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A critical approach to human helping in information systems: Heteromation in the Brazilian correspondent banking system

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1. Introduction

Information systems often fail after implementation. Sometimes they fail because users refuse to incorporate them into work. Other times they fail because they do not provide hoped-for benefits. Strategies to avoid failure include user training (so users might better operate the system), user input into design (so designers might better craft the system for use), and user alterations (so users might better fit the system to use) (e.g., Jasperson, Carter, & Zmud, 2005; Majchrzak, Rice, Malhotra, King, & Ba, 2000; Markus & Mao, 2004). These strategies often rest on the implicit premise that a gap between how designers envisioned system use and how users experienced the system begets failure (Heeks, 2003; Suchman, 2002). Narrowing the gap between designers' conceptions and users' reality thus becomes the goal in many efforts to achieve system success.

Information systems can nonetheless succeed if human users provide labor to bridge the gaps. Ekbia and Nardi (2014, 2017) coined the term “heteromation” (in contrast to automation, which removes humans) to describe this labor relation in which organizations or individuals appropriate the economic value generated when users provide the labor necessary to make an information system work. Because users' labor is typically thinly compensated, if at all, heteromated systems carry with them the risk of labor exploitation (Ekbia & Nardi, 2012, 2014, 2017). As such, these systems underscore van Dijck's (2009) concerns about an increasingly participatory culture that lauds unpaid contributions to the corporate good. Following critical scholars of digitalized labor such as Fuchs and Sevignani (2013), Andrejevic (2015), Berg and De Stefano (2017) and many others, it is imperative that we consider how heteromation can serve useful purposes while ensuring worker rights. Berg and De Stefano (2017) pointed out that computer-mediated labor can be managed to regulate work and protect workers, if the right protections are in place. We are a long way from such protections. We hope this paper raises awareness of the fact that heteromation is value-producing labor and as such, it should be part of conversations about worker rights.

Heteromated systems do have the potential for positive applications. Consider ICT for development (ICT4D) projects, which employ technology to address social problems. Examples of ICT4D projects include telemedicine systems to provide hospital consultation to doctors in rural health centers in Crete (Constantinides & Barrett, 2006) and the use of email programs for social inclusion of refugees in New Zealand (Andrade & Doolin, 2016). In many ICT4D projects, because designers do not know distant users or their context well, they cannot well account for user needs (Wyche & Murphy, 2013). As the literature on information systems would predict, and as the ICT4D literature documents, designs that leave such large design-reality gaps often fail (Heeks, 2003). Heteromated systems hold the promise of avoiding such failure: by relying on human labor for critical functions, these systems avoid tailoring the technology to fit an imagined and uninformed use scenario. Whereas technical systems lean towards closure that renders

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customization difficult even for technically accomplished users (Kallinikos, 2004), human activity is, by contrast, a non-deterministic, open system. As such, human helping may adapt readily to fill unforeseen system gaps, and heteromation may prove a good approach in ICT4D projects as well as in many organizational systems.

In this paper, we examine heteromation's reliance on users for the helping necessary for system success to understand better the implications of this labor relation for system design and system users. Through an empirical study of heteromation in the case of the Brazilian correspondent banking system, an ICT4D project aimed at the financial inclusion of remote and underserved people, we adopt a critical approach to the issue of reliance on user helping as we examine the type of heteromated labor expended and the amount of effort that labor required. We pay attention to how users interpreted their helping and to the contextual factors that shaped it.

Understanding heteromation as a labor relation and gaining insights for heteromated system design are important given the recent rise of heteromated systems. We see heteromation in knowledge repositories (Kankanhalli, Tan, & Wei, 2005), patient-centered health records (Davidson, Østerlund, & Flaherty, 2015), and product review and recommender systems (Barrett, Davidson, Prabhu, & Vargo, 2015; Xiao & Benbasat, 2007). In and beyond ICT4D projects, heteromated systems have potential whenever information systems must serve large numbers of users in varied settings and with diverse needs, such that tailoring systems to meet user requirements may prove impossible (Heeks, 2003; Janssen, van der Voort, & van Veenstra, 2015). Heteromation may also prove useful when users are not skilled in technology use; in such cases, user training may prove too expensive to be viable and user alterations may be unlikely (Lee, 2001). As these examples suggest, being cognizant of the labor demands of helping in heteromated systems should prove useful across a wide range of modern work settings.

