JUS
JOURNAL OF USABILITY STUDIES

Vol. 3, Issue 2, Feb 2008, pp. 74-89

How May I Help You? An Ethnographic View of Contact-Center HCI

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Abstract

This study used an applied ethnographic research method to investigate human-computer interaction (HCI) between call center agents and agent-facing software in the context of contact-center culture. Twenty semi-structured interviews were completed, along with non-participant observation at two contact centers, one that followed a user-centered design (UCD) process for software development and another that did not. Agent productivity and satisfaction at the non-UCD center were hampered by poor task-UI integration, ambiguous text labels, and inadequate UI standardization. Agents required multiple applications to complete a single task, leading to long task times and cognitive strain. In contrast, the UCD center used a unified UI that reduced task times and decreased cognitive strain. In both centers, the workflow was reported to be stressful at times; however, management at both companies employed high involvement work processes that mitigated this stress. Implications for possible high-involvement UI design are considered and a strategy for applied ethnographic research is discussed.

Keywords

Agent-facing software, call center, contact center, customer experience, ethnography, ethnographic study, graphical user interface (GUI) design, high involvement work processes (HIWP), participatory design, user-centered design (UCD)

Introduction

Several factors make the contact center an interesting place to study human computer interaction (HCI):

- The contact-center industry is large. Since the first call center opened at Continental Airlines in 1973, the industry has grown to employ millions of agents worldwide (Datamonitor, 1998, 2002a, 2002c, 2003a, 2003b). More than 3 percent of the US workforce is employed in a contact center and the industry is similarly robust outside the US (Whalen, Whalen, & Henderson, 2002). Although US growth has stabilized, growth continues internationally at rates of between 7 percent and 24 percent per year (Datamonitor, 2002c, 2003a). The size of the industry means that user interface (UI) improvements could have a significant impact if they are adopted.
- A contact-center agent's tasks involve continual interaction with a computer while carrying on a dialogue with the customer. Indirectly, the customer also interacts with the computer, a phenomena described by Steel, Jones, and Apperley (2002) as Computer-Human-Human Interaction (CHHI). The extent of both HCI and CHHI means that UI improvements could have a significant impact on both the agent's and the customer's experience.
- In most contact centers, all agent activity is monitored, logged, and analyzed with the intent of improving agent productivity and enhancing quality of service. This means that changes in the UI immediately show up in productivity and quality metrics, motivating contact-center management to consider potential UI improvements.

These were some of the motivations for the present study, which was undertaken to better understand how technology assists or impedes agents in helping their customers within the context of a contact center's organizational culture.

Contact Centers

For the purpose of this study, a contact center is defined as a centralized office that receives incoming calls or emails for customer service, order fulfillment, or technical support. In the contact-center sector, these are referred to as inbound centers, a definition that specifically excludes telemarketing organizations that initiate calls (outbound centers). A contact center could be a *call center*, receiving service requests over the phone only, or a multimedia contact center, receiving service requests over the phone and via email, Internet chat, or other electronic forms of communication (Datamonitor, 2002b).

Contact centers depend on sophisticated software, including some or all of the following:

- an interactive voice response (IVR) system that allows customers to key in account numbers and preferences with a touch-tone phone
- an automatic call distributor (ACD) that routes each call to an appropriate agent, based on the IVR inputs
- agent-facing software (AFS), typically a database front-end that agents use to retrieve and enter customer information. Since the AFS is the agent's primary UI, much of this article focuses on agent-AFS interactions.

Additionally, contact-center managers may listen in on or record calls to coach agents and enforce quality standards, and they usually keep detailed statistics on call times, wait times, abandoned calls, first-call resolution rates, and cross-selling rates. In the contact-center sector, cross selling involves reviewing the customer's record to offer new products or services once the customer service issue is resolved.

Impact of Ethnography Research Method on This Study

This study used an ethnographic research method whose exploratory nature sometimes uncovers research opportunities that were not part of the original research goals. This occurred in the present study when interviews revealed that one of the two centers had evolved their own form of user-centered design (UCD) to develop software for their agents. The other contact center did not use UCD, thus providing an interesting contrast. Therefore, this paper reports on both the usability of the contact-center software and the impact of UCD on that usability. In so doing, it has two main objectives:

- To enhance the existing body of contact center research so as to provide designers with data that can inform the design of contact center software and related technologies.
- To provide an example of an ethnographic research method that can be added to any usability professional's tool kit. Although the research reported here was of a general nature and not tied to the design of a particular product, the methods described below can be used in an applied context.

Ethnographic Research Methods

Ethnography is a qualitative research method employed by anthropologists and sociologists to document cultural groups and attempt to "understand another way of life from the native point of view" (Spradley, 1979, p. 3). Ethnographers study groups of "informants" (an ethnographic term roughly equivalent to "research participant") and record the details of what they say, do, and use in a document that is also referred to as an ethnography.

Ethnography does not follow a single protocol, but rather employs a range of methods that vary with the demands of the cultural context and the preferences of the researcher. However, ethnographic methods typically include the following:

- *Interviews*. Both informal conversation and formal in-depth dialog. These probe what is *said* to draw out the informants' subjective perspective.
- *Direct observation of activities and interactions*. If the ethnographer simply observes, this is called non-participant observation. This method reveals what is *done*, adding an objective perspective to the interview. If the researcher joins the activity, it is called participant observation, which further enriches the ethnographer's understanding.
- *Documentation of artifacts and traces*. Artifacts are physical objects used by informants and traces are the physical impact the informants have on their environment. These items demonstrate what is *used*, which further refines the data collected from the interviews and observations.

In the triangulation between what is said, done, and used, a detailed and meaningful understanding of the culture under study emerges that can be documented and shared with others. Access to this detailed, contextual understanding is the primary strength of ethnography, and is the facet that has attracted the attention of applied researchers.

