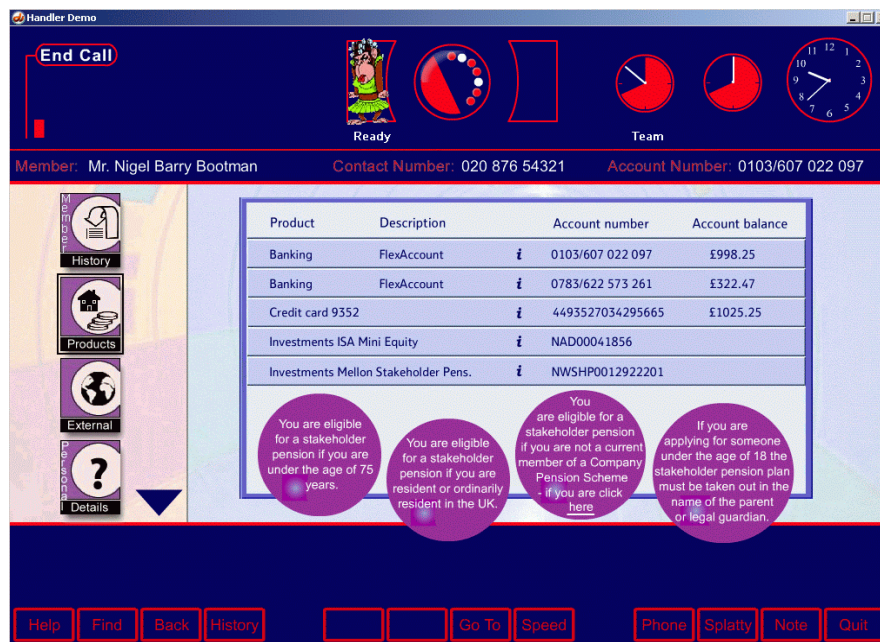


Figure 49: Customer ‘products’ screen with bubble dialogues.

The content of the fields was established by taking screen shots from the bank’s databases and intranets after observing advisors conduct tasks on the phone. A selection of advisors were then asked to provide a post hoc cognitive walkthrough, to try and understand what data they typically looked for whilst online with a customer. Screens were paper prototyped with these advisors before the multimedia prototype was implemented.

○ **Managers’ Push Function.**

During call monitoring, managers can use the bottom element of the screen to push constructive messages (e.g. “Well done, you managed that call really well – keep it positive!”) to the advisor either during or after calls. Timely feedback is better in terms of performance improvement and learning (Kluger and DeNisi, 1996) as well as enjoyment (Tsukahara & Ward, 2001). However, Kluger and DeNisi (1996) also found that feedback *per se* didn’t necessarily have any positive effects on behaviour. Currently call centre advisors are coached on calls that they took hours, if not days, previously and are often unable to remember what they did or why they did it. Use of IT mediated feedback has also been positively associated with decreased stress and anxiety (Ang and Cummings, 1994; Kluger and Adler, 1993) when compared with face-to-face. Earley (1988) found that workers

preferred receiving feedback via the computer rather than directly from their supervisor and concluded that this was because they had more control over the computer than was the case in a face-to-face leadership assessment.

- **Speed keys.**

Another criticism of the original MUI, and many GUI applications, is that experienced users can be slowed down by the need to continuously point and click. The new MUI counteracted this by introducing a bank of speed keys at the base of the screen. These keys map to the function keys on a standard keyboard. Some of these adhere to standard function key actions such as 'find', 'help' and 'quit' but others provide unique MUI functionality (including the 'splatty' (this MUI's equivalent of the 'moodie')).

- **The Splatty.**

The F10 function conceals the 'Splatty' (see Figure 50). The functionality of the 'moodie' in the previous MUI seemed to capture people's imaginations (many people have commented that they would love to have a 'moodie' on their desktop – see section 5.2.3.2 for a full discussion of the moodie). The need for relief from frustration or stress after calls was as evident in this call centre as in the previous one described in chapter 5. However, the animated stick figure did not seem to fit with the sparse graphical approach to the customer narrative space.

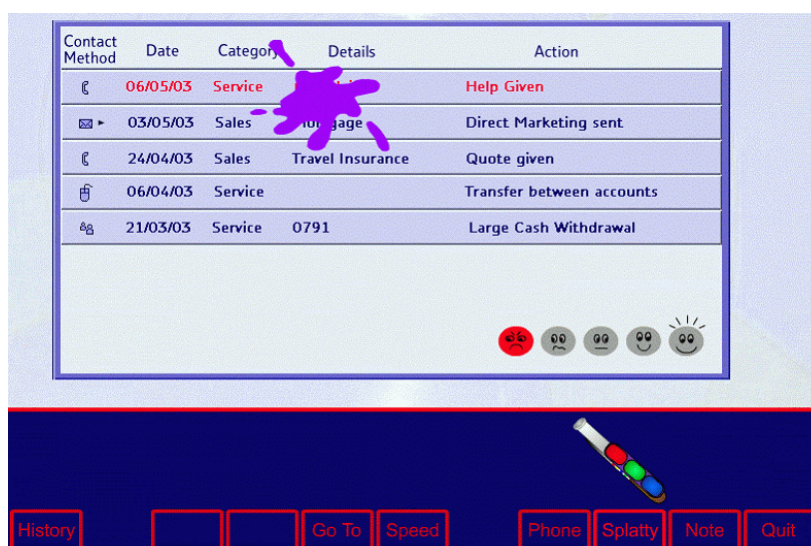


Figure 50: The 'Splatty'.

Observations in various call centres had unearthed the phenomenon of 'cyberfidgeting'. This is where advisors unconsciously and repeatedly fiddle with either their mouse or, occasionally,

objects on their desk (blu-tack and elastic bands being particular favourites) as they are listening to customers talk. This was observed (to a greater or lesser extent) in about 70% of advisors during the course of customer calls in this call centre.

A search of the literature unearthed a study by Scheirer et al (2001), where a similar pattern of activities with the mouse had been observed as indicators of user frustration. Further discussions between the author and this study's co-author, Roz Picard, revealed that they had started to characterise significant patterns of mouse clicking activities among users in response to (deliberately induced) frustration with the interface. Although there is a significant amount of possible applications of this to the call centre (see future development discussion in 8.4), the design of this MUI was influenced by the fact that clicking the mouse in response to frustration was the norm for a significant majority of advisors observed.

Ideas involving the mouse as a frustration release device were storyboarded with a small group of advisors during their rest breaks. The idea of a pump action shotgun had come up in previous discussions with advisors on the original MUI, but had been discarded as being too politically incorrect. However, the idea recurred and was toned down somewhat into a pump action 'splat gun'. Murray (1998) notes that the mapping between a click and an explosion in computer games offers a "tight visceral match", with "easy immersion and a direct sense of agency". Although a gun is not entirely consistent with the MUI narrative, the link to emotional need seemed to make sense for the design.

The original concept design was to shoot a randomly generated picture (e.g. a parrot, a rabbit, a donkey) with a splat of paint as many times as the user could click the left mouse button. On a right click, the advisor could send the splatty to their manager to indicate that they had dealt with a difficult call or were stressed as a result of it. In this way they could communicate frustration to their manager who could then analyse the call and provide support and advice.

Initial user testing on this idea was very negative. The manager's feedback mechanism was received well, with the proviso that "management don't use it to penalise me for getting

stressed”. In terms of the splat gun, the users liked the emotional release of shooting the paint. However, they felt somewhat disconnected with the random picture (as one user stated, “what’s the rabbit ever done to me? Why do I want to shoot it?”)

Why did the concept of the moodie capture people’s imaginations but the splatty did not? One theoretical explanation is simply that users found it easier to anthropomorphise the moodie and empathise with it (Nowak and Biocca, 2003). However, to further investigate this, a panel of industry experts taken from the fields of psychology, usability and multimedia design performed a cognitive walkthrough exercise on both the moodie and the initial splatty idea.

The words that were generally used to evaluate the moodie were more visceral (e.g. “it’s a big virtual ‘v’ sign to customers, isn’t it?”). The experts commented that they felt a “bit naughty” throwing the call in the waste bin. They tended to naturally associate the moodie with both the customer and the call. The splatty, however, was evaluated as “a release” and “good fun” but didn’t have the same ties with customer and call, so did not get the users as emotionally involved.

In an attempt to more closely tie the splatty with the customer and the call, the resulting splatty redesign took away the picture target and allowed the user to shoot the customer record directly. This was met a little more positively when user tested but still didn’t quite achieve the emotional tie that the moodie seemed to generate.

- End call/customer mood indicators.

Once the customer’s problem has been solved, the advisor needs to record actions and input both narrative and emotional data to the customer’s contact record via the mood indicator (see Figure 51 and the section on the ‘Customer Narrative Space’). Calls can then be categorised into a call category (from a drop down menu), any actions recorded in free form text and, finally, a ‘smiley’ chosen from a five-point scale ranging from ‘very dissatisfied’ to ‘very satisfied’. This echoed a paper-based system that one of the bank’s corporate account teams was observed using to assess the general mood of the customer. Of course, this will

only work if the advisors provide an honest assessment of how the call went and how they believed the customer felt. Advisors, therefore, should not be incentivised on the extent of happiness induced in their customers because all customers would mysteriously end up as ecstatically happy. This would significantly skew the data and render it meaningless. Although this is a subjective assessment, it gives the company access to more emotional data on the customer than was previously available. It also adds an additional element of control to the advisor since they can tailor the customer interaction with some awareness of the customers' emotional as well as transactional history.

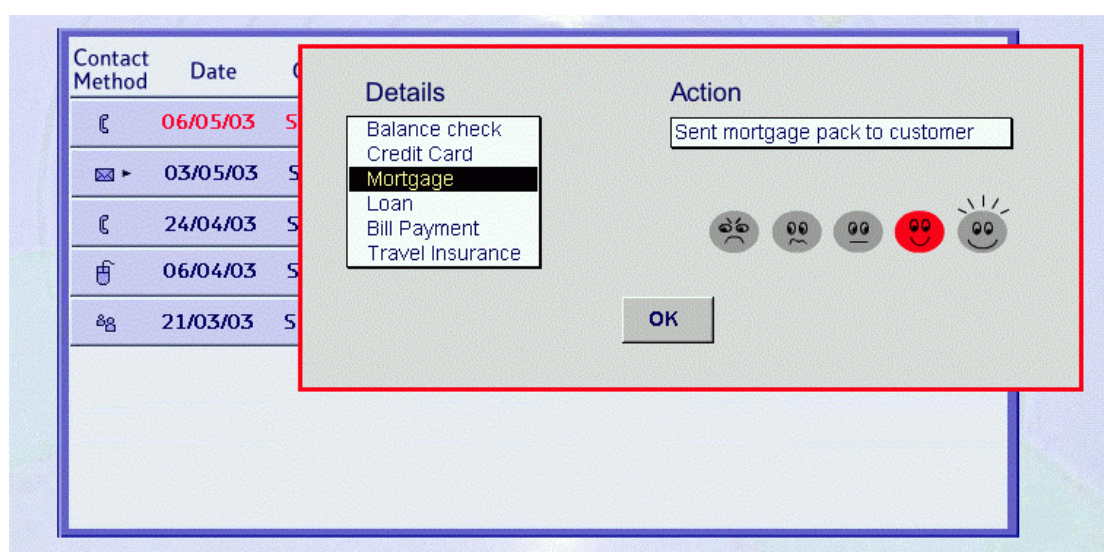


Figure 51: End Dialogue Screen.

6.4. Lessons Learned and Discussion.

6.4.1. Progressing Beyond the Original MUI.

The original MUI was developed as an experiment in innovation to explore the acceptability of 3D graphical interfaces in call centres and whether design components could encourage advisor motivation and increase levels of technology acceptance. The banking MUI took lessons from the initial MUI development and constructed a less deliberately provocative approach that was rooted in the needs of the potential users of the interface. Once again,

field methods (supplemented by focus groups and futures workshops) and prototyping proved to be the cornerstone of the MUI development approach.

The banking MUI had a number of differences in approach to the original MUI. This included:

- **The Offline/Online Split.** The major design difference was the decision to split the offline/action and online/goal mode and reflect these states with designs that emphasise pleasure and efficiency, respectively. This recognised the distinct split in motivation and task focus that advisors were observed to have depending on whether they were online with a customer or offline before or between calls. The design needed to reflect a mode of discovery and exploration whilst offline (Murray's (1998) concept of 'orienteering') and focus on efficiency whilst online (more akin to 'jetpiloting'). This was a case of balancing affect with effect and the two modes reflected very different design approaches.

Offline, the focus was more on discovery (through the personalised 'news' pages), an awareness of team (through the 'team space' and the 'games' pages) and an expression of individual identity (through the choice of team member icon and personal profiles). Online, the advisors needed access to relevant information about the customer but did not want to be overwhelmed by it. The GUI design was generally less visually crowded to reduce extraneous cognitive load through split attention or redundancy effects (Chandler and Sweller, 1991). This included access to a customer 'pen picture', past interactions (including a mood indicator), an indication of how well the customer navigated the IVR and a timeline signifying how long the customer has been on the call.

In addition, speed keys and shortcuts were introduced for common functions to combat the time penalties that often occur with GUIs (especially for experienced users).

- **Supporting the five 'C's.** The offline/online split started to support motivation through a balance of task-focused affect and effect. However, the fundamental five 'C' framework was also present in the design rationale through:

Motivators.	Banking MUI Design Rationale.
Culture	<ul style="list-style-type: none"> ○ Providing a picture of individual advisors' skills and qualifications so that strengths and weaknesses can be exploited within a more 'self managed team' philosophy. This implies increased ability to collaborate and share knowledge. ○ Cultivating a sense of team awareness through the 'team space' and, through informal communication channels, such as instant messaging and team games, encourage collaboration, support and knowledge sharing. ○ Providing an awareness of time so that advisors could manage their breaks and shift patterns. ○ Making reward and recognition more public – including manager 'thank you's. ○ Allowing coaching feedback to be more instantaneous in order to facilitate performance improvement, learning and behaviour change as well as providing a less controlling channel for that feedback. ○ Incorporating targets within the MUI operations dashboard so that advisors could track their progress against them. ○ Including stress relief in design so that advisors could manage the demands of 'emotional labour' and managers could manage the effects of stress on their advisors and put emotional context around their statistics. ○ Encouraging an element of play within the offline environment to facilitate learning and discovery.

Content	<ul style="list-style-type: none"> ○ Presenting simple customer histories (including both transactional and emotional data) in the 'customer space' and putting advisors within one click of customer, product and service information in a way that does not result in cognitive overload. These histories present a fuller picture of the customers' contact history and allows the advisor to tailor the interaction accordingly. ○ Streamlining time consuming, non-value add tasks such as the need to log on to multiple systems using multiple passwords. ○ Personalising knowledge to the advisor so that it becomes more relevant to their job, team and location. ○ Linking management information systems into public or personalised information displays. In this way advisors can more effectively manage their time by seeing how busy the centre has become.
Control	<ul style="list-style-type: none"> ○ Giving advisors an increased ability to choose their media contact preferences (i.e. telephony, e-mail, chat, video) from the contact centre's multimedia universal queue. ○ The ability for advisors to choose and personalise their own knowledge space and public team personality. ○ Providing an outlet for stress and a way to increase management visibility of emotional call context via the 'splatty'.
Collaboration	<ul style="list-style-type: none"> ○ Bringing teams together in a virtual environment where there is an awareness of team, availability and an ability to provide a virtual 'community of coping' by facilitating team communication and collaboration. ○ Reinforcing team identity and belonging through providing team specific information on the advisor's knowledge portal. ○ Incorporating team-building games into the 'team space'.
Curiosity	<ul style="list-style-type: none"> ○ By providing advisors with the ability to increase the visibility of their individual skills and strengths, they can potentially collaborate and share knowledge within teams more effectively. ○ Engaging a sense of play and discovery during 'offline' time through novel and pleasurable interface design. This is inspired, as in the first MUI, by the interaction style of a game and a narrative style taken from a film metaphor (complete with a cinemascope style and a cast of colourful characters).

Table 6: Mapping the Five 'C's to the Banking MUI Design

- **Team identity and interaction.** The team space evolved as a logical progression from the 'buddy' system of the first MUI and reflected the strong team orientation of the banking call centre. This occurred in spite of the fact that the teams were rarely co-located. Collaboration, social identity and social facilitation have strong effects on motivation and well-being so the team space was designed to facilitate a sense of collaboration, support and group knowledge transfer. The sense of team presence was built in the team space with the ability to see, through the characters and the dots on the dialler, who is online and whether they are busy talking to a customer. Individual identity within the teams was established through individual web pages and the choice of team icon. This facilitated the recognition of different expertise within the team and was designed to make possible a more autonomous or self-managed work style. This can lead to better productivity and higher motivation through increased advisor involvement in controlling and creating the customer experience (Batt and Moynihan, 2002; Gladstein, 1984; Batt, 1999; Hinsz et al, 1997).

Team communication and knowledge sharing was also encouraged through the team messaging system as well as through team games and personalised news and discussion boards.

- **The Battle of the Stress Relievers: The 'Moodie' verses the 'Splatty'.** The banking MUI attempted to duplicate the success of the 'moodie' as both a device to express stress and frustration and to put emotional context around statistics. Inspired by observation of a number of instances of advisors' 'cyberfidgeting' (repeatedly clicking the mouse at times of stress) a function was designed that supported the mouse click as a stress relief device. However, the 'splatty' failed to duplicate the visceral tie with the call that the 'moodie' seemed to achieve. Shooting paint at the customer record did not duplicate the anthropomorphic quality, the humour and the attitude of the stick man and the feeling of completion that came with throwing the call in the waste bin. The most successful aspect of the splatty was, as with the moodie, the ability to provide an emotional context to the advisors' productivity statistics.

- **Commercial verses Academic focus.** The biggest difference between the first and second MUI was the fact that the banking MUI was a commercially sponsored piece of work, rather than research per se. This meant that management buy in was stronger than in the original implementation, as the development was costing them money. The result was that the design team got more access to call centre advisors than in the previous development and were able to run futures workshops and focus groups as well as using a 'quick and dirty' ethnographic approach. The team were also able to generate full scenarios to contextualise the designs.

However, the negative aspect of a commercial development from an evaluation perspective was that the design team were not given any further access to the banking call centre to perform any formal evaluation process on whether the MUI increased motivation or acceptance of the technology longer term. Actual implementation of the prototype was handed over to the bank's IT development team. The only aspect of evaluation that the author could perform was to go back to the client for the work, the bank's director of future strategy, a few months after it had been delivered and ask about the impact of the MUI. He stated: "the MUI and the future scenarios gave us some innovative ideas which have helped us to formulate a strategy for our call centre. It has also provided us with a blueprint for the look and feel of our new knowledge management system".

Although the lack of follow up is very frustrating from the perspective of someone writing a thesis, this MUI case study gave further theoretical and practical evidence from call centre advisors to back up the concepts being explored.

The banking MUI demonstration and the scenarios now reside in the bank's future showcase, where it is, at the time of writing, still used to inspire the bank's senior managers, strategists and customers.

Again, this could be where the MUI story ends but further demonstrations of both the initial MUI and the banking one attracted the attention of the director of customer service of a major telecommunications company. The director was experiencing serious problems with the acceptance of a new knowledge system by the call centre population.

Chapter 7: A Home Page is Where the Heart Is: Balancing Pleasure and Efficiency in Knowledge Management Interfaces for Contact Centres.

“Unlike machines, human minds can create ideas. We need ideas to guide us to progress as well as tools to implement them...computers don’t contain brains any more than stereos contain musical instruments...machines can manipulate numbers; people connect them to meaning”, Penzias (1989).

The banking MUI gave further insights into the methodology, building blocks and design components that make a GUI a MUI. The most significant step forward in design rationale was to acknowledge the differences in motivation between ‘offline’ and ‘online’ tasks and the resulting need to balance pleasure and efficiency.

The next MUI had a subtly different design emphasis. After the director of customer service and the head of knowledge strategy of a major telecommunications company approached the author with a challenge, it became apparent that the focus of this new MUI was to increase technology acceptance rather than motivation per se. Previously, in a drive to increase adherence to regulatory compliance and accuracy of information given to customers, a new knowledge management system (KMS) had been introduced into the call centre. However, although it had been designed in a user centred way, usability alone had not resulted in the advisors accepting it as part of ‘business as usual’. This resulted in legal challenges and high-level escalations as well as customer complaints. On a number of occasions these escalations and complaints were linked to information that was actually on the knowledge system but the advisor had not used it. The challenge was to investigate why the KMS was not being used and how it could be redesigned to increase the level of technology acceptance amongst the advisor population.

The previous MUIs created complete advisor portals supporting all aspects of their interaction with customers. This MUI was to be very different in that it concentrated on the effective delivery of knowledge support at the customer interface via a ‘knowledge portal’. The KMS sat alongside a suite of other tools (such as the CRM database) used to support the dialogue with the customer. Unlike the other MUIs, this one did not attempt to provide a single

interface onto all these systems. Since the knowledge system is not a panacea for the advisors' customer interaction task, the focus shifted from helping advisors to become motivated to do their job, to investigating the motivational drivers surrounding advisors' acceptance of the KMS.

Although this was a subtly different type of MUI, it worked on the same principles of motivation as the previous one and also had to operate on both effective and affective level. It needed to be easy and attractive to use (usable) as well as effectively supporting the advisors' task (used).

7.1. Background and Context for Design.

The call centre under study was located in the North West of England in an area that boasts five major UK company's call centres. The centre is one of the largest call centres in Europe and is capable of seating over one thousand advisors (see Figure 52).

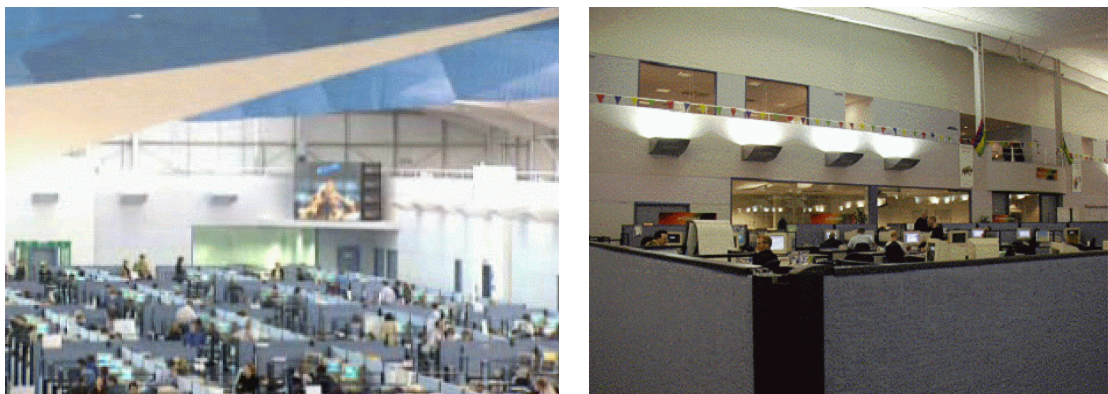


Figure 52: Views of the Telecommunications Call Centre.

Competition for good call centre advisors is extremely high, as is call centre staff turnover (around 32% of employees churn per annum). The emphasis, therefore, is to retain good advisors but provide express training programmes for new inductees, given that they may not stay with the company for more than two years. The emphasis is often on customer care training rather than product knowledge. Customers tend to want "fast accuracy" (Muller et al,

1995) from a call centre. Iglezakis and Reinartz (2002) articulate customers' requirements further:

1. They want an answer to their problem and if they don't get one they perceive the company to be incompetent.
2. They want correct answers to their problems. It does not need to be the best answer but it does need to be a correct answer.
3. They want answers quickly. Customers are impatient and believe their problem to be more urgent and important than anyone else's.
4. They want confident answers. They do not want multiple solutions. They simply want one solution that will work.

To meet these customer requirements, the centre had introduced a knowledge support tool for the advisors since there was simply too much specific product, service and procedural expertise to reside in the head of any single advisor.

The knowledge management system (KMS) was based around what Muller and Millen (2001) calls a 'quality control model' of knowledge distribution. Unlike a 'knowledge worker' model where users themselves are responsible for maintaining and updating their working practices and knowledge, a 'quality control model' suggests that users' work is monitored and knowledge is presented to them at the appropriate moment in the workflow. Both the knowledge and the moment at which it is introduced is predetermined and authorised by a central knowledge gatekeeping function. The end user is often discouraged (and often prevented) from contributing to the knowledge base.

The new knowledge system had been in place for three months at the time of the study. A half-day training course had provided most advisors with an introduction to the intranet-based system and how to use it. The rationale for the system was to provide a 'one stop shop' for all the knowledge about products, services, procedures and job specific briefings that advisors needed to do their job. Information specific to the customer was contained in the separate

CRM system. The knowledge system comprised the main KMS and a knowledge maintenance (or update) system, which was administered by the knowledge gatekeeping function (see Figure 53).

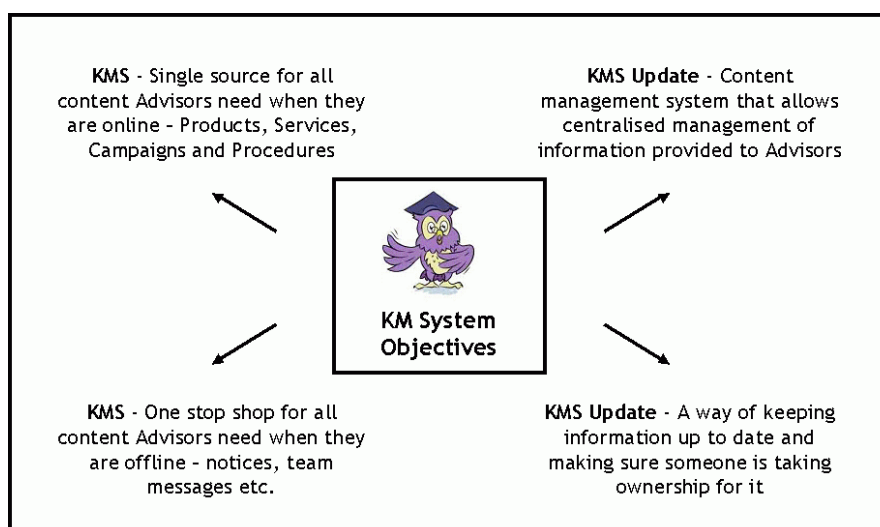


Figure 53: Components of the knowledge management system (KMS).

The KMS provided a view of knowledge tailored to the advisor's principal job role – i.e. sales, service or repair. The home page comprised a number of links to search facilities, tools and information (see Figure 54). The designers had recognised the difference between the needs of advisors whilst offline and online from a knowledge perspective by splitting the home pages into these two modes. However, interaction styles between these two modes were not differentiated. The bottom tool bar contained links to knowledge that was outside the governance of the KMS.