In the balance of this paper, we briefly situate critical theory in the information systems literature to explain how and why we will use a critical approach to examine heteromation as a labor relation. We then describe Ekbia and Nardi's (2014, 2017) concept of heteromation, with a focus on the types of user labor they identified. Because these types remain undertheorized, particularly in terms of the amount of effort required and why users would willingly exert effort, we turn briefly to the literature on helping to gain insight into why users might provide significant uncompensated labor. We detail how we explored heteromation in the context of the Brazilian correspondent banking system, employing critical case analyses to tease out the contextual factors that shaped the type of heteromated labor and related effort as well as the broader discursive factors that shaped people's interpretations of their own helping. We conclude by theorizing the implications of our findings for heteromation as a labor relation, as a design strategy in ICT4D projects and beyond, and as a counterpoint to automation.

2. Theoretical background

2.1. Critical theory in information systems research

Critical theory in information systems research aids scholars in addressing socio-political questions in the hopes of bringing about improvement in actors' lives (Gregor, 2006). Scholars who introduced critical theory to the field adopted a Habermasian perspective that emphasized emancipation from alienating or distorting practices in technology and social relations to enhance freedom and justice (Lyytinen & Klein, 1985; Ngwenyama, 1991). For example, Lyytinen (1992) called for research to improve the human condition through (possibly, alternative) information systems. Later work drew upon Foucault, Giddens, and Bourdieu to complement attention to alienating or distorted practices with consideration of power relations, expanding the scope of critical theory to include theoretical traditions such as environmentalism, feminism, and Marxism (McGrath, 2005; Myers & Klein, 2011). With this expansion, Howcroft and Trauth (2005:3), drawing on Doolin (1998), argued that “critical research questions and deconstructs the taken-for-granted assumptions inherent in the status quo, and interprets organizational activity (including information systems) by recourse to wider social, political, historical, economic, and ideological context.” Within the information systems literature, attention to this wider context has arguably been greatest among ICT4D studies (Avgerou, 2008).

Although scholars disagree to what extent critical research differs from interpretive research (see Gregor, 2006; Mingers, 2004; Myers & Klein, 2011), some scholars claim this emphasis on context is what differentiates them. As Orlikowski and Baroudi (1991: 20–21) noted when considering critical theory's attention to the totality of relationships around an information system:

...critical researchers depart from their interpretive colleagues, in that they believe interpretation of the social world is not enough. The material conditions of domination need also to be understood and critiqued, and these are typically not accessible by merely asking participants, who often are unable to perceive and penetrate the circumstances that shape and constrain them. Thus, researchers working in this tradition do not merely accept the self-understanding of participants, but also critically analyze it through the particular theoretical framework which they adopt to conduct their work.

Other scholars have noted the importance of context when arguing that a critical approach permits detailed causal explanations of events and phenomena that incorporate actors' interpretations and analysis of the structures that shape outcomes (Mingers, 2004; Wynn Jr & Williams, 2012).

Critical studies in information systems have employed a variety of theoretical frameworks to guide their analysis of context (Myers & Klein, 2011). For example, Doolin (2004) employed Foucault's theory of disciplinary power to analyze responses to a new medical information system while Kvasny and Keil (2006) examined the digital divide in two cities by focusing on Bourdieu's concepts of habitus and forms of capital. Among ICT4D studies, Lin, Kuo, and Myers (2015) turned to postcolonial theory to uncover a narrative of marginalization within a digital divide project hailed as a success while Kanungo (2004) framed his analysis of the introduction in poor Indian villages of computer kiosks that provided information about agriculture, commerce, and health in terms

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