New product development researchers have begun to use ethnography to capture data that can lead not only to product innovation, but also to profitable new product categories. For example, Procter & Gamble's Swiffer brand was inspired by ethnographic researchers watching customers mop their kitchen floors. With these data, Procter & Gamble developed an innovative, more usable mop and created an entirely new revenue stream worth $500 million annually (Zaccai, 2005). HCI researchers have also adapted ethnographic methods to facilitate requirements gathering (e.g., Hughes, King, Rodden, & Andersen, 1995) and to guide design choices, especially for products that are socially oriented (e.g., A. S. Taylor & Harper, 2003).

The main challenge that applied researchers face in adapting traditional ethnography is reducing the time investment required by this approach. Early ethnographers could spend years collecting and analyzing ethnographic data about geographically remote cultures (e.g., Mead, 1978), and although contemporary ethnographers often study subcultures close at hand, they can still spend months conducting field studies and an equal amount of time analyzing and reporting their findings (e.g., Thompson & Harred, 1992). In the context of technology development, this type of time investment is impractical, so applied researchers have developed various strategies to significantly reduce it (Beebe, 1995; Millen, 2000).

Chief among these strategies is narrowing the research focus. Traditional ethnographers are interested in capturing copious detail that results in vast quantities of field notes, photos, and audio or video recordings, all of which take time to collect, organize, transcribe, analyze, and report. Though laborious, this broad focus can lead the researcher to discover important patterns of behavior that might otherwise be overlooked. The challenge for applied researchers is to narrow the focus without missing the critical data they are seeking. To meet this challenge, the present study used a four-phase approach. Each phase used data collected in the previous phases to narrow the focus of the study and thus reduce the time required.

The following is a general overview of the phased approach (the Methods section contains additional detail):

Reviewing existing ethnographies and related research

Ethnographers have examined many social contexts in which technology is used. Most of the resulting reports have a wide focus that describes the broad behavioral and social issues, although a few focus narrowly on HCI. Reviewing both types of research is useful in formulating the initial questions to be examined in a particular ethnography, and the next section in this paper summarizes those questions that influenced the present study. If no body of work specifically addresses the area to be studied, some researchers have turned to ethnographies from related fields (Hughes et al., 1995).

Phased ethnographic interviews

Based on issues highlighted in earlier ethnographies, a list of open-ended questions was drafted and interviews set up in a phased manner. Here, this means beginning with informants who could provide orientation on some of the cultural vocabulary and conventions of the group to be studied, before proceeding to interviews with those at the core of the group. The present study began the interview phase by meeting with a number of contact-center consultants, as well as former managers and agents before moving on to the core group. These fringe informants offered valuable insights and helped to refine the questions that would be asked of the core informants.

Core informants were interviewed at their work site, which offered two advantages. First, the work environment served to facilitate recall of the details of their work process. Second, convenient access to their work artifacts (in this case their computer, software, phone, notepad, etc.) allowed informants to use them to demonstrate some of the issues under discussion.

This multi-phase approach to interviewing progressively narrowed the focus to questions that were most likely to elicit relevant data that would not only reduce time spent in the field, but that would also reduce time spent in analysis, since a smaller dataset had to be digested and documented. However, a narrowly focused interview carries the risk of overlooking important data. To mitigate this risk, a semi-structured interview format was followed (Wood, 1996). Initially, scripted questions were asked, but other questions were added on the fly to probe for missing information and to clarify ambiguous points. A common understanding was ensured using active listening methods (Rogers & Farson, 1975).

On-site observation

The present study used a combination of silent observation, think-aloud protocols, and master–apprentice approaches. Informants were silently observed while working, and when they were engaged in a task that did not involve interaction with a customer, they were asked to verbalize their thoughts. Additionally, they were, at times, asked to explain what they were doing as if they were speaking to an apprentice, a method adapted from Contextual Inquiry (Beyer & Holtzblatt, 1998). These focused observation methods clarified points discussed in the ethnographic interviews and collected additional data in a brief time period.

Documentation of artifacts and traces

The primary work artifact in the present study was the AFS, which was reviewed and documented. Secondary artifacts included objects, such as the notepads used by agents to capture information that could not be immediately entered into the AFS, training materials, schedules, and posters displaying team objectives and statistics. Traces included data entered into AFS, emails among agents and other organizational members, and spreadsheets that captured agent statistics. These were reviewed and included in the data analyzed. Note that although the documentation of artifacts and traces appears last in this list, this phase occurred throughout the site visit. Site visits began with a tour of the AFS, which was further examined during the interview and observation phases.

These four phases captured what was said, done, and used in the contact-center environment as it pertained to HCI.

It is worthwhile comparing the ethnographic method used in this study with Beyer and Holtzblatt's (1998) contextual inquiry, whose core premise is to "go where the customer works, observe the customer as he or she works, and talk to the customer about the work" (p. 42). Both methods rely on on-site interaction and direct observation. However, the present study's

phased approach prepares for on-site observation by reviewing existing ethnographies and conducting initial interviews with fringe informants. Additionally, the present study used a longer, more thorough interview than in contextual inquiry before moving to observations (the interviews in this study lasted about an hour, whereas Beyer and Holtzblatt recommend spending less than 15 minutes on the initial interview; p. 65). This longer interview, with more targeted questions, can reveal important data that simply may not happen to arise during observation.

In comparing his ethnographic approach—which is similar to the one used here—to contextual inquiry, Wood (1996) wrote, "I refer to my approach as top-down because I use semi-structured interviewing with clients prior to doing systematic observations of work. Doing so provides a general framework in which to interpret and document specific observations and samples of real work. On the other hand, I refer to contextual inquiry as a bottom-up approach because of its usual emphasis on first observing and gathering large sample of real work" (p. 37). Clearly, both approaches have merit, and which one is appropriate for a given project will have more to do with the demands of the project and the skills, resources, and preferences of the researcher than the relative strengths or weaknesses of each approach.