Driven by regulatory requirements for increased compliance and accuracy, the director of customer service (who was beset with complaints and escalations largely attributable to inaccurate information being given out to customers) asked the author to conduct an initial independent audit on knowledge usage within the various functions in the target call centre. The fundamental question was whether the new knowledge system was being used and, if it wasn't, why?

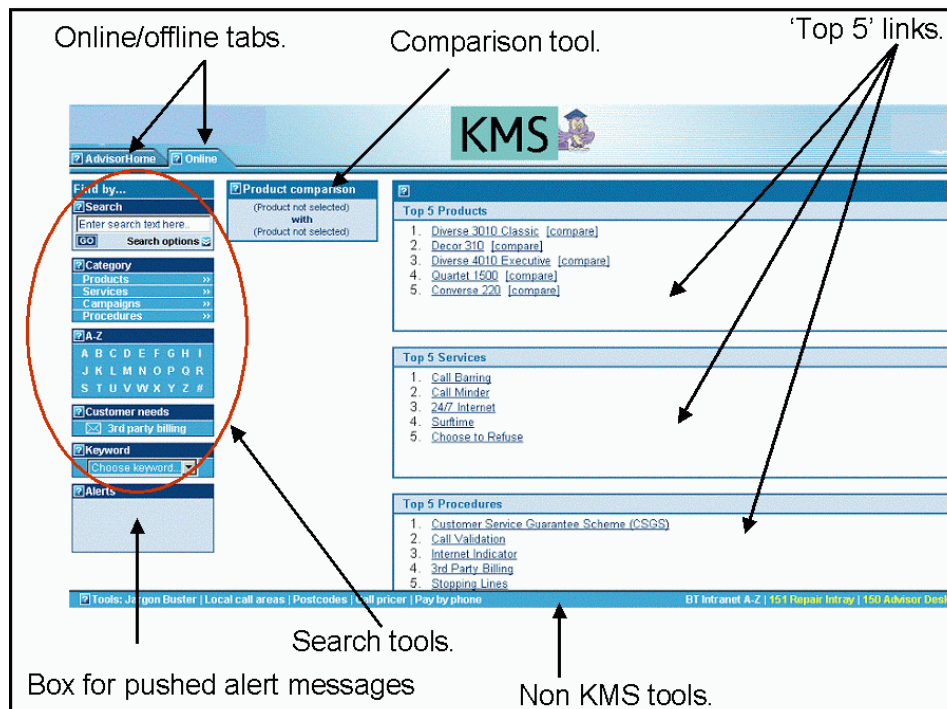


Figure 54: The KMS Home Page.

7.2. Requirements Capture.

7.2.1. Field Data Capture.

The call centre management allowed the author, plus two research assistants, to conduct a three-day requirements gathering exercise comprising:

1. A field study of the call centre service operation. This included observation of call taking with twenty-four advisors (listening into calls, where possible, for an average of one and a half hours).
2. A call and knowledge classification tick list, which advisors filled in as they worked.
3. Short interviews (maximum ten minutes) with sixteen advisors focusing them on how they currently used knowledge on calls, what they thought of the KMS system, what motivated them to use systems and how they thought the KMS could be improved.
4. An analysis of the system logs for the KMS to track which pages were being accessed the most.
5. Administration of a standard usability questionnaire (SUMI – see 4.2.3.3).

The layout of the centre was such that the researcher could sit within a team space (see Figure 55) and observe eight advisors and one team leader at any one time. Team members were separated by glass partitions that served as acoustic shields whilst also allowing team members to see each other. This, of course, also meant that the co-located team manager could also see everything going on within the team. The centre operated on a 24/7 basis, with multiple shift patterns so all desks were hot desks to accommodate an ever-flexing workforce.

In the three days of observation, major call types were classified using a tick list by the advisors (see appendix F) and usage of knowledge sources were noted for a sample of these call types.

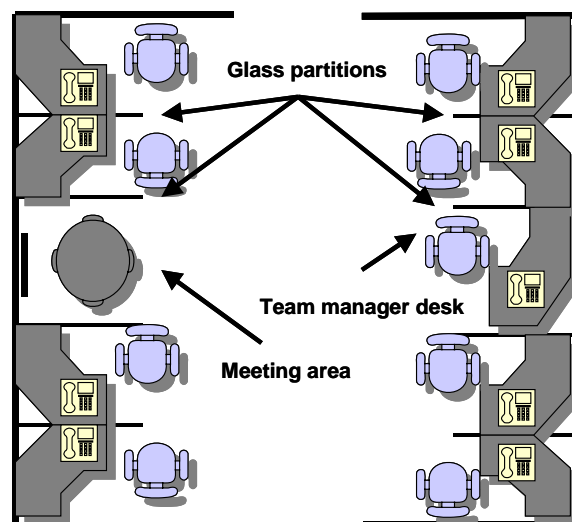


Figure 55: Physical layout of team space.

7.2.2. Data Analysis.

Observations of systems usage during calls found that the knowledge system was only being used for 7% of the time. 75% of KMS users observed accessed the knowledge system less than ten times each over the three-day study period. Further analysis of the system logs found that, of the top twenty five pages accessed in the knowledge system, only two pages could be described as having useful content for customer handling. Advisors were only using *any* physical knowledge resources 22% of the time (generally either the old, familiar outdated

database system or the 'little black book' that they had illicitly concealed in their bottom drawers).

The knowledge system had fallen into the trap that besets many such developments, in that it is assumed that knowledge, once acquired, will be used willingly, appropriately and efficiently (Pfeffer and Sutton, 1999; Alavi and Leidner, 2001; Stenmark, 2000; Zack, 1999). Most knowledge management initiatives largely measure success through collecting, distributing and re-using existing knowledge. They tend to ignore the fact that much knowledge transfer is tacit "working knowledge" (Harper, 1987). Surveys have shown that up to 70% of workplace learning is informal (Leader to Leader, 1998). However, most knowledge management efforts focus on technology that tends to ignore the tacit element of knowledge transfer. As Pfeffer and Sutton (1999) state: "When knowledge is transferred by stories and gossip instead of solely through formal data systems, it comes along with information about the process that was used to develop that knowledge".

In addition to this, although the call categorisation made it look like all calls were broadly the same, every call was actually very different, due to variations in customer needs and moods. It is always the customer element in a service encounter that creates the element of uncertainty and gives the encounter a dynamic and emergent quality (Alferoff and Knights, 2002). The way that this interaction is managed is critical because it shapes customer perceptions (Ashforth and Humphrey, 1993). Advisors quickly pick up on call themes and will often use their own (often tacit) knowledge in preference to any of the systems supporting them. Access to knowledge was required for the less frequent queries or ones involving complex products and services. For the remaining 71% of the time advisors simply used the knowledge in their heads.

Advisors universally agreed that the knowledge system was "a good idea". The system also came out as being extremely user friendly after a standard subjective usability assessment (SUMI) questionnaire was administered to a sample of thirty advisors. The teams involved with this questionnaire were given time by their team leader to fill it in, so returns were

relatively high (60%). Analysis of the SUMI questionnaires and the results of the field observation showed that, although the system was deemed to be *useful* and *usable* it was not being *used*. The commitment and motivation of users was not sufficient for it to be consistently used whilst online with customers.

The initial capture of requirements showed that the knowledge-mediating task of an advisor is not a trivial one (see 2.3.1). Transformation of a customer request into search criteria for the system requires the advisors to span a large “gulf of execution” (Norman, 1988) between the customer’s request and finding the relevant knowledge on the KMS. This relies on the advisor’s knowledge of the KMS, the company and customer (Lawrence, Atwood and Dews, 1994). The advisor needs to construct both an accurate and well-specified search based upon often incomplete or partially incorrect information given by the customer. In transforming the request from the customer into a search criterion, the advisor needs to make a judgement about what information to exclude. In addition, they have to not only be fast but also communicate in real time to the customer. This causes a fair degree of cognitive load and requires the advisor to multitask. Lawrence, Atwood and Dews (1994) found that advisors exclude some component of the information offered by the customer about 40% of the time. All this activity, of course, is largely invisible to the customer.

As with the previous MUI studies, advisors tended to approach calls in a classical problem-solving manner. They assess what the customer wants and seek to provide answers to the their questions by using information from the CRM system (usually information about the customer, their products and services and prior contacts), the intranet knowledge base and other non-systems data sources (including knowledge in their own head, paper, managers and colleagues). They then record or execute the solution to that problem on the CRM system, before summarising their actions back to the customer.

The process of giving knowledge to the customer involves a number of “memories” (Ackerman and Halverson, 2000). Knowledge given to the customer was generally either from the advisor’s head, from the new knowledge management system, the company intranet or from other sources such as notebooks or paper. General access to the Internet was

prohibited. Usage of the knowledge system was only noted if advisors actually interacted with the system with the intention of finding out a piece of knowledge, rather than just toggling from the CRM system onto the KMS home page.

Analysis of the observational and interview data showed that there were a number of reasons for the low levels of use of the KMS:

- *Retrievability* was cited as an issue. The system was neither simple nor intuitive to use and there was a danger of information overload. Verbatim comments from advisors included:
 - “The system is very messy at the moment”;
 - “It is too busy. It is too full of information – it looks too complicated”;
 - “We need information that is straightforward and quick. Our jobs depend on meeting our talk targets so if the system is slow and complicated, I’m not going to use it!”
 - “There’s loads of information in the system – it’s just difficult to find it!”.

Retrievability involves knowing what is and is not in the knowledge base and if it *is* in the knowledge base, where it is. Dix et al (2003) suggest that knowledge management is more to do with finding the knowledge than the actual knowledge itself. Although advisors had completed the introductory course, they had not been given the time or the incentive to familiarise themselves with the content of the new knowledge system. Any system that aids human cognition in non-trivial ways generally requires a substantial investment in learning time. Disillusionment can set in if users find the system less than supportive of their problem solving task (Nickerson, 1981). Using the system to successfully solve a problem can convert a non-user to a user. This implies that the systems needed to be designed so that users can be encouraged to do something of genuine interest very early on (Nickerson, 1981).

- *Speed* of access to information was perceived to be a problem. This is frequently cited as a reason for rejecting technology (Nickerson, 1981; Miller, 1968). The advisors felt that the intranet-based system was too slow. This had an impact on their call handling time so they tended to prefer to use their own knowledge because it was

quicker. They also stated that they found it difficult to find information (“it’s sometimes like finding a needle in a haystack”) since A-Z indexes were often strangely categorised (e.g. the name of the company often preceded the name of the product, giving a very long list under that letter of the alphabet). They were also unable to bookmark useful pages (bookmarking had been disabled on machines since they were often shared between different advisors, plus management wanted to discourage people bookmarking information that could go out of date).

- *Readability* was observably problematic. Advisors found the knowledge (often multiple pages of unbroken text) hard to read off the screen, whilst simultaneously attempting to talk to customers. The amount of cognitive effort required to read and process this written information on screen whilst online with customers was considerable. This meant that customers were effectively being put on hold whilst advisors skimmed through large amounts of text. In addition, over 15% of screen acreage on the home page was taken up with a product comparison tool that was rarely used (ten instances of use out of the four thousand calls which were listened to during the three days of field study (only 0.25% of the time)).
- Advisor’s *goals and motivation* were not well supported. The primary goal for advisors is to help customers, rather than follow process rules such as call handling times and compliance. However, they were compelled to remember compliance rules and had to try and work the required compliance activities into the natural flow of the call. Advisors had to cope with numerous demands on their cognitive resources such as listening, talking, interpreting and recording. The complexity of services, products and processes were too numerous and complex for any one person to keep in their head. Knowledge needed to be integrated into the task flow and support the way that advisors naturally solve problems. Experience has shown that ‘Q&A’ style knowledge support tools – including scripting tools – are not used and are often ignored because of their inflexibility and inability to support the advisor’s goals of natural conversation and customer rapport.
- An additional problem in the introduction of this kind of technology is the usual human *reaction to change*. The problem, as in the case studies before, is that the knowledge

system may be perceived as devaluing the advisor's own knowledge, therefore deskilling the job. The system may also be perceived as being complex and difficult to use. The advisor base in this centre was biased towards female (approximately 68% of the workforce) and largely low levels of computer literacy (only 42% of advisors interviewed regarded themselves as having 'high' levels of computer literacy). There was a reluctance to explore the system prior to having the introductory training.

- *Trust* of the knowledge in the system was a significant factor in advisor's usage of it. Given that advisors are driven to solve customer's problems quickly and accurately by their compliance and call handling times, they have to continually trade off between accuracy of information and the time penalties of finding it. Advisors were insufficiently familiar with the system to believe that the information contained within it was reliable, accurate and trustworthy. This was not helped by inconsistencies and differences between different online sources of information. When under pressure to provide customers with an answer, advisors tended to go for information sources that they trusted (i.e. the legacy ones or their own memory) and could be accessed fast. If advisors encounter information that threatens their subjective certainty it is all too easy for them to discredit both the information and/or its source.

These observations were supported by evidence from Kalbach (2004) and Kuhlthau (1993) that searching for knowledge is not an emotion neutral experience. Searching frequently involves confusion or frustration, as well as joy and satisfaction if the user finds the information that they require. Given the emotional nature of searching, a motivational approach to design seemed to be appropriate to investigate as part of prototyping a new, improved interface for the existing call centre knowledge management system (a new MUI).

7.3. Motivation and Knowledge Management: Towards a Knowledge Management MUI Design Rationale.

7.3.1. Motivation and Knowledge.

Both Malholtra and Galletta (2003) and Dyer and McDonough (2001) found that the success or failure of knowledge management systems depended on the commitment and motivation of the users. This was also reflected in the extent to which people shared both tacit and explicit knowledge (Stenmark, 2000; Tuomi, 2000). Davenport et al (1998) observed that unsuccessful knowledge management projects had “struggled to get organisation members to contribute to repositories” and “the motivation to create, share and use knowledge is an intangible critical success factor for virtually all knowledge management projects”. Barth (2000) found that there was no incentive for people to invest time and energy to solve other people’s problems. However, even when formal incentives were deployed, organisational knowledge management systems still often fail to stimulate knowledge sharing with knowledge targets often providing low quality and value information into the system (Chiem, 2001; Wenger et al, 2002).

Alavi and Leidner (2001) observe that the reasons for negligible user uptake include the fact that the knowledge management systems are often not embedded in the user’s task, often capture common knowledge rather than tacit knowledge and represent little in terms of personal benefit for the user.

Rather than mandating or incentivising the usage of the system (where the danger is that the advisors fail to understand or appreciate the value of using it), the knowledge system needs to be socialised and accepted by the call centre community (Malholtra and Galletta, 2003; Davis, 1989; Klein and Sorra, 1996). Wenger et al (2002) observed that recognition by peers, rather than financial rewards, is the primary motivator for technology usage. This was reinforced by the observation that teams who were either managed by or coached by an individual who was a frequent user of the knowledge system were more likely to use the system than teams who

were not. This is likely to be an effect of collaboration motivation through ‘social influence’ where the presence of others, observation of others’ behaviour, social conformance and comparison all contribute to increased usage.

Implicit in knowledge management is the ability to capture knowledge as well as disseminate it. One of the primary reasons that the advisors mistrusted the knowledge on the system was that they did not know where it had come from or where it had been validated. Although advisors did have the ability to contribute knowledge or comment on its validity via a ‘feedback’ button, no-one questioned as part of the study had actually used this functionality. When asked why this was all but two advisors commented that they “doubted anything would happen if we said anything”.

7.3.2. Technology Acceptance.

For the new knowledge system to be accepted, advisors needed to be convinced that the system was both useful and relevant to the task of solving customer problems. The decision about which resource to use (e.g. physical (i.e. paper notes), electronic, memory or consulting with others) is influenced by the success (in terms of efficiency and result) of previous searches for related material (Dix et al, 2003).

Theories of technology acceptance (e.g. Lu and Gustafson, 1994) suggest that people use computers to increase their problem solving performance (usefulness) at a reduced amount of effort (ease of use). According to behavioural decision theory, “people will seek information when its expected value exceeds the expected cost” (Dix et al, 2003). This suggests that there is a cost-benefit paradigm involved in the advisor’s choice of decision-making strategy, effort to perform strategies (ease of use) and the quality (accuracy) of decision result (usefulness). This requires them to become familiar with what is on the knowledge system as well as being able to rapidly access and use this knowledge to solve customer’s problems.

However, Dix et al (2003) have suggested that this is less about the advisors actually committing the resulting knowledge to memory but encoding the method of accessing that knowledge ('meta knowledge'). The cost/benefit equation for encoding the location of the knowledge is different to that for the knowledge itself. If the perceived cost of retrieval is too high (i.e. it takes too long or is too difficult to find) then advisors are more likely to store a local copy, in the form of the notes in their 'little black book', or rely on sources other than the knowledge system.

As users find out how useful the knowledge management system is, through trial and error, their future usage tends to become a factor of perceived usefulness as well as perceived ease of use (Adam, Nelson and Todd, 1992; Moore and Benbasat, 1991).

Another factor relating to perceived usefulness is 'credibility'. Since many advisors did not trust the knowledge in the system they chose to use alternative sources that they perceived to be more trustworthy. Self (1996) suggests that there are two dimensions to credibility and these are 'perceived trustworthiness' and 'perceived expertise' (see Figure 56).

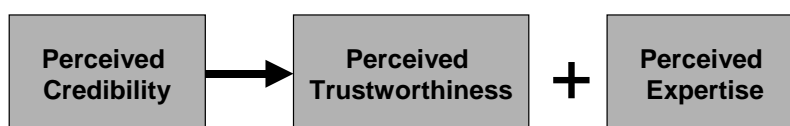


Figure 56: Elements contributing to perceived credibility (Self, 1996).

Trust can be defined as fair, unbiased, honest and having perceived similarity to the user's beliefs (Self, 1996; Walster, Aronson and Abrahams, 1966). Expertise can be defined as perceived knowledge, skill and experience (Fogg, 2002). Trust and expertise do not necessarily go hand in hand. However, if one dimension is strong then perceived credibility might still be high because of a halo effect.

Fogg (2002) suggests there are 4 types of credibility:

1. Presumed – This is the assumption in the mind of the perceiver. Technology is often held in awe (although this is diminishing), so people may assign more credibility to

technology than they would a human (Bauhs and Cooke, 1994; Andrews and Gutkin, 1991).

2. Surface – This relates to the simplicity and visual appearance of the interface.
3. Reputed – If the knowledge system has been endorsed by a respected third party it has an increased amount of credibility. (This could be the reason that adoption of the KMS tended to be higher in teams where managers and coaches endorsed it).
4. Earned – This is earned through first hand experience. The system gains credibility when it provides information that users find correct and loses it when it provides incorrect information (Kantowitz, Hanowski and Kantowitz, 1997; Lee, 1991, Muir and Moray, 1996). There can be some tolerance for errors depending on the significance of the error. If significant, the user is not likely to give the system another try.

From these observations it follows that, for the technology to be accepted, the system must allow advisors to quickly retrieve answers, provide some indication of the credibility of the source of information, look simple, be consistent in navigation, support the user's problem solving style and be up-to-date. From observation, advisors found significant problems with the lack of simplicity of the interface and the retrievability of knowledge. Credibility can be destroyed if links do not work, information is out of date, it contains inaccuracies or typos, or it is slow to respond. Again, from observation, the main problem that the advisors were experiencing was the perceived delay in finding and retrieving information. These issues were contributing to the low usage of the KMS during calls.

7.3.3. Emotion and Knowledge Searching.

Existing theories of information seeking consider different strategies with respect to searching for information. Kuhlthau's (1993) Information Search Process (ISP) uniquely incorporates feelings and emotions alongside actions and thoughts. ISP has 6 stages:

1. Initiation – the user recognises that they have a gap in their knowledge. People have a desire for a firm answer to a question, an aversion to ambiguity and a need for

'cognitive closure' (Kruglanski and Webster, 1996). They tend to feel uncertainty and apprehension at this point (e.g. if advisors are measured on the accuracy of the information that they provide to a customer). Since they are under time pressure to provide an answer (because of call handling time targets), they are likely feel stressed and are more likely to resort to knowledge that they are familiar with. If they find knowledge on the system that goes against their beliefs or past knowledge, there is a tendency to avoid it. This would explain the need for familiarity with the knowledge base and the perceived consistency and reliability of knowledge.

2. Selection – identification of the problem topic in the language of the organisation. This is often a case of interpretation of the dialogue from the customer and finding the nearest criteria in the language that the company has couched it in. Uncertainty can give way to optimism at this point.
3. Exploration – as advisors are exploring the knowledge base, feelings of uncertainty and doubt may return as they search for the answer to the customer's problem. If the search yields no concrete results, the advisor may resort to other exploration strategies such as searching in paper documentation or asking colleagues, coaches or managers.
4. Formulation – as advisors start to find out more information that matches the need of the customer, their confidence starts to rise. This can mark a turning point in the search strategy.
5. Collection – the advisor starts to collect and make sense of relevant information. Confidence increases even more.
6. Presentation – the advisor provides the information to the customer. There is a feeling of relief and satisfaction on completion and the advisor's sense of curiosity is enhanced as they absorb the new knowledge.

Uncertainty is prevalent in this model and is often caused by distrust of the information source (as evidenced by observations in the field). This is a factor that needs to be addressed as part of the design.

User models concerned with reducing cognitive load would benefit from incorporating the users' affective states (Kalyuga et al., 1997) and, by presenting information structured in the most efficient way, eliminating avoidable load on the advisor's working memory.

7.3.4. Knowledge, Emotion and the MUI Motivational Framework.

7.3.4.1. Motivation and Knowledge.

Given that the users' underlying motivation seems to be key to the usage of knowledge systems and the fact that knowledge searching is not emotion neutral, a MUI approach to designing a new interface for the knowledge system seemed to be appropriate to investigate.

Exploring the 5 'C's of motivation in a knowledge management context, it was found:

- Culture.

The best customer service organisations tend to combine the principles of the service-profit chain (Heskett et al, 1997 – see chapter 2.1.3) and the Japanese principles of Kaizen (Imai, 1986) to form an 'adaptive culture' (Millard, 2001 - see Figure 57).

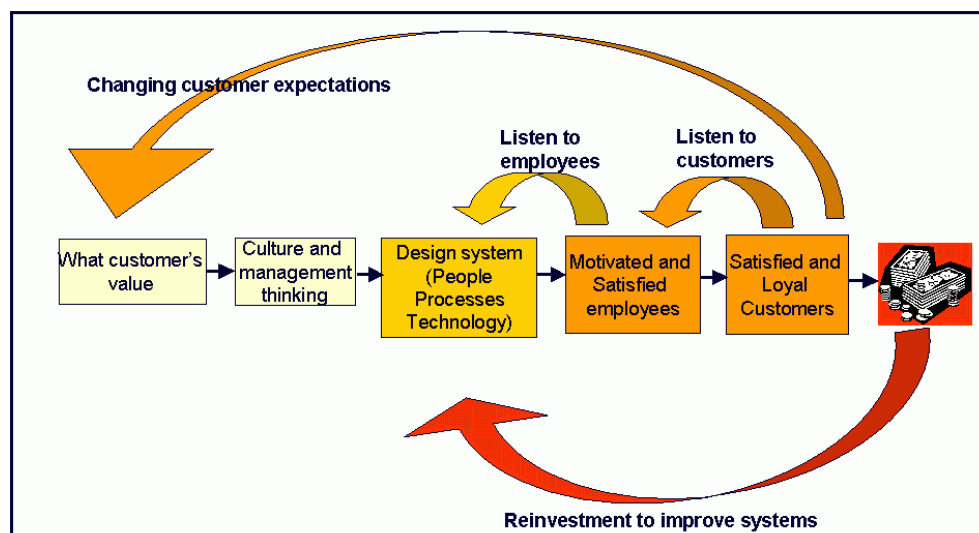


Figure 57: Adaptive Culture Model (Millard, 2001).

The service profit chain philosophy (Heskett et al, 1997) has motivation and satisfaction of employees influencing customer satisfaction and, ultimately, profitability. Often the best people to improve the experience are those delivering it, rather than those managing it or those disconnected from it. The front line is usually the first to know if there is a problem because customers will tell them. They are also often the first to find solutions to these customer problems.

The Japanese principle of Kaizen (literally 'continuous improvement') is a variation on goal directed (specifically achievement) motivation. It depends upon employee feedback to improve the quality of customer experience. The principal human factor underlying Kaizen is an individual's innate need for personal development and growth (e.g. Hackman, 1987; Hackman and Oldham, 1980). According to Hackman and Oldham (1980), individuals with stronger growth needs are more highly motivated by jobs which present greater opportunities for growth, whereas those with lower growth needs are less motivated, if at all, by those same opportunities. Although growth need strength would appear to be an effective gauge by which to identify employees who are more likely to contribute ideas and knowledge, attempts to define the moderating effects of growth need strength on the relationship between job design and motivation have yielded mixed results (Champoux, 1980; Evans, Kiggundu, & House, 1979; Fried & Ferris, 1987; Graen, Novak, & Sommerkamp, 1982; Graen, Scandura, & Graen, 1986; Loher, Noe, Moeller and Fitzgerald, 1985; Oldham, 1976; Oldham, Hackman, & Pearce, 1976).

However, McClelland (1988) found that only 10-15% of the population spontaneously exhibited achievement motivation behaviours. An additional problem is that most western cultures emphasise individual rather than team achievements, which tends to foster knowledge hoarding and a lack of active feedback. Kaizen demands entrepreneurial, self-motivated, adaptable, flexible, fairly autonomous and knowledge driven employees. These are not normally qualities encouraged in a call centre

advisor, especially when they are subject to a 'quality control' model of knowledge management (Muller and Millen, 2001) where active input is discouraged.

Another barrier to knowledge feedback can be the presence of both legacy culture and legacy systems. When rewards and measures act against improvement (for example when the call centre is very busy) and motivation and trust are so low that knowledge sharing is non-existent, employees are unlikely to invest their time and creativity into contributing to a system which is unlikely to change (in the short term anyway). If change control on systems and processes causes a significant time lag, the changes are likely to be too late to save the damage done to the customer experience. Employees will only start to become motivated if they have increased control over the way that they do their job and the ability to enhance the customer experience.

Effective knowledge management assumes that the culture fosters trust, action, flexibility and customer focus. A knowledge management MUI needs to support these qualities by providing a method for feedback that is both acknowledged and acted upon.

- Collaboration.

Since much knowledge is tacit rather than explicit, the importance of including information about the source of that knowledge and a possibility of networking with the originator, or people with experience of solving the problem, can be invaluable to increasing the usefulness of the knowledge base. In addition, people who contribute their expertise often want their contributions to be recognised by the organisation (Malholtra and Galletta, 2003). People rarely behave entirely altruistically and jump to solve other people's problems without any personal sense of gratification or recognition.

In the call centre under study it was the coaches who were the hub of tacit knowledge sharing. Coaches have generally been promoted from the ranks of advisors or, in the case of repair, field engineers. They are usually the most skilled and experienced employees in the call centres and their job is to disseminate that expertise to the advisor population through face-to-face coaching and remote monitoring.

