Usability in the Larger Reality: A Contrarian Argument for the Importance of Social and Political Considerations

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ABSTRACT

Usability engineering is situated in a much larger social and institutional context than is usually acknowledged by usability professionals in the way that they define their field. The definitions and processes used in the improvement of user interfaces are subordinate to interests that often have narrow goals, having adverse effects on user awareness and autonomy that have further adverse effects on society as a whole. These effects are brought about by the way that knowledge about systems is limited by the design of the interface that limits the user to tasks and goals defined by organizations, often commercial ones.

It is the point at which the structures of the user interface are defined by usability professionals that sources of the limitation of knowledge can be identified. These sources are defined by their reliance on a construction of the user’s wants and needs that cyclically reinforce, through the actual use of the interface, the user’s own construction of her wants and needs. To alleviate this, it is necessary to come up with new processes of user interface design that do not make assumptions about the user that tend to subordinate the user, and it is also necessary to reconstruct the user as a participant in the interface.

This paper is intended as a philosophical critique, as described above, of the concept of usability engineering. It is also occasionally illustrated with examples of relevant situations involving the social and political effects of usability engineering.

NOTE: This article was written in 2003 as a final project for a Master’s course in human-computer interaction at the University of Ottawa. The author attempted to publish it at the time, but did not really understand the process. The ideas stand up fairly well, however, and he would like to contribute it as a comment on the current state of affairs. It is only lightly edited for format.

1 INTRODUCTION

Over the years, work in various areas of science and engineering has become increasingly subject to public scrutiny over the effects it may have on the environment, on individuals, and on society. The public as a whole has begun to recognize that while the act of scientific observation and analysis itself may be value-neutral (subject to caveats of scientific ethics), the context in which science and engineering are conducted is often not. Questions arise about the benefits such research may bring and what harm. These questions are political ones and arise in debates about values. It thus behooves those who work in science and engineering to examine carefully the ideological assumptions under which they choose to conduct research and how they intend for their work to be applied.

Genetic engineering is an obvious and recent case in point. Questions about biodiversity, effects on human health, economic effects, and so on have reached a point where researchers must pay attention and recognize the effect that their work has on society and the role of politics in their research agenda—and that is just for agricultural genetic engineering. We have barely begun to scratch the surface of the moral, social, and political implications of human germline engineering; it has everything from medical implications to implications for class and social structure, and it is thus a cornerstone of public debate on science as well as the fuel of any number of science-fiction novels.

What makes this science so politically significant? Part of the answer is that it either directly touches the lives of human beings or has future implications that will. This is the case, to a greater or lesser degree, with other scientific and engineering research endeavors. Usability engineering and the study thereof is a component of software engineering that is explicitly devoted to studying the relationship between computer systems and users. As such, it is one of the points at which the several fields often known as information technology have a more direct impact on people and society.

Unfortunately, usability professionals and researchers appear often to discuss deeply political and philosophical questions with only an eye toward narrow usability goals, seemingly not recognizing the relationship between their work and writing and larger questions of power and society. For example, in a recent panel discussion at CHI [1], Janice Rohn and Don Norman argued for a considerable period of time about how to gain influence within organizations by aligning themselves with powerful forces in the organization: who are these powerful forces, what are their values, and so on. But the idea that this context of values may influence the direction and goals of usability work does not appear to be a major factor in their discussion; it is taken as a given that usability should primarily benefit the organization and not the individual user or the society in which the organization exists. Indeed, Norman proposes that usability engineers acquire business administration education, an education that is laden with the values of management. However, all is not lost: Rohn attempts to attribute “feature bloat” in Microsoft products to Microsoft’s monopolistic control of the market; Norman, however, attempts to redirect blame to non-political factors.

Unstated or unexamined political ideas appear to surround or bracket discussions of usability in often quite blatant ways. For
instance, the motto of the 2001 CHI conference was “anyone. anywhere.” This statement appeared in bold text in the footer of papers published in the conference proceedings. In this simple statement is packed a variety of potential meanings

- that anyone can apply usability techniques to any context.
- that everyone should apply usability techniques to every relevant context.
- that such things can benefit anyone, anywhere.
- that usability research is already directed toward making technology accessible to everyone.
- that this is clearly a major goal.

Whether or not these implied claims are true is the matter at hand, though it will take far more than this report to support or deny all of them. But it serves as further illustration the importance of context and contextual assumptions in discussions of usability.