Finally, it is important to note that ethnographic research does not replace quantitative methods and controlled experiments; rather, "these traditions can be seen as complementary rather than contradictory" (Monk, Nardi, Gilbert, Mantei, & McCarthy, 1993, p. 3). In an applied setting, ethnographic research excels in its ability to generate new product ideas, gather requirements, and provide data on which to base initial UI implementations at the beginning of the development cycle. Later in the development cycle—after initial prototypes have been developed—usability testing is better suited to evaluating these prototypes and to refining the design.

Existing Ethnographies and Related Research

Contact-center work typically involves a series of similar client contacts of limited duration that may require the agent to display positive emotions in order to provide "service with a smile." Management monitors agent productivity and customer-contact quality, which are measured and compared between agents. Indeed, the contact center is one of the only white-collar environments where everyone is doing the same thing, so productivity between agents can be meaningfully compared. These elements have caused some organizational behavior researchers to describe contact centers as similar to industrial assembly lines but for the service sector.

Drawing on research that included non-participant observation in 12 contact centers and interviews with 21 agents, P. Taylor and Bain (1999) describe the contact center as a kind of "assembly line in the head" (p. 101) with tasks that are "inherently demanding and frequently stressful" (p. 115), and Goldberg and Grandey (2007) showed it to be emotionally exhausting. Additionally, call monitoring has been shown to induce stress in agents (Smith, Carayon, Sanders, Lim, & LeGrande, 1992; Varca, 2006).

However, the stress of contact-center work and call monitoring can be significantly mitigated through management practices that provide agents with more control over their jobs. For example, high involvement work processes (such as employee-led quality circles) have increased agent job satisfaction and performance (Workman & Bommer, 2004). Increasing agent control over their tasks has also been shown to reduce the strain associated with call monitoring (Varca, 2006). These adjustments are similar to methods that have already reshaped the automobile industry through the quality movement (Schoorman & Schneider, 1988), suggesting that although contact centers share some of the negative characteristics of the industrial assembly line, agent job satisfaction and productivity can be enhanced by borrowing some of the management solutions that were developed in that industry.

HCI research into contact centers began with Whalen (1995), who used participant observation and ethnomethodological analysis to learn about the relationships between caller, agent, and the computer-aided dispatch system in an American 9-1-1 emergency center. Whalen provides a detailed analysis of a single call, drawing from a videotape of the agent's data entry and an audiotape of the 9-1-1 conversation. Whalen found that the organizational needs of the emergency center largely determined the structure of the computer-aided dispatch data-entry window. The window structure in turn influenced the structure of the interaction between the

agent and the caller. However, the caller often provided data in a different order or in a different form than required by the data-entry window. Sometimes, the agent found elegant solutions to these problems that allowed the data-gathering process to continue unimpeded. Other times, the data-collection process was impeded. Also, keyboard sounds conveyed to the caller that the agent was involved in data recording. Some callers responded by waiting for the keyboard sounds to stop before providing additional information, but others continued to talk while the information was entered. Whalen concludes by saying that the influence of the computer-aided dispatch system, although designed to be "indifferent to the local circumstances" (p. 221), can only be understood in the situated local context.

Whalen et al. (2002) later applied similar methods to the study of a contact center for a multinational manufacturer of office products. They described the work of the five agents they studied as "improvised choreography" because it was proactively organized (choreographed), yet this organization served to allow agents to improvise based on the needs of each conversation. Agents anticipated what the caller needed and collected information from the call-center software and from paper sources so that it would be available as the need arose. The agents' intention was not only to maintain call efficiency, but also to appear competent to the customer by preventing long pauses in the conversation as they searched for data. Whalen et al. referred to this as "hearable competency." Also, agents used paper to compensate for the limitations of the call-center software. For example, because the software did not allow an agent to enter the caller's name (usually the first piece of information provided) until the agent first entered a customer number, the agent jotted the caller's name down on a piece of paper. This preserved the information so the agent could use it later in the conversation and eventually record it in the software, but it also reduced the efficiency of the call.

Bowers and Martin (2000) studied the contact center of a UK bank from 1996 to 2000 using ethnography and conversation analysis (Sacks, Schegloff, & Jefferson, 1974) of more than 80 hours of recorded calls. During this period, the bank switched the type of agent-computer interface from character-based (DOS) to graphical (Windows). The Windows system provided the agent with customer information that the agents used to sell additional services while they wrapped up a call. Bowers and Martin noted the following:

- Agents could choose a conversational style that was oriented toward customer needs (How may I help you?) or oriented toward the needs of the computer system (May I take your account number please?). The customer-oriented approach produced fewer disfluencies (interruptions in the flow of speech by a pause, filler word, or repeated word).
- Agents used keyboard sounds and pausing statements ("just hang on a moment", p. 52) to signal their involvement with the computer system. Although these pauses slowed down the transaction, they also provided callers with an opportunity to remember relevant information.
- The attempt to sell additional services increased the number and duration of disfluencies because the agent had to scan sales-related information while entering customer details, and because the interjection of a sales offer while a call was ending conflicted with the caller's social expectation of how a conversation should wind down.

Bowers and Martin concluded that computer system designers should

> *explicitly consider technologies in settings like contact centers from a 'third party' perspective in addition to the more familiar 'first and second party' perspective (system and individual user) that they may be more used to. That is, one should design interaction techniques, key sequences, screen changes, auditory feedback and so forth so that they can be detected by others as appropriate occasions for initiating or withholding interaction. (p. 58)*

Steel et al. (2002) attempted to design for this type of third-party perspective (i.e., one that includes the customer), which they called CHHI. They created auditory icons to convey various system states to the caller. For example, keyboard sounds indicated that the agent was typing and a ticking clock sound indicated that the system was busy. They then compared call progress, flow, and satisfaction in a between-subjects study of 22 participants who called a New Zealand-based contact center. Auditory icons were associated with a trend to faster call

resolution (7% faster) and a statistically significant reduction in the number of times callers provided information at inappropriate moments. However, the control group (no auditory icons) displayed a slight trend to greater satisfaction. Steel et al. concluded that although the overall results indicated limited benefit, a larger study with more sophisticated icons was merited.