Coaches are sources of knowledge so are, in themselves, a knowledge resource for the advisors. Much of this knowledge is in their head and has been developed through years of operational experience. Their knowledge requirements are deeper than are often provided by the current knowledge systems. They often keep personal files of knowledge (their “bibles”) that they have accumulated over the years so that they can “manage anomalies”. These anomalies include queries about products and services that no longer exist or obscure procedural requests that only occur once a year. They also tended to have an extensive list of bookmarks of pages on both intranet and internet that they had found useful as reference sources.

There was also evidence that coaches were forming informal networks and communicating via media such as instant messaging. This provided them with quick access to knowledge and expertise. One coach commented that a large percentage of their knowledge came from networking with other coaches either face-to-face, via e-mail or via instant messaging. (This type of knowledge sharing was also noted by Nilsson et al 2000 and Pickering and King, 1995).

Some of the coaches had only recently got access to the knowledge system. Most welcomed it as a great idea to help advisors with their knowledge requirements (especially with the high levels of advisor turnover in some centres) and had also found some of the information useful themselves. However, with their level of expertise, they said that they found the knowledge system to be “too basic”.

They stated that they would have more faith in the validity of knowledge on the knowledge system, if they had a more active role in building the knowledge base and feeding comments back. They felt that they should be part of a 'knowledge worker' model of knowledge management (Muller and Millen, 2001) with the implication that they should be able to contribute and sanity check knowledge.

- Content/Curiosity.

Advisors' intrinsic goals and motivations are generally directed towards solving customer problems. They are also subject to a number of the usual extrinsic call centre work drivers such as speed, accuracy, compliance, customer satisfaction measures and a general human compulsion to minimise effort whilst maximising results (as predicted by expectancy theory). There is very much a legacy mindset driving advisor behaviour for speed over accuracy. This can cause expensive cost of failure problems down the line. The MUI needed to help facilitate a change of mindset as the principles of CRM started to become fully integrated into the advisor job and call handling times became less important than customer satisfaction and loyalty. The interface needed to support accuracy without permitting inefficiencies in terms of knowledge access and usage. Advisors also have differing knowledge needs according to their current skill levels and experience.

The difference in the call centre to the average corporate intranet based knowledge system is that users do not have the luxury of 'orienteering' (Murray, 1998) whilst they are in online/goal mode. Orienteering behaviour could and should be encouraged during offline/action mode in order for advisors to be aware of what knowledge is contained in the knowledge space and how to access it. Whilst online, as in the banking MUI, what they require is jet piloting. Advisors need to get from A to Z in as few moves and with as little penalty in terms of cognitive load as possible. Simplicity is, therefore, the key to enabling effective navigation through the portal in online mode. The most frequently used elements of the old interface were links that it provided to pre-packaged "gadgets" (e.g. a pricing tool).

This pointed towards the MUI facilitating 'relevance amplification' for the advisor. There are a number of ways in which advisors can be helped to diagnose problems using "context detectors". In their most basic form these can simply be a list of the most popular current queries coming in from customers, e.g. responses to current campaign material, or caller specific items listed on the CRM system. On a more sophisticated level this includes technologies that proactively push links to advisors based upon key words recognised by an automatic natural language system (BT Technology Briefing, 2001).

The ability to track advisors' experience levels can also be used to good effect by pushing out key messages to reinforce recently acquired knowledge.

Knowledge spaces, however, often have no end point and no way out (Murray, 1998). They often have no landscape or mapping, no way of marking routes that allow quick acceleration to knowledge (especially since bookmarking had been disabled on the advisor's browsers) and no way to get back easily once a route has been taken. The new interface needed to provide clear 'signposts' for navigation

Another assumption, based upon observation, is that advisors tend to use their own knowledge to understand the customer's need in the first thirty seconds of the call. In the field observation data this was because they were largely ignorant of what knowledge was supported on the system and how to find it quickly. The new version of the interface needed to facilitate use of knowledge earlier, especially since products and services were increasingly subject to changes (e.g. tariff changes).

- Control.

The field study data pointed towards the fact that people store, access and use knowledge in different ways to support their own particular approach to problem solving. The disabling of bookmarks on the system was essentially forcing people to

remember routes to get to information from the beginning every time they encountered that problem, rather than allowing them to fast track to it via 'favourites'. This meant that the need for minimal effort was not supported and this resulted in advisors simply not using the system.

The knowledge system provided a (default) view for key call centre service roles, but this was not sufficient to truly personalise it for the individual advisor or even the team. Given the importance of choice and control in motivation, the key to gaining user acceptance for day-to-day use pointed towards the ability to access more personalised knowledge both online with the customer and offline. This would help the user manage their own style of working and problem solving.

7.3.4.2. Knowledge and Problem Solving Styles and their Impact on User Interface Design.

One of the principal observations whilst in the call centre was that advisors seemed to utilise different problem solving, information organisation and search strategies when dealing with customer problems. This impacted on the *content* aspect of motivation since there was considerable frustration when the system did not help the task in the way that advisors anticipated.

Active participation is essential for acquisition of new skills and memory retention for complex tasks. The interface needs to affirm and reinforce the advisor's mental model of complex solutions. The interface must be able to accept all possible advisor responses in order for active feedback to work.

The typical model of problem solving in the call centre is one where solutions are often reached with imperfect knowledge, under stress, high cognitive demand and time constraints. Current skills are a major determinant of task performance and choice of problem solving strategy. Umbers (1979) suggested that, if the advisor has sufficient knowledge, they can use open loop strategies and can take advanced action against problems instead of having to wait

for UI feedback in order to act. Open loop strategies require substantial experience and processes and systems can inhibit these strategies, e.g. if the interface limits advisor choice (this is termed qualitative 'underload' (Kahn, 1981)). This often results in advisors sabotaging any superfluous steps or navigation on the UI, e.g. selecting a simple fault diagnosis rather than a correct diagnosis that pops more forms.

Heavy task loads and increased physiological arousal lead to decreasing accuracy of signal discrimination, slowing of responses, disorganisation of problem solving strategies and disruption of short term memory, possibly due to the need to continuously keep track of information (Welford, 1976). When time constraints are such that quick action is needed, there is no possibility of exploring and evaluating all the potential solutions. In this case neurological shortcut pathways for deciding upon the next appropriate action are preferred over more optimal but slower ones (Ledoux, 1992).

However, different personality types also tend to have different preferences for problem solving, so user models can be further enhanced and refined with the user's affective profile (Paranagama et al, 1997). The problem solving task for the advisor becomes one of understanding or appreciating the problem (Checkland, 1999; Rittel and Webber, 1973; Mason and Mitroff, 1981), generating conjecture solutions as a part of that understanding process and finding a solution that works well enough. This is reflective problem solving (Dewey, 1910; Mintzberg and Wesley, 2001), which implies that advisors jump to a rapid conclusion and then use some form of 'distributed cognition' (whether it be the KMS, a colleague, their manager or more unofficial knowledge sources) to confirm or deny this.

Another consideration that needs to be taken into account is that people's attitudes towards organisation and management of knowledge seem to differ. How and where knowledge is stored is critical, given the importance of meta-knowledge in the search process (Dix et al, 2003). Peacock et al (2001) found that people managed information in different ways and some were more organised than others. They also found that people were reluctant to change the level of organisation at which they operate. They identified four typologies

describing the ways in which people store information and their attitudes towards information storage:

- **Happy disorganised** – these people report little or no organisation of data with messy drawers or storage systems and little idea of what is in them. They offered no explanation as to why that was, did not consider organisation as important and often used other people or notes to remind them where information resided.
- **Rummagers** – these have some form of ad hoc information management using criteria such as security and accessibility as a rationale for storage. However, these criteria tended to be applied in an ad hoc way so these individuals would then rummage until they found it.
- **Info managers** – these tend to carry a lot of information on their person – like post it notes, diaries, and personal organisers. They don't have any particular hierarchies of information but they do tend to split between official and unofficial information. They generally have a good idea of where information is in their system.
- **Mega structured** – these people are both structured and consistent in the way that they stored information, tend to spring clean regularly to ensure information is up to date and ensure that they back information up. Being well organised was a source of pride and enjoyment and they have developed a sophisticated hierarchy of data.

In the light of this, the KMS needed to support user's disorganisation as well as supporting highly organised behaviour. However, the designs of most systems often reflect the training of their designers (Overbeeke et al, 2000; Cooper, 1999; Shneiderman, 2002). Hence, software engineers tend to create designs that reflect logical and structured problem solving (Cooper, 1999), i.e. 'mega structured' behaviour.

The key issue in the interface design is the extent to which the interface structure should dictate the way in which users find and manage knowledge (Bergman and Haitani, 2000). The old KMS interface tended to impose a rigid structure on knowledge. This can produce gains in efficiency provided that the structure imposed does not conflict with the user's view of the way in which knowledge should be structured (Jordan, 1998). However, it is difficult to avoid

conflict with some users (Grudin, 1989). Going the to the other extreme by providing an open structured interface would allow the user to structure information input as they wish but they may offer the user little assistance, particularly with respect to retrieving knowledge quickly (Pane and Myers, 2000).

Apple's (1996) solution to that particular challenge was to use progressive disclosure, where the interface presents the most commonly accessed types of knowledge to users whilst hiding the less commonly accessed. This supports users with a less rigid approach to learn the way that the interface structures knowledge. Users who want to use more highly structured knowledge management paradigms can find deeper support within the hierarchy of the interface.

The implication for the KMS MUI interface design was that, for "business as usual" tasks that follow a simple problem structure (e.g. quotes, orders), the category based hierarchy should provide efficient support. However, for more rarely performed (but simple) activities there needed to be some advisor support. This might include smart scripting, which can support different levels of users expertise. For more unstructured tasks, advisors would benefit more from outcome selection as a method for prompting rather than procedural scripts or unassisted keyword searches. This is where the advisor makes a best guess at the most likely outcome and the system supports them getting there. For example, the advisor might select 'Broadband' as a solution and would then get a series of questions which sanity checks that selection with the customer.

7.3.4.3. Emotion, Knowledge and Learning.

Mandler (1975) suggests that there is a tight interface between affect and cognition in that people can no longer be modelled as pure goal driven, task-solving agents. Lisetti (1998) suggests that this impacts on the way that user behaviour is modelled. Knowledge management is not simply about passively providing information to the user, it is about engaging curiosity and allowing users to learn. The users' emotional state, however,

influences how efficient, effective and enjoyable they find knowledge discovery (Kort et al, 2001; Isen et al, 1997; Isen, 2000).

Kort et al (2001) suggest that there is a correlation between constructive learning and positive affect (see Figure 58).

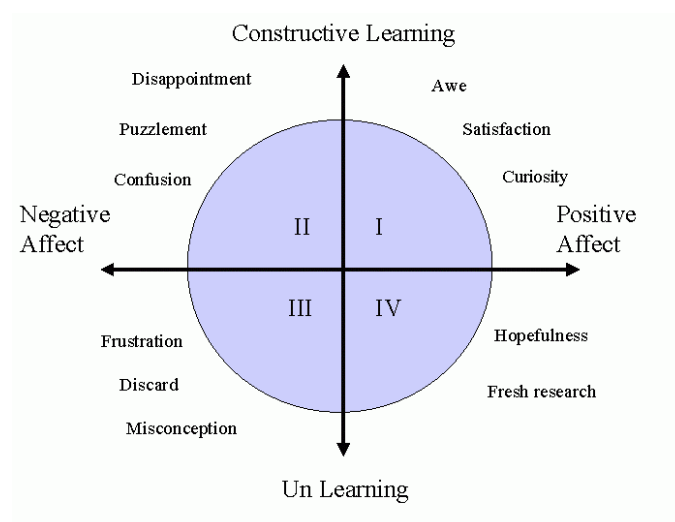


Figure 58: Kort's Learning – Affect Circle (Kort et al, 2001).

Ideally the user starts in quadrant I or II with anticipation and expectation high as they are curious and fascinated about a new topic of interest or might be puzzled and motivated to reduce confusion and uncertainty. Users may then fail and move to quadrant III as they get bored, frustrated or disappointed and cognitive focus changes to eliminating misconceptions. As progress is made, the positive attitude returns and the user then moves into quadrant IV. A fresh idea would propel the user into quadrant I. Learning involves a range of emotions and a learner may be in multiple quadrants with respect to different tasks. In order to learn the user needs to keep going around the loop.

This implied that the KMS MUI needed to engage curiosity whilst the advisor is in offline (action) mode since their emotional and cognitive resources are not diverted on a customer call. However, during this period of time there is no motivated impetus for learning, i.e. there is no specific problem to be solved. As investigated in the previous chapter, effectiveness and efficiency are less important in this mode than playfulness and spontaneous action because if

arousal decreases, people will get bored. This, again, implies a more emotional approach to UI design to encourage advisors to explore and play (Hassenzahl et al, 2001).

During online (goal) mode, the KMS MUI needed to minimise user's entry into quadrant III. If frustration gets the best of the advisor, they are less likely to use the system on any calls since they relate it with negative emotions. The initial emotional interpretation associated with usage of the system is likely to impact on future inclination to use it (Gloyd, 2003; Jordan, 2000). If the system also matches the advisor's problem solving style, then they will be more likely to maintain a positive attitude towards it and use is likely to increase (Jordan, 2000). As the advisor spends more time interacting with the KMS they are also more likely to retain information and gain knowledge (Gloyd, 2003).

7.4. Designing a MUI for Knowledge Management.

Despite the fact that the approach to design was similar to the other MUIs (i.e. evolutionary prototyping, see 4.3), it became clear that this particular MUI would have some significant differences to the others described in the previous two chapters. It could not be a portal onto all advisor information since customer data resided on the CRM system and a redesign of that system was deemed out of scope for this particular project. One potential problem of separating product/service/procedural knowledge from the customer knowledge is that the advisor's task flow is interrupted. This was a potential risk factor in terms of the success of the KMS MUI redesign.

From the theories of motivation, technology acceptance, emotion and problem solving styles described in 7.3, a number of user interface design challenges emerged.

Establishing **trust** in the system is essential as a first step to acceptance. Advisors needed to be persuaded that the system actually helped them achieve their tasks and was useful. Trust needed to be engaged early on in the introduction of the system by allowing advisors to solve a frequently asked but complex problem (within the first thirty seconds of the call). This also works on user perception of self-efficacy by increasing the perceived benefit verses cost ratio

(Vroom, 1964) and positive attitudes towards the behaviour. By doing so the frequency of this behaviour (i.e. use of the system) should increase (Bandura, 1997). Reduction of uncertainty needed to be facilitated through engaging curiosity (quadrant I behaviour) and allowing users to become more familiar with the content of the system. This needed to occur whilst the advisor was in offline (action) mode since their emotional and cognitive resources were not diverted on a customer call. The system design needed to acknowledge that searching for knowledge is not an emotionally neutral experience.

Another critical factor in acceptance seemed to be the **speed** with which advisors could get access to knowledge. This included providing the ability to 'jet pilot' to answers and share useful links. This could be achieved using simple navigation tools, shortcuts and pre-packaged gadgets in combination with progressive disclosure, outcome oriented support and increasing readability through chunking of information.

Increasing **motivation** through creation of a MUI emphasising collaboration and control. This included moving from a 'quality control' to 'knowledge worker' model (Muller and Millen, 2001) based on that of 'adaptive culture' (see 7.3.4.1). It needed to facilitate sharing both knowledge and meta knowledge through discussion, suggestions and links. Since there appeared to be a link between management use and advisor use, coaches and managers also needed to be involved with contributing to the knowledge base. Individual contributions needed to be acknowledged in order to increase the contributor's self esteem and reward quality rather than simply quantity. Shneiderman (2002) also suggests that recording the results of creative problem solving as part of 'history keeping' allows individuals to "make their mark" (fulfilling needs based theories of motivation).

The first decision in the design was to split online and offline activities into, respectively, a 'knowledge portal' and a 'home' page, as in the previous MUI.

7.4.1. The Knowledge Portal.

Construction of the knowledge portal had to address the efficient access of knowledge, reduction of advisor cognitive load and the usability and structure of the knowledge that advisors had to read off the screen.

The design of the original KMS was very linguistic and relied almost entirely on hyperlinked text. The only visual coding was on the menu structures but this seemed to add little to navigability. The redesign involved usage of space-semantic relationships to logically group related links together such as 'browser tools' that help advisors to price products and access general reference sources (see Figure 59).

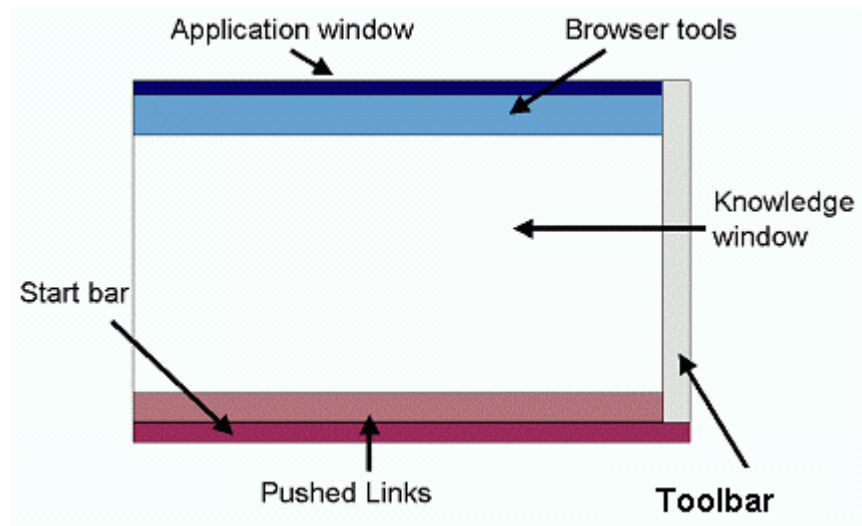


Figure 59: Knowledge Portal Redesign Architecture.

The page is personalised to the advisor according to both their job and skill level. In terms of the knowledge displayed, they have a link to a page that gives them a view of 'the picture'. This informs them of the current state of service, including links to pages which give details of planned and unplanned service outages and any important messages relevant to their job. They were also given access to tools such as an 'A-Z' of standard responses. To ensure that advisors were able to capture, store and quickly access knowledge sources, advisors could build up an 'encyclopaedia' of favourite links using a 'keep this page' tool in the browser tools bar (to get around the problems with bookmarking on shared machines). These could be published via an application called 'Push Me, Pull You' (PMPY) which allows advisors,

managers or coaches to temporarily share their links pages with others. Managers could also maintain team pages of useful links using the same PMPY application. These were all accessed through the tool bar icons on the right hand side of the screen as well as appearing as pushed links at the bottom of the page.

The design (see Figure 60) was deliberately big, bold, concise and simple to enhance both an intuitive interaction and also readability. The design was not slavish to consistency, especially with respect to the browser tools since these largely sat outside the main KMS and did not conform to a standard look and feel. What the design emphasised, however, was the definitive nature of the knowledge contained within it. This included a KMS rubber stamp of a 'sell by' date after which the knowledge would be reviewed and either updated or removed, plus some indication as to who authored the piece to give it some credibility. This was designed to counteract the problems of multiple information sources that could be contradictory and was designed to increase trust.

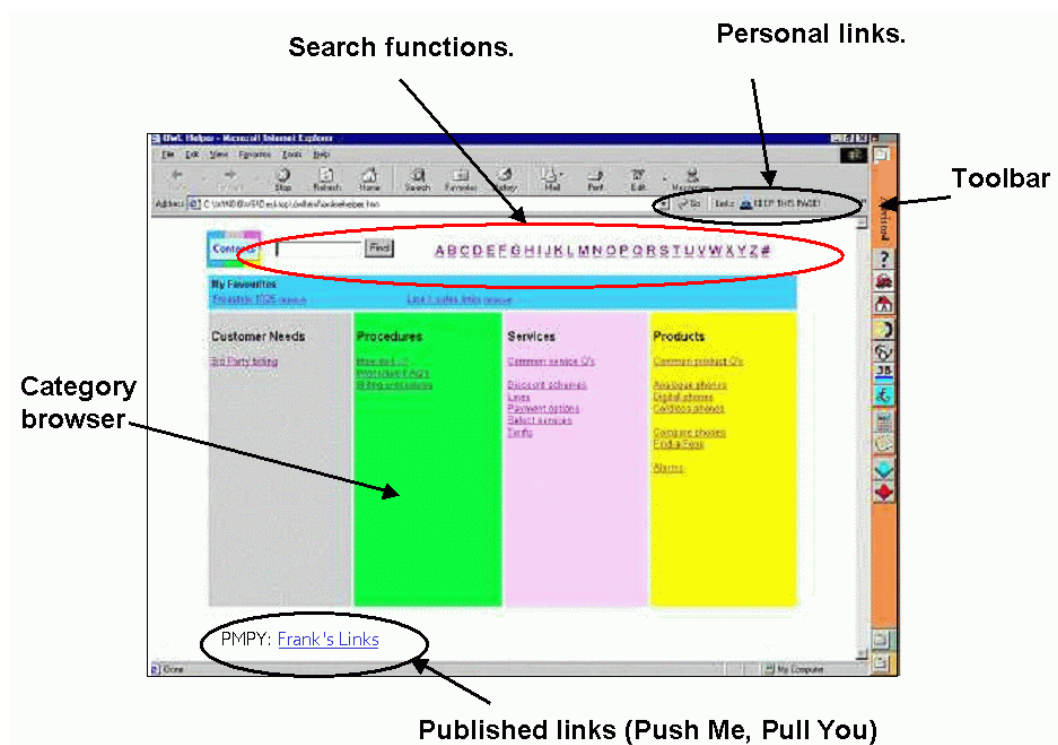


Figure 60: The Knowledge Portal.

The new interface also offered a number of ways in which advisors could search for information. These were designed to provide support for a number of problem solving strategies and levels of organisation/disorganisation. These included a 'Find' function and an

'A to Z' as well as the encyclopaedia function. The other element designed to help searching was an icon based side toolbar providing rapid links to tools that would be tailored to the advisor's particular role. The simplicity and familiarity of the search mechanisms was designed to reduce cognitive load and ensure rapid access.

The most radical change in look and feel of the interface was the use of colour on the front portal screen. Colour, when used appropriately (e.g. Misanchuk and Schwier, 1995), can have a number of usability benefits since it gives aesthetic and emotional value (Humphrey, 1992; Evans, 2001), whilst also giving visual cues of logical groupings and relationships. It was decided to use colour on the front screen of the knowledge portal to provide a more definite grouping of product (yellow), procedural (green), service (pink) and customer (grey) information and continue these colour signposts along a knowledge path to lower levels of the knowledge space.

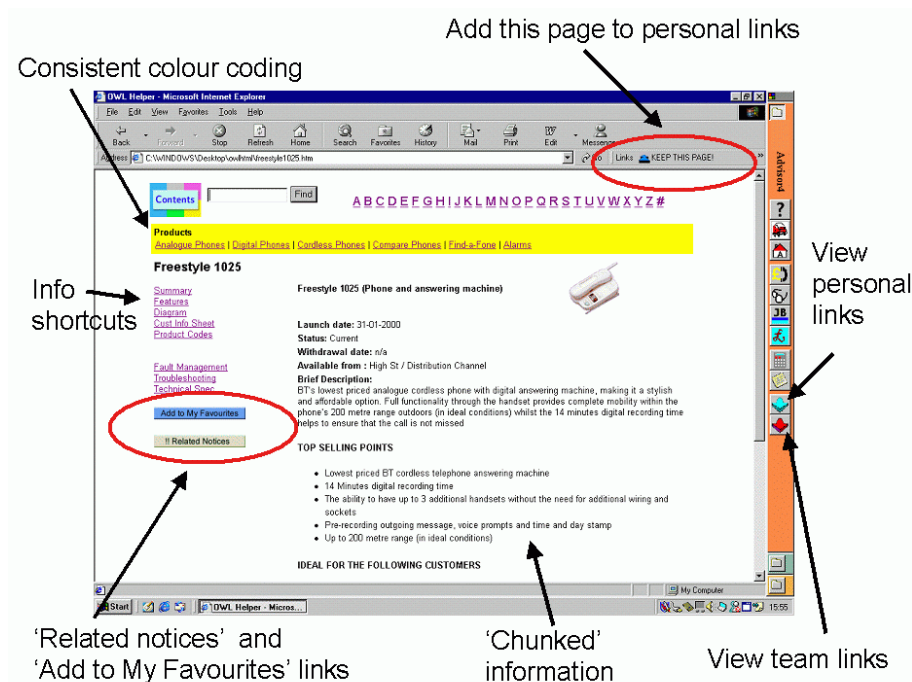


Figure 61: KMS Product Page.

The product pages (see an example in Figure 61) were radically redesigned from multiple screens of largely unbroken text, to more manageable chunks of text (designed to promote better task flow (Csikzentmihalyi, 1991)). These were navigable through a set of hyperlinked

shortcuts, plus links to related notices about that product and, where appropriate, a picture of the product.

7.4.2. The Home Page.

The technology acceptance literature identifies perceived usefulness, perceived ease of use and perceived enjoyment (Davis et al, 1992), along with perceived fun (Igbaria, 1994) as factors for adoption. Fun is an example of intrinsic motivation, where the person performs an activity for no apparent reinforcement other than the process of performing the activity *per se* (Malone, 1981). Increased ease of use of a system motivates the user to explore the system functionality, which may in turn increase intrinsic motivation and result in greater enjoyment of the activity. In this case, encouraging browsing of the knowledge space (engaging advisor *curiosity*) whilst offline was one objective. This exploration mode is often very much in evidence in the construction of the narrative of games (Hopson, 2001).

The Home Page component of the interface needed to draw upon all these factors. The interface had to be friendly and familiar to draw advisors in, but also needed to fit the individual advisor's way of working. In designing the new home page inspiration was taken from guidelines that were derived for the design of websites for children (Nielsen, 2002) and the design of computer games (Malone, 1982). In this service oriented contact centre the typical advisor was 25-35 and female, so a user interface metaphor was selected to appeal to that demographic. Due to the surfeit of home improvement programmes on British television at the time and the popularity of games such as 'The Sims' it was decided to use the metaphor of a house as a home page (see Figure 62).

The homepage was designed as a section through a house with the objects in it providing an entry point to the intranet and knowledge base. The element of challenge (Malone, 1982; Csikszentmihayi, 1975) key to computer games, exists within the advisor job so the interface was designed to be inviting, entertaining, fun, clear and colourful rather than challenging to master.

Logan (1994) stated that computer games are a good example of products with emotional usability. Since this interface was designed to engage the user, the decision to use a games-like home page was deemed appropriate because the mode of interaction was both engaging and (relatively) intuitive. By providing advisors with “permission to play” and fostering an atmosphere of curiosity and discovery, the users can orienteer the knowledge space whilst they are in offline/action mode and start to discover what knowledge exists in it.



Figure 62: The Home Page.

