Usable Products Gone Unused: Experience Design and Customer Research

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Customer Experience Design and Usability

A consensus is emerging that business success increasingly depends on making the customer experience reflect the needs of the customer rather than the business organization. Think about many of the corporate web sites you have visited. How often have you seen web sites, as well as printed materials, where "the information architecture mimics the…structure of the bureaucracy producing the design?" (Tufte 1997, p.148). The basic idea is that a customer experience strategy designed to increase loyalty and retain customers must incorporate those same goals in all its processes (Donoghue 2002). In other words, to make the experiences customers have with any business reflect their needs, the business model must be aligned to the experience of customers with the people, processes, and technologies of that business.

Customer experience design is quickly incorporating the usability discipline as one part of an emerging interdisciplinary approach to human-computer interaction. The difference between customer experience design and usability comes down to a contention that the pleasure of the experience with most products and services, (i.e., the ability to support user goals, look good, and provide a pleasing experience), is equally important to the ease with which users apply those products and services (Jordan 2001). Let's clearly understand the

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statement though. We are not claiming that functionality, usability, and ergonomics don't matter.

Postrel, for instance, makes the point clearly stating, "Functionality is, of course, important…But functionality can be a background quality rather than the design's primary justification (2003, p. 179). The insight is both mundane and transformative since increasing numbers of consumer products include computing and wireless networking in their design, making them computing artifacts. As Donoghue (2002) recently noted:

> The term *customer experience* describes the customer relationship and its enabling mechanisms…, which include the physical user interface, the engagement and interaction processes, and the feedback system. At a broader level, the customer experience also encompasses the behaviors of end users and the change management required to drive adoption and usage (pp. 5-6).

In other words, focusing on the customer experience, rather than usability per se, leads those interested in design and use to consider more than the technology and its users. Usability is typically applied to the physical user interface and interaction processes. Neither the traditional, experimental approach, nor the more recent "discount usability" (Nielson 1994) approach with its emphasis on iterative development, deals effectively with engagement processes or feedback systems for the customer experience.

The additional focus needed requires design to go beyond the human-factors concern with a product's ease of use, to a sustained consideration of the way

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marketing, operations, information technology, and product development relate to the customer experience and the business strategy. The approach entails a fundamentally different point of view on design and users; one which ties business strategy to the customer experience (Donoghue 2002). It involves a shift away from a primary emphasis on laboratory experiments in usability to a contextual focus using ethnographic methods.[1] Let us be clear about the nature of this shift because it involves more than merely a methodological dispute.

Some commentators remark that the move away from experimental designs using cognitive science, toward approaches that emphasize the user's goals and experience in context, results from "gurus" touting unique approaches (Waloszek 2003). Yet, discounting the emerging emphasis on customer experience in that manner fails to recognize that the issues currently faced by designers of computing artifacts are unique to the history of the field of study. Indeed, the issues currently facing human-computer interaction are uniquely challenging for the experimental method, largely because that approach's goal, i.e., testing causal theory, does not take into account the importance of user goals and emotions in designing and delivering products and services.

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[1] The term *context* does not have a standard definition in the area known as Contextual Inquiry. The result is widespread confusion between focusing on the user's context in customer experience design and a focus on context for the design of *context aware* computing artifacts. A rigorous discussion of context is beyond the scope of this paper. However, it is important to note that the conventional approach to context draws from cognitive science, treating it as something to "represent" and manipulate symbolically (Dourish 2001). The ultimate goal of that approach to context is representing it to developers who aim to engineer an awareness of context into computing artifacts. Our focus is on the study of context as a corpus of practices that users enact as they go about their everyday life achieving day to day goals. It is an interaction model rather than a representational model.