The organizational behavior literature asserts that contact-center culture is informed by the assembly-line nature of the work, close supervision by management, and a stressful work process. However, it also shows that high involvement work processes can go a long way toward mitigating this stress. HCI research shows the strong influence of the third party (the customer) in these processes. Agents must juggle data retrieval, data input, and data analysis along with the customer conversation, all the while appearing competent and maintaining a positive customer experience. Software is the primary tool the agent uses to make this possible, and if the software is to succeed, it must be designed to account for the customer's presence and to respect the social norms of conversation.

Methods

After reviewing existing ethnographies and related research, a list of questions was drafted for the first interview phase, which consisted of semi-structured interviews with one contact-center agent and six contact-center managers and consultants from five major North American cities. Five of these were telephone interviews and two were conducted face to face; all interviews were recorded and transcribed. Participants were recruited from existing industry contacts, Internet and literature searches, and snowball referrals. The purpose of the first phase was to gain an overview of current technology and management practices in the contact-center sector.

The next phase of this study consisted of site visits to two contact centers located in Montréal, Canada. The visits included a guided tour of the AFS, informal observation of contact-center activities, semi-structured interviews with managers and contact-center agents that were recorded and transcribed, and formal observations of agents as they worked (at one site only). A report was drafted on each center and submitted to their respective managers, who verified the accuracy of the information that was recorded. Sites were recruited from existing industry contacts and referrals from the managers interviewed in the first phase. The purpose of the second phase was to gain an in-depth understanding of HCI in the context of the organizational culture and workflow of each contact center.

The first site I visited was a small technical support center (TSC) for a highly specialized software product offered by a large company. Here, two managers were interviewed and three agents were observed and interviewed.

The second site I visited was a large customer service center (CSC) for a credit card offered by a major bank, at which two managers and six agents were interviewed. In order to protect customer privacy, visits to the CSC did not include formal observation of agents as they handled confidential customer data.

Results

This section begins with a description of the environment, business process, and software in each center and continues with a summary of the HCI issues described and observed in these centers.

TSC Overview

The TSC is in a centrally located office converted from a factory, with large windows and a spacious open-area design. Three male support engineers work at the TSC and a female support engineer works overseas. All four report to a supervisor who also handles some cases. The support engineers are either expert users of the software they support, computer programmers, or system administrators. No support engineers have quit the company, but some have been promoted or transferred to other parts of the organization. The engineers I interviewed had worked in the TSC for two to three years. Support engineers are not formally trained, although they are encouraged to develop their competency with the software they support by working on their own projects.

About half of the support cases come to the center by email and the other half come by phone. No IVR system is used, and a basic ACD distributes calls to agents. Calls average 8 minutes and are not monitored, although call statistics are maintained and reviewed monthly by management.

Support engineers use five main software tools to do their job:

- Microsoft Outlook® for email
- the software they support (so they can replicate the customer's problems and test resolution strategies)
- a case database to log resolved cases
- a Web-based search tool to find customers' support-contact number
- a Web-based knowledge base to enter new issues and associated solutions. The knowledge base can be searched by customers and colleagues.

The typical support case begins with an email or phone call. The support engineers must first verify that the customer has a valid support contract. This is done with the Web-based search tool. The customer number that the tool returns is noted on paper, along with a few details about the case. Engineers are not always able to find the customer number while the client is on the phone so they may need to pass the call on to another department; alternatively for a simple call, they may provide support and find the number later. The degree of effort required to resolve a customer issue varies significantly. The software engineer may know exactly what to do and be able to immediately explain the solution to the customer over the phone or may need to do a significant amount of research.

The initial mode of communication—whether by email or phone—is chosen by the customer. However, the support engineer may change the mode of communication if necessary. For example, if an email contains a problem description that is vague or incomplete, the support engineer may call the customer to efficiently collect the required information. Alternatively, if during the course of the initial phone call, the support engineer determines that sample files are needed to analyze the problem, the engineer may ask the customer to email the files and may continue the interaction by email.

Once the issue is resolved, the support engineer logs it in the case database. This involves typing data in various fields and, if the information was collected by email, pasting the email thread into a description field. Usually, the support engineer has made a few notes on paper that serve as a mnemonic aid.

The case database was developed using a platform that is used throughout the company. Because its interface is generic and not tailored to the needs of the support engineers, it does not effectively support tasks in progress and is used primarily to deposit information once a case is closed. In fact, the Web-based search tool that is used to find a customer's support number was developed in house to compensate for the inadequacies of the case database.

All agents interviewed described their desire to help the customer as an important motivator, and often, as the most important motivator. In the words of one support engineer:

> *You're kind of the savior. It's a good feeling. Sometimes people call and they tried on their own for weeks, months, days, or hours. They didn't sleep; they have a deadline. They call you and for you it's easy because you are doing that stuff everyday. You hear "thank you very much, you're good." You're flattered a little bit but you know in the end that you have done something good for those people.* (Support Engineer 1)

The TSC is different than the contact centers that are described in the literature. For one thing, support engineers have an almost missionary zeal about the product they support and the organization for which they work. For example: "It's just like a big family and everybody is focused on the product and everybody wants the product to succeed" (Support Engineer 3). All support engineers praised their organization. For example, "The company's great. Everything's great here. The people I work with. The salary. Everything" (Support Engineer 1).