This is one example of well-known usability professionals either ignoring or merely scratching the surface of the political questions of their claims. However, there are writers in the field of usability who have tried to direct attention to usability in the context of wider social goals. Carroll and Rosson [3], for instance, discuss the extension of usability evaluation techniques from the study of interactions between individual users of the systems in question to the integrated study of wide-ranging groups of people in their larger scale indirect interactions through the system. They seek to extend usability evaluation to handle the heterogeneous environments that do not always reflect the relative uniformity of the traditional business organizations. They discuss the application of these techniques to the evaluation of community networks, and they connect such evaluation to the improvement of the social utility of computer systems, given an understanding that in some modern societies, there is a “crisis of community,” wherein people’s integration with local community life is being stifled by the exigencies of the modern daily existence. In this case, it becomes important to see, among other things, whether or not community networks are being used in such a way that they serve community goals or whether or not they are being used as on-ramps to other unrelated services.

While it is clear that there is a growing trend in seeing usability issues in social terms, however, there are still areas of socially significant usability assumptions that have not yet been questioned. This report will deal with a small number of them.

1.1 Objectives

The component of the debate about usability that I intend to focus on most closely in this report is the politics of users’ knowledge of the system and how it influences user interface design goals. Specifically, I intend to give a brief introduction to arguments

- that definitions of usability are relative to the world-view of the usability professional, as partially explained above.
- that this world-view assumes that users are static entities defined by goals of organizations.
- that this is connected to power relationships in human society.
- that these relationships depend on limiting knowledge.

- that expanding the the flow of knowledge to the user (indeed, making more demands on the user) can have a subversive effect on power relationships in society.

It is important to note that I am specifically acknowledging a goal here: the empowerment of users to the detriment of interests that already have power over them. It is not necessary for the reader to agree with the way that this goal has been defined, but it should be noted that often other writers’ goals, as seen above, are not defined even if they exist.

2 USABILITY AND GOALS

I have spent the previous section introducing the relevance of social and political goals to usability engineering. However, in light of the objectives above, it behooves me to narrow down the discussion to the goals against which I intend to evaluate aspects of contemporary usability engineering. After this, I will discuss how narrow definitions of usability depend on the particularization of users and users’ knowledge and its subjugation to organizational goals. Thereafter, I will discuss the social impacts of user interfaces that narrow the information flow.

2.1 Politically Motivated Goals

There are different kinds of goals, but in particular they can be classified by their nature as general or situation-specific. Carroll and Rosson, for instance, define a set of social goals to inform the evaluation of a specific type of system created to alleviate a particular social problem that they felt the need to address—community networks for solving the crisis of community. But Muller et al. [8] do not have a specific type of system to evaluate. They instead discuss systems in a business context with the view that the values of business cause usability analysis to see the relationship between humans and computers primarily in terms of “productivity and efficiency,” a “Tayloristic” approach. They would prefer to see an alternative characterization of work expressed as the quality of three things: work product, work life, and communication. They set quality of the work product against productivity, since increasing productivity may lead to a decline in quality; they define quality of work life in terms of the intangible psychological effects felt by the user; and they express the quality of communication in how computer systems affect the user’s communications with other entities involved in the organization, such as customers or executives.

Only two of these three values are justified in terms of the user or any human environment surrounding the user. And unfortunately, they still justify these criteria in terms of economic goals; for instance, they justify the idea of designing user interfaces that improve the quality of work life in terms of the enthusiasm brought by the user to his or her work in the organization. So this general view of making use of “non-Tayloristic” values in user interface evaluation still has the side effect of reinforcing a business goals, not social goals.

So Carroll and Rosson [3] have a broad social view but a specific goal, while Muller et al. [8], starting with a radical hypothesis, ultimately lead to a business-oriented view but one that applies to more general usability evaluation issues. But it would be better if
there was a way to provide a broad social view that informs usability analysis in general and not just for specific circumstances, finding the equator between these two poles. What sort of goals are these? As suggested in section 1.1, they are, among others, goals relating to the distribution of power between individuals, a distribution that can be affected and effected by the information that is provided by the user interface. Then the goal becomes to design in such a way

- that recognizes that power is enforced in organizations by limiting certain kinds of knowledge.
- that is based on recognizing the places in the design that limit such knowledge.
- that is willing to limit reliance on certain traditional goals of user interface design, such as "ease of use," that may often depend on limiting knowledge to the end user.

