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Deconstructing the Text:
the human/ machine paradox in technical documentation

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ABSTRACT
This paper is an empirical study that deconstructs a technical document to empirically extend an earlier theoretical proposition – that argued that an imbalance exists between the dichotomous presentation of human and machine language utilised when constructing technical documents in Information Systems development and implementation. By drawing on writings from critical and cultural theory this paper applies theories of post-structural analysis to the United Kingdom division of a multi-national firm’s user documentation for an Intranet system. The paper does this by presenting the background to the theory of post-structural analysis itself and then discussing why and how this particular deconstruction has been carried out. The paper draws on exemplars from the data obtained from the research site to deconstruct the text’s presentation of human to machine relations. Finally the paper provides an alternative representation of this particular technical text as the necessary application of the poststructuralist imperative. It is argued that to enact change in technical documentation practices the dominant presentation of the human to machine relationship in Information Systems practices must be challenged. This practical example attempts to disrupt and illustrate how existent dominant power relations in Information Systems development can be challenged.

Keywords
Deconstruction, textual analysis, cultural and critical studies, documentation

INTRODUCTION
This research presented in this paper extends already published theoretically-based research (Greenhill, 2002). The original theoretical proposition explored the disruption that virtual reality has upon identity construction in computer mediated environments. In particular it was posited that a theoretical imperative existed to critically examine structural dichotomies perpetuated by language-based polarisations of human machine relationships within the context of computer usage (Marakas, & Elam, 1998). Post-structural theory was discussed as a means to challenge existing hegemonic conditions and politically empower those who are impeded by the perpetuation of technological dominance in computing (Stephanidis, 2001). My research has subsequently deconstructed a series of technical documents in order to examine the semiotic dichotomies of the human and the machine. The aim of the research is to explore the wording and the associated meanings conveyed through technical documents developed for virtual environments such as the World Wide Web. Semiotic studies focus on textual analysis and printed technical documents offer a significant opportunity for exploring the theoretical propositions put forward in earlier works.

Information Systems, irrespective of their provenance, rarely are acknowledged as contributing to the identity construction of users (Greenhill, 2001, Greenhill & Isomäki 2004, Wilson & Greenhill, 2004). Furthermore, little subsequent consideration is given to the human qualities or ‘presence’ of users as an integral component of the system (Lamb & Kling, 2003). The neglection of human qualities, such as emotional expression in computing results in the ambiguity of identity within technologically enabled spaces (Becker, 1997; Gisler, 1997). Information Systems development has a homogenising influence
which emphasises particular methods of interaction and, impacts upon the interpretation that users can achieve via the computer interface of a computer - as a technologically orientated information system. The current technologically-driven Human Computer Interface (HCI) agenda for constructing the computing experience is a fraught position that remains entangled between the interposed detachment of the screen and the fully immersive qualities found ‘in’ virtual realities such as flight simulation (Greenhill, 2001). The interaction brings with it an experience of distanciation, where exchange is anchored by the screen (cf. Argyle 1969; 75). It is argued, by Preece (1994) that current HCI configuration provides a disassociation from real life experience. Post-structural approaches to the interpretation of society through deconstruction are particularly suited to the examination of the computer mediated experience, and should be an approach that could be more thoroughly drawn upon in Information Systems studies (Klein & Hirschheim, 1993). The human/machine polarisations in computing imitate the heavily trodden terrain of the mind/body dichotomy. Post-structural theory argues that dualistic reductions contribute to the reproduction of hegemonic power relations (Easthope & McGowan 1992). This is the premise that this paper explores, ultimately challenges and hopefully disrupts.

BACKGROUND
Semiotic analysis has its roots in Philosophical, Literary, Critical and Cultural theories. Seiter (1987, 17) defines semiotics as “the study of everything that can be used for communication: words, images, traffic signs, flowers, music, medical symptoms, and much more. Semiotics studies the way such signs communicate the rules that govern their use.” With such a diverse tradition seemingly disassociated from Information Systems studies it is important to state the initial and underlying assumptions. The primary assumptions that informed this study are consistent with post-structural and critical theory studies in that there is an emancipatory agenda and a status quo to be challenged. Post-structuralism - in this way - requires more than ‘just’ conducting a test of reality. These studies have a core emphasis on affirming that for human beings nothing is simply ‘there’, natural, objective, self-evident, that there is no class, race, gender or sexuality which can claim an automatic privilege (Easthope & McGowan 1992, 2). Hall (1974) explains that cultural studies began the challenge to literary works as self defining objects and in this way enabled texts to be explored as transitive. That is, the studying of a text, can reveal the relationship between the reader and the written piece. The next and most significant element of semiotic analysis is the ‘text’ itself. Thwaites, Davis & Mules (1994, 67) define the text as “a combination of signs”. This current research - as a piece of textual analysis - is an exploration of the written word taken from a technical document. The document is a textual configuration and as such is a structural representation of human interaction.

