Broadening the View: Human-Computer Interaction & Critical Theory

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Abstract
In this paper we argue for the usage of critical theory in human-computer interaction. HCI should not only look at the positive potentials of new interaction technologies and interactive systems, but also on their negative consequences they might have in society. We introduce a set of societal and individual design principles, where "technology" and "society" are understood in a multi-directional and multi-dimensional way. By introducing this dialectical thinking we aim to reach a more holistic view on users' experiences and support the discussion about sustainable and value-based design approaches within the HCI community.

Keywords
HCI, critical theory, society, dialectical thinking, design principles, values, sustainability, user experience

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction
Jeffrey Bardzell [1] uses the term critical theory in HCI as an "umbrella term for theories developed in and for (what would eventually become) cultural studies" and mentions that he does not use the term in the

understanding of the Marxist Frankfurt School. In contrast, Mark Blythe uses the term critical theory in HCI in the less wider sense of Marxist theory by referring to Marxist authors such as Theodor W. Adorno and Slavoj Žižek ([2], [3]). As what is today widely known as critical theory is rooted in the works of Karl Marx [13]. Marx argued that all forms of domination bring disadvantages to humans and therefore formulated the "categoric imperative to overthrow all relations in which man is a debased, enslaved, abandoned, despicable essence" [12]. He said that ideology misrepresents reality in order to console humans and forestall societal change. For Marx, an ideology is a partial, simplified, and distorted representation of reality [12]. Ideology critique was later conceptualized as the critique of commodity fethishism by Marx, which is the critique of modes of thought that consider alternatives to existing states of society as impossible.

We argue for the usage of the Marxist notion of critical theory and critique in HCI, as we are convinced that a critical theoretical approach is beneficial for supporting design strategies within the HCI community by taking a broader view on the interrelationship between technology and society.

Broadening the View with Critical Theory

The notion of critical theory today is also widely associated with the works of the so-called Frankfurt school that consisted of critical scholars such as Theodor W. Horkheimer, Max Horkheimer, Herbert Marcuse, and Jürgen Habermas [9][7][16]. The works of the Frankfurt school were grounded in the works of Karl Marx and the Marx-interpretation of Georg Lukács [10]. Max Horkheimer [8] reformulated Georg Lukács' concept of reification in his notion of instrumental reason. Instrumental reason means that human cognition is manipulated in such a way that it tends to behave like an automatic machine. It reacts to certain stimuli in a predetermined manner and sees reality only from one perspective that neglects alternative qualities, possibilities, and viewpoints. Herbert Marcuse [11] used the term technological rationality for describing the phenomenon of instrumental reason. He wanted to express that ideology and manipulation try to make human consciousness and human behavior function like an automatic machine that has only a limited set of available response behaviors. Technological rationality denies that reality could be other than it is today. Technological rationality causes a one-dimensional thinking, in which only one alternative of existence is considered and potential other alternatives are denied.

Critical theory opposes instrumental reason, technological rationality, and one-dimensional consciousness by the concept of dialectical thinking. Dialectical thinking sees reality as complex, as developing process, full of potentials for change, and as contradictory. It assumes that to each one-dimensional pole of reality there is a second pole that opposes (negates) the first pole and points towards a different reality. Dialectical thought is therefore "two-dimensional" [11].

Building up a Dialectical Thinking in HCI

Dialectical thinking is important for a critical theory of technology and complex technology assessment. It reminds us that in respect to technology and society, it is unlikely that technologies only have positive effects in society and that we should look for the negative aspects of technology in society. A critical theory of

technology also implies that accounts of technologies presenting only advantages and opportunities are one-dimensional modes of thinking that neglect the dialectic of technology. The claim that a technology has exactly one positive (or negative) consequence lacks complexity. It does not consider the complex interactions between technology and society and is a form of technological determinism: it assumes that technology in a one-directional and one-dimensional way causally determines society.

Dialectical thinking in contrast argues that a technology has multiple, contradictory effects on society and that society has multiple, contradictory effects on technology. Andrew Feenberg has elaborated a critical theory of technology based the concepts of dialectical thinking, in which technology is considered as an ambivalent process of development suspended between different possibilities [4]. HCI researcher and designers should become more aware about this dialectical approach and should address it in their work (e.g. design methods), especially when designing for user experience, a multi-dimensional and complex concept. User experience is increasingly addressed in a more holistic way, trying to understand users' values related to a technology and going beyond single interaction. Therefore, we see it as essential that "... technology design practices should support *both* designers *and* users in ongoing critical reflection about technology and its relationship to human life" [16].

Our Contribution for Designing Technology

Based on a critical theory of technology, we can argue that HCI should not only look at the positive potentials of new interaction technologies, but also on the negative consequences technology might have in society. This requires understanding design not only as interaction design, but also as the design of society [6]. The critique of ideology, fetishism, instrumental reason, and one dimensionality that was grounded by critical theory and Marx provides a foundation for seeing HCI as not only concerned with only one dimension of reality (technology), but also with societal (economic, political, and cultural) structures that shape and are shaped by technology. We tried to combine this different dimensions and perspectives in a set of societal and individual design principles.