CSC Overview

The CSC is located in a downtown office tower, with large windows and agents spread out in a spacious open-area design. About 240 agents work at the center (59% female, 41% male) most of them between 8 AM and 11 PM. Agents had varying backgrounds and goals. One was a student working part time. Others had worked in the CSC for a few years and hoped to eventually move to other positions in the bank. Some had been at the CSC for more than eight years and did not have a desire to move elsewhere in the near future.

Agents are divided into teams of about 30, including two senior agents, with an assistant manager and manager supervising each team. In addition to taking calls, senior agents have three other responsibilities:

- to assist other agents by responding to their questions over a help line
- to coach less-experienced agents by providing feedback after watching and listening to them handle calls or by allowing less-experienced agents to observe them
- to silently and randomly monitor 6 to 12 calls per agent per month and to rate the quality of those calls according to predetermined quality criteria.

Agents reported different feelings about the monitoring process: two liked the feedback, one wanted more calls monitored to prevent one random bad call from skewing an evaluation, two did not worry about it, and one found it stressful. Managers present monitoring as a coaching tool:

> *The vast majority of what an agent needs to hear is what they did well. Very, very, very rarely will we have to touch on a sub-performance situation. We coach people as opposed to lean on them if they're not performing.* (CSC Manager 1)

In addition to monitoring quality, statistics are kept on call times and sales. Quality metrics are provided to the agent monthly and statistics are provided daily. Metrics form the central component of the agent's annual evaluation, which determines pay increases and promotions.

Prospective agents must first pass various aptitude tests that evaluate basic math, interpersonal, and sales skills. Once accepted, agents receive two weeks of classroom training before they begin taking calls and for several weeks after training, they are coached by senior agents. Calls are divided into four levels of complexity, and new agents are only routed the simplest types of calls. Once they master this level, they are trained on the next level of calls, and so on, until they can handle all types of calls. The last level of training they receive is on cross selling. Once their sales training is complete, agents are required to make various sales offers to callers. After a sales-trained agent has assisted callers with their customer service request, the agent may suggest additional features to the customer, features that may benefit the customer and be more profitable for the bank.

Turnover at the CSC is on the low side compared to the rest of the industry. On average, agents stay three years, compared to the industry average of two years (Anton & Gustin, 2000). Many agents move on to non-CSC positions within the organization. Average call time is also low, with a typical call lasting less than 2 minutes compared to contact-center averages of 4.3 minutes (Anton & Gustin, 2000).

Most customers enter their credit-card number into the IVR system so when the ACD distributes the call to an agent, it arrives with a *pop* (window) containing their account information. Common calls include balance or transaction inquiries, address changes, adding and removing features from a card, unrecognized or rejected transactions, lost or stolen cards, and card activations.

The primary repository of customer information is a mainframe system accessed from desktop computers. Data input and output was originally spread over about 20 different screens, each displaying 32 lines of 70 characters. When the bank changed its marketing strategy to allow many combinations of features to be assigned to a newly deployed credit card, configuring a card required moving between so many mainframe screens that the task became too time-consuming and cognitively demanding to be practical in the time-sensitive contact-center environment.

At that point, the bank's information technology department created the Presentation Agent Layer (PAL). The PAL is a graphical user interface (GUI) that consolidates data from many mainframe screens into one GUI window and automates some data entry. For example, it performs routine calculations on the fly and copies an address entered in one field into many related fields. PAL was designed to cover about 80% of the tasks that agents must do, so the remaining 20% still must be completed from the mainframe screens. Despite having to support many more options, PAL allowed agents to maintain an average call time of less than 2 minutes while supporting the newly deployed credit card.

The other important tool is a standard procedure databank. Hundreds of step-by-step procedures are listed to cover almost any task the agent is likely to complete. The databank is keyword searchable and the procedures are presented in a collapsible hierarchy with hyperlinks to related topics.

Mainframe screens, PAL, and several other infrequently used tools are organized in a tabbed interface that covers most of an agent's desktop. By clicking a tab, agents navigate between tools. In most cases, agents can also electronically forward information to other agents or other departments with relative ease.

The CSC has had a continuous improvement program in place for eight years. Any agent can suggest improvements to the software or procedures by submitting an email to operations staff. Agents submit 50 to 60 requests per month, all of which are acknowledged, and 25 to 30% of which are implemented.

CSC agents voiced similar motivations to those of the TSC, for example: "Answering the customer's need is always interesting. Some customers are very polite, very grateful" (Agent 3). Another agent expanded on this sentiment with the following statement:

> *I want the customer to be happy and satisfied. I don't want them to, like, hang up and not be satisfied. Cause you know I've been there, when you have called somewhere and they don't give you the information you requested or you're not happy about something. It sucks.* (Agent 4)

This does not mean that money is not important, rather that it is described as the basic purpose for coming to work; for example, "the purpose is to pay the bills" (Agent 3). Because salary increases are tied to performance, it is also a motivator for particular on-the-job behaviors. One agent joked, "I'll go for the money. Money, money, money, money" (Agent 1).

The pace and repetitiveness of work at the CSC produces some stress for the agents; however, the CSC's management style and software tools go a long way towards minimizing the stress. In the words of one agent:

> *It's not an easy job. It is stressful sometimes, for example if you have a lot of calls in the queue. But I find that my managers and my tools to do my job are really good. People here who used to work for other companies, they think here is heaven.* (Agent 4)

High Involvement Work Processes

Both contact centers studied used high involvement work processes that allow employees to make informed decisions, to act on them, and to be rewarded for actions that contribute to organizational effectiveness. The TSC allowed support engineers to decide how to handle their cases and when to take their breaks. Their workplace is characterized by high levels of employee freedom and trust. CSC management more closely monitored and controlled agent behavior, including scheduled break times. However, they also financially rewarded effective behavior and provided a mechanism for employees to control their collective environment through the continuous improvement program. These high involvement work processes likely mitigated the stresses associated with the contact-center environment.