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The goals of customers using a product, their wants, and needs are paramount concerns for organizations that aim to gain efficiencies in product design and development while selling products that work for customers in the ways they need them to. Accurately depicting those goals is the key to developing products with embedded information processing capabilities. The ensuing discussion makes one basic point: the disappearance of the interface, from the desktop to the context, as computing artifacts diffuse to the pragmatic majority of users, makes experimental design's usefulness to usability increasingly suspect. It is no longer good business to trust the design of computing artifacts to the gut feelings of designers, software engineers, or "visionary" managers. Rather, customer insight and feedback are the basis for sound product development strategies that unify distributed business units around the customer experience. Easy to use products don't matter if no one uses them because the product doesn't support customer goals.

Origins of Customer experience Design

Starting in the early 1980s, researchers focused in earnest on the relationship between design and computing, specifically on the relationship between functionality and usability. Engineering's concern with functionality dominated design in the first few decades of the development of computing technologies. The engineering focus assumed that:

1. functionality is the most basic concern of design, largely drawing from the "gut," intuitive insights of engineers and designers (Walsh, Roy, Bruce, and Potter 1992)

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2. development proceeds most effectively in sequential stages with usability addressed last (Grudin 1990; Jordan 2001)[2]

The trend was accentuated in the old saying among technical writers that they "write right what was designed wrong."

An initial reliance on gut feelings for design insights on human-computer interaction didn't matter much since most users were engineers or programmers using terminals and punch cards (Grudin 1990). As the users of computing technology expanded over time to include office workers and then the general population, human-factors proponents developed methods and techniques to convince key decision makers that usability testing delivers the most important benefits to development and functionality when it is included in the design process, preferably before a functioning prototype is made (Mantei and Teorey 1988; Nielson 1994).

An increased concern for the computer user interface developed along with the general recognition of usability's place, primarily in test scenarios, in the design and development of products and services. As Norman (1998) notes, the initial emphasis on engineering, next marketing, and, ultimately, the customer experience with products and services parallels our general understanding of

[2] A general trend of development seems evident in the human-factors discipline since the 1970s. Jordan (2001) contends that the "new human factors" is best seen as an evolving set of understandings about the relative importance of pleasure as well as usability and functionality to product design. Indeed, following the psychological insights of Abraham Maslow (1954), Rutter and Agne (1998) noted that design research appears to follow a path of development that calls for it to study designs that "work well" and "look good." Jordan (2001), in more specific terms, advances the concept that a hierarchy of "user needs exists" (moving from functionality, to usability, to pleasure) that parallels the hierarchy of human needs articulated by Maslow (1954). On this same point see Schneiderman (2002). We do not plan to assess the warrant behind the Maslow analogy, but merely want to make note of similar concerns in product design in general, and human-computer interface design in particular.

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how new technologies diffuse in markets, from early adopters to pragmatic majority customers. Engineering and marketing tend to shape the design of new products and services until those products are bought and used by a majority of potential customers.

Usability started in the laboratory by testing prototypes under controlled conditions. The laboratory focus is largely on how easily subjects use a product or service. A usability approach employing experimental methods is sufficient when research development is largely concerned with the ease of use for products or services. Yet, as Wixon (2003) recently argued, an emphasis on experimental research diverts attention from design approaches that actually focus on people using technologies to get things done. Indeed, the importance of the customer experience to product and service success is increasingly apparent as customers and users change from early adopters to the pragmatic majority who use products that incorporate computing and networking capability.

Once technology products or services develop a base in the pragmatic majority of customers, rather than the technically inclined early adopters, you get the kind of distinctions and expectations we now see with desktop computers, i.e., mothers and fathers, grandmothers and grandfathers are all users of the products along with children. People expect using computing artifacts to provide pleasant experiences that let them readily fulfill their goals, even though their actual experiences certainly fall short in many instances.

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A good example of the development pattern mentioned above is available from the medical device industry. The U.S. Food and Drug Administration released a set of guidelines in 1996 for designing the user interface for medical devices, noting that, “Lay people increasingly use medical devices. Because of illness, poor reading ability, inadequate facilities, insufficient assistance, and inexperience, this population often represents a special challenge to designers… For these reasons, as well as the lack of medical training, the lay user's operation of highly complex devices is problematic” (Sawyer 1996). The FDA's point is applicable to a range of devices produced in a number of industries, though most do not involve the painful, sometimes life or death, consequences of poor user interface design in medical devices.