On what sort of knowledge, then, is this goal predicated? If it is simply the knowledge that must be imparted to the user in order to perform his or her specific tasks—that is, domain knowledge—then there is no particular significance to these goals. Under any reasonable set of design goals, if domain knowledge is not being correctly imparted by the user interface, then there is a problem. No, in this case, the knowledge in question is knowledge of how the system works, knowledge that would normally be confined to system designers, implementers, and expert users.

Why is it important for this knowledge to be exposed to end users? Some of this question will be answered in a later section (2.3). However, to give a concrete example from consumer software, consider the growing use of popular software on the Internet that sends data back to its manufacturer (KaZaa figures among these). In this case, many users are not aware what kind of information is being sent for data mining purposes. It is likely that they are not aware that a program can monitor their activities without their knowledge and transmit it without their explicit actions. As we move into a more paranoid security situation with more government surveillance and scrutiny of everyday life, it is necessary that consumers become more aware of these things; designing other, more ethical Internet applications that do not hide so much of the underlying Internet reality from end users may be a step in the direction of user interfaces that promote social goals and social change.

Now, one may claim that this way of characterizing and justifying design goals are simply relative to the person holding them and an entirely subjective manner. Why should usability professionals be concerned about these goals? The answer is to say, yes, these are relative to the views of individuals, and there is indeed a subtext of social radicalism in their construction. However, this is a matter of degree; most people would likely view at least the encouragement of user understanding of security-related matters to be a positive effect. But ultimately, the actual moral value of such goals goes into philosophy and beyond the scope of this report.

2.2 Usability and Roles

How is system knowledge apportioned and limited? How do current concepts of usability engineering help to encourage this state of affairs? This is inextricably tied up in how usability professionals see themselves and their field, as with Rohn and Norman are described to do in the interview mentioned in introduction to this document [1]. I will therefore discuss a definition of usability and usability engineering as provided by Butler, who seeks to describe usability engineering’s past accomplishments and rise to importance [2].

To begin with, Butler [2] defines usability to be the “effectiveness of interaction between human operators and their machines.” Butler attempts to define this in objective terms by claiming that this effectiveness reflects “how well intended users can master and perform tasks on the system,” given empirical measurement brought to bear by the observation of “actual user performance of frequent and critical tasks on the system.” Usability engineering, therefore, is a “new discipline” that serves “to address system usability in a reliable and replicable manner.”

It is important to note that Butler provides this definition only after he provides background information about the larger context of usability in much the same way that I have arrived at this point of definition after describing the larger context in which I intend this discussion. However, he is not at all self-conscious about the nature of his background. He specifies his primary motive in the idea of the success of a system, clearly defined in terms of its commercial value on the marketplace or its cost to a buyer.

How does poor usability cost the buyer? According to Butler [2], it can cause businesses to lose opportunities to “re-engineer their processes.” The work that a user does is defined in terms of the institution; the value of the user interface is entirely contingent on how it allows the user to serve the institution, and, more abstractly, how it allows the institution to manipulate the environment of the user, as represented by the processes of the business organization. Indeed, “work pressures” give the user less time to learn the interface, making usability crucial to efficiency and reducing overhead.

Task analysis is one of the main tools which Butler expects usability professionals to use in order to provide information as to how the interface should be designed. But these tasks are apportioned by the organization. In fact, it is the tasks that apportion users into different roles in the organization—indeed, that is one way that organizational roles can be defined: by the tasks they imply. In other words, usability as seen by Butler, whose article [2] is devoted to discussing recent trends, is not only defined by the tasks that the user must perform, but it also partially circumscribes the user’s role. It is designed, by its reliance on task analysis to improve business efficiency, to reinforce aspects of society that are by their very nature political and philosophical.

By what mechanism does usability come to define the role of the user? Butler notes that an important part of usability work is determining what should be automated by the machine and what should be performed directly by the user. This is one direct way of limiting the user’s role. But what about the interface itself? Does it contain some characteristic that constrains the user and helps to subordinate the user to the goals of the institution? Part of the answer to this is the way in which user interfaces constrain the access of the user to knowledge about the system, an issue to which I have alluded in the previous section and to which I will return in section 2.3. Furthermore, it is the presupposition of the organizational roots of tasks that cause usability analyses to prescribe user interfaces that promote these constraints.
2.3 Effects of Limiting Knowledge

By now I have reached a point where I have described usability as a force that affects the user’s power the define his or her own role in the organization and in society—in other words, notions of usability can constrain the user’s knowledge and therefore the user’s power. However, I have not as yet described some of the means by which this is accomplished.

Much of the answer is discussed by Johnson-Eilola [7]. He is concerned most directly with training and documentation aspects of computer systems, but he also applies his ideas to the philosophical underpinnings of user interface design as well.