Customer Dialogue, Multitasking, and Hearable Competency

As noted by Whalen et al. (2002) and Bowers and Martin (2000), agents must juggle data retrieval, data input, and data analysis with the customer conversation, all the while maintaining hearable competency. CSC agents displayed a range of abilities in this area. One agent with six months experience described how she would verbally intervene so she could complete her data entry tasks:

> *If they [customers] want to change a product, which is a little bit more time-consuming entry-wise, and then they're already talking, "well, what's this Air Miles. And what about your medical insurance?" You're like, just a moment, I'll finish that, and I'll get back to you.* (Agent 2)

Another agent with 10-years experience explains how she enjoys the challenge associated with multi-tasking:

> *So I'll ask him some security questions prior to activation, and then while I'm asking him these questions, I'm also going to be analyzing the account and see what the customer has already as features. See what the [sales] potential is. I personally need that; you know, that variety, the analytical side.* (Agent 1)

Prolonged silence, or as it is called at the CSC, "dead air" reduces hearable competency. The CSC has policies to minimize it, as described by Agent 6:

> *Let's say I'm typing information, if I am typing too long. If there is a silence between the two parties, OK, we are not supposed to be on the phone that way. We call that dead air. Then I have to put the customer on hold.*

The TSC's support engineers encountered fewer multi-tasking challenges. First, about half of their cases arrived by email, so while there is a customer conversation, it is an asynchronous one. Second, even when they were handling a case over the phone, they entered their case notes after the conversation was over. However, even at the TSC, there were times when a technical problem was too complex to solve while the customer waited on the phone. In these cases, service engineers simply arranged to contact the customer when they had solved the problem, an arrangement that is generally acceptable to customers because they appreciate the complexity of the software and would rather not have to wait a long time on hold.

UI Integration

One consultant described how contact-center managers "throw a lot of stuff on the desktop and ask the user to integrate it." I observed this at the TSC, where the burden of integrating Microsoft Outlook®, the Web-based search tool used to find customer numbers, and the case database falls on the shoulders of the support engineers. Here is an example of how time consuming this can be:

> *Support Engineer 1 goes to Outlook's Sent folder, which is used by all support engineers, and opens an email that he believes is ready to be logged into the case database. He scans the email to find the company's name. Something about the company name suggests he may have entered it already, so he goes to the support database and searches under the company name but finds no records for the company. Even if he has not logged the case, he believes he has resolved the customer issue, so he goes back to Outlook and transfers it to a Monthly folder (once a month his supervisor will check to make sure that these emails have been entered in the case database correctly). Now he thinks he may have logged this case but without a company name. He returns to the case database and searches again with a generic company name. He scans the 20 records returned and does not see the case. He is now satisfied that the case has not been logged, so he opens a new case record. He types the company name into one field, a 40-character case summary into another field, pastes the email thread into another, fills out a few more fields, and saves the data. The case is now logged.*

Other cases are easier to log than the example above, but some are harder. The logging process is so tedious that all the support engineers I interviewed confessed to jotting down case notes on paper and entering them into the case database at the end of the day (if they had time) or a within a few days (if they did not). They all assumed that other, presumably more organized, support engineers entered case notes directly in the database as they worked, but none that I interviewed or observed followed this procedure.

One of the most common complaints support engineers had about their software was its lack of integration and automation. One said, "Why do we have to go to all these places. Log here, look for here, oh I didn't find it here, so I have to go to there. Why can't they integrate everything in

one place?" (Support Engineer 2). Retrieving data from the case database is also difficult, so many support engineers do not bother. They just treat each call on a case-by-case basis, and do not review the customer history to gain insight from previous issues. TSC's management is well aware of their software's poor integration and accepts it as the cost of database integration with the rest of the company. In order to gain the benefits of cross-department integration (lower software licensing and support costs, immediate access to data entered by staff in other departments) they must pay the price of poor software integration within the contact center: lower employee productivity and morale.

The contrast in the degree of software integration between TSC and CSC is dramatic. About two years ago, the CSC introduced PAL, a graphical front-end for its mainframe system. Although the mainframe screens are still available if agents want to use them, they can now complete a task from a single window instead of navigating through 20 non-integrated screens to enter data. In the words of one agent, "PAL helps you. Instead of, say, going into five mainframe screens, you can see everything on PAL in one big screen" (Agent 5). The difference in user experience is especially significant to agents who had worked with the mainframe screens years ago. For example:

> *I like PAL a lot because you get all the information in one screen. It's easier. Your call is quicker. You don't have to look for the information on different mainframe screens like you used to do before. So I like PAL. PAL is my pal.* (Agent 4)

Text and Typography

Using meaningful and memorable interface labels and field names makes software much easier to learn. This is especially important if a feature is only used occasionally, since users often forget the details of a feature before they have an opportunity to use it again and reinforce previous learning. Unfortunately, the language used in the TCS case database is cryptic and littered with obscure jargon:

> *It's very, very convoluted. We're basically looking for data in fields with names that are totally unrelated to what you're actually looking for. You look for a license number in an equipment field. It's just not intuitive at all. Not intuitive. And the abbreviations don't make sense at all. It really frustrates new people and occasional users.* (Support Manager 1)

Typography can significantly influence the readability of interface text. CSC's PAL often used all-uppercase text for field names and other interface labels, even though uppercase text takes 13% longer to decode than mixed-case text (Tinker, 1955).

User Centered Design

The user experience in each contact center studied could not have been more different. A CSC agent described their software as follows: "Everything is user friendly. After a couple months you're a pro" (Agent 6). In contrast, a TSC support engineer described their software as, "not, like, user friendly" (Support Engineer 2).

One possible explanation for this varying user experience is the different development process used in each center. The TSC used an out-of-the-box database designed to meet the needs of all the employees in their large parent organization. Input from TSC support engineers was not solicited during the software design.