The FDA guidelines on human-factors issues make a compelling case for using ethnographic research to replace, or at least augment, laboratory usability. Without going into the range of guidelines offered, one of the most frequent ones mentioned is as follows: “Do not contradict the user's expectation. Rather, exploit their prior experience” (Sawyer 1996, p. 10). Getting to know how the needs, wants, and expectations of product users relate to everyday experience typically involves field research and in-depth interviews.[3]

[3] Indeed, the FDA has taken the lead in emphasizing human factors and user interface design in the development of medical devices. The Center for Devices and Radiological Health, for example, “is convinced that manufacturers must pay more attention to human factors at the earliest stages of product design and development, when user input can make a difference. A commitment by company management to ensure that the design team takes the necessary steps to involve users early in the design and development process is essential. It is simply not possible for designers to predict the sort of problems that the typical user will have with a device and the kind of misinterpretations and errors that will occur. A range of typical users, including novices and occasional users, should be engaged to help designers develop design input requirements, evaluate concepts, test prototypes, and validate the final design” (Carstensen 1996).

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As products approach maturity in their life cycle, the most sensible strategy to use in their design involves asking customers and users themselves what they want in a particular type of product, as well as observing them use existing, and mockup, products and services. The sales staff is the traditional source for this kind of feedback, reporting customer responses to new or upgraded products (Walsh, Roy, Bruce, and Potter 1992). Indeed, using the sales staff as a channel for ideas about product development can lead to “feature” creep as a product line matures. An important customer mentions a “nice to have” feature and that becomes a “must have” for sales and marketing. Attention to the customer experience requires increased observation of individuals and groups using products where they work and live, and less reporting of their expectations alone through the sales staff or marketing surveys. The point is to maintain a focus on user goals when designing a product line, especially those incorporating computing and networking capabilities, even if a recommendation that the product needs less features results. In generic terms the approach is referred to as *customer experience design*.

Beyond Experimental Methods

By definition, customer experience design does not use experimental methodology because the very purpose of laboratory settings is to control the user’s environment for the purpose of measuring the product’s ease of use,

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typically concentrating on the user interface as an information processing environment. Jordan insightfully notes,

> "Usability-based approaches tend to lead human-factors specialists to consider people as processors. Physical processors with attributes such as strength, height and weight, and cognitive processors with attributes such as memory, attention and expectations. Here, then, the user is often looked at as being simply a cognitive and/or physical component of a three-component system – the other two components being the product and environment. It could be argued that this 'usability engineering' approach is, in effect if not in intention, dehumanizing the user, ignoring, as it seems to do, the very things that make us human – our emotions, our values, our hopes and our fears," (2001, p. 320).

Wixon (2003) adds to the point in his discussion of the limitations of experimental methodology for assessments of usability. Leaving aside issues of methodology and statistical inference that usability experiments often fail to address (Gray and Salzman 1998), Wixon (2003) notes that many of the issues which experimental approaches to usability fall short on really result from the disjuncture between the goals of the experimental method used by human-factors and usability, and the goals of product development.

The "discount usability" techniques popularized by Nielson (1994) attempt to remedy the mismatch between usability testing goals and product development goals. Yet, Nielson (1994) dismisses "field studies," i.e., ethnography, as equally expensive as experimental testing, preferring instead one or more of the following techniques: scenarios, simplified thinking aloud, heuristic evaluations. Moreover, Nielson's (1994) model of usability contends that as a company's experience with usability grows it will implement the full range of the usability life

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cycle, ending with the classical experimental research design. Yet, the evolution of computing artifacts actually leads to the opposite result, i.e. the increasing irrelevance of experimental methodology to the design of computing artifacts where the way users act in context is key to understanding their goals.