Johnson-Eilola notes that as users have come to expect that computer technology becomes increasingly automated and “anticipates our every desire,” it becomes more difficult—“pointless”—for users to “think critically about the operation of the machine and our position within it.” Indeed, users become less aware of how technologies “construct positions that users assume” the more invisible the workings of technology seem to be. In other words, users come to expect that technology will automatically satisfy their needs, requiring less and less participation on their part.

Designers of software respond to these expectations by designing in such a way that “users shouldn’t have to think.” But this creates a vicious cycle, as it reinforces that very expectation. As users come to expect that their contribution in terms of effort and thought will be reduced, users become less and less capable of defining the reasons for what they expect. Johnson-Eilola refers to this situation as the “politics of amnesia.”

Is amnesia always bad? Should the user be involved in every detail of the operation of the system? Where is automation-induced amnesia a good thing and where is it bad? Johnson-Eilola notes that modern society requires such a complex flow of information that it is impossible that human beings be required to process all of it. But the cycle that causes designers of user interfaces and writers of documentation to reduce the flow of information to the user tends to a limit at which the user is deprived of any information that would allow the construction of a mental model of the system. “Amnesia” is not always a bad thing, but Johnson-Eilola wants to identify the ways in which user interfaces go too far rather than help users to “actively build memories and experiences.”

In section 2.1, I briefly gave an example of situations in which the user’s lack of a mental model of Internet communication leads to situations in which the user’s data can be exploited by common software that communicates without the user’s consent. I gave the example of the music-finding software, KaZaa, and this piece of software illustrates this point quite well. KaZaa is a program whose purpose it is to automate as much as possible the user’s search for music and other files; not only does its automation exploit the user’s data, it itself reinforces the patterns that give rise to the user’s lack of knowledge.

But KaZaa is a minor example of the unknowing loss of autonomy experienced by the user. A much larger example is that of email standards and the marketplace. This is discussed in detail by Jakobs et al. [6] in their paper on the relationship between users and the standardization process that focuses on the reluctance of organizations (here apparently defined as a sufficient representative of the user) to become involved in standards bodies. While Jakobs et al. describe a number of reasons for this phenomenon with respect to email standards, one of them is that the organizations and the people responsible for setting up email therein are used to viewing email through the products and services being used to provide it.

This necessarily makes the user interface of these products the main arbiter of how email and email standards are viewed by the end user. Since leading commercial email packages such as Microsoft Exchange tend to obscure the challenges that are faced in other, heterogeneous environments where multiple email packages are used, the user organization becomes increasingly less aware of the issues of interoperability that standards are intended to solve. This reinforces reliance on proprietary products, which in turn reinforces the lack of awareness, in a similar cycle as the politics of amnesia. As such products as Microsoft Exchange are generally integrated with other Microsoft products, it further increases the prevalence of Microsoft in the organization, leading to the near-monopoly that Microsoft presently has in the marketplace1. This demonstrates how user knowledge and the politics of amnesia has an effect on user choices and the technological situation.

In a sense, the subordination of the concept of usability to institutional goals creates a series of interlocking amnesiac cycles of various scales (from KaZaa to monopolies) that inhibit a practice of usability that realizes the goal of returning autonomy to the user. The remaining task is to locate the conjunction of these cycles, the point which they all have in common, in order to diminish their effects.

3 USERS, DESIGN, AND KNOWLEDGE

I have accomplished the main task of discussing some ways in which usability engineering and the goals and assumptions behind it control knowledge in such a way that the user is inadvertently subordinated to institutional goals. But there is the remaining task of explaining the aspects of user interface design that wherein the control of knowledge is actually implemented.

The fundamental link in the chain of stifling visibility are the design practices followed by usability professionals in the way that they choose to arrange and structure user interfaces; while these practices are informed by their unacknowledged political understandings, they could have no understanding or reinforcement without a point at which they become real. Task analysis and other organizationally embedded processes do not have any relevant effect on reality until the work of building the user interface is accomplished.

Consequently, in the remainder of this section, I will discuss the flaws with the philosophy of user interface design that appear to be prevalent in usability engineering; I will discuss a potential way of alleviating these flaws through by re-orienting established design heuristics; and I will expand the discussion not only to the interface itself, but to reconstructing the user as a participant in the interface.