Societal and Individual Design Principles

A sustainable design of technology needs to be embedded into a sustainable design of society. Such an approach has been applied to the relation of Internet and society [5], and can be further supported in the field of HCI [14]. This requires combining societal design principles and interaction design principles. Societal principles include ecological preservation, human-centered technology, economic equity, political freedom, and cultural wisdom. We distinguish between socio-oriented and individual-oriented design principles. Openness, participatory decision-making and community-formation are defined as major social design principles. Each of these principles can be further assigned to one of three subsystem of the information society (economy, policy, culture). The same categorization can also be undertaken for the individual level, where we identified efficiency, freedom of involvement, and mental user capacities as major individual design principles [6]. A summary of these principles is given in figure 1, which results from our work on a conceptual framework that synthesizes general social theory and HCI (for details see [6]). Design is understood on the one hand in the tradition of

social systems design as the conscious shaping of social systems, on the other hand in the tradition of HCI as interaction design of technological systems (where essential usability and user experience as well as user acceptance factors are considered).

	Economic	*Political*	*Cultural*
Social Design Principles	**I-T-I**	**I-T-I**	**I-T-I**
	Openness (Free Software, Open Access, Open Content, Creative Commons)		
		Participation in Decision-Making (Including Informed Consent, Privacy, Security, and Reliability)	
			Community-Formation (User Involvement, Co-Experience, Sociability)
Individual Design Principles	**I-T**	**I-T**	**I-T**
	Efficiency (Usability, Perceived Ease of Use, Perceived Value/Usefulness, Perceived Ease of Adoption)		
		Freedom of Involvement (User Engagement)	
			Mental User Capacities (Fun/enjoyment, Emotion, Motivation, Trust)

figure 1. Summary of societal and individual design principles
(I-T-I (Individual-Technology-Individual)= *Social Level* / I-T (Individual-Technology)= *Individual Level*)

Towards a Holistic View on Experience Design

A recent focus in HCI is to find a holistic approach for user experience. As already stated by McCarty and Wright [13], an experience of a product begins long before it is first used. "Watching advertisements, discussions with friends, going to the shop, taking it out of its box, these are all a part of the experience of technology" [3]. Next to aspects related to the interaction itself, it becomes increasingly important to get the big picture and a more comprehensive view on social and individual factors, which influence the overall user experience. The basic idea of our design principles presented above is the techno-social system in which individuals interact with technology as well as with other individuals. Moreover, the system is embedded into an "umwelt" [environment] constituted by other social systems with which there is interaction (economic, political, and cultural dimensions shown in figure 1). HCI should become more aware of such forces as a first step toward possible changes in design

strategies, following a more critical and dialectical thinking (e.g. considering the negative consequences of technology in the design, in the design methods and techniques). This claim is supported by several current approaches on value-based design, sustainable design, and reflective design strategies (e.g. [14], [16]).

Conclusions & Discussion

In our paper, we tried to combine HCI with critical theory in order to broaden the view of designers on how to design interactive technologies. Critical (social) theories want to contribute to designing society in a way that gives advantages to all. HCI aims at supporting human activities with the help of interactive systems. In combining both views, one can try to find ways of how technology, social systems, and the combination of both need to be designed in order to support a good life for all and to provide people an optimal user experience. Our contribution to such a holistic design approach is summarized in the presented societal and individual design principles, which should stimulate further discussions.

References

[1] Bardzell, J. 2009. Interaction criticism and aesthetics. In *Proc. CHI'09*, ACM, NY, 2357-2366.

[2] Blythe, M. 2007. The digital music box: using cultural and critical theory to inform design. In *Proc. CHI'07*, ACM, NY, 2297-2302.

[3] Blythe, M. and Cairns, P. 2009. Critical methods and user-generated content: the iPhone on YouTube. In *Proc. CHI'09*, ACM, NY, 1467-1476.

[4] Feenberg, A. 2002. *Transforming technology: A critical theory revisited*. Oxford: University Press.

[5] Fuchs, C. 2008. *Internet and society. Social theory in the information age.* New York: Routledge.

[6] Fuchs, C. and Obrist, M. Forthcoming. HCI and Society: Towards a Typology of Universal Design Principles. In *International Journal of Human-Computer Interaction*, accepted for publication.

[7] Held, D. 1980. *Introduction to critical theory. Horkheimer to Habermas*. Berkeley, CA: University of California Press.

[8] Horkheimer, M. 1974. *Eclipse of reason.* London: Continuum.

[9] Jay, M. 1996. *The dialectical imagination. A history of the Frankfurt school and the Institute of Social Research.* Berkeley, CA: University of California Press, 1923-1950.

[10] Lukács, G. 1972. *History and class consciousness*. Cambridge, MA: MIT Press.

[11] Marcuse, H. 1964. *One-dimensional man*. Boston, MA: Beacon Press.

[12] Marx, K. and Friedrich E. (MECW). *Collected Works.* New York: International Publishers.

[13] McCarthy, J., and Wright, P. 2004. *Technology as Experience.* Cambridge, MA: MIT Press.

[14] Nathan, L. P., Blevis, E., Friedman, B., Hasbrouck, J., and Sengers, P. 2008. Beyond the hype: sustainability & HCI. In *Proc. CHI '08 EA*, ACM, NY, 2273-2276.

[15] Ritzer, G. 2008. *Sociological theory*. Boston, MA: McGraw-Hill.

[16] Sengers, P., Boehner, K., David, S., and Kaye, J. '. 2005. Reflective design. In *Proc. of 4th Conf. on Critical Computing: between Sense and Sensibility*. O. W. Bertelsen, N. O. Bouvin, P. G. Krogh, and M. Kyng, Eds. CC '05. ACM, NY, 49-58.

[17] Wiggershaus, R. 1995. *The Frankfurt school. Its history, theories, and political significance*. Cambridge, MA: MIT Press.