In contrast, the CSC had developed an organizational culture of user involvement in their internal software development and solid management backing for a user-centered approach. When developing PAL, a preliminary screen mockup was distributed to a pilot group of 20 experienced agents who kept the designs in their work area for a few days. They provided feedback to the development team who modified the design and redistributed it to the pilot group. This process continued for about eight iterations until both the agents and the development team were happy with the design. At this point, the UI was developed in Visual Basic and used by the pilot team in the contact-center environment. Feedback continued on the live version of the UI and a new version of the software was deployed weekly. Finally, after several weeks of refinement, all contact-center agents were trained on the new software and it was deployed in the contact center as a whole. Suggestions for improvement are still being collected about a year and a half after deployment, and redesigns are released monthly.

What motivates a company to invest in usable software? In the case of the CSC, a clear understanding of the cost-benefit equation. CSC's technical operations manager said, without hesitation, "every second is a full-time employee in our world." He when on to describe how if the average-call time increased by 20 seconds per call, they must hire 20 new agents, at a cost of almost $1 million every year. That cost is likely to be significantly more than redesigning the UI.

Keyboard and Mouse Navigation

If data entry involves mostly linear navigation through a series of fields, tabbing between fields or using function keys for navigation reduces task time. If data entry involves jumping between different fields, using a mouse to select fields can potentially reduce task time. The ideal system design allows both types of navigation so that users can select the most efficient and comfortable method. In most cases, software at TSC and CSC allowed both keyboard and mouse navigation. However, one CSC agent, who had a strong preference for keyboard navigation, wanted more: "I like to use Tab, and Shift Tab to go back. What would make it much faster, I think, would be switching between PAL and mainframe screens with just a key stroke" (Agent 4).

Standard Look and Feel

When software looks and behaves like the user expects it to, it is easier to master. For most users these expectations are formed by their experience with Windows software. However, TSC's case database did not behave as some users expected:

> *It doesn't have a Windows look first of all. In Windows, this button [points to the close box] is placed here [right corner of the title bar], but on our application it's here [points to middle of the title bar]. And the menus are not the same. So I get confused. Why to create such a different way?* (Support Engineer 2)

Discussion

This ethnographic study drew from a relatively small, non-random sample; therefore, its findings cannot be generalized to contact center software or UCD development processes as a genre. However, most of the findings are consistent with those of other studies in the contact center domain, including those reviewed in this paper, and therefore, enhance the growing body of knowledge. Additionally, the contrast between the usability of contact center software developed with a UCD process and that developed with a non-UCD process further reinforces the well-documented value of involving users in the design process.

Although P. Taylor and Bain's (1999) conclusion that an agent's work is "inherently demanding and frequently stressful" (p. 115) seems justified when considering the workflow described in the CSC, high-involvement management practices, usable software, and appropriate financial compensation go a long way in mitigating this stress. The rapid work pace and close employee supervision associated with contact centers is almost entirely absent from the TSC. Here, a trusting, hands-off management style has produced an atmosphere of mutual support and teamwork that motivates support engineers. However, poor software integration introduces a new stress into their workplace.

Although either center could use monitoring technology to micromanage and berate their employees, both centers have chosen not to do this because it is viewed as a bad business strategy. In the words of one former contact-center manager who is now a contact-center consultant, "Take care of the agent, who will in turn take care of the customer, who will take care of the company's bottom line." This is not to say that all contact-center managers share this view. Perhaps the most appropriate conclusion is that when managers hold this view, it has a positive impact on employee morale and productivity.

The observations and interviews described in this paper lend support to the view that good software design increases agent productivity, reduces agent stress, and increases agent motivation. One of the most straightforward UI design lessons that has been learned is one of integration: group data by task and not by technology. If logging a case is one task, all the relevant steps should be done from the same interface. Searching in one tool, writing in another tool, and recording cases in a third tool not only consumes time, but also consumes the user's

cognitive resources. To the lesson of integration, we can add the lessons of using meaningful text labels, appropriate typography, flexible keyboard and mouse navigation, and a standard look and feel.

Beyond these immediate GUI design lessons, the concept of high involvement work processes can be considered from a technological perspective. How can contact-center technology support an agent's job control without compromising organizational effectiveness? Any design decision that gives agents control over how their work is structured is likely to help. Even something as minor as being able to schedule their own break times inoculates agents against stress, and therefore, improves service quality (Varca, 2006). This fact could be applied to UI design by developing a feature that could allow agents to schedule their own breaks as long as call volumes are below a certain management-defined level. The technology could keep track of call volume and how many other agents are on break, and give an agent several choices about when to take a break, putting more control into the agent's hands. Although this may appear to be a mundane example, at the time of this writing, no contact center scheduling software supported this feature. Research and development of a "high-involvement UI" is an area of promise for future work in the contact-center sector and other highly structured work environments. In a world where computers, the Internet, and mobile devices have radically influenced our social behavior, it may be time to consider how to design technology to have a positive influence on organizational behavior.

Practitioners' Take-Away

The study revealed several practical implications for practitioners to consider:

- Ethnographic research methods complement experimental methods, are effective for exploring new use environments, and may reveal unexpected data.
- The time required to apply traditional ethnographic research methods can be condensed by narrowing the focus using a four-phase approach that includes (1) reviewing existing ethnographies and related research, (2) phased ethnographic interviews, (3) on-site observation, and (4) documentation of artifacts and traces.
- Productivity of contact-center agents is extensively measured and very sensitive to the usability of agent-facing software (AFS). Shaving off a few seconds of task time per call can radically reduce contact-center operating costs, making user-centered design an attractive investment.
- Consider that the customer is an ever-present third party in the agent-AFS interaction. For example, the agent needs to sound competent to the customer while interacting with their system. Long pauses must be avoided and data exchange between agent and customer must respect social norms of conversation. To facilitate this, AFS must support rapid and easy data retrieval (to prevent long pauses) and flexible data entry (to allow the agent to record data while the conversation progresses naturally).
- To maximize agent efficiency consider organizing GUIs by agent task rather than by the underlying technology. Enhancing agent efficiency also enhances quality of service.
- Consider how software can be designed to support high involvement work processes. Any design decision that gives agents control over how their work is structured without compromising organizational effectiveness is likely to reduce agent stress and improve service quality.