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1I take it here for granted that monopolies are bad. The negative economic, social, and technological impact of monopolies are beyond the scope of this report.
3.1 Invisibility and Design

Johnson-Eilola [7] goes on to discuss the aspects of the politics of amnesia that cause these effects as they are expressed in documentation and user interfaces. He notes that the most important technologies that human beings use are the most invisible and used without thought: "It’s hard to argue with something that’s not there." But when it comes to user interfaces, the invisibility that defeats user awareness is often a design choice. According to Johnson-Eilola, designers and documenters operate on "Shannon and Weaver’s" communication model from the 1940s. In this model, the sender imparts information to a receiver through a limited channel; the task of the receiver is simply to present itself. Very few models of communication involving human beings rely on this view of the human receiver, having instead complex models of the receiver’s response, interpretation, social situation, and so on. But the fact that this model is simple for designers to conceive and happens generally to "work well enough" to help most users to accomplish their desired tasks allows this model to persist.

The first component of the expression of the Shannon-Weaver model in user interface design is summed up by Johnson-Eilola as "Do as I say, not as I do." In Johnson-Eilola’s specific area of computer documentation, this aspect of invisibility is expressed in the way that documentation writers measure the success of their texts: the ease at which the users are able to follow the instructions. But most documentation writers are also aware that users interact with texts in an often highly creative process, by doing such things as linking the information in the texts to prior experiences. So users are paradoxically encouraged to view the text as trivial while the information in the texts become more complex with the technology.

I can easily extrapolate this to user interface design beyond documentation. The invisibility of technology as produced by automation is a result of designing the interface to satisfy the user’s desire for simplicity while enabling the user to perform complex actions in such a way that telescopes complexity into user actions that minimize the user involvement. Though invisibility is not always bad, it is the assumption that this paradox must always be satisfied in favour of simplicity that leads to design decisions that produce invisibility that reduces the ability of the user to imagine a social criticism.

This telescoping of complexity leads into the second component of the denial of the receiver/user’s agency produced by a Shannonistic model. Once again, to put it in Johnson-Eilola’s pithy wording [7], "real learning disappears in the collapse of time." Johnson-Eilola emphasizes the difference between learning and being trained. Learning implies an attempt at increasing the possibility of future creative use of the acquired knowledge; but merely to be trained is to acquire knowledge in such a way that it is only useful for a particular task. Johnson-Eilola uses the example of a hammer: should the use of the hammer be taught only sufficiently to succeed in the task of hanging nails, or should it be taught in such a way that allows the hammer’s user to acquire carpentry skills in the future? To Johnson-Eilola, the latter is clearly the more desirable option—it is the true learning.

In the desire to improve efficiency, whose nature with respect to user interfaces has been discussed in previous sections, the time required for documentation to impart knowledge is often reduced to the time required for training, not learning [7]. Once again, this can be extrapolated to user interface design. Aspects of the user interface that can be designed to teach (that is, bring about real learning) are instead co-opted into performing tasks in an invisible manner. Johnson-Eilola brings up the example of "wizards," tools that can be used to allow the system to engage in complex interactions with the user. In their potential to expand the user’s understanding of the system by revealing through interactions what the system is accomplishing, instead wizards are typically given the role of automating for the user complex tasks that do not lend themselves well to this sort of automation. Microsoft Word, for instance, contains many wizards for creating different kinds of documents, but these wizards do not discuss well how and why these documents are structured so that learning—and therefore user autonomy—can ensue.

A last issue brought up by Johnson-Eilola that can be translated into this discussion is that of the “collapse of critical distance” brought about by the expectations of speed: “At the speed of light, time ceases to be an issue.” From the point of view that I am presenting, it is impossible for users to regain autonomy and power, to reduce the negative effects of the politics of invisibility and amnesia, if their capacity for criticizing the system’s wider effects is diminished. The time expectations of the user, that “the distance between desire and result should be zero” [7], are cyclically reinforced to produce a situation wherein the user does not even have the opportunity to criticize. Johnson-Eilola discusses the tendency of word processing and other productivity tools to move important interface elements from invisible places such as menus to immediately visible places such as tool-bars. It may seem paradoxical, but this kind of change from apparent invisibility to visibility—reducing the need for the user to search through menus—actually serves to increase the overall invisibility of the context of actions and the whole menu arrangement of action, decreasing the critical distance of the user.

I have thus used Johnson-Eilola’s ideas to characterize the nature and effects of three components of the Shannonistic approach to user interface design:

- Designing so that complex tasks are performed in deceptively simple ways destroys the possibility of creative and critical interaction with the system.
- Focusing design on specific tasks reduces the opportunity for real learning.
- In making actions more easily available to the user, there is a price to be paid in terms of encouraging user assumptions and reducing the opportunity for thought.