Semiology’s (Semiotics) basic principle is that where there is signification and text, there must be a knowledgeable underlying system that gives rise to meaning… On this model texts can be analysed in terms of shared features in an attempt to describe the rules which would generate such texts as instances to these rules. (Easthope & McGowan 1992, 5).

Semiology is the study of signs. A sign is something that stands for something else (Easthope & McGowan, 1992). The underlying methodological assumption is associated with Saussure’s distinction between langue and parole. Language in this context provides a synchronic system for understanding, sharing, saying and writing a specific language. Language is not made up of a series of arbitrarily assigned signs or sounds. Language is a social fact, in which community defines its values, usage and maintenance. Saussure’s dyadic model introduces the relationship firstly between the existing sign,secondly the signified or concept associated with the sign, and thirdly the signifier. The signifier exists because in language there is only difference. That is, the existence of differences between symbols and sounds allows us to associate a single sign with a dominant meaning and therefore develop a language.
The signified and signifier are locked in a continual battle. As Easthope and McGowan (1992) state, “Language is a system of interdependent terms in which the value of each term results solely from the simultaneous presence of the others. The relationship can be modelled as:

![Diagram of signified and signifier](image)

Figure 1. Easthope & McGowan 1992, 9

Textual analysis therefore aims to reveal the shared features of a language and attempts to describe the rules associated with the creation of text. Beasley (1980) states that the critical approach employed in deconstructing text seeks to challenge ideological assumptions associated with the readings conducted by the reader. She states,

The object of the critic, then, is to seek not unity of the work, but multiplicity and diversity of its possible meanings, its completeness, the omissions which it displays but cannot describe, and above all its contradictions. In its absences, and in the collisions between its divergent meanings, the text implicitly criticizes its own ideology; it contains within itself the critique of its own values, in the sense that it is available for a new process of production of meaning by the reader, and in this process it can provide a real knowledge of the limits of ideological representation (Beasley 1980, 109).

In this way the text, as Beasley describes it, provides the instances of the rule usage. Deconstruction, therefore, is attempting to disentangle the signifier in the text - in this case the machine, and what is being signified by the associate framework of meaning to the reader - in this case the user or human.

**METHODOLOGY**

Full details of the deconstruction process are detailed here and rely heavily on the interpretive skills of the researcher conducting the research. The scope of this paper therefore limits the account of the methodological approach followed in this empirical study and instead what is described is an overview of the technique (for further detail see Gerberner et al 190; Hall 1973; Hall 1974). The researcher utilised the deconstructive techniques described by Hall (1980). A systematic analysis of the technical document itself was carried out. The text was read over and the researcher coded the document through colour coding applied to specific categories (i.e. green for machine signs, pink for human signification etc.). The first level of analysis occurred through listing and disentangling the dichotomies of the associated terms machine and human. The variety of terms revealed by the first stage analysis was then converted into a chart. This data has not been directly drawn upon in this analysis. A second level of analysis was then carried out, sorting the discourse into clear or exemplar occurrences of machine or human rule usage. This was achieved by identifying and then sectioning up the written text to understand the encoding and decoding in the language relationship of the technical document. This can occur because as Hall (1980, 130) states, “The institution-societal relations of production must pass under the discursive rules of language for its products to be ‘realized’. This initiates a further differentiated moment, in which the formal rules of discourse and language are in dominance. Before a message can have an ‘effect’ (however defined), satisfy a ‘need’ or to be put to a use, it first must be
appropriated as meaningful discourse and meaningfully coded”. To present this deconstructive process the methodological application of can be modelled in this way,

![Diagram](image)

_Figure 2. Hall 1980, p 130_

The text itself is interpreted and analysed as a wholly meaningful document. In this case the text was a document serving to inform a broad-based audience - within the company - who are the less technically experienced then the document writer and who will be working with a specific set of technologies – the Intranet. The analysis of the document utilised a critical assessment of the language used in the document. The meaning encoded within the text is understood as an expression of the existent social relations within the group. The text is then decoded to plot the message and rules associated with its reading by the audience. The clearest indication of the application of deconstruction methods to technical document analysis can be seen in the subsequent analysis section. The method and subsequent deconstructive analysis follows the structure outlined by the model described above.