The page was constructed so that the artefacts in the house could be used as links to pages on the intranet, e.g. the exercise equipment links to their training records and the refrigerator has a fridge magnet function so that they can write reminders to themselves. Artefacts were given labels that appeared as the cursor moved across them so that it became obvious what they were (see Figure 63 and Figure 64). Artefacts could be moved to any room in the house. The DIY box enabled advisors to fully customise the wallpapers and décor to taste.



Figure 63: DIY page.

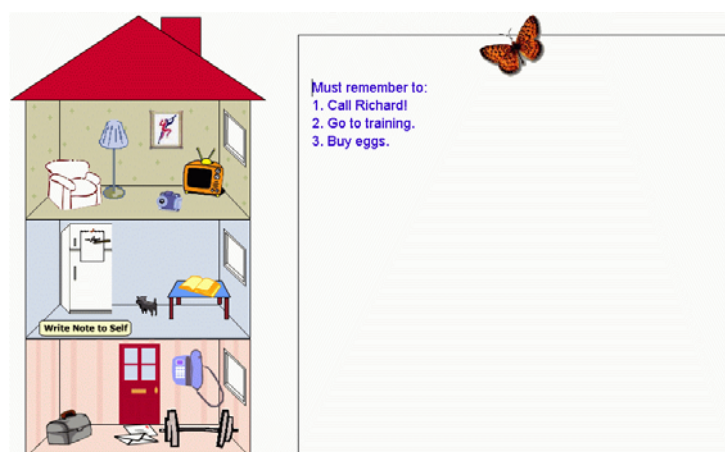


Figure 64: Notes page.

It was also decided that the page would be fully customisable by the user. Giving people a choice, or even the illusion of choice, often increases their motivation to do a task (Zimbardo, 1969). Wallpapers can be changed and artefacts can be moved. Although the fridge logically sits in the kitchen, the user can, if he or she wishes, move it to any room in the house. This again encourages a sense of play and ownership of the interface but also starts to acknowledge that different people like to construct their information spaces in different ways (as described in 7.3.4.2). By allowing an element of customisation it was hoped that some of these strategies could be better accommodated.

The 'intended character' of the interface (Hassenzahl, 2000) was familiar, friendly and inviting. Swanson (1987) and Thompson et al (1991) suggest that this intended character can be a major determinant as to whether the system is subsequently used.

7.4.3. The Knowledge Broker System.

During the field study, a number of key differences in knowledge use between advisors, coaches and managers within the call centre were observed.

Advisors require shallow and fast access to knowledge because they are under time pressures when talking to customers and need to process information quickly. Since managers and coaches often deal with "management of anomalies" they need deeper understanding of issues. They also often have fewer pressures on their time with customers, so have the ability to take more of a research and browsing approach to problem solving than advisors. Advisors also tend to deal more with routine and familiar knowledge. Coaches, especially, often deal with more obscure and often tacit knowledge.

Given that the managers are a key influence for use of the KMS (though social influence or what Malholtra and Galleta (2003) call 'commitment by identification'), building an additional element of the MUI for managers to gain their buy in to the knowledge system seemed critical. By using coaches and managers as a conduit for knowledge, they gain both *control* through input and recognition of their expertise with respect to *content*. Rather than simply providing a feedback button, which is dependent on people being motivated altruistically (see 7.3.4.1), the management MUI was designed as a self-regulated knowledge broking environment based around establishing online credentials. This was based on the trust and persuasion model used by online communities such as eBay (Fogg, 2002), where regular contributors are acknowledged as trusted and competent knowledge sources using a rating system. Knowledge that proved to be useful and accurate could then be validated and mediated by the central knowledge management team, before being made available to the call centre organisation as a whole via the KMS.

The design of the knowledge broking system started as a scenario (see appendix G). This was then translated into a paper prototype (see Figure 65). This element was not included as part of the main MUI multimedia prototype due to time constraints on delivery.

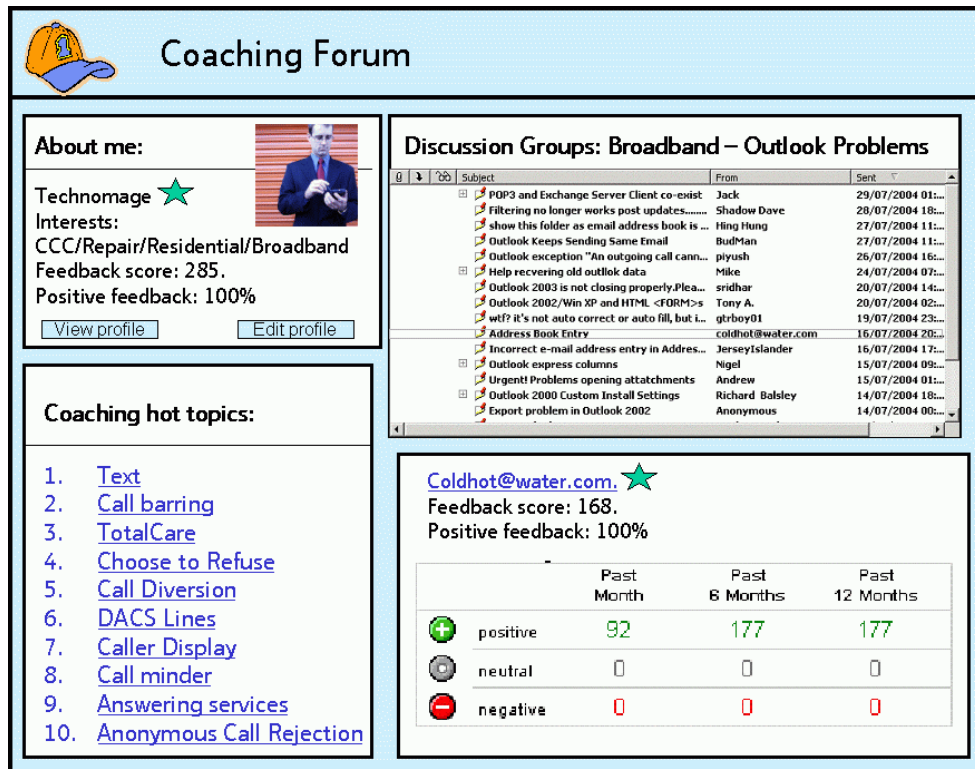


Figure 65: Knowledge Broker Paper Prototype.

This knowledge could be used to enhance the KMS (and could be intelligently linked to the KMS topics structure on the advisor pages). To survive, the community needed to be self-sustaining rather than under the control of 'the management'. Anonymity could be assured via the use of pseudonyms and feedback should be open and honest rather than subject to incentive and motivation schemes, which could serve to skew the contributions.

The paper prototype was validated with a selection of coaches and managers in the call centre. Reaction to the prototype was positive. Coaches, especially, welcomed a more active role in building the knowledge base and were positive about the fact that the community could be self-regulating. They also commented that being recognised more for their expertise would have a positive effect on their job motivation and would make them more likely to use the KMS for the more complex knowledge that they require.

7.5. Evaluating the Initial KMS MUI Designs.

The home page and the knowledge portal were evaluated using a number of instruments to gauge both ergonomic and hedonic quality (see 4.4). This included an assessment of usability (using a SUMI questionnaire), efficiency (using a simple comparative task completion study), user satisfaction and engagement (using thinking aloud protocols, facial expressions and body language plus self report techniques using semantic differentials) and, finally, levels of technology acceptance (gained through further field observation of usage five months after some of the design changes had been made).

7.5.1. SUMI Questionnaire.

The returns from the second SUMI questionnaire were disappointingly small (7%), since the questionnaire was neither incentivised or endorsed by a familiar senior manager. This meant that there was insufficient data to gain any insight of statistical significance. The questionnaires that were returned indicated a very slight improvement in terms of the perception of usability from the original SUMI questionnaire administered prior to the redesign.

7.5.2. Task Completion Study.

This was a direct comparative study where users were asked to find three specific items of knowledge (information on broadband tariffs (task 1), how to deactivate select services (task 2) and the contact number for the nuisance calls bureau (task 3)), on both the old and new UI designs. Ten advisors were selected to participate in the study. Five (type A) were new advisors who had yet to go through the old KMS introductory course (although they were somewhat familiar with the KMS because it resided on their system) and five (type B) had gone through the half-day introductory course (although none claimed to be advanced users of the KMS). Both sets of users were given a brief overview of the new KMS MUI prior to beginning the experiment but no formal training on usage was given. All ten advisors ran through the old KMS first and then the new KMS, so the tasks were not counterbalanced.

	Old KMS/ Type A	New KMS/ Type A	Old KMS/ Type B	New KMS/ Type B
Average time Task 1	21.2s	17.4s	18.6s	17.1s
Average time Task 2	59.4s	37.6s	49.7s	29.3s
Average time Task 3	44.1s	42.9s	39.9s	39.8s

Table 7: Average times by task, user and KMS.

This simplistic experiment found that, for predefined tasks that had been designed into the prototype, the new interface provided a more effective route to information with an average saving of 21% of call handling time per query for type A users and 22% for type B (who were more familiar with the old KMS and were completing tasks on that system faster than type A, who were not so familiar with the old KMS).

There are a number of criticisms that could be levelled at this data. Firstly, the user sample was small due to constraints on taking advisors off the phones and the short timescales involved, which meant that the design team could only spend one day in the call centre. Secondly, although the advisors were being observed (which may have provided a social facilitation effect), they were not subject to the conditions of cognitive and emotional load that they would have when they are taking a call. Thirdly, the prototype KMS did not have the complexity and depth of knowledge of the old KMS, which meant that there were less wrong turns to be made.

However, as an indicator of user efficiency, the data seemed to indicate that the redesigns were working and that searching was more intuitive since neither type A nor type B users had received any significant training on the new KMS.

7.5.3. User Satisfaction and Engagement.

This aspect of the evaluation involved capturing user perceptions of hedonic quality rather than simply ergonomic quality since MUIs are designed to increase usage through both pleasure and efficiency.

To assess the user's emotional reaction to the interface a self-report technique (e.g. Abeele and Maclachlan, 1994) was used since, as Moon and Kim (1997) state, "the most convenient measure of emotion is the self report given by the person experiencing the emotion" (see 4.4.2.3). To do this, the design team allowed another sample of fifteen advisors from various functions in the call centre, with a selection of experience levels to conduct a supervised guided tour of both the Home Page and the Knowledge Portal prototypes. These advisors were drawn from teams who had all gone through the half day KMS introductory training, so they were all familiar with the old KMS. Sessions lasted ten to fifteen minutes and were scheduled by the team leaders during lulls in call volumes. They were, once again, asked to find the three specific pieces of knowledge (described in 7.5.2) and to talk through where they thought that they might find it. Users' actions were not timed in this instance. They were also asked to evaluate the KMS MUI both on a general usability level, but also how they felt towards the system as they explored it. These self-reports of emotion were recorded as a form of 'free labelling' (Philippot, 1993).

Comments were recorded but, because emotional data can be difficult to verbalise, general demeanour and expressive cues (e.g. basic facial expressions (Ekman and Friesen, 1978; Ekman, 1999; Kaiser and Wehrle, 1994), vocal expressions (Litman and Forbes, 2003; Toivanen, Seppanen and Vayrynen, 2003) and posture (Kapoor, Picard and Ivanov, 2004)) were also recorded to assess emotional reactions to the prototype. Physiological indicators were discounted in this instance because of the ambiguity of information that they tend to give (i.e. ability to detect arousal but no way of detecting whether it is positive or negative (Axelrod and Hone, 2004)). There were also difficulties around getting permission from the call centre union to conduct this kind of experimentation (see discussion in 4.4.2.1).

The drawback to the observational approach is that the presence of an observer may influence the extent to which emotion is displayed (Plutchik and Kellerman, 1980). However, cues for basic emotional reactions, which are automatic, reflex reactions over which we have very little conscious control, can be observed (Evans, 2001; Hone and Axelrod, 2004) if the observer knows what cues to look for. This technique is frequently used to assess the user experiences of games (Lazzero and Keeker, 2004).

As part of the subsequent post demonstration interview process, users were also asked to respond to a set of semantic differentials (e.g. Osgood et al 1957). This semantic differential instrument was based on the fourteen basic emotions (seven pleasant, seven unpleasant) suggested by Desmet (2003) as part of his PrEmo self report tool (see Table 8):

7 pleasant:	7 unpleasant:
Desire	Disgust
Pleasant surprise	Unpleasant surprise
Inspiration	Uninspiring
Amusement	Boredom
Admiration	Contempt
Satisfaction	Dissatisfaction
Fascination	Indifference

Table 8: 14 Emotion Semantic Differentials.

Users were asked by the interviewer to identify the emotion that most accurately described their reaction to the interface (a neutral state was not an acceptable response). Some researchers (Desmet et al (2001); Desmet (2003); Lang (1980)), have argued that a pictorial self report is simpler to express than verbal. However, the author decided that a verbal self report was more self explanatory in the short period of evaluation that the design team had with the advisors. Despite the argument that users find it difficult to express the subtler emotions that a system tends to provoke (Desmet et al, 2000; Tahti and Arhippainen, 2004), the advisors had little difficulty in verbalising their feelings. One possible explanation for this is that advisors tend to be highly articulate, due to the nature of their job.

The common comments captured during the cognitive walkthrough were that the interface was “simpler” or “easier to use” (mentioned by all but one of the advisors), “inviting” (mentioned by ten out of the fifteen advisors) and “friendly” (mentioned by all the advisors).

Other verbatim comments included:

- “I would want to use this”.
- “It would save time”.
- “The colours are much better – more inviting and friendly”.
- “I would use this more than old system – it seems to be easier and friendlier”.
- “The toolbar is great – I love the fact that it stays there, it’s much more useful”.
- “You must have spoken to loads of people, it is exactly what we have been asking for and what’s needed”.
- “It’s a bit ‘noddly’ – it’ll take a bit of getting used to”.
- “It encourages you to use it”.
- “They’d be foolish not to use it”.
- “I think people shy away if they have nothing to look at, this would help”.
- “It’s much less office-y and official – I feel less intimidated by this system”.
- “This is great fun – I could play with it all day!”
- “Why can’t all our systems be like this – life would be much less boring”.

In terms of observation of the emotional reactions, it was extremely difficult to capture the subtleties of facial, voice and body expression without the use of a video camera. Aside from the difficulties of videoing in a call centre, video based observation can also serve to inhibit user’s natural behavioural reactions. In addition, video based observation of subtle behaviours can incur an analysis time of between eight and one hundred times the duration time of the video captured (Axelrod and Hone, 2004) and was impractical in the time frame for this study.

One research assistant was assigned the task during the interview to observe user’s behavioural reactions and note anything of interest. The behaviours noted were the more obvious indicators of particular positive and negative emotions. Axelrod and Hone (2004) term these ‘affectemes’ (“mutually exclusive and exhaustive indicators” of emotion), which can be recognised and quantified during an analysis. They have identified both positive and negative affectemes. Positive ones include the ‘getting involved postural twirl’ as participants shift to engage in a task, a ‘genuine smile’ of relief or enjoyment or a ‘satisfied nod’ on task

completion. Negative affectemes include an 'anxious peer' where users peer at something on screen for several moments that they are not sure about, signs of an 'angry manner' and the 'fed up chin dump' where the user leans their cheek or chin onto one or two cupped palms.

During the observation, it was noted that all the users were initially quite anxious and cautious when interacting with the interface (evidence of anxious peers and non engaged posture). In all but one of the users, these changed into more positive affectemes including genuine smiles and a forward posture on the chair indicating some level of positive engagement. The extreme negative affectemes such as chin dumps or signs of frustration or anger were not in evidence. These observed reactions are far from scientific but provided visual indicators of user positivity.

The post-walkthrough semantic differential exercise further confirmed the (largely) positive perceptions of the KMS MUI and gave more quantifiable confirmation of the observed evidence (figures in Table 9 represent the responses from the 15 subjects). It should be noted that the single negative user also exhibited more negative observable behavioural responses during the evaluation with less evidence of genuine smiles and a less forwardly engaged posture.

7 pleasant:	7 unpleasant:
Desire (15/15)	Disgust (0/15)
Pleasant surprise (14/15)	Unpleasant surprise (1/15)
Inspiration (14/15)	Uninspiring (1/15)
Amusement (15/15)	Boredom (0/15)
Admiration (14/15)	Contempt (1/15)
Satisfaction (15/15)	Dissatisfaction (0/15)
Fascination (14/15)	Indifference (1/15)

Table 9: Results from Semantic Differentials.

7.5.4. Technology Acceptance Study.

It was decided that some elements of the knowledge portal prototype should be incorporated into the next version of the KMS UI. The home page design was rejected as a redesign option despite the positive user testing, because it was felt to be inconsistent with the

corporate brand. This is an instance of the culture not being ready to accept some of the more radical, pleasure based design concepts (see discussion in 8.3.2).

The initial knowledge portal page was redesigned along similar lines to the proposed portal redesign architecture (see 7.4.1) with tools given more logical groupings on the user interface. Colour coding was more widely utilised as well as multiple search options to support a number of modes of problem solving. New content was chunked in a more manageable way with better use of hyperlinking and 'related links'. PMPY, 'Keep This Page' and the tool bar were deemed too difficult to implement in the short term. The knowledge broker tool was out of scope for this particular development.

The call centre was revisited five months after the changes had been implemented for a further two-day field study of KMS usage. Ideally, the design team wanted to correlate the actual usage of the twenty-five advisors that had been surveyed as part of the time and motion, user satisfaction and engagement studies. However, call centre turnover and reorganisations meant that only fourteen of the original subjects remained. The subjects of principal interest for experimental comparison were the minority of advisors that either had trouble in the time and motion study, or had ranked the user experience negatively. The technology acceptance literature posits that a *negative* perception in terms of whether the advisors perceive that the technology is useful and will help them do their job and whether it is usable and compelling to use, would result in rejection or limited use. Unfortunately, the advisors who had been slowest in the time and motion study and the advisor who had been negative in the user satisfaction study had all left the call centre, so no meaningful comparison between those with a positive and negative experience could be made.

However, observation of instances of usage of the KMS during call handling had increased from 7% to 49%. Evidence from an external consultancy company also points towards a 23% increase in accuracy and compliance (although the author was not able to get access to the source data from this study to independently verify it).

Mindful that one hypothesis of this thesis is that MUIs can increase usage and technology acceptance, this implementation seems to indicate that a motivational redesign of the KMS *did* increase usage of the technology. However, it is difficult to conclude definitively that the design alone was responsible for the changes in usage pattern, as there is likely to be influence simply from increased familiarity with the tool. Observers taking a more covert approach to observation in the call centre during the latter part of the study negated the possible bias introduced by subjects being aware that they were being observed.

7.6. Discussion.

The KMS MUI case study provides some more quantitative as well as qualitative evidence for the MUI's role in increasing technology acceptance. Although the old KMS was perceived to be usable (according to a standard usability benchmark instrument), the system was only observably being used on 7% of calls. The study unearthed perceived problems with both efficiency and motivation.

With respect to efficiency, because of the underlying pressures of the job, such as call handling time, advisors needed to work in a mode of 'fast accuracy' (Muller et al, 1995). The issues were in the areas of **retrievability**, **speed of access** and **readability** of information in the knowledge base (**content** issues). Since the KMS was separate to, rather than embedded within the task, the efficiency benefits for the user were perceived to be negligible. Users tended to favour a more distributed cognition model (Hutchins, 1995) as they focussed in on problem solving on behalf of the customer using multiple resources (whether from their head, their 'little black book', colleagues, managers or coaches). The KMS was seen by many as one of the most inefficient ways of achieving the goal.

The advisors' primary motivational goal was to help customers rather than slavishly follow process rules (thus maintaining a level of **control** over how they execute their tasks). However, there is always too much for advisors to learn and remember. The KMS needed to support the task flow and support the ways that advisors naturally solved problems.

Knowledge searching is not emotion neutral with factors such as frustration, confusion and curiosity all playing a part in determining whether advisors become engaged with the KMS or not. **Perceived credibility** and **trust** of the system were also factors contributing to acceptance of the KMS (Adam, Nelson and Todd, 1991; Self, 1996). If the KMS could provide advisors with useful material within the first thirty seconds of a call, their perception of the system's usefulness is likely to increase. Teams with managers and coaches who used the system were more likely to use it. This was the result of a social facilitation effect where peers endorsed the system (Wenger et al (2002).

Advisors' decision to use the KMS is often a cost-benefit analysis that factors in both cognitive and emotional perceptions. These include efficiency (whether the KMS was actually useful in supporting the task), with minimal effort (easy and quick to use) and emotional factors (trust, cultural endorsement, perception of credibility etc). The system needed to allow advisors to quickly and confidently retrieve answers, provide some indication of credibility, look simple and be up-to-date.

In terms of relating the motivational drivers for the KMS, it is apparent that **cultural** and **collaborative** factors also rank highly in the rationale for adoption of the system.

In a **culture** where knowledge is power, there is little chance of knowledge sharing or organisational learning. The KMS was based around a 'quality control' model of knowledge management (Muller and Millen, 2001) where a gatekeeper function, separated from that of the call centre, mediates and controlled the content. Even the ability to bookmark had been removed in an effort to ensure that only the latest information was used in the customer dialogue. This not only took **control** of the knowledge away from the advisor and coaching community, it also made it slower to find.

This central gatekeeping function can actually decrease acceptance of the KMS. From the advisors' perspective, finding the knowledge can be more important than the actual knowledge itself (Dix et al, 2003). If the perceived cost of retrieval is too high (i.e. it takes too

long or is too difficult to find) then advisors are more likely to store a local copy, in the form of the notes in their 'little black book', or rely on sources other than the KMS.

Since they have no input or buy-in to the KMS process, there can be an attitude of mistrust of the knowledge. Evidence from best practice would suggest that an 'adaptive culture' model (see 7.3.4.1), where advisors and coaches can actually input and validate knowledge that they have acquired through experience would increase motivation through increased control. However, McClelland (1988) suggests that only 10-15% of the population would spontaneously contribute to the knowledge base. By starting to move towards more of a collaborative rather than individualistic culture (through tools such as PMPY), advisors, managers and coaches can help people that they know (whether physically or within a virtual environment) and receive recognition for it.

Rather than mandating or incentivising actual usage of the system, acceptance is largely a process of trust and socialisation (Malholtra and Galletta, 2003; Davis, 1989; Klein and Sorra, 1996).

In addition, most knowledge management projects ignore the fact that much knowledge transfer is tacit 'working knowledge' (Harper, 1987). The coaches, in particular, mentioned that the knowledge in the KMS was "too basic". Knowledge is often acquired through experience and transferred through a process of story telling and gossip and comes with the information about the thought processes and experiences that were used to develop that knowledge (Greengard, 1998). This was why, in the case of the coaches in particular, the knowledge broker system was based around sharing and validating experiences. In addition, advisors would be able to share some of their thought processes through the PMPY function.

The case study in this chapter is a subtly different style of MUI than those described in the previous two chapters in that it serves as a focused element of the advisor's desktop as opposed to being the complete advisor's portal. It focuses less on the aspects of collaboration

and group identity than the previous MUIs. However, its approach still encompasses both effect and affect and addresses the 5 C's through:

Motivators.	KMS MUI Design Rationale.
Culture	<ul style="list-style-type: none"> ○ Use of employees to enhance the customer experience (through Kaizen thinking and service-profit chain). ○ Encouraging management and coaches' usage of the system through the knowledge broker – since usage by management seemed to be linked to increased acceptance by advisors. ○ Ability to contribute and (in the case of the knowledge broker system) rate knowledge. ○ Individual contributions to the knowledge broker are acknowledged in order to increase the contributor's self esteem and reward quality rather than simply quantity. ○ Validation of knowledge by central function (who 'rubber stamp' it) but on the advice of the advisors and coaches.
Content	<ul style="list-style-type: none"> ○ Supporting accuracy without permitting inefficiencies in terms of knowledge access and usage. ○ Splitting content into offline (the home page) and online (the knowledge portal) functions and reflecting these modes with respect to "orienteering" and "jet piloting" routes to knowledge. ○ Personalised access to 'the picture', giving a real time view of events. ○ Finding knowledge fast is more important than retaining the knowledge itself, so personalised and shared bookmarking are facilitated through PMPY, objects within the house and the personalised toolbar. ○ Searching functions restructured into space-semantic relationships, colour coded taxonomies, a freeform find, an A-Z and shared and personal bookmarks. ○ Increased chunking of text into a more screen readable format. ○ Designing simple navigation tools, short cuts and retaining pre-packaged gadgets (e.g. pricing tool). ○ Use of context detectors and outcome selection to accelerate routes to commonly accessed information.

Control	<ul style="list-style-type: none">○ Ability to personalise and share bookmarks (through PMPY).○ Personalised knowledge according to role and function.○ Ability to contribute and (in the case of the knowledge broker system) rate knowledge.○ Different problem solving and organisational styles supported through a choice of search functions and the ability to tailor resources on the home page.○ Moving from a 'quality control' to 'knowledge worker' model of knowledge management.○ Home page fully customisable.
Collaboration	<ul style="list-style-type: none">○ Facilitating the sharing of both knowledge and meta - knowledge through discussion, suggestions and links.○ Networking experienced advisors and coaches through the knowledge broker tool.
Curiosity	<ul style="list-style-type: none">○ System designed so that users can be encouraged to do something of genuine interest very early on.○ Use of affective design to engage curiosity whilst the advisor is in offline mode since their emotional and cognitive resources are not diverted on a customer call.○ House look and feel designed to provide advisors with "permission to play" and to foster an atmosphere of curiosity and discovery.

As in the previous MUI, the design reflected the differences in focus between online and offline task modes. The offline 'home page' was specifically designed to encourage a sense of play and discovery by using a familiar metaphor of a house, designed using games-like conventions. In contrast, the style of the interaction whilst online was designed to facilitate fast and efficient access to knowledge whilst supporting a number of problem solving styles.

Acknowledging the importance of management style in the adoption of technology, a 'knowledge broker' portal was designed for coaches and team leaders. This was designed to increase management engagement and also reward appropriate contribution to the KMS.

Unlike the other MUIs, elements of this design were incorporated into an operational environment and some degree of longitudinal evaluation was possible. On the evidence of

this evaluation, the motivational approach to design seems to have succeeded in increasing usage and acceptance of technology (and, through this, increased advisor compliance and the accuracy of information given to the customer). There is no denying that other factors contributed but, given that laboratory conditions were not possible in an operational environment, an increase in usage was evident in the study. There was also solid theoretical support for the approach, as well as practical evidence of its efficacy.

Chapter 8: Towards Motivational Machines - Discussion, Evolution and Lessons Learned.

“Along came Broadband networks, multimedia and mobile devices and with them came fun, persuasion, outrage, delight, faith, campaigns, satire, lifelong learning, identity, communities and passion. Now, increasingly, we interact to be, not just to do”, Cockton and Korhonen (cited in Axelrod and Hone, 2004).

The case studies in chapters 5, 6 and 7 have all highlighted applications of Motivational User Interface design into various call centres. They have all been subtly different implementations of MUIs but have established common building blocks and principles for the design of such interfaces. This chapter reflects upon these implementations past, what has been learned from them, whether they can truly be called motivational and speculates on possible future directions for MUIs.