Acknowledgements

I thank Dr. Mary Lee Maurel of Concordia University for her guidance on the ethnographic research methodology; Alan Asper, Bob Schumacher, John Carver, Pierre Mark Jasmin, and Scott Gilkeson for their expert input on contact centers, and the managers and agents at the two contact centers that I studied for their generous cooperation and support.

References

Anton, J., & Gustin, D. (2000). *Call center benchmarking: How good is "good enough"*. West Lafayette, Indiana: Purdue University Press.

Beebe, J. (1995). Basic concepts and techniques of rapid appraisal. *Human Organization, 54*(1).

Beyer, H., & Holtzblatt, K. (1998). *Contextual Design: Defining Customer-Centered Systems*. San Francisco: Morgan Kaufmann.

Bowers, J., & Martin, D. (2000). Machinery in the new factories: Interaction and technology in a bank's telephone call centre. *Proceedings of CSCW 2000, USA*, 49-58.

Datamonitor. (1998). *Call centers in Europe: 2nd edition*. London: Datamonitor.

Datamonitor. (2002a). *Call centers in EMEA to 2007: A thousand markets, one report* (No. DMTC0852). London: Datamonitor.

Datamonitor. (2002b). *Contact center component technologies to 2007: The six big trends* (No. DMTC0856). London: Datamonitor.

Datamonitor. (2002c). *Opportunities in North American call centers to 2007: A market approaching maturity* (No. DMTC0860). London: Datamonitor.

Datamonitor. (2003a). *Call center markets and technologies quarterly briefing Q2 2003: Revisiting the Indian outsourcing market*. London: Datamonitor.

Datamonitor. (2003b). *Opportunities in Caribbean and Latin American call center markets to 2007: Are the opportunities worth the risks?* (No. DMTC0861). London: Datamonitor.

Goldberg, L. S., & Grandey, A. A. (2007). Display rules versus display autonomy: Emotion regulation, emotional exhaustion, and task performance in a call center simulation. *Journal of Occupational Health Psychology, 12*(3), 301-318.

Hughes, J., King, V., Rodden, T., & Andersen, H. (1995). The role of ethnography in interactive systems design. *interactions, 2*(2), 56-65.

Mead, M. (1978). *Coming of age in Samoa: A psychological study of primitive youth for Western civilization*. Gloucester, MA: P. Smith.

Millen, D. R. (2000). Rapid ethnography: Time deepening strategies for HCI field research. *Proceedings of DIS 2000, USA*, 280-286.

Monk, A., Nardi, B., Gilbert, N., Mantei, M., & McCarthy, J. (1993). Mixing oil and water?: Ethnography versus experimental psychology in the study of computer-mediated communication. *Proceedings of INTERACT and CHI 1993, The Netherlands*.

Rogers, C. R., & Farson, R. E. (1975). *Active listening*. New York: McGraw Hill.

Sacks, H., Schegloff, E., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking in conversation. *Language, 50*, 696-735.

Schoorman, F. D., & Schneider, B. (Eds.). (1988). *Facilitating work effectiveness*. Lexington, MA: Lexington Books.

Smith, M. J., Carayon, P., Sanders, K. J., Lim, S. Y., & LeGrande, D. (1992). Employee stress and health complaints in jobs with and without electronic performance monitoring. *Applied Ergonomics, 23*(1), 17-27.

Spradley, J. P. (1979). *The Ethnographic Interview*. New York: Holt, Rinehart & Winston.

Steel, A., Jones, M., & Apperley, M. (2002). The use of auditory feedback in call centre CHHI. *Proceedings of CHI 2002, USA*, 768-769.

Taylor, A. S., & Harper, R. (2003). Age-old practices in the 'new world': A study of gift-giving between teenage mobile phone users. *Proceedings of CHI 2002, USA*, 439-446.

Taylor, P., & Bain, P. (1999). 'An assembly line in the head': work and employee relations in the call centre. *Industrial Relations, 30*(2), 101-117.

Thompson, W. E., & Harred, J. L. (1992). Topless dancers: Managing stigma in a deviant occupation. *Deviant Behavior, 13*, 291-311.

Tinker, M. A. (1955). Prolonged reading tasks in visual research. *Journal of Applied Psychology, 39*, 444-446.

Varca, P. E. (2006). Telephone surveillance in call centers: Prescriptions for reducing strain. *Managing Service Quality, 16*(3), 290-305.

Whalen, J. (1995). A technology of order production: Computer aided dispatch in 9-1-1 communications. In G. Psathas & P. Have (Eds.), *Situated order: Studies in the social organization of talk and embodied activities* (pp. 245-262). Washington, DC: University Press of America.

Whalen, J., Whalen, M., & Henderson, K. (2002). Improvisational choreography in teleservice work. *The British Journal of Sociology, 53*(2), 239-258.

Wood, L. E. (1996). The ethnographic interview in user-centered work/task analysis. In D. Wixon & J. Ramey (Eds.), *Field methods casebook for software design*. New York: John Wiley & Sons.

Workman, M., & Bommer, W. (2004). Redesigning computer call center work: A longitudinal field experiment. *Journal of Organizational Behavior, 25*(3), 317-337.

Zaccai, G. (2005). Designed for loving. [Electronic Version]. *Business Week.* Retrieved January 19, 2008, from http://www.businessweek.com/innovate/content/jul2005/di20050721_304729.htm

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