In addition to the textual analysis of the technical document, a series of interviews were carried out with both the technical writer of the document, the manager and a number of employees working in the company at the time of the study. In total, three interviews with the technical writer and manager occurred and as well as individual interviews with eight employees was carried out. The interviews were semi-structured and focused on the existent Intranet, its current usage, the feelings about it - including suggestions about how to improve the new Intranet. The interviews and observations relating to the changes to the Intranet were carried out over a six month period.

SITE DESCRIPTION

The technical documents examined in this study belong to the United Kingdom (U.K) branch of a Multi-national firm, who were expanding the capabilities of their Intranet web site in 2002. The parent company of this U.K. branch is best known for its status as world leader in sales and retail of sporting goods. The company has an extensive Internet system for the global presentation of their products. The Intranet was being expanded as a component of corporate improvements to its UK branch business operations. The documents that were obtained through an associated research project that was carrying out an evaluation of the existing Intranet site changes being made to the system. This evaluation was required to make suggestions about the changes being implemented by the technical team. The analysis was conducted by an impartial expert party. Permission for further examination of the technical documentation was sought and granted provided the anonymity of the company itself was preserved. Therefore, for the purpose of this examination this company is referred to as Piper Ltd. The only details revealed relating to the company is a broad description of the parent company. The names used are purely fictitious.
The technical document’s author describes the document as, “a reasonably detailed technical overview of the web site [it] is included to help developers understand the nature of the site and hence further develop it in a consistent and suitable manner.” He stressed the technical nature of the document on many occasions in the introduction to the Web discussion, however in contradiction he also states that, “this document provides a guide and reference point for personnel new to the Intranet or unfamiliar with techniques and tools such as MS Frontpage 98, Active Server Pages, Active Data Objects and JavaScript. It is not envisioned that authors will require in depth knowledge of these technologies”. In this way the writer of the text from the outset is ambiguous in his assessment of what the writings are intended to achieve of who is intended to be the audience.

DATA ANALYSIS

Document Overview, Standards & Guidelines for Authors & Webmasters

It is important to stress at this point that the writing of technical documentation as a users' manual has at its foundations in a desire to convey useful and practical information, knowledge and meaning relating to technology usage within the organisation (Goguen, 1996). It therefore can safely be assumed that there is a desire to shift from one framework of meaning (FWM1): an initial technically based meaning, through an encoded (ENC) meaning structure, where technically driven meanings are negotiated for a less technical meaning, to a decoded (DEC) meaning structure that a user who is less familiar with the technology can use. This occurs so that a meaningful framework (FWM2) can be achieved for the user of the manual and therefore facilitates their ability to use the technology on a daily basis. The first exemplar example of technical rules and signifiers governing the meaning being conveyed can be observed in the following passage:

It is vitally important that the objects are cleaned up by setting them to “nothing” after use to prevent large numbers of defunct objects from cluttering up the memory of the server. If this is allowed to happen, the server will eventually grind to a halt or, worse still, it will start producing unpredictable responses before falling over.

The first deconstruction of the passage can therefore be modelled as such:
(Machine) server (FWM1) \(\rightarrow\) clean predictable, controllable (ENC) \(\rightarrow\) unpredictable, cluttered computer memory (DEC) \(\rightarrow\) fall over (human quality) (FWM2)

The signifier of the server therefore signifies a machine that
i. if kept clean
ii. is controllable and predictable

In contrast the signifier of the user signifies a human (with undesirable qualities) who
i. if leaves the computer unclean with ‘objects’ that are not set to nothing
ii. will make the computer fall over

The text requires the reader to understand that this is signifying a representation of a successful computer/user relationship. The cleaning up of ‘defunct objects’ after use is a signifier for the successful engagement with the capabilities of the machine. The rules being set out here present a clean and predictable computer server = good, cluttered objects that are left after human use = bad.

The second exemplar text states:
A number of special files never get shown directly as web pages or only ever get run once the first time a user visits the UK Intranet web site. The files served to validate users and control the navigational flow of the web site.