8.1. Could MUIs Really Motivate?: Examining the Hypotheses.

The aims of this research were challenging and involved an aspect of psychology that is often very personalised and contextualised. The MUI was designed with two hypotheses in mind:

1. Motivational User Interfaces can be used to help advisors in call centres become more motivated in a job that has notoriously high levels of stress and turnover. Since Reeves and Nass (1996) asserted that there was an analogy between human-human interaction and human-computer interaction, MUIs were conceived as technologies that could fuse together an understanding of the psychology of human motivation at work and user needs with both effective and affective user interface design.
2. Motivational User Interface design can be used to increase user adoption, acceptance and use of technologies in a call centre situation. Given what is useful and usable is not always used (Dix, 2001), can a combination of effective and affective design (incorporating motivational and emotional needs) be used to increase technology acceptance?

Call centres were selected as an ideal application area for MUIs because they offer a number of challenges in terms of both human factors and human-computer interaction (see chapter 2 and discussion in 8.5). Call centres are the public voice of a company and are regarded as key to delivering customer service and CRM strategies. However, they have to continuously manage the contradictions of delivering a quality customer service whilst increasing standardisation and consistency, reducing costs and increasing profitability. To do this they often adopt a 'mass production' model that often inadvertently causes advisors to mistreat customers. Technology has served to both intensify work and make it more visible whilst Tayloristic management principles have reduced variation, increased focus on productivity and imposed extrinsic motivation through targets and incentivisation. This increased intensity of work (both in terms of task completion and 'emotional labour'), low levels of employee discretion and control, plus the need to manage the pendulum swing between quality and quantity has resulted in high levels of employee burnout and churn. This creates a 'cycle of failure', where less skilled advisors are recruited on lower levels of pay and reward, with less knowledge and less investment in training and development. This tends to act against the delivery of a quality customer experience.

One of the key trends in best practice has seen automated and self-service technologies take mundane and repetitive transactions away from the call centre. The call centres' role then moves more towards a 'mass customisation' model where higher value transactions can help deliver a deeper level of customer support (Zuboff and Maxmin, 2003). However, to do this requires a shift towards empowerment, motivation and retention of highly skilled call centre advisors and new models of call centre management, measurement, process and technology.

The role of the user interface in the call centre is to mediate and improve both the effectiveness and affective nature of the interaction between the advisor and the customer. There is always too much to know and remember. The system becomes the third actor in the dialogue between the customer and the customer service advisor (what Steel et al (2002) refer to as Computer-Human-Human-Interaction (CHHI)). CRM implies the use of systems based customer data to enhance the relationship with the customer. It requires getting the

right information to the advisor in a timely manner so that they can better tailor the dialogue to the needs of the customer.

The MUI is not, in itself, a CRM system. What it intends to do is support and enable more effective knowledge management and empowerment strategies, by helping advisors work in the way that they find most effective. In doing this, MUIs seek to address both the task and emotional components of call centre work. They need to decrease levels of cognitive load through increasing usability and accessibility of knowledge and increase visibility of the affective component of call centre 'emotional labour'.

Given this context, the evidence for hypothesis one (increasing employee motivation whilst decreasing turnover) could have been proven if the MUI had been implemented operationally and employee sickness levels (one of the key precursors for churn) and employee turnover had dropped or customer satisfaction levels had gone up (as predicted by the service-profit chain (Rust et al, 1995; Zeithami et al, 1996; Heskett et al, 1997; Reichheld, 1998; Reichheld and Sasser, 1990)).

In practical terms, it was always going to be difficult to prove this hypothesis because of the numerous variables that can be attributed to both employee and customer satisfaction and churn, other than the technology (see discussion in 8.5). Given that the average length of service for a call centre advisor in UK call centres can be as short as twenty seven months, the MUI needed to be used operationally for at least that period of time to conclusively prove hypothesis one. None of the MUIs were evaluated longitudinally for that length of time. However, the evidence that was acquired during the literature search (see chapter 3), the field requirements process and the evaluation of each of the MUIs pointed towards a strong theoretical support for the first hypothesis (see chapters 5, 6 and 7).

Hypothesis two (increase in technology acceptance through evidence of increased technology use) again relies upon evidence of actual usage in the call centre. Again, there are a number of variables outside that of the technology itself that contributes to user acceptance. These

can include user resistance to change, perceptions that the technology is deskilling the job and techno-phobia (Nickerson, 1981). These factors point towards the importance of the underlying culture in technology acceptance and motivation (one of the key 'C's). There is strong anecdotal support indicating that the one of the principal reasons why technology is not accepted is because it has not been designed with the existing organisational culture in mind or that the organisational culture has not been changed (Goss et al, 1993; Kotter and Heskett, 1992).

However, there is evidence that motivation with respect to technology acceptance can be influenced through users' attitudes towards the use of the technology in question (Fishbein and Ajzen, 1975). This is linked to the users' perceptions about how easy the system is to use, as well as how useful the system is perceived to be in terms of achieving the users' goals (i.e. solving the customer's problems - Davis, Bagozzi and Warshaw (1989)). The resulting attitude towards the technology predicts intention to use (which, in turn, predicts actual use (Davis, Bagozzi and Warshaw, 1989)). However, the theory of planned behaviour (Fishbein and Ajzen, 1975; Yeaman, 1988; Mathieson, 1991 and Davis et al, 1989) also predicts that advisors' attitudes towards the system are also influenced by peer pressure (whether other advisors and managers are endorsing its use), as well as how much choice they have with respect to use and whether they perceive that they have sufficient resources available to them.

The first MUI case study resulted in a largely positive evaluation from both advisors and managers when the prototype system was presented to them (see 5.2.4). However, further longitudinal evaluation was not possible so there was no way to empirically investigate the MUI's influence on technology acceptance in this case. No evaluation was possible in case of the banking MUI. However, evidence gathered in the evaluation of the final MUI supported the technology acceptance hypothesis (see 7.5).

In the knowledge management (KMS) MUI, there was an opportunity to assess perceptions of:

- Usability (through a SUMI questionnaire),
- Usefulness (through a time and motion experiment),
- Attitude towards the system (through capturing user perceptions of hedonic quality via a self-report technique, a set of semantic differentials and observation of a number of behaviour 'affectemes' (Axelrod and Hone, 2004) to sense levels of user engagement).

The high levels of user perception of usability, plus initial indication of users' emotional engagement would predict high levels of technology acceptance using both Davis, Bagozzi and Warshaw's (1989) technology acceptance model and the theory of planned behaviour (Fishbein and Ajzen, 1975; Yeaman, 1988; Mathieson, 1991 and Davis et al, 1989).

Field observation conducted five months later indicated that actual use of the KMS on calls had risen from 7% of the time to 49%. However, it was impossible to correlate attitudes to use verses actual use, because the design team were unable to gain access to the same user sample in the call centre. This instance of a MUI implementation seems to indicate that a motivational redesign of the KMS *did* increase usage of the technology. However, it is difficult to conclude definitively that the design alone was responsible for the changes in usage pattern since other variables, such as increased familiarity with the KMS, could also have been influential in adoption.

However, strong support from the literature plus some empirical evidence points towards MUI design being somewhat influential with respect to user acceptance of technology (supporting hypothesis two).

8.2. What Makes a GUI a MUI?

A Motivational User Interface *is* a Graphical User Interface but there are significant differences in design, and design approach, that separates MUIs from GUIs:

- **MUI design is concerned with a balance between pleasure and efficiency, between affect and effect.**

Based on the observation that what is usable is not necessarily used (borne out by the case study in chapter 7), MUIs seek to motivate users to use technology by going beyond usability and tapping into theories of technology acceptance and motivation. They need to support the “holy trinity of interaction” (Overbeeke et al, 2002), knowing, doing and feeling, as well as fulfilling technology’s multifaceted role (Fogg, 2002) as a tool (helping the advisor help the customer), a social actor (supporting sociality and collaboration) and a medium (as a vehicle for motivation).

Usability has moved from being a ‘satisfier’ when present, to a ‘dissatisfier’ when absent. However, MUIs cannot simply provide users with a pleasurable, emotional or aesthetic experience. Not everyone wants these experiences when achieving a goal. MUI design has to balance the aesthetic with the functional. In terms of design, these can be fundamentally in conflict with each other, e.g. consistency in interaction style can act against curiosity. This parallels the contradictions that are present in the call centre itself in their constant battle to balance quality (delivering a customer experience) and quantity (managing cost to serve through call throughput). The MUI does this through reflecting the different interaction styles of the call centre advisors whilst online (efficiency) verses offline (explorative).

Whilst online, the urgency to solve customer problems drives the need for a fast, effective and efficient interaction. The task goal is central to the design. Anything that prevents achievement of this goal (including usability problems or over elaborate designs) will result in frustration and anxiety. Aesthetic may exist as part of the task (the “beautiful call” (Alferoff and Knights, 2002)) rather than the interface. Traditional ergonomic principles for interaction design are emphasised for online tasks.

Whilst offline, context of action drives goals, effectiveness and efficiency are less important, volatility is a key factor and playfulness and spontaneous action is

frequently experienced. If arousal decreases, people are liable to get bored. This implies a more emotional, or hedonic, approach to UI design to encourage advisors to explore, play and orienteer through knowledge spaces. Designs are often inspired by computer games, since they are possibly the ultimate in pleasure-based usability, in that they won't be used unless they are both usable and pleasurable.

Rather than ignoring the emotions of both the customer and the advisor, MUIs employ 'emotional widgets' (e.g. 'the moodie', the splatty' and 'customer mood indicators') to reflect the moods of both parties. This enables advisors to go beyond the hard measures and statistics that drive the call centre. This reflects the fact that the call centre is not simply a call processing factory but a place where affective interactions and emotional labour occurs (Hochschild, 1993; Taylor and Bain, 1999; Deery et al, 2002; Erickson & Wharton, 1997; Deery and Kinnie, 2002). The MUI is not simply reflecting task effectiveness, it is acknowledging both customer and advisor affect.

- **MUI design is influenced by motivational psychology (specifically the five 'C's framework of motivation) and tailored to the motivations and needs of the users.**

Design goals for the MUI go beyond that of simply supporting task functionality and investigate the motivational needs of users in their job. Motivation and retention are both strategic concerns in the call centre industry, which has notoriously high levels of staff turnover. Theories such as the service-profit chain imply that motivated employees are the key to achieving both customer satisfaction (Heskett et al, 1997) and organisational effectiveness (Smith, 1993). Facilitating acceptance of technology encompasses aspects such as usability, intrinsic motivation and perceived usefulness (Davis, Bagozzi and Warshaw, 1992) plus fun (Hassenzahl, 2000) and emotional engagement (Venkatesh, 2000). However, to understand usage, it is necessary to understand the motivation of the user and the process that they go through when deciding whether to use the system or not (Mathieson, 1991). There is increasing evidence that people tend to respond to computer systems as though they were

social entities that use principles of motivation and influence (Reeves and Nass, 1996; Fogg, 2002; Fogg and Nass, 1997; Fogg and Nass, 1997; Nass, Fogg and Moon, 1996). The MUI model of motivation is, therefore, grounded in a shallow model (Sloman, 2001) of human-human motivation, influence and affect (Muller et al, 1997 and Fogg, 2002).

Part of the process of requirements elicitation for the MUI is to capture the motivators of the advisors in their work, through either focus groups or questionnaires. These motivators map to the framework of 'C's of motivation that were derived from the psychological literature; culture, content, collaboration, control and curiosity. These 'C's have been used as a framework for MUI design and evaluation (see 8.3 for an examination of the 'C's as building blocks of the MUI).

- **MUIs are interactive and personalised, not just informative.**

Call centre wallboard displays provide data to advisors that may be considered motivational. However, this does not qualify them as a MUI since there is no interactivity or personalisation in the interface. MUIs do not simply contain motivational information, they are integrated into advisor tasks in an interactive fashion. They need to fulfil technology's role as a tool, a medium and as a facilitator for social action (Fogg, 2002 – see 3.2.2). They need to enhance the customer service advisor's capabilities to serve the customer, by helping them navigate through the vast amounts of knowledge on customer, product and process. They need to help users become motivated and allow exploration of the knowledge space without fear of punishment but providing feedback on progress. They also need to support the more social and collaborative aspects of work.

The look and feel of the MUIs is usually the single aspect that comes under the most scrutiny when they are demonstrated. Although look and feel *is* important, the MUI methodology and the building blocks for design are the most critical factors in MUI construction. These building blocks are explored in the next section.

8.3. The Building blocks of a MUI.

Each MUI considered in this thesis reflects the different motivations, ways of working and styles of the call centres for which they have been created. However, in the journey from 1995 to present day, there have been a number of building blocks that have become characteristic of MUI design. Rather than being about specific look and feel, these building blocks surround methods of capturing and evaluating both effect and affect, plus supporting the five 'C's of motivation in the design of the user interface. Other 'C's such as challenge and competition are not explicitly designed in as building blocks. Challenge should be evident in the job and competition can act against knowledge sharing and collaboration. Technology is never going to become the *cause* of motivation. However, if technology is designed with motivation in mind, it can be an enabler through which knowledge can flow to help support both affective and effective components of the advisors' job.

8.3.1. Methodological Building Blocks.

Each of the MUIs shared a broadly similar approach to requirements capture, design and evaluation. This was detailed in chapter 4 (see Figure 66). Methodological approaches were subject to the challenges and complexities of design in an industrial environment where users are often inaccessible because of the demands of their job.

The crux of the MUI method is the non-disruptive, observational approach offered by field observation and, in particular 'quick and dirty' ethnographic techniques. These are used throughout the design process. This is accompanied by the ability that evolutionary prototyping provides to make ideas sufficiently concrete to user test. These methods are supplemented by other techniques for requirements capture and evaluation (e.g. focus groups, interviews and talking aloud protocols), where they are appropriate and operationally possible. This corpus of methods allowed the capture of affective, effective and motivational data from the call centre environment and translated them into MUI designs.

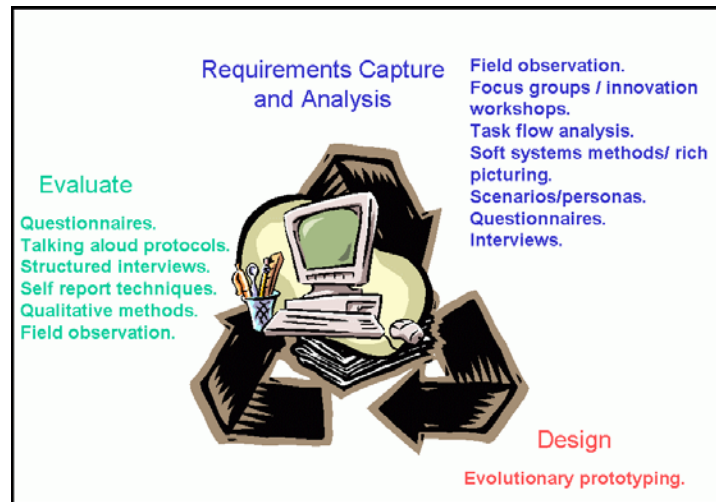


Figure 66: The MUI Method.

These methods provided a mix and match approach, according to the objectives of the MUI and the conditions and pressures under which the development team were operating. The extent of evaluation was entirely governed by the degree of access to the call centre post prototyping. The banking MUI, in particular, suffered from very limited evaluation due to the fact that it was a commercial development and the client did not invite the author back to assess progress on MUI implementation. In the world of the call centre, management buy-in and co-operation was the single most important critical success factor for the MUI. Without management support, advisors were unlikely to be made available for observation or comment.

The emphasis on qualitative methods, such as observation, rather than quantitative research was largely governed by the fact that it is almost impossible to do anything meaningful under controlled conditions in an environment where circumstances of cognitive load and emotional labour cannot easily be recreated.

8.3.2. Culture Building Blocks.

In terms of supporting **culture**, the MUI needs to be located in an environment where advisors can become motivated. Motivation is very idiosyncratic and is difficult to externally impose, so multiple opportunities need to exist as triggers for individual motivation. Inevitably, many of these triggers lie outside the remit of technology. These include elements such as advisor

empowerment and the extent to which they have the ability to participate in the design of their job (see the adaptive culture model in 7.3.4.1) and progress in their career. In addition they need to have measures that are appropriate to them (rather than simply productivity measures) and processes that support them in delivering a customer experience. A large element contributing to this is a dynamic, open, honest and people-centred management style.

The MUI's role in the call centre's culture is twofold. One is to support their task (functionality) under conditions of high cognitive and emotional load (usability) whilst encouraging a pleasurable and engaging interaction (pleasurability). The second is to tap into basic motivational psychology and use it to shape UI design in order to support the MUI's role as a social actor and a medium for motivation (Fogg, 2002).

Given that the attitude of management to technology seems to be a key factor in its acceptance, inclusion of management in the MUI is essential. In the original MUI, the manager was present as part of the advisor's 'communication cube'. Through this, they were able to offer interventions and support to the advisors, if required. In the banking MUI, the interface could be used by the manager to push messages, give instant feedback and provide a mechanism for publicly thanking people for their contributions. In the knowledge management MUI, the coaches and managers were given a 'knowledge broker' application that allowed them to share knowledge and expertise and enhance and broaden the scope of the knowledge base. This gave them an active role in the design of the content of the system. This resulted in higher levels of trust in the data. As a consequence, they were more likely to recommend usage of the knowledge system to their advisors (see 7.3.3). This increased the levels of technology usage through social influence (Kelman, 1958).

Culture can also be an inhibitor in terms of technology acceptance, especially with respect to the more hedonic aspects of MUI design. The MUIs were deliberately created with a look and feel that was different to the traditional ergonomic designs that are generally in evidence in the majority of 'productivity' applications. The argument for keeping hedonic design out of

'productivity' applications is that there are fundamental motivational differences between software as a toy (used for its own sake) and software as a tool (used to achieve external goals). However, Norman (2002) has observed that "attractive things work better" and Jordan (1999) has pointed out that usability alone has moved from being a 'satisfier' when present to a 'dissatisfier' when absent. Pleasure does not subsume usability, nor does usability alone generate pleasure. The banking and knowledge MUIs acknowledge people probably don't want an aesthetic experience when achieving a goal (i.e. when in goal mode where tasks determine actions (Hassenzahl, 2000)) by separating out the design strategies between online and offline modes. However, more hedonic design principles have been used in all three MUIs to encourage a sense of exploration and play, so that advisors start to use the system because it supports both their task based and emotional needs. The cultural challenge here is evident in the fact that many of the more affective elements of the MUI were not incorporated into the final design of the new knowledge management system. Although fun at work is occasionally officially endorsed, for example dress up/down days, generally it is culturally unacceptable to encourage it through technology. This is the biggest barrier to the operational adoption of MUI technologies (see discussion in 8.4).

8.3.3. Content Building Blocks.

Content is largely about job design since, as McClelland (1975) stated "if you want people motivated to do a good job, give them a good job to do". Call centres are moving from the 'mass production' model of simply processing large volumes of simple calls to the 'mass customisation' model of adding the value of human empathy, creativity and intelligence to often complex customer demands. This shifts the needs of both the advisors and the technologies that they use from efficiency alone to efficiency and affect.

To effectively support the advisor's task, the knowledge accessed via the MUI needs to be up-to-date, credible, from a trusted source and must support retrievability, readability and speed of access whilst online with the customer. With the stresses and strains of call centre work, high levels of customer demand and a need for fast and confident access to knowledge, the technology needs to facilitate orienteering and discovery (Murray, 1998), as well as jet piloting

through knowledge spaces. This is why both the banking and knowledge management MUIs are split into online (goal mode (Hassenzahl, 2000)) and offline (action mode (Hassenzahl, 2000)), to acknowledge that the motivations and demands whilst on the telephone verses the time between calls are very different. The original MUI sought to simplify access of knowledge through the use of the customer capsule and books containing customer details, so that advisors were within one click of knowledge they needed to deal with customers. This developed into the customer narrative space in the banking MUI. The criticism that the original MUI's direct manipulation interface was too slow was negated in the banking MUI, where speed keys were introduced to accelerate common tasks. In the knowledge management MUI, the online mode supported a number of simple and familiar search mechanisms, personalised useful links, colour coding, text chunking and an icon-based toolbar. These were all designed to help advisors accelerate to the knowledge that they require to deal with customers.

In order for the MUI to be accepted as an essential tool for the job, it needs to be perceived as both useful and usable for *all* aspects of the advisor's task (Davis, Bagozzi and Warshaw, 1989). To increase perceptions of usefulness, the MUI needs to convince users early on in its introduction that it enhances the way that they do their job. In the banking MUI, the 'logging on' process allowed advisors to use a single logon to multiple systems that would previously require them to logon individually with different passwords. This was perceived as both time consuming and "a hassle" by the advisors so taking this chore away initially instilled a positive perception of the MUI to the advisors. In the knowledge management MUI, the home page was designed to engage curiosity whilst the advisor was in offline mode and had cognitive resources to cope and learn. In online mode, the knowledge MUI was designed to allow advisors to solve frequently asked but complex problems with minimal search effort within the first thirty seconds of the call.

Most of the theories of motivation acknowledge that people need feedback (Hackman and Oldham, 1980; Csikszentmihalyi, 1978), assurance that they are performing a significant role (Hackman and Oldham, 1980) and are given recognition for their achievements (Herzberg,

1959; Maslow, 1970; McClelland, 1988; Covey, 1994; McGregor, 1960; Roethlisberger and Dickson, 1939). They also want to achieve advancement and growth through learning and development (Herzberg et al, 1959; Maslow, 1970; Covey, 1994). The MUI needed to reflect this through presence of management on the system to provide timely support and feedback. It also needed to increase the visibility of individual and team contributions to the call centre operations.

This exists in the original MUI via the 'communications cube', the clouds in the sky and the clock call counter. In the banking MUI, this was realised via the manager's ability to push timely feedback during or after calls and provide public recognition for advisor's actions, plus the 'operations dashboard' that tracks both individual and team achievements during the day. The knowledge MUI exists to allow advisors access to high quality knowledge to enhance their task of dealing with customers. It gives advisors, coaches and managers the ability to feedback any knowledge or learning to enhance the knowledge base, via the 'knowledge broker' system. This provides an element of control and adaptability to the system content (see 7.4.3).

To recognise the stresses and strains of emotional labour (Hochschild, 1983), the original MUI and the banking MUI also provided the 'moodie' and the 'splatty' in an attempt to express the frustrations of dealing with customers both privately and publicly. These 'emotional widgets' also provide an affective aspect to the call centre's operation and provides some contexts to the otherwise objective productivity data that is routinely captured. Productivity data alone fails to portray the full picture of customer interactions. Other emotional indicators are included in the original and banking MUIs through the 'customer capsule mood indicators'. These were designed to reflect the customer's emotional state, providing advisors with a potentially critical piece of data on customer's state of mind, and potentially giving the company with (albeit subjective) data on customer satisfaction generally.

8.3.4. Control/ Choice Building Blocks.

Perception of **control** is a key motivator that the MUI needed to address (DeCharms, 1968). Interfaces should promote feelings of self-determination and control onto the user. Ultimately, advisors should feel in control of the dialogue with customers. However, the customer is only one of the elements in the triangular dialogue that comprises the Computer-Human-Human-Interaction (Steel et al, 2002). The advisors need to feel in control of the interaction with the system in order to control the interaction with the customer. To this end, MUIs are designed to be intuitive and simple to use, without adding any additional cognitive load onto the advisor's already strained brain.

The MUI look and feel was highly influenced by computer games since games have to be relatively intuitive to use and don't require extensive training courses or large manuals. This is a desirable quality for a high turnover profession where induction training should emphasise customer care and products, procedures and services, rather than how to use the system. Although the toy verses tool debate (Malone, 1981; Hollnagel, 1999; Lazzeri and Keeker, 2004) makes it clear that the motivations between games and productivity applications are different, this should not prohibit mutual learning between the design disciplines (Carroll, 1987). Any environment where users get meaningful feedback on actions, are kept informed of progress and achievements and are permitted to play and make mistakes, promotes exploration and learning. However, it also allows the user to feel in control.

In user interface terms, the predominant element of control comes primarily as a result of personalisation (Blom, 2000). Personalisation and customisation both provide users with decision-making authority over technology (Fogg, 2002). These can have two possible social functions. They can help users to achieve their goals and can also provide a public expression of social identity. The original MUI supported a basic form of customisation through the choice of panorama on the advisor's 'window on the world'. It also gave advisors access to personalised information via floating banners that drag a continually changing set of relevant headlines across the screens. In the banking MUI, the advisor could choose their

cartoon persona on the 'advisor team space', as well as having personalised access to a team portal that incorporated information pertinent to their role, their team and their location. The home page in the knowledge management MUI allowed customisation of the wallpapers and furniture to allow users to get a sense of ownership of the space. The knowledge portal gave them a view of knowledge pertinent to their role and level of expertise as well as the ability to collect (through 'keep this link') and publish personal links (through PMPY).

Providing access to the 'knowledge broker' in the knowledge MUI gave people the opportunity to add to the corpus of knowledge. This, again, provided users with the perception of control through contributions that are acknowledged and, where appropriate, acted upon (see 7.4.3).

Another aspect explored by the original and banking MUIs was via employees having some element of control over the type of performance data collected and presented to management. Both the 'moodie' and the 'splatty' could be used by the advisor to paint a picture of their day that was not necessarily reflected in their productivity statistics and also allowed them to express their feelings and frustrations to a (hopefully) sympathetic ear.

8.3.5. Collaboration Building Blocks.

Collaboration and teamworking are powerful motivators in stressful environments such as call centres, largely due to the support function that they provide. The Computer Supported Cooperative Work (CSCW) literature extensively documents technology's contribution to collaboration. The MUI seeks to exploit this type of functionality through facilitating a sense of social presence (Short et al, 1976). This used and extended the natural "communities of coping" (Korczynski, 2001) that are ordinarily evident in the call centre environment. The advantage that technology has is that it can work on a visual rather than a verbal channel. The call centre is often very isolating because it is primarily a verbal environment. Getting verbal help from managers and colleagues generally requires the advisor to put the customer on hold and then find out who is available to help. The original and banking MUIs exploited the text chat concept, allowing advisors to interact either as part of a 'buddy' system within the "communication cube", or via a team messaging space. In the knowledge management MUI,

collaboration channels were established through instant messaging, the knowledge broker system (which also brought in trust and reputation factors into shared knowledge) and the ability to share pages of useful links.

Team identity locates advisors in a social landscape and creates a sense of community (Thackara, 2000), comparison and facilitation (Zajonc, 1965). The banking MUI allowed teams that were not necessarily co-located to have a sense of team awareness via team space which indicated who was online or offline (depending if the team member's icon was in colour or greyed out). They also had access to further information about online status via the dots on the dialler that indicates who is on a call (and, by implication, who is interruptible). Personalised team news and team games were designed to increase the levels of informal interactions between team members.