The goal of experimental methodology is to test a hypothesis about the usability of the design of a product or service, rather than produce information for use in the product or service development process of an organization. It is the latter goal that customer experience design keeps in focus. An unprofitable computing artifact is not a success, regardless of how well it supports the information processing requirements of product use in the laboratory (Donoghue 2002). The likelihood of the success of usable computing artifacts increases when the pleasure they provide users, while supporting their goals, is accounted for in their design.

Involving a customer experience design team in the concept stage of development, before user requirements are specified, means that research observations occur in the contexts of use, on people's activities with the product or service (Anschuetz and Rosenbaum 2003; Whitney and Kumar 2003). Donoghue (2002) provides an interesting example of how failing to explore the user context can lead to a system usable for one group (early adopters) and not for another (the pragmatic majority). RetireCo launched an online retirement planning site which attracted many users, but most of them came to the web site

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and left without engaging the site tools. As Donoghue summarizes the experience:

> "Before launching the site, RetireCo never bothered to ask its prospective customers about their goals for an online retirement planning service. Since many users were novice Internet users, they needed help in understanding how to initiate and complete the registration process. Early adopters, however, had no difficulty registering but felt underserved by the lack of 'power user' features" (2002, p. 3).

Similarly, Zapolski and Braiterman (2003) describe a customer experience engagement where a financial services organization's web site was easy for customers to navigate, but failed to motivate customers to use it because their needs were not sufficiently addressed. These are not isolated cases.

Designing for customer experience results in the designer, both before development and after purchase, focusing on the way users apply, and feel about, existing or proposed products and services (Norman 1998). Multiple disciplines are involved, bringing unique analysis techniques to bear on the user's interaction with new or existing products and services. Its general goal is to inform product design thereby increasing the likelihood of a product working well and looking good to people who use it (Rutter and Agne 1998; Norman 2002).

Why Use Ethnography?

Usability proponents apply a variety of methods to evaluate computer-human interfaces, though the preponderant approach, in both time and money

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expended, is the experimental method or some variation of it (Mantei and Teorey 1988). Ethnography is one of the promising research techniques currently available to assist in designing for customer experience (Wixon 2003). As noted above, to some extent the increased need to engage the customer experience where it occurs comes from the maturity of the uses made of computing technologies and their diffusion to the practical majority of users in products other than desktop computers.

Computational and networking capability is increasingly engineered into everyday objects such as microwaves, refrigerators, stoves, PDAs, mobile telephones, toys, pens, etc. Moreover, many of these devices are designed to connect with wireless sensors in their environment, further complicating the interface for the customer experience (Hallnas and Redstrom 2002). The desktop metaphor is not applicable to devices with so-called “baby faces” (Marcus 2002). The implications of these developments for usability are transformative. Laboratory approaches produce less design information as the interface disappears into the context of use.

Some who write about customer experience design contend that the future of the interface of humans with computing artifacts depends largely on developing systems that understand the context and interact affectively with minimal user instructions (Marcus 2002, Donoghue 2002). Yet, few claim that artificial intelligence is advanced enough yet to support that degree of inactivity between

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the user and the interface. Until those “intelligent” agents are available, if ever, customer experience professionals must work with the design challenge of respecting the prior experiences of users by developing interfaces that use new metaphors.

When compared to the experimental method, ethnographic methods are important because they provide insights into the context in which users put products and services to use. Ethnography is the preferred research technique of contextual inquiry. The data gathered from ethnography, as well as the insights and information produced, are distinct when compared to the sources typically used in getting to know users, i.e., surveys, focus groups, and subject matter experts. Let’s consider each one of these to better understand their differences with ethnography.

Surveys

Surveys provide useful information for high level issues and problems provided the surveyor knows the optimal questions to ask.   Yet, surveys do not provide needed information on the tasks involved and the constraints (physical and socio-cultural) that impinge user actions. Focus groups help with that part of the information gathering effort but only to a limited extent.