This deconstructed passage can therefore be modelled as:
(Machine) files served (server based) FWM1 \(\rightarrow\) validate user (ENC) \(\rightarrow\) in control (DEC) \(\rightarrow\) user, navigational flow (human, human action) FWM2
In this case the signifier the files served (machine) signifies
i. if machine validates user
ii. will allow navigational flow
In contrast the signifier of the user signifies a human (with undesirable qualities) who
i. if user is not validated
ii. computer files will be available

The text requires the reader to understand that this description signifies the successful transfer of a computer's computing file from the server to the target audience. For successful computation practice to occur the computer must validate the user's level of permission. As with the first example, the interaction with human and machine signifies that the successful engagement is governed by the machine and therefore verified through the capabilities of the machine. The rules are set to allow validated users to obtain a predictable file transfer from the computer server = good, non valid users cannot receive the file = bad.

The third exemplar example from the document states:
The names of the owner and editor should be mail enabled to allow feedback to be sent [to] the individual. The date last updated value should be kept within the last six months – even if no actual changes have been made within this period. Due to the nature of Web technology and culture, users will tend to disregard any information that is “perceived” to be out-of-date. It is the responsibility of Web section owners to make sure their page time-stamps are kept within the rolling six month period. A monthly reminder should be sent-out by the webmaster to the owners of web sections (sub web masters) to check that their listed sections’ details, links and dates are all up-to-date.

(Machine) date last updated "time stamps" (FWM1) → in control owner of valid information (ENC) → the constant is to be maintained (DEC) → Web section owner (human), uncontrollable requires reminding etc (FWM2)

In this case the signifier the time-stamp served (machine) signifies
i. if information is valid
ii. machine will validate user and allow navigational flow

In contrast the signifier of the user signifies a human (with undesirable qualities) who
i. if control owner does not maintain dates as current
ii. users will tend to disregard any information that is “perceived” to be out-of-date.

The text requires the reader to understand that these signifiers are signifying a representation of information validation for successful computing practices to occur for the target audience. For the success of such computation practice to occur the computer must utilise current data. The interaction between human and machine signifies a successful engagement that is governed by the machine and therefore verified through the capabilities of the machine. The rules are set to only use validated information defined through the examination of current dates which results in an interesting and valued Web site = good, non current information that is not maintained by sub web masters (humans) = bad.

Analysis, Discussion & Reconstruction
This section discusses the central research question does an imbalance exist between the dichotomous presentation of human and machine language utilised when constructing technical documents in Information Systems development and implementation? This discussion draws together the analysis of the previous and completes the deconstruction of the text. This reading explores the underlying system that gives rise to meaning when the target audience reads the technical document. It analyses the shared features of the document in an attempt to describe the rules that generate the texts. The focus for the research has been to explore the wording and therefore the associated meanings.
conveyed in technical documents when developing information systems for virtual environments such as the World Wide Web. These discourses restrict and structure the fluidity of specific information or meaning that can be obtained. These structures and restrictions, in turn, impact upon the form and context of organisational activity utilising technology in its daily operations. However, casual and personal forms of information sharing via technical documents are distinct from ‘other’ administrative and organisational level documents and operate at a distinct, but potentially complimentary, level (Hoffer, George & Valacich 1996, 290). These formal processes of information sharing employed through the use of crafted documents to inform users of the technical dimension of computing exist to promote increased understanding and awareness of the technology being utilised by the organisation. Therefore the term, ‘real life’, has been utilised here to reflect the binarism that defines the real & imagined, the mind & body and the human & machine power relationship. Information technology (IT) holds the promise of enabling unlimited access to information irrespective of a person’s social or work place situation. To realise this promise particular considerations must be given to the issues of IT access and the representation of meaning in technical documents. In addition, strategic planning which has as its aim the reduction of social and technological barriers that lead to work place inequalities must be addressed at the outset of the practice of technical document writing. Therefore, considerations of IT access and equity must address the barriers legitimized through written texts, as well as the opportunities that inclusive technological description of computing can enables.

The reconstruction to the specified message within a technical document can only exist in a hypothetical scenario. The main objective of the reconstructing of the text is to provide an example of how meaning can be challenged through an awareness of the usage of signs and signification. In this case it is the hegemonic relationship that exists when technology is reinforced as the dominant component in the relationship between human and machine. Therefore taking the first exemplar example from the text we can reconstruct the written document as such:

It is vitally important that Web user understands their capacity to regulate and clean the server of all and sundry “cluttering” objects in the memory of the server. Users have the capacity to clean up the computer by setting then to “nothing” after use. In this way large numbers of defunct objects are prevented from cluttering up the memory of the server. A cluttered sever will eventually grind to a halt or, worse still, it will start producing unpredictable responses before not working at all.