8.3.6. Curiosity Building Blocks.

Curiosity is part of the human need for advancement, growth and learning (Kohn, 1999; Herzberg, 1959; Covey, 1994; Malone, 1981). Although the MUI is primarily a tool, not a toy, all three MUIs have been designed to encourage advisors to explore their knowledge space through innovative and hedonic design. The emphasis whilst online with the customer is on achievement of goals (solving customers' problems). However, the emphasis offline is more around the opportunity to learn, collaborate and discover. The principal problem with the original MUI was that these two distinct modes were treated in the same way in terms of interaction style. This created some inefficiencies in navigation whilst online, so the later two MUIs created a distinct split between online and offline modes (Hassenzahl, 2000). The banking MUI had a 'team space' (for offline work) and 'customer space' (for online) and echoed the different goals in these two modes by designing for efficiency and for exploration (respectively). The knowledge MUI echoed this distinction via the 'home page' (offline) and the 'knowledge portal' (online).

Although curiosity and surprise tend to go counter to conventional user interface design, they are used to good effect in computer games. The design of all three MUIs was influenced by

elements taken from the design of games. This included an element of sensory curiosity (Malone and Lepper, 1987) via the first MUI's "window on the world", the cinematic narrative space and the ability to choose a public persona from a selection of character icons in the banking MUI and the knowledge MUI's DIY-friendly house. These were designed to give advisors "permission to play" or "orienteer" in a safe and friendly environment.

More subtle aesthetic indicators were employed in the knowledge MUI through the use of colour to help provide signposts along a knowledge path.

In addition to aesthetic curiosity, cognitive curiosity (what Malone and Lepper (1987) define as the desire for completeness of knowledge) was also employed through access to ever changing, real time information pertinent to the advisor. The drag banners on the original MUI, the operations dashboard, team games, push functions and the personalised news pages on the banking MUI and alert boxes on the knowledge MUI all provided advisors with easy routes to continuously changing personalised team and task information. This could range from team member's wedding photographs and the restaurant's lunch menu, to the launch of a new product or the availability of a team member.

8.4. Towards Motivational Machines: The Future of the MUI.

Picard (2000) defines affective computing as "computing that relates to, arises from, or deliberately influences emotions". MUIs are, therefore, examples of affective machines. MUIs can influence emotions in two ways. They are designed to motivate by addressing aspects of the advisors' task and also by providing a medium through which advisors and managers can evolve "communities of coping". It can trigger support and sympathy through affective widgets such as the 'moodie' and the 'splatty'.

However, the MUIs are not emotional machines in the sense of detecting and responding to emotions themselves. Shneiderman (2002) criticises the obsession with building machines that seek to recreate things that are people are better at doing. Emotion theorists are still working on understanding and defining emotion (see Oatley and Jenkins, 1996; Picard, 1997;

Goleman, 1995; LeDoux, 1996; Ortony et al, 1988; Sloman, 2001; Evans, 2001). Weiss and Cropanzano (1996) observe that emotions are intuitively well understood, yet a definitive definition of emotion has been difficult to come by. There is currently no definition precise enough that it can be implemented in a machine.

Sandelands and Boudens (2000) criticise scientific methods of study for the dearth of emotion research stating that; “the problem of putting feelings to words is met and mastered all the time in daily life by everyone except scientists who demand direct evidence”. The difficulty in developing a definition seems to arise from the fact that that people often cannot verbally express emotions (Sandelands and Boudens, 2000) and the observation that an emotional reaction is not one reaction but a collection of related reactions (Frijda, 1993). Although philosophers have been debating the nature of emotion for thousands of years, the scientific study of emotion is still very much a topic of, often controversial, deliberation. A century ago William James (1907) observed that scientists tend to put the “intellectual cart” before the “emotional horse”. However, recent work in neuroscience, psychology and cognitive science suggests that emotion plays a critical role in rational and intelligent behaviour (Picard et al, 2001). In fact, a creature without emotions probably would not survive very long because they would not be able to avoid danger or make decisions (LeDoux, 1996; Salovey and Meyer, 1990; Evans, 2001). However, without knowing how such emotions work, humans still do pretty well in identifying emotional states most of the time! This is why the MUI uses the human advisors to identify, log and communicate emotion rather than building a machine to detect them.

Since Reeves and Nass (1996) assert “successful human-human interaction can be used to inform human-computer interactions”, it is important for the machine to not only interpret the emotion accurately but also then respond appropriately with the user. A MUI that could automatically sympathise with advisors would be an admirable challenge, technically speaking. Despite assertions that machines can detect and classify certain emotions to a degree of accuracy (Vyzas & Picard, 1999; Picard et al, 2001), there is little evidence to show that this can be done outside the laboratory and with a diverse set of users. If the machine

could recognise the emotion, the biggest challenge for HCI would be to get the machine to react empathetically back. There are many examples of badly designed 'pseudo-empathy' in social agents, the undisputed champion being Microsoft's much-maligned Clippy. Clippy means well but lacks the ability to learn and the emotional intelligence to judge when it is appropriate to intervene. Other virtual agents such as Gandalf (Thorisson, 1997), Steve (Rickel and Johnson, 1998) and Olga (Beskow and McGlashan, 1997) have all promised increases in user engagement, performance and effectiveness. However, evaluations have yet to prove their worth (Dehn and van Mulken, 2000). Shneiderman (2002) characteristically questions whether users *want* a relationship with their machine, arguing that they just want to have control over it. The MUI meets this half way by providing the user with the ability to express emotion using the computer as a medium for communicating it to other users, rather than having the computer itself react to it.

Physiological data has not been used with the MUI so far, largely because of the invasiveness of the sensors and opposition of the unions. However, Turner and Karasek (1984) suggested "a system able to sense an operator's arousal level could dynamically reallocate tasks so as not to overload the human advisor, while still maintaining overall system performance". The "Angelo" project (Andersson et al, 2001) is attempting to do precisely this by detecting advisor stress (through physiological data and subjective reports) and controlling which call queues advisors are handling. To date there have been no published papers reporting progress on this research.

The advent of less invasive physiological sensors, such as 'emotion mice' (Ark, Dryer and Lu, 2000; Reynolds and Picard, 2001), provide a less threatening method of collecting GSR, heart rate, skin temperature and general somatic activity (GSA). Ark, Dryer and Lu's (2000) justification for the efficacy of the mouse as an affect collecting device is that people spend about 30% of their time during interaction in physical contact with them. It also fits with advisor's cyber fidgeting habits, reported in 6.3.2. The next phase of MUI research is likely to investigate how this kind of technology could be used to support the current self-report mechanism for accurate feedback of advisor stress.

The aim of the MUI, therefore, is not to build a machine that sympathises with the user. However, it should act as a medium through which emotions can be communicated to others and, where necessary, form virtual (and real) communities of coping. People express and communicate their emotions through behaviour and through stories (Polkinghorne, 1988). These can both be a source of direct information about emotions (Wensveen, Overbeeke & Djajadiningrat, 2000). Klein, Moon & Picard (2002) suggest that systems can be used to actively support users in their ability to manage and recover from negative emotional states. The original and banking MUIs, therefore, support the existing social networks by allowing advisors to choose to communicate emotional data to their buddies or their managers through both behaviour and story telling. This is a factor that drives technology acceptance and adoption through the effects of collaboration and social support (Shneiderman, 2002).

The other 'affective' aspect of the MUI is through the use of aesthetic and hedonic design to draw users in and seduce them into accepting the technology. As Norman (2002) states "attractive things work better". These designs have been used to deliberately draw users in through enjoyment of the system (Hassenzahl et al's (2001) definition of an inward hedonic quality) and exploit elements of extrinsic and intrinsic motivation via the five 'C's (Hassenzahl et al's (2001) definition of an outward hedonic quality).

8.5. Will MUIs Become Mainstream: To Infinity and Beyond!

*"If we continue to ignore what makes us happy, what makes our life enjoyable, we shall actively help perpetrate the dehumanising forces which are gaining momentum day by day. Because we can compute material costs, increase production, rationalise institutions and control behaviour we go ahead and do these things. They are controllable; they are feasible. They offer opportunities for action and hence we may enjoy doing them even though we destroy the possibility of enjoyment in the process. To build an assembly line is fun; it is a fascinating problem to solve and the cost/production ratio provides concrete feedback to the engineer. It cannot be helped, it seems, that as a result the workers are deprived of opportunities to enjoy their own work. Enjoyment is left out of the equations for production, rationalisation and behaviour control, partly because it has remained for so long a vague concept. Something that cannot be defined can safely be ignored",
Csikszentmihalyi, 1975.*

MUIs alone cannot motivate people. Design alone can influence acceptance but it cannot force it. In all the 5 'C's of motivation, the biggest influencing factor in the environment that creates the conditions for acceptance is that of '**culture**'. Culture is an intangible factor, often ignored during the implementation of technology, but defined simply as "the way we do things around here" (Deal and Kennedy, 1982).

The quote at the start of this section was written by Csikszentmihalyi in 1975 but is as true today as it was then. In the call centre industry, time is money and measures drive an emphasis on efficiency and economic value. Faster is better. Costs are to be driven out. Speed equals efficiency, time savings and cost savings. The human factor in the call centre production line is expected to maintain maximal efficiency regardless of the stresses and strains of emotional labour. However, customer relationship management (CRM) places the onus on the front line person to both empathise with the customer and develop a relationship based upon the data available to them. This tends to, inevitably, make the call centre interaction less efficient (i.e. call handling times go up) and increases the importance of the human side of the interaction. Placing emphasis on the well being of the advisor by incorporating motivational design into systems intuitively makes sense. However, with the exception of evidence from the service and value profit chains (Heskett, Sasser and Schlesinger, 1997; 2003), there is little to prove that recognition of the emotional well being of the advisor actually leads to increased economic value. Whilst industry is driven by the metrics of economic rather than human value, affective HCI (and even conventional HCI (see Lindgaard and Millard, 2002)) may have a tough time in being accepted as an asset in the design of technology (Wensveen et al, 2004). Although the concept of the MUI has received universal acceptance from users and has, in the case of the knowledge management MUI, been shown to increase effectiveness, the ultimate challenge is in its acceptance into the culture of the call centre.

MUIs will only work if the culture accommodates motivational aspects such as collaboration, curiosity, content and choice. In many call centres, this requires a massive cultural shift towards empowerment. Cultural factors are often cited as causes of failure of technology

implementations. This is especially evident in the less than successful implementation of CRM into the call centre. Gartner (2002) claimed that CRM is a fantasy in most organisations with over 70% of CRM projects ending in some form of failure. One survey estimated that 55% of CRM systems drive customers away and dilute earnings. This is because most CRM systems are installed without any thought about how they will be used to add value for the customer and that employees found no reason to use them (eCSW.com, 2003). Peppers and Rogers, (2004) claimed that 32% of CRM software has no effect at all.

Zuboff and Maxmin (2003) criticise companies for their failure to serve either the customer or employees. Companies are forever rediscovering the customer, but it's hard to make customer-focus stick because it's contrary to the fundamental way organisations work (Zuboff and Maxmin, 2003). To survive in a competitive market, companies become, by nature, internally focused and their interactions with customers (and also often with employees) are generally adversarial. This promotes the Taylorist or Theory X management models that were discussed in chapter 3, where (usually short term) internal transactions drive behaviour and manage costs. In response to the need to increase revenue and profit this model can only look to reducing operating costs or increasing sales or prices. This requires a strict inward focus on production and distribution and a management team enforce efficiency through strict command and control management. As managerial hierarchies grow, they also became intensely political which makes the inward focus even worse. That inward focus, which began for rational reasons of efficiency, always removes managers from their consumers and their employees. For the past fifty years, managers have kept re-discovering consumers and then forgetting them again because of the fundamental nature of the system (Zuboff and Maxmin, 2003).

This creates the contradictions of quality verses quantity as customers are disappointed with the trade-off between cost of service and the service itself, and customer service people contend with managing increasing demand whilst maintaining quality standards. Hence, customer service advisors are trained to keep calls short and sell high margin items that customers don't necessarily need or want, whilst being told that customer satisfaction is the

single most important aspect of their job. This is why Korczynski (2002) suggests that the advisor's job is more about management of customer disillusionment, than the promotion of the "enchanted myth of customer sovereignty" which has informed customer expectations. Customer service advisors are often put in systems that cause them to mistreat customers. Rules and policies put pressure on service advisors and the costs of that undue stress come in turnover, morale and hostile treatment of customers.

The high prevalence of the 'mass production' model of call centre management (see 2.1.2) in the UK (84% of call centres according to Fielding (2005)) means that the command and control culture would be unlikely to accept the more liberal concepts of the MUI. Call centres have been criticised for often using bullying management tactics (e.g. forcing staff to wear nappies if they go on too many toilet breaks (see The Guardian, 2001)). Although these extremes are in a minority, these centres are very unlikely to ever consider collaborative, hedonic and emotional applications. Theory X managers achieve the ticks in the boxes required by their scorecards and manage their costs. However, in doing so, they may remove the fundamental drivers that motivate employees. This may, in turn, degrade the customer experience resulting in less customer loyalty and negative customer word of mouth. With Theory X management style and a fundamentally flawed notion of what motivates employees, tools such as the MUI are unlikely to flourish.

A shift towards the 'mass customisation' model of call centre management (see 2.1.2) would ensure that more effective and individualised service could be given. By moving from management control to advisor autonomy gives them real control of the customer interaction. This culture is one where the motivational concepts of collaboration, content, control and curiosity supported by the MUI are able to flourish.

The call centre is inevitably situated in the context of the general industrial environment that is evolving in the early part of the 21st Century. The general increased emphasis on productivity in business whilst decreasing employee control through centralisation of decision-making and process implies a negative impact on the experience of the employee. This impact was

predicted by Mayo (cited in Roethlisberger and Dickson, 1939) when he observed, “technical concerns of machinery and optimisation have been put ahead of human concerns for a stable and emotionally satisfying group life”. Symptoms of this include the stress pandemic that is widely predicted in business in the next five years and an increase in ‘presenteeism’ (“the problem of workers being on the job but, because of illness or medical conditions, not fully functioning” (Hemp, 2004)). One company Chief Medical Officer interviewed by the author stated, “stress is the new lumbago”, referring to the prevalence of stress related, rather than back related, sick absences in the past few years. Can user interfaces such as the MUI start to play more of a role in emotion and stress management in business? If they can, there are still debates to be had around what happens to the data that the MUI gathers in terms of how it is managed and who sees it.

Technology is not emotionally or politically neutral. Foucault (1980) posited that “technologies” are used to allow people to understand themselves and the environment around them. Technologies of ‘production’ allow us to produce, transform and manipulate things. Technologies of ‘signs’ allow us to use signs, meanings, symbols or signification that enable us to interpret and understand things. Technologies of ‘power’ determine the conduct of individuals and use them to submit to certain ends or domination. Finally, technologies of the ‘self’ allow individuals to effect their actions, thoughts, behaviour and needs either by their own means or with the help of others. The MUI attempts to support elements of all four of these by helping people to do their job, incorporating richer, clearer and even emotional data into transactions, put increased amounts of control into the hands of the advisors and facilitate better communities of support and knowledge sharing. However, pushing these technologies into the hands of the advisors can be politically sensitive. It implies levels of management trust, willingness to delegate responsibility and power and a degree of flexibility and intelligence from the advisor population. Technology such as the MUI in the hands of a constantly churning, low skilled and low paid advisor population is unlikely to enhance the customer experience.

Can MUIs be used to increase advisor motivation? Evidence from the three MUI implementations and the theoretical evidence seem to support the use of such technology to motivate. However, it will take more than a MUI to motivate.

Can a combination of effective and affective design embodied within the MUI increase technology acceptance? On the quantitative evidence from the knowledge management MUI and the qualitative evidence gathered from the original and banking MUIs it seems likely that it can. By working on increasing positive attitudes and perceptions as well as ensuring that ergonomic concerns such as usability and efficiency are addressed, Norman's (2002) assertions that "attractive things work better" have some element of truth, on the evidence gathered as part of this research.

Glossary of Terms and Acronyms.

ACD – Automatic Call Distributor. Telephony switch employed by call centres to intelligently direct calls to call centre advisors. See 2.1.1.

Affective Computing – “Computing that relates to, arises from, or deliberately influences emotions” (Picard, 2000).

Affective Design – Design that aims to engender positive affective states in the user.

BT - British Telecommunications PLC. Major UK based telecommunications and ICT company.

Call Centre Advisor – Individual who is employed to talk to customers in a call centre.

Call Centre – Defined by Houlihan (2001) as “centralised operations where trained advisors communicate with customers via phone and use purpose built information and communication technologies”. An umbrella term that can refer to anything from customer reservation centres and helpdesks to helplines and information lines. See chapter 2.

CCA – Call Centre Association. UK body representing the interests of call centre managers and employees.

CEO – Chief Executive Officer. The CEO is often the highest-ranking manager in an organisation. They are usually responsible for the company's finances and strategic planning.

CHHI – Computer-Human-Human Interaction. Term proposed by Steel et al (2002) to illustrate the key role that technology has in shaping the emerging dialogue between the customer and the call centre advisor.

CLI – Caller Line Identity. Ability to identify callers through the number that they call from via CTI through the ACD.

Coach – Generally a senior advisor who is appointed to help other advisors to improve their skills and knowledge. They may also deal with difficult or specialist calls and escalations.

Cognitive load – Defined as “the amount of mental energy required to process a given amount of information” (Feinberg and Murphy, 2000).

Compliance – The degree to which a company complies with the rules and guidelines set by their particular industry regulatory body.

CRM – Customer Relationship Management. Defined as “any action that retains, recruits or develops a customer”. Generally an initiative designed to improve company relationships with customers but often used to refer to the technology used to deliver this relationship.

CSCW – Computer Supported Co-operative Work. Discipline concerned with the study of groupware and online collaborative communities.

CTI – Computer-Telephony Integration. Ability to link ACD (telephony switch) data with the computer database. This provides the ability for the advisor to use on screen diallers and can also be used to automatically retrieve customer records through CLI data.

Customer – Individual wanting service from an organisation.

DILO – Day in the Life Of. A linear scenario outlining the routine of a persona's typical working day.

Escalation – A customer call or enquiry that has been passed up the management chain (e.g. to team leader or, in some extreme cases, to the CEO). These are generally problematic or difficult interactions or high-level complaints.

Emotional labour - Employees are expected to display emotions that comply with certain expression norms or rules of the organisation that help to create a desired 'state of mind' in the customer, despite what emotions they may feel themselves.

Emotional usability – “The degree to which a product is desirable or serves a need beyond the traditional functional objective” (Logan, 1994).

Extrinsic motivation – Defined as performing an activity because it is seen to be important in achieving results that are separate from the activity itself (see 3.3.1).

EU – European Union.

FAQs – Frequently Asked Questions.

Five 'C's of Motivation – A 'shallow model' of motivation (Sloman, 2001) upon which the Motivational User Interface is based. The five 'C's comprise: Culture, Content, Collaboration, Curiosity and Control (see 3.4.1).

GOMS – Goals, Operators, Methods and Selection Rules. Goal oriented user interface design method.

GPO – General Post Office.

GUI – Graphical User Interface. A GUI is a graphical (rather than purely textual) user interface to a computer.

HCI – Human Computer Interaction. The study of interaction between people (users) and computers. Interaction between users and computers occurs at the user interface (UI), which includes both hardware (i.e. peripherals and other hardware) and software (for example determining which, and how, information is presented to the user on a screen).

Intrinsic motivation – Defined as performing an activity for no apparent reinforcement other than the performance of the activity itself (see 3.3.1).

IT – Information Technology.

IVR – Interactive Voice Response. A telecommunications system that can accept a combination of voice and telephone touch-tone keypad input and then provides appropriate responses in the form of voice, fax, callback, e-mail and perhaps other media. Such services can use touch-tone or speech recognition interfaces.

KMS – Knowledge Management System. Centralised repository of knowledge. Common definitions include the fact that most KMS are based up a combination of communication (knowledge dissemination), coordination (maintenance) and collaboration (contribution), can be linked with organisational performance and are dependent on the active participation and involvement of knowledge workers to convert the knowledge to organisational performance (Malholtra and Galleta, 2003).

Knowledge Management – A method where an organisation consciously and comprehensively gathers, organises, shares and analyses its knowledge assets.

Macromedia Director – Multimedia design tool.

Mass customisation model (see 2.1.2) – A customer centric business model based on customer needs, employee autonomy and empowerment. Aimed at delivering effective, high quality, personalised customer experiences that enhance loyalty and encourage long-term value (Fielding, 2005).

Mass production model (see 2.1.2) – A business model, adopted from the manufacturing industry, based on centralised control, rigorous process definition and employee compliance. Aimed at delivering uniformity, repetition of simple processes, predictability and high productivity (Fielding, 2005).

MIS – Management Information System. System attached to the ACD to give management visibility of call handling statistics.

Moodie – An ‘affective user interface widget’ used in the first MUI to allow advisors to vent their frustration if they have experienced a difficult call (see 5.2.3.2).

MUI – Motivational User Interface. MUIs are GUIs that are designed with user motivation as a primary goal.

Offline/action mode - User mode where the context of action determines goals and effectiveness and efficiency are less important, e.g. whilst offline, the advisor’s task is keep up-to-date with news and information that may impact their interactions with customers (Hassenzahl, 2000 - see 6.2.2).

Online/goal mode – User mode where the task goals determine actions, e.g. during a call, the advisor’s task is to solve customer problems (Hassenzahl, 2000 - see 6.2.2).

Panopticon – Literally translated as “the all-seeing eye”, this is a regime of control through surveillance and the introduction of uncertainty. See 3.1.2.

PCA 15 – Percentage of Calls Answered in 15 seconds. Typical quantitative service standard measure employed in call centres.

Persona – Representation of an archetypal user, usually an amalgam of viewpoints, demographics information and behaviours that have been captured during the requirements capture process.

PMPY – Push Me, Pull You. An application that allows advisors, coaches or managers to temporarily share their personal bookmarks and links with others.

Productivity software – Technologies that are developed to enhance the productivity of the user in achieving a pre-existing task or goal. Generally used to describe business or non-games/entertainment software.

POW – Personal Office Workspace. Precursor to the MUI (see 5.1).

Scenario – A personalised story that features characters, events, systems and environments (Preece et al, 1999).

Service-Profit Chain – Model proposed by Heskett et al (1997) linking employee satisfaction and loyalty to quality, productivity, service value, customer satisfaction and loyalty which, in turn, drive profit and growth.

Shallow model of emotion – Models of emotion that do not attempt to present a plausible model of human emotion linked with cognitive theories (Sloman, 2001).

Splatty - An 'affective user interface widget' used in the Banking MUI to allow advisors to vent their frustration if they have experienced a difficult call (see 6.3.2).

SSM - Soft Systems Method. An epistemological framework for the study of organisations as purposive human activity systems (Checkland and Scholes, 1990; Checkland, 1999).

SUMI – Software Usability Measurement Inventory. Standard usability evaluation questionnaire (developed by Kirakowski and Corbett, 1993).

Tacit knowledge - Personal knowledge embedded in individual experience. It involves intangible factors, such as personal beliefs, cultural biases, intuition and subjective insights.

Taylorism – Principles of scientific management derived by F.W. Taylor (1911). See 2.1.2.

Theory X Management - Theory X (McGregor, 1960) is similar to the Tayloristic theory of motivation. It posits that relationships are built on the achievement of organisation's objectives (getting the job done). Motivation is by clear direction, authority, rewards, control and incentives and penalties that reinforce rational behaviour and achievement of objectives. See appendix A.

TQM – Total Quality Management. An approach to business management that focuses on quality and typically has a strong customer orientation, total involvement, measurement systems, systematic support and continuous improvement

UI – User Interface. The combination of menus, screen design, keyboard commands, command language and online help, which creates the way a user interacts with a computer.

'Wrap' time – Offline time where advisors complete any actions as a result of a call.

APPENDICES.

Appendix A: Psychological Theories of Motivation.

There are a multitude of motivation theories coming from both cognitive and organisational psychology.

Theories can be themed in 4 broad categories:

1. Theories of **needs**.
2. Theories of **contribution/control**.
3. **Goal directed** theories.
4. Theories of **enjoyment / gratification**.

1. Needs theories.

Needs theories address the fundamental drivers behind human motivational behaviour. Needs involve specific physiological or psychological deficiencies that people are driven to satisfy. Needs theories of motivation look at the interaction between needs and drives.

Herzberg (1959) posited two aspects to motivation relating to job satisfaction (motivators) and job dissatisfaction (hygienes):

1. Hygiene factors, e.g. company culture, company policies and administration, leadership style, working conditions, interpersonal relationships, salary, security and status. Hygiene factors do not lead to higher levels of motivation but their absence leads to dissatisfaction. On a practical level, paying someone a good wage is an important hygiene factor but giving them more money is not necessarily going to increase motivation.

2. Job motivation factors. These include:

- Achievement – gaining satisfaction through delivering a quality performance.
- Recognition of achievement – gaining accurate feedback on performance.
- Work content – having interesting and challenging work and developing relationships with customers. The customer relationship is often the most frequent source of satisfaction and motivation for advisors.
- Responsibility – the extent to which people have influence and control over their job. This includes the ability to self-manage, authority to communicate, accountability and extent of control of the resources necessary to do the job.
- Advancement and growth – the ability to gain new learning on the job leading to unique expertise.

This theory has been criticised since motivators and hygienes can be interchangeable depending on situation (Schneider and Locke, 1971) but it has been influential in job design.

Maslow (1970) articulated this split into a more detailed hierarchy of needs (see Figure 67).



Figure 67: Maslow's Hierarchy of Needs.

1. Physical comfort - basic physical needs (food, drink, clothing, and shelter).
2. Security - the need to feel physically and economically safe.
3. Social Acceptance - human beings will look for support and social interaction from similar groups within their environment.
4. Personal Esteem. This level is where people focus on their achievements as part of their personal growth (recognition, achievement, honour, awards, job title, rank and accomplishments).
5. Individual Self-Actualisation. At this highest level, individuals seek to achieve total fulfilment of their potential at a spiritual, physical, and intellectual level.

Maslow argued that lower level needs must be satisfied before higher drivers can become influential. Typical reward systems tend to satisfy an individual's lower level needs for safety

and physiological security, working on the level of hygiene factors and extrinsic motivators. Applying this to the call centre, much of the responsibility lies with the team leader in terms of ensuring that salary and compensation meet the advisor's second level needs. Once these needs have been met then the cohesion and support of the team becomes important. At level four, satisfaction is dependent upon an individual's self-esteem being supported by the job they do and the recognition they receive for that work (again pointing towards the management role being vital to reinforce this).

However, few attempt to satisfy the individual's higher level needs for esteem and individual self-actualisation. Neither Maslow nor Herzberg really address *how* this can be done or how individual differences in needs are catered for.