As these issues are in conflict with the goals laid out in section 2.1 and serve, in the long term, to subordinate the user in ways discussed in sections 2.2 and 2.3, we need to revise the approach to user interface design in order to diminish the effects of a Shannonistic model.

3.2 Beneficial Complexity

The primary purpose of this report has been from the beginning to discuss the concept of usability from a political and philosophical standpoint. However, I shall now briefly turn to what is an even
Table 1: Mac vs. Anti-Mac design principles; after Gentner and Nielsen.

| Mac                  | Anti-Mac                      |
|----------------------|-------------------------------|
| Metaphors            | Reality                       |
| Direct Manipulation  | Delegation                    |
| See and Point        | Describe and Command          |
| Consistency          | Diversity                     |
| WYSIWYG              | Represent Meaning             |
| User Control         | Shared Control                |
| Feedback and Dialog  | System Handles Details        |
| Forgiveness          | Model User Actions            |
| Aesthetic Integrity  | Graphic Variety               |
| Modelessness         | Richer Cues                   |

Table 1: Mac vs. Anti-Mac design principles; after Gentner and Nielsen.

more complicated discussion of what to do about the critique, relating it to ideas that already exist in the usability literature but were not necessarily intended to be used to implement a philosophical programme.

There are a number of techniques used to design user interfaces, but one particularly interesting one is the use of design heuristics. Heuristics attempt to present a manageable set of guidelines that capture good practices in user interface design; they can be used both in prototyping and in evaluation. Heuristics present a boiled-down encoding of how user interface professionals view the structure of the user interface, and thus they present a useful target for reform. From such a change, there can be a re-evaluation of the larger construction of the concept of usability.

An interesting proposal for altering the way we see user interfaces comes from Gentner and Nielsen [4]. They discuss the history of user interface design guidelines as they have supported the WIMP (windows, icons, menus, pointers) model with the view that the reliance on certain guidelines has stymied the production of new user interface paradigms beyond WIMP. In effect, their concern is not social like the motivation behind this article; nevertheless, there is potential in their proposal for a politically-aware practice of usability engineering.

For Gentner and Nielsen [4], an important exemplar of modern user interface design guidelines are those for the Macintosh, published by Apple in the 1992 (though they appear to be much older). These design guidelines were set under certain assumptions, some of which involved the need for the guidelines to help Apple to sell products to users. Gentner and Nielsen wish to perform a thought experiment: what if user interface design was performed under heuristics that violated those guidelines? They call these the “Anti-Mac” heuristics and proceed to define and contrast them with the Mac interface guidelines. Table 1 lists these contrasted principles by name.

Some of these principles bear directly on the matter at hand. The Mac principle of See and Point, wherein the user is limited to clicking on only the presented objects, represents a form of limitation on the user that coincides with invisibility; the user can do nothing but what is presented there, which may be very limited in relation to what the user may eventually wish to do. The Anti-Mac principle of Describe and Command, however, represents the view that language is central, that subordinating the user to a limited, “easy,” interface is a step back in human communications; in the Anti-Mac interface, Gentner and Nielsen suggest, the user can instead compose commands in a simple language (so as not to set the infeasible requirement that computers understand the entirety of human language) that express a much broader range of interactions than See and Point. The use of language can help to return control over complex actions to the user, rather than requiring that the complex actions be inscribed in the interface itself.

Another contrast between the Mac design guidelines and Gentner and Nielsen’s Anti-Mac guidelines is the role of WYSIWYG. WYSIWYG stands for the well-known dictum, “What You See Is What You Get,” so that what is displayed represents as closely as possible what needs to be produced after the user performs her tasks (such as an image of a printed page in a word processor). But as Gentner and Nielsen [4] point out, often this merely translates to “What You See Is All You Get.” The Mac guidelines specify WYSIWYG; the Anti-Mac guidelines focus on representing the meaning of interface objects that appear to the user. Indeed, Gentner and Nielsen call for Anti-Mac systems to have richer internal and external representations of objects with which the user interacts. Richer internal representations are needed because the freedom of interaction produced by a language-oriented user interface requires more complex information about the objects. A richer external representation with more complex ways of interacting with objects allows the user greater autonomy and freedom in using the objects. From the point of view of autonomy as a social good, richer internal and external representations of user objects allow users to expand their use beyond the tasks intended by the designers of the interface, reducing their subordination to the interests that establish the requirements of the design.