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Focus Groups

Focus groups are another good way to learn about user wants and needs. Focus groups are best for identifying potential sales points and product-feature hot buttons, but not for the contextual details necessary to make design decisions about benefits and user goals.

Users' practical actions with a product or service shape, but do not determine, the accounts given by users when explaining their actions. In other words, focus groups allow the analysis to observe what people *say* about their actions, not what they in fact *do* in their actions. This insight is relevant to the design of products and services as well as the analysis techniques used to inform those designs. For example, what people say in a focus group often contradicts in small, but meaningful ways, what they actually do in the context where the practical action occurs.[4]

Subject Matter Experts

Product development teams typically appoint a subject matter expert who is relied upon for information about how users accomplish a range of tasks. People selected for the role can provide useful information. Yet, even if they are current in performing the tasks involved, ultimately they are insiders who face the same incongruities of accounts and practical action that other practitioners face. The role of informant is the most productive role for subject matter experts in

[4] Although the insights offered here on customer experience design are applicable in many ways to everyday things that do not include computational capabilities, our primary concern is with product and service design that makes computational things a feature of the everyday environment.

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customer experience design. Informants help the rapid ethnography team to isolate key attributes of users and the context of use as bounded research topics.

How Is Rapid Ethnography Different?

First off, let's be straight about it. Ethnography is not easy and, regardless of claims to the contrary, such as Kenney and Leggiere (2003), people aren't capable with ethnographic methods just because they can develop software. You can't necessarily do it well just because you are a good communicator either. Indeed, more enlightened computer scientists understand that potential ethnographers require formal training and some experiential mentoring (Weinberg and Stephen 2002).

Relying on customer surveys, focus groups, or feedback from sales staff provides information about what customers say, with a resulting focus on expectations alone. In researching customer experience, what users do is equally as important as what users say they do. Those practical exceptions can occur in work settings, family settings, or for that matter, settings of play. They do not happen in laboratory settings, period. The inconsistencies do not typically result from deviousness or deception but, rather, from the way people incorporate products or services into their everyday routines. As Millen notes, "Ethnographic methods …provide ways to elicit user requirements that would be hard for typical users to articulate" (1996, p. 280).

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Information-rich instances of incongruity between accounts (what users say) and practical actions are more amenable to discovery when product design research focuses on the *context* of action as well as *accounts* of that action (Squires 2002). Watching users practice with existing, or mockup, products and services is the optimal way to discover patterns of action that go unnoticed, often by those same individuals.

In traditional ethnographic research the ethnographer spends extended time in the research setting, getting to know the local culture's traditions and rituals, beliefs and value systems. In contrast, rapid ethnography narrows the focus of field research (here the role of informants, or subject matter experts, is often key), employs multiple observation and recording techniques, and uses collaborative data analysis strategies with other team members, especially designers (Millen 2000). Customer experience design applying rapid ethnography does not perpetuate the quantitative/qualitative distinctions that proponents of traditional ethnography tend to keep in focus to distinguish their approach. Rapid ethnographers readily turn to quantitative data sources, i.e., registration data, customer analytics, web logs, to select subjects and sites for analysis.

Rapid ethnography doesn't permit months of immersion in the research setting collecting data and, subsequently, extended analysis. It accelerates the research process in the following ways:

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1. Research questions are targeted using established sources of information from informants, marketing data, contact center data, etc.

2. Observations are targeted to times and locations in which the users in the sample chosen are engaged in the activities of interest.

3. Data is analyzed through group collaborative techniques and, when feasible, augmented by software techniques.

The time advantages gained from employing rapid ethnographic techniques make it possible to use the approach even with the constraints that typically apply to the development of information technology products and services (Braiterman and Larvie, 2002). The fact that rapid ethnography escalates the user research process, using triangulated methods that combine qualitative and quantitative data, makes it that much harder to do well. Done well, however, the benefits are real.

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