McClelland (1988) noted that individuals are driven by different needs for achievement:

- Achievement motivation – these people seek achievement, attainment of realistic but challenging goals and career advancement. There is a strong need for feedback as to achievement and progress and a need for a sense of accomplishment. Highly achievement oriented people want to influence the way that they work and contribute to the knowledge that they use (linking to contribution and control theories).
- Authority/power motivation – this drive produces a need to be influential, effective and to make an impact. There is a strong need to lead and for their ideas to prevail. There is also motivation and need towards increasing personal status and prestige.
- Affiliation motivation – these people have a need for friendly relationships and like to interact with other people. These people like to be liked and be popular and are team players. They want to help others do their job better and are critical in building group cohesion.

Covey (1994) provides a variation on needs theories exploring the motivational aspects of different facets of human relationships in his 'living, loving, learning and leaving a legacy' theory. This explores our needs for independence, dependence and interdependence.

These needs based theories are perhaps the most visible in organisational literature but they have little or no predictive power or directive suggestions to help drive a theory of motivation that is useful for the MUI. Many of the needs lie in the environment, culture and job design aspects of work. However, the fact that motivation is very individual (from McClelland, 1988)

supports the need for flexibility and personalisation in a user environment (including the user interface – see Blom, 2000). Other principle factors that seem useful to pull out are the factors around social support and affiliation (from Maslow, 1970 and McClelland, 1988) and recognition of achievement (Herzberg, 1959 and McClelland, 1988) and the role that management can play in this.

2. Contribution/Control theories.

Contribution/control theories align motivation with the value that people perceive that they deliver into the organisation. According to Hackman and Oldham (1980) employees must perceive their work as meaningful, have a sense of responsibility and have some feedback on their efforts. Job characteristics supporting this include:

- Skill variety – challenging and meaningful jobs utilising a full range of skills and abilities.
- Task identity – ability to see a job through to completion.
- Task significance – how people perceive that they contribute to an organisation's success.
- Autonomy – the degree of control and accountability in carrying out the job.
- Feedback – information about how effective a person has carried out a task.

These are not all equal motivators. A job needs autonomy and feedback and at least one other component in order to be motivating. These are also moderated by an individual's need for challenge, responsibility and growth.

McGregor's (1960) X and Y theory of motivation also acknowledges the fact that people want to be treated as responsible and valued employees.

Theory X (also termed 'Bureaucratic/Pyramidal' by Argyris (1994; 1998)) is similar to Taylor's (1911) theory of motivation in that it assumes that the average human being has an inherent dislike of work. Theory X posits that relationships are built on achievement of organisation's objectives (getting the job done). It assumes that the average human prefers to be directed, dislikes responsibility, is unambiguous, desires security above all else and dislikes working so

they must be controlled and threatened before they will work hard enough. Motivation is by clear direction, authority, rewards, control and incentives and penalties that reinforce rational behaviour and achievement of objectives. It seeks to suppress emotional behaviour since effectiveness can only increase with logical, rational and clear behaviour. Theory X management educate their employees to respond in the expected manner.

Minkler (2002), among others, critique theory X. There is little evidence that people will not work unless sufficient incentives are given them (intrinsic motivation can play a part). People need a deeper, higher order motivator such as self-fulfilment (aligning with the needs theories). Theory X management tends to lead to poor, shallow and mistrustful relationships, rigidity and internal conflict.

Theory Y (termed 'humanistic/democratic' by Argyris (1994; 1998)) takes the opposing position to theory X. It assumes that control and punishment are not the only ways to make people work and that, if the job is satisfying and if people are committed to the aims of the organisation, they will be motivated to work. Relationships are based not only on achievement of objectives but also maintaining the organisation's internal system and adapting to the environment. The average human learns (under proper conditions) not only to accept but also to seek responsibility. It also believes that the imagination, creativity and ingenuity of employees can be used to solve work problems and that, under the conditions of modern industrial life, the intellectual potential of the average worker is only partially utilised. All relevant behaviours (both rational and emotional) increase effectiveness. In addition to direction, controls and rewards/penalties, behaviour is influenced through relationships, commitments, success and confirmation.

Argyris (1994; 1998) found that worker demotivation is not because of worker laziness but because organisations keep people from achieving and maturing through theory X management practices. These tend to result in passive, dependent and subordinate employees who are taught to behave in an immature manner.

Appendices.

Mayo's Hawthorne Experiments (Roethlisberger and Dickson, 1939) showed that better job performance and higher motivation was enhanced by the act of paying attention to people. The experiment participants became a tight knit team during the experiment (even outside work) and they felt that they were working without coercion or limitations. The group developed an increased sense of responsibility and discipline came from within the group rather than from above. There was a general upward trend in production, independent of any of the changes Mayo made. This went against the Taylorist theories of motivation (worker's being solely motivated by self interest). The findings showed that workplaces are social environments and people are motivated by more than economic self-interest. The participants who were singled out achieved greater levels of self-esteem and the more informal relationship with the supervisor made them feel happier. Even when Mayo took away lunches and rest breaks, they felt co-operative and loyal.

Mayo found that work is a group activity and that the social world of an adult is primarily patterned about work activity. The need for recognition, security and sense of belonging is more important in determining worker's morale and productivity than their physical conditions. Informal groups exercise strong social controls over the work habits and attitudes of the individual worker. Group collaboration needs to be planned and supported since it doesn't happen by accident. This cohesion will help people through change.

Likert (1967) focuses more on management styles and proposes that the organisation that makes most effective use of their human capacity works in highly effective work groups linked together in an overlapping pattern by other similarly effective groups.

He identified 4 types of management style:

- Exploitive-authoritative – where decisions are imposed on subordinates, motivation is characterised by threats, hierarchical structure is based on power, there is little communication and no joint teamwork.
- Benevolent-authoritative – leadership is on master-servant lines with reward-based motivation, managers hold responsibility but lower levels do not and there is little communication or teamworking.

Appendices.

- Consultative – leadership have some trust in their subordinates, motivation is by rewards and some involvement, most employees feel they contribute to achievement of organisational goals, there is some communication both upwards and downwards, and a moderate amount of teamworking.
- Participative – group system – leadership have complete trust in subordinates, motivation is by economic rewards based on goals which have been agreed, all employees feel responsibility for organisational goals, there is communication throughout organisation and a lot of co-operative teamworking.

This resulted in Likert (1967) proposing a number of features of motivational management. Motivation to work should be based on mutual respect, reward and collaboration rather than through rewards and threats. Employees need to be valued in order for their self-esteem to be maintained or enhanced. Tightly knit and effective work groups need to be built up to achieve the objectives of the organisation. These work groups need to have existed long enough to have achieved a well-established working relationship, have mutual trust, share values and goals and work collaboratively with other groups.

The influence of teamwork on behaviour is reinforced by theories of social influence where people play a key role in persuasion and motivation (Turner, 1991). Social influence includes four theories:

- Social facilitation – This posits that people perform better, longer, harder when other people are present (Zajonc, 1965). However, for activities that are not well learned, performance may decrease with monitoring.
- Social comparison – Attitudes and behaviours of individuals are formed on the basis of others (Festinger, 1954). The effect is strengthened when it allows people to compare with similar others (Festinger, 1954; Suls, Martin and Wheeler, 2002).
- Conformity – This can work as a 'normative process' where people tend to change attitudes and behaviours to match the expectations, attitudes and behaviours of the group. (Turner, 1991; McGarty et al, 1997; Turner et al, 1987).
- Social learning (also known as Social Cognitive Theory) – This assumes that people learn through observing the behaviours and attitudes of others (Bandura, 1986), especially if they are similar to them but older/more experienced (Bandura, 1997).

These theories often emerge in the use of social sanctions to effect behaviour such as self motivated teams and profit sharing organisations because each worker effects the

performance of the collective (Kandel and Lazear, 1992). Guilt (an intrinsic motivator) and shame (an extrinsic motivator) are often the motivations here (Minkler, 2002). If a company succeeds in instilling loyalty and team spirit in its workers, then external sanctions for non-performance are less necessary because internal costs are incurred (guilt).

Contribution theories present an intriguing challenge for MUIs. They all emphasise the importance of teamwork and effective management, active participation and recognition and feedback on achievement. This needs to counteract the naturally isolating nature of call centre work since social interaction with colleagues is limited by the fact that advisors spend much of their time talking to customers and group cohesion is often limited by hot desking and flexible shift patterns.

3. Goal Directed Theories.

These theories explain motivation as a function of goal setting and the achievement process as a balancing act between pleasure and pain, equity and inequity and risk and non-risk.

Goal setting theory (Locke, 1968; Locke and Latham, 1990; Drucker, 1988) is highly prevalent in the call centre domain. This suggests that people need specific, challenging, attainable and measurable performance goals. If workers have set these goals themselves (Erez and Arad, 1986) and agree with them (Locke, Latham and Erez, 1988) they can provide direction for behaviours. The main problem in the call centre is that these goals are usually based around productivity statistics that the advisors have not set themselves and can cause employees to feel role conflict when they have to juggle the needs of the customer with the requirements of production (Amick and Smith, 1992).

Performance monitoring against these goals is also frequently done electronically (see section 2.4). Reward and punishment through monitoring produces behaviour changes (Turner, 1991) that are reinforced by operant conditioning (Skinner, 1974). For surveillance technologies to change behaviour they must be overt not covert (as in the Panopticon – see 2.4.2). This can lead to public compliance without private acceptance as people exhibit these behaviours

when being watched but don't change their attitude (Kelman, 1958). The act of monitoring performance has also been linked to increased stress (Aiello and Shao, 1993; Smith et al, 1992; Gallatin, 1989), decreased job satisfaction (Cahill and Landsbergis, 1989; Grant and Higgins, 1989; Irving et al, 1986), perceived loss of control (Smith et al, 1992) increased feelings of social isolation (Aiello, 1993; Amick and Celentano, 1991; Amick and Smith, 1992) and increased perceptions that quantity is more important than quality (Gallatin, 1989; Shell and Allgeier, 1992). To the extent that the employee has control over the type of performance data collected and presented, the greater the impact on employee motivation and performance (Earley, 1988) since these can lead to feelings of task mastery and a greater sense of control via the ability to make informed decisions about work strategies (Amick and Smith, 1992).

It has been suggested that goal directed motivation is successful because it generates better planning rather than engaging better motivation (Smith, Locke and Barry, 1990). However, increased workloads and time pressures can offset the motivational advantages of bonus led pay (Locke et al, 1980; Rothe, 1960). This may lead to diminished opportunities to exert control or to seek social resources to meet demands and can exacerbate the effects of tension and fatigue resulting from the effort to achieve higher pay.

Vroom (1964) proposed 'expectancy theory' as a more cognitive explanation of goal directed motivation. He suggested that momentum towards goals depends upon:

- Expectancy (perceived relationship between effort and performance) – does the person believe that the goal is achievable?
- Instrumentality (perceived relationship between performance and outcome) – if the goal is achieved, is the outcome desirable?
- Valence (desirability) – does the outcome achieve results that the person values?

These are expressed as probabilities that translate into actions that will maximise pleasure and minimise pain. The theory is based on the belief that the effort of an individual will lead to performance and performance will lead to rewards (either positive (resulting in high

motivation) or negative (resulting in lower motivation)). This can explain why people can start to limit their contribution rather than becoming increasingly motivated under a goal directed model (Seddon, 2003; Amick and Smith, 1992). The effects of this can be counteracted by supervisory support, which is essential as a social resource for coping with work demands (Coch and French, 1948; Amick and Smith, 1992).

Regulating this process are perceptions of equity. Equity (or inequity) is a psychological state residing within an individual. It creates a feeling of dissonance that the individual attempts to resolve in some manner. Equity is a social comparison process, resulting when individuals compare themselves to similar others.

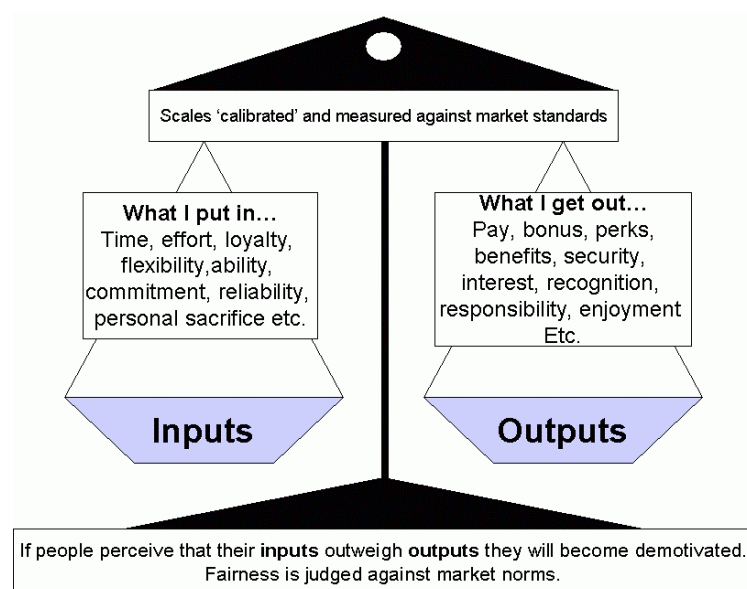


Figure 68: Adams' Equity Model (1963).

Adams (1963) proposes a social exchange or equity theory of motivation, where people compare their inputs with what they perceive that they are getting in return (the outputs). When the perceived ratio of inputs to outputs is in balance, the individual perceives equity. Inequity is experienced when the ratio is out of balance.

This perception of equity or inequity can result in behavioural changes (Minkler, 2002). The implication is that a fair worker will be honest with an honest employer and dishonest with a company that they perceive has broken promises. The extent to which the person indulges in this will be governed by an individual's internal moral principles rather than the behaviour of

others. Adams (1963) suggests that the individual response to inequity includes reducing job effort and decreasing performance (again explaining reduced rather than increased contribution), attempting to increase pay or attempting to increase the performance of others, generally through peer pressure. Rather than violate moral principles, some people choose to leave the organisation rather than decrease their performance (Bok, 1978).

McClelland (1988) suggests that behaviour can also be moderated by an economic theory of risk versus control and achievement. High achievement oriented people will work to influence the outcome of a task by minimising risks and influencing outcomes. If high achievement people start to fail or miss their performance targets, their reaction is to 'cheat' - they do anything they need to do to keep their manager happy. This causes behaviour such as 'call bouncing' where advisors hang up on difficult customers – to the detriment of customer satisfaction. People start to look at the incentives rather than the reason for them and their energies are engaged in surviving rather than improving performance. Call centre managers are essentially inspectors, setting and monitoring work standards, productivity and procedures. As a consequence, management becomes concerned with managing people's productivity. Paradoxically, managing productivity can undermine productivity (Seddon, 2003).

It would be easy to entirely base the MUI model of motivation on goal directed theories since performance statistics from the call centre's management information systems are readily available. Although it is logical to incorporate them because they are an integral part of the current call centre motivational regime, they look to be insufficient to gain more than short-term behavioural changes.

4. Enjoyment /Gratification theories.

Work motivation theories are dominated by extrinsic theories of motivation (mainly because, as Csikszentmihalyi (1975) points out, it is easier to gather empirical evidence to support them). Work and play are assumed to be two separate and even opposite conditions in most of the motivational literature. Work is assumed to be "grim and unpleasant" and management

of behaviour is based on the tacit belief that people are rewarded only by external rewards or by the fear of external punishment (Taylor, 1911).

In Western societies there seems to be a vast gulf between the concepts of work and pleasure. The Taylorist approach of scientific management tends to exacerbate this by emphasising optimisation of functionality, whilst simplifying complexity and minimising pleasure at work, whilst at home we do the opposite (Sengers, 2003). However, the move towards the “experience society” (Pine and Gilmore, 1999; Jensen, 1999) requires a move away from traditional engineering approaches (including traditional HCI) and towards a more hybrid, multidisciplinary approach to both organisational and technological design (Sengers, 2003; Norman, 2003; Ehn, 1998; Wilson, 2002; Shneiderman, 2002). There is a need to evolve theories emphasising quality of experience rather than simply increasing efficiency.

Experiences, enjoyment and motivation are all subject to individual interpretations and are a product of what the user brings to a situation. Qualities such as enjoyment and fun are not properties of technology; they are outcomes of experiences with or through technology (Wright, McCarthy and Meekison, 2003). This implies that these cannot be designed. However, an understanding of what constitutes an experience and why people enjoy doing things can facilitate motivational design.

Intrinsic motivation, according to Murphy (1947), posits both physiological and activity drives with respect to pleasure. In other words, we perform intrinsically motivating activities because we enjoy both the novelty and challenge of performing them. The earliest theories of motivation, including psychoanalysis (Freud, 1950), were rooted in hedonism. As with operant conditioning (Skinner, 1974) these theories posit that we seek pleasure and try to avoid pain and anxiety. Emotional responses are critical to the formation of plans of action, attitudes and behaviours. It is, however, surprising that there are very few models of emotional motivation in existence in the psychological literature (examples include George and Brief, 1996; Pinder, 1976). It is suggested that most cognitive researchers and management theorists still regard emotion as a thing to be tamed (Fineman, 2000; Cacioppo

and Gardner, 1999) and that emotion research cannot, by its nature, be objective, detached and scientific. Emotion research is difficult to perform quantitatively. This is because emotions and private feelings do not necessarily correlate, nor can individuals actively articulate them. Emotion and feelings are also continuously changing in response to interpersonal, group, contextual and political influences. Many emotional experiences will be fleeting and confused. There are cultural constructs (particularly in a work situation) that determine codes of appropriate emotional display so observable emotional behaviour may be inhibited or disguised.

However, emotions are important to consider in the context of motivation because they direct the most primitive and unconscious reactions on a physiological level, provoking actions to meet needs and goals (Tomkins, 1963) and providing internal warnings that keep people from harm (Zajonc, 1965; LeDoux, 1996; Kagan, 1994). Brain research (cited in Klein, Moon & Picard, 2002) suggests that autonomic reactions from the amygdala (one of the most primitive parts of the cerebral cortex), can trigger elevated levels of adrenaline and other neurochemicals in the body which, in turn, can cause diminished abilities with respect to attention (Kitayama and Niedenthal, 1994), memory retention (Kahneman, 1973), learning (Lewis and Williams, 1989), thinking creatively (Isen et al, 1987) and polite social interaction (Goleman, 1995). These can impair the effective performance of people like call centre advisors who are engaged in emotional labour (Hochschild, 1983). The implications for the user interface designer are outlined by Norman (2002) when he points out that “negative affect can make it harder to do even easy tasks while positive affect can make it easier to do difficult tasks”.

Leventhal et al (1983) suggests that motivation is a combination of emotional and cognitive contexts. Emotional interpretation is an instinctive response based upon subjective information (e.g. style, aesthetic, delivery) and cognitive interpretation is a more strategic response that depends upon objective information. Emotional interpretations can override both cognitive and logical ones (Lipkus and Hollands, 1999; Gloyd, 2003) but are often *justified* cognitively in rational terms on a post hoc basis (Leventhal et al, 1983). Emotional

response is critical to the formation of an appropriate plan of action based on the information that users have in front of them. This points towards a link between a pleasurable user experience and greater motivation to use technology (Davis et al, 1992).

Jordan (2000) mirrors Leventhal's emotional and cognitive contexts by defining practical and emotional components of pleasure by adapting Tiger's (1992) hedonistic framework. This comprises:

- Physio Pleasure: This includes pleasures derived from the senses.
- Socio Pleasure: This is the enjoyment derived from relationships with others.
- Psycho Pleasure: This type of pleasure pertains to people's cognitive and emotional reactions.
- Ideo Pleasure: This concerns people's values.

Most motivational theories of pleasure tend to focus on 'psycho pleasure' with referents to the other pleasures in Jordan's model. Various theories addressing intrinsic motivation and pleasure suggest that there are a number of needs that are satisfied by pleasurable activities (Callois, 1958; Csikszentmihalyi, 1975; Malone and Lepper, 1987). Humans have a need for fantasy, escapism and to be creative. They also have a tendency to enjoy the challenge of competition.

There is a need to be in control. This includes the extent to which people have the authority to make their own decisions and the user's feelings of being in control of the interaction (what Laurel (1993) terms 'engagement'). In jobs with high demand and low control, the result is often stress so increasing decision-making authority can improve well-being at work (Karasek, 1979). This includes the ability to personalise technology and the ability to see the effects of actions to give a sense of agency or personal power (Brandtzaeg et al, 2003).

Challenge, including the ability to use and develop skills, is linked to self efficacy (Bandura, 1997; Deci, 1971; McClelland, 1975). This posits that people are motivated by a need to be effective. This involves monitoring and evaluating actions in order to decide which activities to engage in and master. Low self efficacy is likely to mean that the use of technology is not

perceived as rewarding and it is less likely that it will be used in the future (Eastin and LaRose, 2000). As skills are acquired and mastered, activities will gradually become intrinsically satisfying (Dreyfus and Athanasiou, 1986).

Co-operation and sociability, including the overall levels of helpful social interaction from both colleagues and managers, is important in designing a good user experience (Thackara, 2000). This implies designing technology that promotes collaboration, thus increasing motivation through a social facilitation effect (Zajonc, 1965). It is more rewarding and motivating to do things in the presence of others because of the increased effects of arousal (Zajonc, 1965; Battarbee et al, 2000). Social cohesion (Cartwright and Zander, 1960) also comes in here since being part of a community provides increased motivation to participate in the activities of a group. High levels of social cohesiveness has been positively related to well-being (Sonnentag, 1996) through attention of others, social comparison, emotional support and sympathy (Hogg and Abrams, 1993). Jordan (1997) considers pleasure with products to be characterised by social relations and communications enabled by the product – bringing people together and providing topics for discussion in conversation. High levels of social support are important in providing good effects in the interaction between demands and decision latitude (Karasek and Theorell, 1990).

Csikszentmihalyi (1975) defines the ultimate motivational state as a state of 'flow'. 'Flow' is a balance between goals, abilities and subjective feelings. It is "the holistic sensation that people feel when they act with total involvement". This is a state where the individual is neither bored nor anxious and is where action and awareness merge. When in a state of flow there is a "narrowing of consciousness" and a loss of ego. This state of experience is intrinsically motivating in itself. For work situations to achieve flow it is proposed that there needs to be:

- Activities with clearly designed beginnings and ends.
- A limited stimulus field to allow the merging of awareness and action.
- Clear goals and immediate feedback.
- Competence and a chance to be in control.
- Complete concentration required.
- Unambiguous criteria of right or wrong.

Appendices.

- Matching of skills with demands so that people are neither bored nor worried.
- A feeling of control over the environment.

Flow relies on a mixture of simplicity and challenge (Csikszentmihalyi, 1975). Routine and repetitiveness induces boredom. Variation can be seen as harnessing the human need for novelty, surprises, spontaneity, freshness and unpredictability. A certain degree of unpredictability has been deemed necessary for the experience of fun (Davenport et al, 1998) and inducing curiosity (Skelly, 1995).

Csikszentmihalyi (1975) suggests that the role of extrinsic motivation in work is greater than in play. However, work could be enriched if the pattern of action provides flow experiences, requires no goals and rewards external to itself and takes into account the issue of control (White, 1959; DeCharms, 1968; Deci, 1971; Lepper, Greene and Nisbett, 1973). This depends on whether the person initiated the act (they will enjoy it) or was forced to do it (they will regard it as drudgery). Status, power and money are signs that one is competent and acquiring control but they are secondary rewards that only matter when the primary enjoyment that could be had from the action itself is not available.

Unfortunately, the act of minimising variation (as frequently practised in call centres) tends to minimise the opportunity for flow. If the situation is routine, flow may occur if it is relaxing and absorbing with some amount of technical accomplishment and satisfaction. In a complex activity, mundane aspects can be relaxing rather than boring. This suggests that motivation is largely a factor for job design with work activities needing to be restructured to make them more challenging and enjoyable. Jobs that are designed as a set of ordered, unified activities with manageable challenges encourage flow.

Although job design is beyond the remit of the MUI, there are many instances of technology encouraging enjoyment flow and pleasure regardless of performance and efficiency implications (Carroll and Thomas, 1988; Deci, 1975; Malone, 1981). Much of this evidence comes from the world of computer games and entertainment technologies (e.g. Holbrook et al, 1984; Malone, 1981) and there is some question as to how this translates to usage of

Appendices.

computers in the workplace (Carroll and Thomas, 1988). According to Brandtzaeg, Folstad and Heim (2003), this seems to hinge around whether technology is perceived as a tool (extrinsic motivation related to completion of a well defined task) or a toy (intrinsic motivation relating to actions which are perceived as rewarding in themselves). The MUI is definitely not a toy and is required to complete the fairly well defined task of serving the customer. However, it can be used in a toy-like way by seeking to facilitate the accomplishment of actions that are intrinsically motivating.

Appendix B: Factors Used in Field Observation.

As part of a 'quick and dirty' ethnographic approach to field observation, guidelines to rapidly focus initial observation on key factors in the call centre were constructed. These included looking at:

1. Physical and Temporal layout:
 - Are teams co-located?
 - How do individuals interact with colleagues?
 - How are desks organised?
 - Are personal spaces personalised?
 - What information is available in the environment?
 - What aspects of work are time dependent?
2. Tasks and activities:
 - What are the skill sets and responsibilities of advisors?
 - What call types do they typically take?
 - What are the features of a typical call?
 - How is work monitored?
 - What measures are used?
 - What tools do they use to accomplish their task?
 - How does interaction with the system help/impede their tasks?
 - What knowledge sources are used?
 - How do advisors work with each other?
 - How do advisors work with others outside the team?
 - What communication resources do they use to communicate with each other?
 - Organisational memory – how do people learn and remember how to work?
 - What motivates them?
 - What makes a good customer experience?
 - What helps/prevents advisors from delivering a good customer experience?
 - How are advisors controlling their emotions? Are the emotions expressed to the customer different to the emotions that they are displaying in the call centre? How are these emotions expressed?
 - What motivates advisors? Observe what is on their desk – e.g. awards, cups, mementos.

Lower level observations.

This stage involves more directed observations. Much of the data capture performed for the MUI studies have involved simply documenting observations as they happen, including:

Appendices.

- A rough notation of customer-advisor dialogue.
- Systems navigation – functions performed.
- Information requirements:
 - What information is needed by the advisor and where is it from?
 - What information sources are available for reference? Typical options include:
 - From the head;
 - From colleagues;
 - From systems;
 - From paper records;
 - From supervisors/ managers;
 - From information displays.
 - What information is needed from the customer?
 - What information is essential/ required?
 - What information is just good to have?
 - How is this information used?
 - Is it recorded electronically (and if so where? What database? What screen? What fields are used?)
 - Is it recorded in other ways (e.g. paper).
 - Who uses the information?
 - Is the information currently recorded sufficient for the task at hand?
 - Is there any redundant information that is not used?
 - How do they ensure this information is up-to-date?
 - What information is taken from the information system(s) available? (Again record details of the database, screen and fields accessed).
 - Which are used and which are not? Does this vary with user experience?
 - Where is this information to be found? What form does it take?
 - Is there additional information required by the advisor that is not currently available?
 - Where knowledge is obtained and at what points during dialogue is it required.
- Customer care protocols – e.g. salutation and closure.
- Emotional leakage – this includes evidence of 'digital fidgeting' such as playing with the mouse, a pen or other desktop bits and pieces plus body posture and facial expressions. It also includes any comments made to colleagues or actions performed as a result of the emotional content of a call.
- Analyse User Interaction Needs - this includes looking at any human computer interaction challenges including:
- Is the system easy to use?