Not all is well, however, with the Anti-Mac guidelines. A Mac design guideline is Feedback and Dialog. Contrasted to this is the Anti-Mac guideline of System Handles Details. Defined any reasonable way, letting the system handle the details of an action promotes a form of invisibility-inducing automation. The Mac guidelines, however, are more inclusive of the user as a participant in the process. The situation can be rectified somewhat by letting the system handle the details in such a way that the user remains informed about the actions that the system is taking, as well as allowing the user control over the nature of the automation itself—once again implying a need for the expressive power of language in scripting or some other medium. Nevertheless, while containing some aspects that further an agenda of user power and autonomy, the priorities of Gentner and Nielsen are considerably more traditional.

Gentner and Nielsen [4] mention that ultimately the Anti-Mac interface is designed for users with a greater level of expertise than the Mac interface. Considering the current levels of computer use by young people, they assume that in the future, a greater and greater proportion of the population will be classed as expert users. Then the trade-off between ease-of-use and power will be much easier to make.

But to assume that this will be the case also assumes that expertise will be generated without social change. In order for users to regain autonomy and critical distance, it is not enough that more complex user interface paradigms be implemented passively over
time. This passive mode envisioned by Gentner and Nielsen does not optimally raise the consciousness of the user to a state of autonomy from the parameters of the institutionally-oriented task analysis performed in the user interface design. Instead, an active mode of creating expertise is required, a user interface design paradigm that does not merely allow the user to take advantage of powerful features, but rather encourages and pushes the user into a heightened awareness of the capabilities of the system. (The benefit of this is explored in section 3.3.)

Already there are interfaces that display some of the Anti-Mac characteristics: the user interfaces for current Unix and Linux systems. The extensive reliance on command prompts even in graphical situations takes advantage of the power of language, albeit perhaps in a less forgiving way than that envisioned by Gentner and Nielsen. And it may very well be a less forgiving user interface that is necessary to create user growth and empowerment, a user interface that reflects more closely the underlying state of the system and thus the possibilities for autonomy that emerge therefrom.

3.3 Expertise and Empowerment

Mention was made in section 3.1 of the practice of indulging the user’s own desire for simplicity and efficiency at the expense of critical distance and autonomy; it has also been noted that focusing on satisfying this desire creates this desire, as the ability to learn and to criticise becomes increasingly less possible. So we must not only begin to reformulate the heuristics of user interface design, which is one half the equation, but also how we deal with users.

Furthermore, an agenda of beneficial complexification runs the risk of reversing some positive social gains made by simplified user interfaces, in particular the accessibility of the user interfaces to disadvantaged groups such as women and minorities. Rather than sacrifice the goal of increasing user involvement in computer systems, we should rather seek to understand why it is that these groups are excluded from technology in the first place.

It is well known that for most of recorded history, technology has been defined ultimately as a masculine space. Technological spaces have generally excluded women; women are still vastly in the minority in computer science and electrical engineering, among other “technology-heavy” fields. In his discussion of an attempt to increase women’s involvement in technology [5], Herman notes that some radical feminists have taken the masculinity of technological spaces as fundamental to technology, seeing, among other things, how it has generally been very closely connected to such historically masculine institutions as the military-industrial complex. In a sense, if one takes this viewpoint to its limit, opening technological spaces to women can often be constructed as a masculine intrusion on women’s spaces, supplanting a transgressive act.

This viewpoint also ignores the fact that there have been technologies that also have liberated women—not perfectly, but they have allowed women to resist patriarchal institutions. There is a kind of technological dialectic whereby, indeed, women’s technological gains can be co-opted. But in this technological world, it is necessary that women be able to reclaim technological spaces, if only for the fact that both men’s and women’s lives are deeply affected by it. Indeed, such a transgression is an essential part of the critique of the social effects of technology.

Herman [5] describes an organization in Manchester, England, called the Women’s Electronic Virtual Hall (WEVH). The WEVH was part of a wider set of Electronic Virtual Halls (EVH) intended to make technology more accessible to disadvantaged groups. One of the successes of the WEVH, as described by Herman, is the introduction of women participants to technology in a direct and hands-on way, not just as a tool but as an item of interest in itself. Courses were offered in which women without prior technical experience were encouraged to touch technology, to be involved with technology not just as a transgressive act but as a normal experience; these courses involved training women in such things as assembling the internal hardware of computers (motherboards and so on), plugging together PCs, setting up networks, trouble-shooting, and maintenance—not just using the computer, but being involved in it.