A reconstruction of the passage can therefore be modelled as such:

(Human) Web user (FWM1) \(\rightarrow\) has the capacity to clean and maintain the server (ENC) \(\rightarrow\) if not done an unpredictable, cluttered computer memory will result (DEC) \(\rightarrow\) computer will not work (computer is the tool) (FWM2)

The signifier of the Web user therefore signifies a human that

i. if the person utilises their capacity & knowledge
ii. is in control and can maintain their tool

In contrast the signifier of the computer (server) signifies a machine (which when left cluttered has undesirable qualities) and

i. if the computer is left unclean with ‘objects’ not be set to nothing
ii. will make the computer not work

Poststructural approaches to interpreting society through deconstruction are particularly suited to the examination of technical documentation. The human/machine polarisations claimed for these documents are laden with the heavily trodden terrain of existing hegemonic power structures that can be observed in
the use of language such as the mind/body dichotomy. These dualistic reductions, in turn, encourage considerations of embedded power relations within 'obvious' aspects of everyday life. The dualisms of mind & body, public & private and others are enhanced, and reconfirmed, within the context of technical documentation (McRae 1996; 245). Challenging the 'obviousness' of these dichotomies and reconstructing the meanings written into technical documents enables a shift in the manner through which users can construct their own identity in relation to technology. Empowering humans in the technological process of document writing in such a way assists in constructing a social space, albeit one defined through the social worlds of 'real life' (Richardson 1989; 5,8). The significance of power relations in the construction and contextualising of technical writing is evident in distinctions between, for example, the formation of public and private documents. The manner in which understanding the human/machine relationship are variously experienced similarly indicates the shifting frameworks by which we are able to relate to technology in our daily usage and how the meanings that are generated as a result are presented to those around us. These shifting relationships suggest that the experience of the social within computer mediated space can be considered as familiar interaction but one that is experienced in a location of reordered significance (and signification). Contrariwise, as an experience founded upon the full range of cultural and social imperatives provided by the machinations of advanced capitalism, it is clear that many existing suppositions regarding human communication and interaction persist within technical domains. More reasonably, these 'existing' social structures are the result of shifted emphasis of the ‘social’ in the technologically-oriented order (Preece, 2000). That the human/machine dichotomy maintains structural inequalities is evident here. While Web and technology users are seen to hold a heavily dependent association with the technology they will continue to be marginalised in the technical manuals designed to impart technical knowledge. Equally while it is assumed that machine attributes provide advantages in the acquisition of knowledge, and by implication the power of the machine itself, a hierarchical order of technological hegemony prevents this from being a transparent relationship (Farganis 1986; 157). I have asserted that the use of post-structural theory allows a rethinking of the human/machine dichotomy because the processes of knowledge formation and acquisition moves beyond simple and supposedly impartial ascriptions of meaning. The shifting nature and ability to alter the representation of meaning within the text forces a reconsideration of the authority and legitimacy of the machine and human as separable ‘vessels’ of knowledge. The complex interplay of sociality and meaning construction that exists between people (and machines) seen here is similar, at a generalised level, as those enacted through other documents of ‘real life’.

CONCLUSION
The importance of the machine/human dichotomy to maintain structural inequalities is evident here. While humans, as users are seen to hold a less capable association to the computer and the technical knowledge embedded in technical documents will continue to be marginalised in writing of these types of documents. Equally, while it is assumed that technological attributes provide advantages to the acquisition of knowledge, and by implication the computing tool itself, a hierarchical order of machine hegemony is maintained (Farganis 1986; 157). I have asserted that deconstructing text and post-structural analysis allows a rethink of the human/machine dichotomy because the processes of knowledge formation and technical innovation move beyond simple ascriptions. The shifting nature and ability to alter the relationship between technical writer and technical document reader forces a reconsideration of the authority and legitimacy of the human and machine as separable ‘things’. The complex interplay of knowledge transfer that exists between people is similar, at a generalised level, within these documents and those ‘other’ documents of ‘real life’. The difference of these forms of documents is evidenced in the differing parameters applied to the construction of technical knowledge and ability to use the machine. The existent notions of technical knowledge formation that is associated
with ‘other’ ‘real life’ practices have been mutually extended, reprioritised and recrafted in technical documents such as the document examined here. It is therefore significant to extend this challenge to hegemonic assumptions found in technical documents and act as a call for technical document writers to reconsider the language of their writing in order to craft a relationship in which the user is the empowered in the text.

REFERENCES CITED