Appendices.

- Is keyboard interaction on-line with the customer a problem (and, if it is, do advisors ever resort to using paper and typing in off-line. What would they be more comfortable with?)
- What do they think of the current system? (SUMI questionnaires can be administered at this point).
- What are the particular problems with the current way of working?
- What is an ideal day? What is the most fulfilling aspect of their work?
- What makes a bad day bad?
- How important is the computer to them?
- What is their current pattern of working/ mindset? (This impacts on the user-centred design philosophy of using the user's mental models).
- Look at individual differences between operators (e.g. male- female distinctions, different interpersonal styles, different levels of knowledge).

Appendix C: Example POW Scripts.

The following scripts provide examples of call handling scenarios that were used in the design of the POW interface.

The 'players' are as follows:

- A = Call centre advisor.
- C = Customer.
- I = Interface.

Scenario 1: Welcome and customer validation.

A: Good morning! <Company name>, Angela speaking. How may I help you?

C: Hello, would you like my customer number?

A: Yes, please.

C: It's ST 4567 3499 Q028 BL

A: Types number onto peel off note.

I: Phonebook opens at the customer summary page.

A: And your name please?

C: Melanie Kaplin.

A: And the address?

C: 13 The Reaches, Northampton...

A: Okay, Mrs Klein, how may I help you?

Scenario 2: Billing Script.

Welcoming.

C: I've just received a red reminder...it should have been put into my ex-boyfriend's name.

A: Drags customer account number onto the Bill File.

I: Bill file opens at the customer's account number.

A: Let me just check the details... we don't normally change names.

A: Bill pages turned to last page to look for notes.

I: Changes pages by mouse input on the corners of the pages.

Appendices.

A: No, there's nothing on here at all. We wouldn't agree to change names. You need to sort that one out between you. You'll need to speak to credit control and sort this out. No one has spoken to anyone here and we'll need to have him call us to confirm details.

C: Okay, thanks, I'll speak to him then.

A: Annotates bill with a peel off note.

Scenario 3: Moving House Script.

Welcoming.

I: Phonebook opens at the customer summary page.

A: How may I help you?

C: I'm changing my address because I'm moving soon.

A: You'll need to give us 24 hours notice when you'd like your phone stopped at your current address.

A: Drags customer's account number onto the Streetfinder.

I: Streetfinder opens at the customer premises.

C: What about at the new address?

A: Where are you moving to? What's the new address?

C: 13 Whitton Road, Parkstone, Poole.

A: Types customer's new address onto a peel off note.

A: Drags peel off note onto the Streetfinder.

I: Streetfinder opens at the customer's new premises.

A: Looks at line field on customer premises.

A: Okay, there's already service there. When are you moving?

C: I'm not 100% sure yet. Will I have to change my number?

A: Which area are you moving from?

C: I'm in Blandford at the moment.

A: Looks at line field on customer premises.

A: I'm afraid that you'll have to change your number because you are moving to a different exchange area.

C: How about our phone bill? How is that changed?

A: We'll stop it at the old address and start it at the new. We'll send you a final bill and then an initial bill for the new connection. Or we can do it as a continuous bill, if you'd prefer.

A: Types a peel off note to leave on the new premises page.

C: Okay. Can I have the two bills, please?

A: No problem, I'll arrange that. As soon as you get a date just call us back.

C: Okay, thanks.

Appendix D: Extract from Futures Workshop for Banking MUI.

Attendees: Service Advisors. 3 Female, experienced advisors, working part time, 2 aged 30 – 40 and 1 aged 20 – 30. 1 Male, new advisor, working full time, aged 20 – 30.

Likes:

- Talking to people/customers.
- Team.
- People working with.
- Helping people.
- Variety of role / interesting job content.
- Mixing different jobs / roles – wide experience range.
- Chance to move on by taking mortgage qualifications etc.
- Flexible hours / rosters – fit around a family.
- Being part time – stops boredom and repetitive nature of job.
- Little bit of competition – between teams etc.

Dislikes:

- Taking calls all the time can be very repetitive.
- Always doing the same shift, on the same type of call – e.g. Mortgages.
- Customers don't realise what the job is like, expect one advisor to know everything. This is not realistic.
- Customers complaining.
- No closure in role. Advisors do what they can, then pass documents (e.g. mortgage applications) to be signed and off to another department for the rest. Advisors get feedback right at the end if everything has gone through ok, but they see nothing in the middle.
- Measures – particularly lead generation. Work in service should be about dealing with a customer and helping them – not about pushing things to them they don't want.
- Targeted on everything. Too many restrictions – need more trust. Advisors are under sales targets, which are good – the make sure you work hard; but advisors are also

penalised for poor talk times, regardless of how well they are doing at their sales targets. People fiddle talk time stats to stay on top. There needs to be no mixed messages. Management should be clear about what they are wanting and what advisors should be aiming for. "People are frightened to stop working". Systems don't help – if they freeze then you can't do anything, but this is not always taken account of in talk time.

- Repetitive nature of job.
- Big Brother – always being observed.
- Pressure of targets stops fun.

What makes a job good?

- Being accountable for what you do – taking responsibility.
- Closure – to know you've helped.
- Feeling like you have done / achieved something.
- Positive attitude – individual / teams / company.
- Team spirit
- To be recognised – thanked.
- Bonus.
- Challenge – to be able to work at something.
- Career progression – ability to transfer skills and move on.
- Getting on well with manager.
- Being left to get on with work – not having a manager on your back all the time. Just there for support if needed.
- Freedom and control. It is important to be treated like an adult, not like being at school.
- Should be treated well by team / management / company if you show commitment.
- Recognition that different people are good at different things – tailor jobs around this.
- Choice – having choice in what you do each day – how you arrange your day.
- A clearly defined role.
- Being with people – do not want to be isolated.
- Chance to progress and learn.
- Praise and recognition – personally as well as team:
- "Money isn't everything".
- Fun at work – although a choice in whether to take part is needed. Sometimes people will not want to join in.

What makes you stay at a job (even when difficult)?

- Paid well.
- Many benefits.
- Lovely people.
- Good management.

Appendices.

- Good company culture:
 - Look after staff – development.
 - Look after customers.
 - Goes one step further than necessary.
 - Feel like they care.
 - Help staff with all they need.

Future ideas:

- Flexible shift patterns. This would be really good, but would need to be regulated or fixed to a certain period of time so that you could plan your week.
- One password. Great idea.
- Multi-skilled and multi-specialised. Good idea, must make sure there is a balance between choice and regulation. Advisors should be able to choose from those they are good at. If there are some they are not, or they do not like then these should not even be part of their choices.
- Specialists in each area – this may work, although there is not time to check everything. Advisors need to have the information and be able to deal with customers themselves.
- Roles should reflect individual skills. Great idea – for emails even, some people are better at spelling than others. Some people prefer to talk.
- Managers taking calls so they are up to date on procedures. A good idea, although you don't just go to managers for help. Normally grab anyone, or ring support lines. Lots of managers do take calls already – mainly ones that were advisors. Many managers were never advisors, so taking calls would be hard. Would be good if managers really understood how advisors worked.
- Targets are linked to shift patterns – should take account of whether working part time or full time etc.
- Personal Development. This is important. Relevant training should be available – courses that do develop skills, not just basic knowledge. All round understanding courses would be great. Business development would be a good idea – ability to progress through the entire company not just the call centre.
- Trust. More trust from managers. Generally advisors do trust each other.
- Rewards. Bonus vouchers are a great idea – really good amounts that make a difference. Cash bonus based on company performance is great.
- Teams / Buddies. Good idea to buddy. Team challenges are good, but must be able to choose if you want to be involved or not. These do not motivate some people. Team days out would be great. Important for teams to sit together, and to see what they are all up to.
- Bubble scripts – would be really useful for those teams that do have scripts.

Appendices.

- Control. Advisors would like more control over what they do, not constantly having to go to managers for decisions, who in turn have to go to their managers.
- Relaxation room. Great idea. Would love to be able to get away from desk and take 10 minutes. A microwave, gym, free massage etc.
- Perks. These are important – hairdressers / beauty / gym.
- Need to feel like advisors are getting something back from the company.
- Must design jobs around people's skills and their likes and dislikes. If they do a job they enjoy they will do it better.

Appendix E: Retail Bank MUI Scenarios.

Scenario 1: Tracey, the Service Advisor.

Tracey arrived at work early, the bus had been on time and traffic had been remarkably clear for eight thirty in the morning. She was in good spirits and was looking forward to the challenges that lay ahead. Yesterday had been pencilled in as a day off but call volumes had hit an unexpected high and, being a designated home worker, she had been rung by her manager and asked if she would mind logging on for a couple of hours from home. The children were still at school and it had been a welcome injection of overtime money to go towards the impending family holiday to France. Tracey hadn't been in the call centre for about 5 days and she was looking forward to catching up on some of the gossip (especially since Catherine had just come back off her honeymoon) and seeing everyone for their weekly team briefing.

She found her team space and was waved at by Rebecca, the team manager. Rebecca had Tracey's desk allocation for the day and she was shown a space facing Geoff and Marge. She turned on her machine and used her OnePassword to log onto all the systems that she needed to do her job for the day. She had a couple of minutes before log on time so she had a quick scan of some of the team news on her personal team space bulletin board. She was delighted to see that some of Catherine's wedding photos were online and made a mental note to look at that later after she'd checked the new mortgage offerings that had just been announced. She also noticed that a new team member, Frank, had just joined the team as part of the secondment programme from the branch network – Jennifer from their team had left a few months ago to job swap in a branch.

As the clock hit nine, Tracey made herself ready to take calls and was almost instantly doing what she liked best, talking to customers. She was on both the phone and e-mail queues and at rare quiet periods of the day she could choose to do some e-mail. She'd been initially nervous about non-phone contacts but, after the induction training, now really enjoyed e-mail and internet chat as a change. She was also still recovering from a bout of laryngitis that her 7 year old son, Jamie, had kindly donated to her a few weeks ago and found that her voice wasn't always up to the strains of an 8 hour day on the phone.

Tracey's first email was from Ms Maria Jones, she wanted a loan to buy a new car. By typing Ms Jones' existing account number into the system, Tracey had instant access to her previous loan history, as well as any other details the bank held about her. Ms Jones already had both a FlexAccount and a buildings and contents insurance policy with The bank. She had a quick look through this and then e-mailed the customer back with loan advice and a suggestion that she could also get car insurance from the bank – providing a link to more information on the internet.

Her second was a general mortgage query from a Mr Partridge. He wanted some information about the bank's mortgage services since he was selling his house to move in with his fiancée who was also selling hers. As well as moving to another part of the country they were also retiring so there was a lot to take into account. Tracey also noticed that Ms Jones had no home and contents insurance, and decided to try and sell her some from the bank. Although Tracey's particular speciality was personal loans, she had wanted to progress so had started choosing more contacts containing mortgage enquiries specifically and was working on getting her CMAP qualification since she fancied moving from service into mortgage sales and advice.

Before sending the reply she had drafted she asked Geoff, the mortgage specialist of the team, to have a quick read. She wanted to make sure she was giving Ms Jones the correct information as she would now be her point of contact with the bank, she would manage things for her until everything was complete, so she wanted to make sure everything was right from the start!

Each team had experts in all the main contact areas – Banking and Savings / Mortgages etc, so there was always someone on hand to help. If supervisors or experts weren't available then there were always the team leaders. They all took turns to deal with customers (at least for one day a month), so every team leader was up to date with the latest procedures and could help out.

A new technology had recently been introduced to the centre that meant that any customers contacting them to check their account balance or find out about interest was handled by the automated system. It was really easy for customers to use, and meant that most of the time any member that came through to an advisor had really juicy queries you could get your teeth into! Tracey no longer had to deal with about three thousand balance checks a day.

Just before lunch Tracey's team had a meeting with the team leader, Rebecca – this was quite informal, and a chance for the team to get together and discuss any issues, get news from head office or give any feedback. Andy had been doing some work on the redesign of the new CRM system and asked the team to feedback any comments on a pre-release version of the software that the development team wanted to have sanity checked. The team also used this time to recognise people that had done well that month. Rebecca always gave them the option to chuck her out for a portion of the meeting if they wanted to discuss things without her being around. They had done this in the past – but they were generous enough to allow her to stay today!

She stayed behind briefly to have a quick chat to Rebecca about adjusting her targets for the year since she was taking on more mortgage work. She and Rebecca often had meetings either around at Tracey's house in her study or via video link so, even if she wasn't in the office, she knew that Rebecca was always there. Tracey agreed to draft up some new objectives for Rebecca to agree.

Tracey caught up with the team for lunch and then returned for the afternoon shift. As sometimes happens Tracey started to suspect that she had the misfortune of getting on the direct line to hell – some days were like this and, with the mundane calls automated away, calls that came her way were not always the easy ones. Bad calls were like buses; they seemed to come in packs.

One call was from a Mr Holloway, he was worried that his pay from work did not seem to have arrived in his account and he really needed it as he was off on holiday. Tracey accessed all the details she needed and could see that there was no money waiting to go into Mr Holloway's account. She decided he would need to do some fishing around to find out what was going on, so asked Mr Holloway if he would be happy to leave it with her and she would call him back as soon as she found something out. Mr Holloway reluctantly agreed and Tracey got on the case. She contacted a number of other departments in the company and finally found out that his employers had entered Mr Holloway's account number incorrectly. She managed to get hold of their pay department to rectify the problem. They swore to try their best to get the money into the correct account, as well as trace where they actually had paid the money.

Tracey felt that although sorted out, this would not help Mr Holloway as she knew he really needed the money today. She consulted Rebecca and after getting an email of confirmation of 'intent of payment' from Mr Holloway's employers, she rang him back with the news. "Hello Mr Holloway, it's Tracey here from The Good Bank. I have traced the problem – your employers made a mistake and paid the money into the wrong account. They are rectifying that for you as we speak. That will however, take a few days to come through, and I am aware you need that money today. I have arranged for the bank to credit you the amount immediately so that you have your money. I hope this is ok, sorry for any inconvenience." Mr Holloway was ecstatic and thanked Tracey for her help.

Rebecca wandered over to see if everything had been sorted out to the customers' satisfaction. Tracey was pleased at the outcome but felt exhausted so Rebecca asked whether Tracey would like her to call out the site masseuse for an at-seat stress relief session or whether she'd simply like a quick break in the relaxation room. Tracey opted for the relaxation room. She got a hot chocolate and sat on the sofa watching the news headlines on BBC News 24 with subtitles as some chill out music played in the background. The

knowledge wall's fish seemed oddly synchronised to the music as she watched them out of the corner of her eye on the plasma screen in the corner of the room.

She returned to his desk refreshed and ready to embark on the final stretch of calls for the day. She bumped into Bill from the sales team on her way out. He was floating on the euphoria of a perfect day and offered her a lift home that she gladly accepted since she knew he lived not a million miles from her – the bus was often jam packed at that time of day, which was one of the major perks of working from home.

**Workshop Results Highlighted in “A Day in the life of Tracey – the Service Advisor”
Scenario 1:**

- Flexible and home working and flexible workforce – the ability to work flexible shifts or work from home if you are suited to do so. Ability to call upon home workers to cover busy periods at short notice.
- Desk allocation – hotdesking means that teams often don't sit together since space is at a premium. Providing home and flexible working arrangements frees desk space up to provide teams with a little more flexibility in terms of co-location.
- One password for all systems means that there is less time and hassle required for the process of logging on in the morning. This time can be reallocated to reading and team building.
- Time to read and digest news that advisors need to do their job.
- Team spirit - awareness of who is in your team and team news.
- Being able to talk to your team – tacit knowledge sharing and greater sense of team working. “I like my job because I like the people I work with”.
- Advisors thrive on being able to talk to customers – 9 out of 10 said that this is why they get out of bed in the morning. They also thrive on being able to solve customers' problems.
- Multimedia blending – not just telephony but e-mail and internet. “Taking calls all the time can be boring”. Ability to choose voice or e-mail contacts according to personal preference, aptitude and how you are feeling. Training given for different media.
- Ability to do other contacts when the voice isn't quite up to being on the telephone all day – an addition to admin tasks currently done on “99% days”.
- Choice and control over type of work, workstyle and work load – can plan and execute at advisor's discretion.
- Access to complete customer histories.
- Using the information on the internet more effectively with customers and using the intranet as a knowledge portal.
- Career progression – options both within the call centre, secondment opportunities outside the call centre and job swapping.

Appendices.

- Closure and end-to-end responsibilities rather than having to continuously hand off to other people and other departments. Being accountable for what you do and taking responsibility for your actions with the customer (if appropriate – reservation was that this could start to take over your day so it needs to be on a value add basis). Advisor as single point of contact with customer when possible and appropriate.
- Having a mixture of expertise in teams and building local experts. Learning on the job – especially since it takes a few years to really acquire the breadth and depth of knowledge to do the job well. Recognition that different people are good at different things and building teams and jobs around this. All contribute to team success by bringing different skills to the area.
- Ensuring that team leaders don't lose touch with operations and keep up to date.
- Automation of boring, repetitive calls so that advisors are freed up to take more complex contacts.
- Team meetings, events, knowledge sharing and feedback opportunities – feedback both down and up.
- Getting more front line upwards involvement to improve customer experience systems and processes. Feel appreciated and listened to.
- More reward and recognition on a local level and encouraging open and constructive (i.e. not just negative) feedback. A simple thank you often says more than a grand gesture or something more formalised.
- Targets appropriate to job (not simply talk times and sales leads) and set individually then agreed with manager. Sales leads should only be done when appropriate rather than pushed when the customer obviously doesn't want it. Recognition for personal development because not everyone can be high flyers.
- Being treated like an adult not a child – trusted to do your job not punished for the few that don't pull their weight.
- Stress relief and relaxation permitted by management. Management not on your back all the time. Not feeling as if you are being constantly watched but getting support when you need it.
- Feeling that you have achieved something at the end of the day.

Scenario 2: Rebecca, the Service Team Leader.

Rebecca was the manager of the Serene Team. She liked to think that they were aptly named since she liked to maintain a happy, calm and fun outlook on life. She managed a team of 8 people – one new secondee, Frank, had just come up from the Academy Team to join this week. He'd been working in the branch network for just over a year (as had she until three years previously) and was well used to customers but was new to call centre work so she had asked Leroy, if he'd mind buddying up with him for a month or so as he got more confidence in the job. Leroy was one of Rebecca's high flyers and was consistently meeting his personal development targets as well as getting a high sales conversion rate. He was

definitely a future candidate for the Service Manager Development Programme and a buddy job would help develop the management confidence that he needed to do that. His personal targets would give him credit for buddying and would count towards promotion prospects.

Once she'd introduced Frank to Leroy, she'd had to find a desk for one of her teleworkers, Tracey, who was coming in for a nine o'clock shift. The Serene team were allocated an area where team members could desk share and Rebecca had some leeway on desks around that area so that she could accommodate flexible working patterns without the need to locate people away from the team or put them in overflow accommodation, away from the energy and buzz of the rest of the call centre. She'd made a point of getting Tracey a seat opposite Geoff and Marge so that they could at least catch up on things that had happened since she was last in the office. Rebecca often nipped over to Tracey's house to make sure everything was going okay but there was no substitute for team contact so she encouraged Tracey to come into the call centre at least twice a month.

She had a team meeting planned just before lunch today – always a challenge with multiple shift patterns to deal with but she'd managed to get all but one in with a minimal overtime implication - but first she had a review with Abigail, the team coach, who had just finished the round of call monitoring which took place every month. If possible, each advisor would have a sample of three calls marked and Rebecca would go through any action points and training actions that needed to be taken after everyone had been given their one-to-one coaching. Feedback on calls was often instant – so advisors knew when they had been monitored and how well they had done prior to Abigail's coaching meetings.

The team meeting was interesting. Catherine had volunteered to write up some minutes so that Marge, who couldn't make it, could at least see what had been talked about. Andy had been nominated as a tester for the new CRM system and there was a lot of discussion as to the practicalities of some of the new designs. She also had the pleasure of singling Leroy out for an prime example of "Exceeding Customer Expectations" for his work arranging a cheque transfer for a customer who'd taken her Invest Direct card with her to Australia only to find that she couldn't use it abroad and didn't have enough money in her Flex Account to cover her holiday spending. She also covered some of the positive feedback that she'd got from Abigail's quality call monitoring – since they'd all done so well she produced a box of Celebrations for everyone to scoff during the next few days (although she suspected that they'd be all gone by 6pm with some of the team's reputation as prodigious consumers of chocolate). As usual she'd asked if the team wanted to discuss anything without her in the room but they'd declined and then gone off for a rare team lunch break together.

After the meeting she'd had a quick chat with Tracey. As a home worker, Tracey often just liked to grab a word with her and, since she was looking to move from service to a more sales

oriented position, she was regularly reviewing her targets to give her credit for the new work she was taking on.

Rebecca would occasionally go online to take calls at periods when the switchboard was on meltdown and also as part of her own personal development. She had worked her way up the ranks over a period of four years (one year in a branch, three in the call centre) and liked to keep her hand in so that she could keep up with the ever-changing nature of the the banking universe. At times when the team were out she was happy to log on and talk to customers and happy that there were tools like 'Ask Amy' around to help her out when she was a bit rusty on a few of the more awkward customer requests.

Tracey tested her in the afternoon with a complex problem regarding a customer who had not received their wages when they'd expected them and was about to go on holiday. The customer was a long time Good Bank member so she'd given Tracey some leeway to resolve the problem, crediting her with initiative time without penalising her talk time target. Tracey had done well but Rebecca knew that the afternoon had been a stressful one for her and asked whether she'd like a quick at-seat massage (which a lot of advisors appreciated) or a bit of time out in the relaxation room since they weren't too pressured in terms of call volume at that moment. Rebecca loved to keep the team happy with these perks and knew that the level of service that her people provided to customers were enhanced by some of these simple things but, if the going got tough, she expected everyone to pull together and deliver that bit extra.

Final meeting of the day was a best practice sharing exercise that some of the team leaders and coaches had initiated as a way of informal discussion of what works and what doesn't and things which could be improved. These meetings often resulted in projects that would influence the way that things were run in the centre and gave managers a forum for feeding things back to their own managers about the way that the call centre was operating. It also gave her the opportunity to try and discuss new ideas in a group of friendly peers across both sales and service.

Workshop Results Highlighted in "Rebecca – the Service Team Leader" Scenario 3.

- Having fun as well as working hard.
- Small teams of around 8-10 people – more personal.
- Team development – buddy systems, job swaps, qualifications and secondments. Training and development opportunities actively encouraged.
- Team meetings arranged in a shift friendly way and minuted to ensure that non attendees can see what was discussed.
- Ability for management to move around the business as well as advisors.

Appendices.

- Personal targets incorporate training and development as well as operational targets.
- Having a co-located team – making it easier for managers to have a local presence and ensure that the team are happy.
- Managing flexible and home workers.
- Quality monitoring and coaching function separated from team leadership role but working close together.
- Quality assessment on a selection of calls not just one.
- Proactive feedback and getting teams involved in improving their own processes and systems.
- Giving reward and recognition, positive feedback and personal thank yous (alongside more process driven recognition schemes).
- Management by walking around but not watching the team's every move.
- Management taking calls to cover heavy call periods and ensure that their knowledge is up to date.
- Knowledge management support tools giving up to date product, service and process information.
- Simple escalation procedures.
- Recognition of the stress of the job and allowing people to de-stress.
- Peer group interactions for sharing of best practice – recognition that the management team is also a team!
- Management empowered to make decisions and try different things without being pressured to continuously have to conform to ticks in boxes.

Appendix F: KMS Call Classification.

Function Type	Call Type	Proportion of All Calls (%)
Information Provided	General	15.05
Problems with the Line	Fault Reported	8.11
Information Provided	Information Requests	7.70
Billing & Payments	Bill Query	6.84
Select Services	Simple Service Requests	6.38
Problems with the Line	Fault Query	5.58
Billing & Payments	Payment Query	5.45
Payment Plan	Direct Debit /Payment Change	5.26
Order Tracking	Order Query	4.63
Unassigned	Unclassified	4.01
Home Movers	Home Mover Information	2.60
Unassigned	Inappropriate Call	2.47
F&F	Friends & Family	2.16
Home Movers	Home Mover	1.94
Products	Product Query	1.78
Billing & Payments	Billing / Account Details Change	1.71
Order a line	Stop a Line	1.70
Choices	Package Change – Other Telco	1.62
Products	Tangible Products	1.41
Problems with the Line	Fault Reported and Appointment	1.30
Problems with the Line	Fault Reported and Call Diversion	1.29
Choices	Package Change - Standard	1.29
Billing & Payments	Duplicate Invoice	1.14
Billing & Payments	Postponed Payment	1.05
Order Tracking	Order Amendment / Cancellation	1.01
Complaints	Dispute / Complaint	0.95
Order a line	Start a line - Other Telco	0.89
Choices	Package Change	0.70
Order a line	Start a Line - Standard	0.66
Billing & Payments	Refund	0.59
Order a line	New Provide	0.57
Billing & Payments	Itemised Billing	0.45
Order a line	New Provide - Standard	0.39
Select Services	Simple Service Query	0.35
Order a line	Start a line	0.29
Order a line	New Provide	0.23
Billing & Payments	Payment	0.18

Table 10: KMS Call Classification

Appendix G: Knowledge Broker System Scenario.

“Fraser (aka ‘Technomage’) is a coach in Broadband repair. He spent 10 years as a field engineer before joining the call centre as a coach and has recently been promoted into a line manager role. His job is to help troubleshoot escalations as well as coaching and advising advisors on technical and customer care issues.

There have been a number of calls relating to a problem with an e-mail service coming in today but he is unsure if this is a common problem or not. He logs onto the ‘Coaching forum portal’ to see if it is a common problem across the repair sites. It doesn’t appear in the top 10 of the day so he searches for discussion strands in the repair news group. He finds a solution to the problem from a person whose ID he doesn’t recognise (pseudonyms are used to disguise identities but you got used to the regular poster’s IDs). He takes a look at the poster profile and sees that the knowledge feedback rating the person has got is good (which means that other coaches have rated his previous advice) so he takes a look at the solution in the message. It looks good so he briefs his team that this may be a good solution to try if any more calls come in.

A few hours later, the solution has proved a success so Fraser leaves some positive feedback for the poster. During an escalation of the same problem, he’d tried another refinement so he posted some further information to the conversation chain under the subject line so that others could try that solution. Hopefully, they’d be kind enough to feed back whether this had been useful to them because Fraser took a lot of pride in his technical knowledge and was well respected as a coach within both his centre and in the coaching forum community”.

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