It is the promotion of expertise that allows the completion of the other side of the usability equation as discussed in this paper—not just expecting that users be passive consumers of computer technology, wholly determined and constructed by their experience of the user interface, but rather that, as active agents, they too are a partner in the construction of the usability. Expecting nothing from the users but the completion of their tasks is precisely the self-reinforcing Tayloristic goal that usability engineers seem not to question, as I have discussed near the beginning of this paper—it is associated with the ubiquitous obsession with productivity and efficiency, not autonomy and creativity. Women who participated in the WEVH are now better empowered to participate in the technological world not merely as users, but as critical thinkers; they are more likely to migrate from being users who are constructed by usability engineers to being users aware of their own construction and the construction of technology as an influence on society.

Ultimately, invisibility must be challenged both from the design of the interface and from the perspective of the user.

4 CONCLUSION

In section 1.1, I discussed my main goal in this paper which was to provide brief introductions to five political and philosophical ideas regarding usability, knowledge and power. In the following sections, I proceeded to fulfill each of these objectives in some measure. I discussed a mainstream definition of usability in the context of current work. I discussed the goals of usability engineering in order to lead into a discussion expanding these goals to a practice that serves to challenge the social order rather than serving the social order. I gave examples of both subtle and blatant exertions of power between varying interests in society, and I connected these to the way in which knowledge flows between these interests. And finally, I discussed the ways in which this flow of knowledge is related to design practices and to the view of the user held by usability professionals and potential ways of subverting these.

When we subordinate usability to the goals of institutions and the short term goals of users, we actually persist in reinforcing a false consciousness of power that is actually invested in Tayloristic goals of productivity and efficiency, concepts that do not liberate
the user but instead subordinate the user to institutional goals as well; if usability is subordinated, then so the user will be.

Often certain programmers and engineers refer, not quite seriously, to end-users as "stupid." While this appears to be a rejected perspective in usability engineering, it may be time to rethink that. Perhaps users really are stupid, stupid in that their level of understanding prevents them from obtaining a level of autonomy from the systems they use, but rather they are subordinated to an institutional idea of tasks and goals. And perhaps this is partly because users have been constructed that way by those who design user interfaces. Perhaps making a more difficult user interface is not so bad; perhaps "ease-of-use" is not an end in itself. In any case, it is time to reevaluate how usability professionals affect the world through their paradigms and decisions.

4.1 Practicality

In several previous sections, I have mentioned examples of where the existing concepts of usability engineering serve to subordinate the user and points at which this control can be broken. But an important remaining question is how the usability practitioner can actually take advantage of these points if he or she is so inclined. A major topic I have avoided dealing with so far is the reward system by which usability specialists are formed into a discipline. Usability professionals are ultimately hired to perform tasks that their employers and clients require them to do and expect them to perform within the material and ideological bounds that benefit them. A subversive practice of usability engineering in which efficiency and productivity are not given primacy may ultimately be impossible for usability professionals to implement in real life in a large, obvious, and direct scale.

Nevertheless, the very act of discussing such a subversive practice in an environment where the institutional goals of usability engineering are assumed is itself useful and important. It transgresses against the boundaries of usability discourse that are already set. Eventually, it may result in small acts of user empowerment that may grow over time.

Perhaps a subversive usability practice can exist. Perhaps it exists already in the freewheeling development of freeware tools. We shall see.

4.2 Subversion

So all this leaves a final question: what research directions to take from this point? At the moment, the way to a truly transgressive practice of usability engineering is not clear at all. While a new way of looking at user interface design heuristics and a new way of looking at the users themselves are very well and good, there is still yet another component that needs to be inserted into the equation: the usability engineers. We need a new way of looking at usability engineering as a discipline. For instance, when they are not merely copying the interfaces of popular Microsoft Windows products, the freewheeling processes that underlie the building of user interfaces for Unix/Linux-based open source freeware appear to produce somewhat "messier" user interfaces, but ones in which the user often has far more control about the nature of her work and her interactions with the system. It is as though the undisciplined processes of open source software design by their very nature produce interfaces more conducive to user learning and to user autonomy. Further work is therefore required to discuss whether or not open source interfaces really are more conducive to end user autonomy, in what ways this is so, and what specific characteristics of open source design processes tend to produce these effects.

If usability engineering is ever to achieve a point where a practice that helps to subvert existing power relationships in society can emerge, then it is necessary to investigate power relationships involved in the current practice of usability engineering. Let the user no longer be used.

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