Emancipatory Design Science: An Alternative to Value Sensitive Design

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Abstract. Kane et al. [1] developed what the authors refer to as an 'emancipatory design theory' for a machine learning application but explaining methodological guidelines for emancipatory DSR (eDSR) fell outside the scope of their paper. This paper clarifies what is meant by eDSR. Emancipatory DSR is a subtype of DSR that: is built on a critical or ethical kernel theory and involves developing theory-based design principles and/or IT artifacts to solve problems of human constraint by promoting emancipation. In this paper, we clarify what is meant by eDSR, provide steps for evaluating the emancipatory impact of an information system, and explain how practitioners can determine whether emancipatory re-design is needed.

Keywords: emancipation, emancipatory design science research, social good

1 Introduction

Information Systems can promote human flourishing, dignity, and a host of emancipatory outcomes when designed for social good. Yet, too often, information systems are developed without adequate consideration of the social impact they will have. Information systems practitioners often ask, "what can we create?" rather than, "what should we create?". Information systems researchers are uniquely qualified to participate in normative debates about what should be created based on their understanding of philosophy, ethics, human behavior, and information systems [2]. With the prevalence of technologies into everyday life, the adverse effects of technologies become prominent. There has been a growing interest in ethics in DSR, sustainable development, and applying critical methodology in IS research [3,4].

Critical social theories explain normative recommendations for promoting social good through emancipation. Defined loosely, emancipation can be taken to mean the improvement of a human condition and may be conceptualized in terms of increases in stakeholders' freedom to act, express, belong, and think [5]. Kane et al. [1] demonstrated how critical kernel theory can be used as the basis of a subtype of design science research (DSR) to promote emancipation through information systems design. They refer to this type of DSR as emancipatory design science research (eDSR). Kane et al. [1] laid out an emancipatory design theory for a machine learning application but

articulating guidelines for eDSR was outside the scope of their paper. Building on and extending their work, we clarify what is meant by eDSR and how eDSR differs from traditional DSR approaches. Further, we propose steps for evaluating the extent to which a system fosters emancipation and determining whether emancipatory redesign of a system is needed.

2 eDSR as an Alternative to Value Sensitive Design

Design science research (DSR) involves developing theory-based design principles and/or IT artifacts to solve problems while contributing to knowledge about how an IT should be designed to accomplish a focal outcome [6]. DSR in IS draws on kernel theories, primarily from the reference disciplines of engineering, management, and psychology [7]. Though design is never value free, theories rooted in values such as ethical and critical theories have rarely been used as kernel theories in the DSR literature. When moral values and beliefs are ambiguous or even missing in DSR, researchers struggle to justify the value of their designs [8].

One way to account for human values in information systems design is value sensitive design (VSD) [9,10]. VSD is a three-component iterative methodology that includes conceptual, empirical, and technical investigations [10]. In the conceptual investigation step, direct and indirect stakeholders are identified, followed by an analysis of how these stakeholders will benefit or be harmed by the technology and the identification of values implicated by the use of the technology [10]. After the values are identified and discussed, tensions among different stakeholders can emerge [10]. In the empirical investigation step, qualitative and quantitative methods are adopted to evaluate how stakeholders experience a technology with regard to the values they consider relevant and important [11]. In the technical investigation step, the insights from previous investigations are combined to explore how a technology could be designed to support identified values [12]. Ideally, all three investigation steps are interdependent and can inform each other [10].

Originated within the field of information systems and human-computer interactions, VSD has been employed in a wide variety of contexts such as crowdsourcing (e.g., [9]), computer mediated work (e.g., [13]), health information system (e.g., [14]), and mobile technology (e.g., [15]). As others have pointed out, VSD runs the risk of conflating stakeholders' benefits with moral values and the risk of ignoring important values that are not emphasized by the sampled stakeholders (e.g., [12,15]). Exclusion of some stakeholders [15] and conflicting values systems [12] are also challenges VSD researchers must address. Notably, reinforcing stakeholders' preferences is not necessarily the same as promoting human emancipation. Fundamental and universal values, such as human well-being, justice, and dignity, have been found missing in some projects involving a VSD approach [16]. VSD may not be a sufficient approach to address the complex and diverse values that are relevant to the masses of users affected by a ubiquitous information system [17]. Thus, we argue that there is room for an additional DSR approach to handle cases where the design task relates to human values and the design goal is human emancipation.

Recently, Kane et al. [1] introduced the method of eDSR using the theory of emancipatory pedagogy as the kernel theory for their design theory. While the eDSR approach is mentioned in passing, it was outside the scope of that paper to develop guidelines and recommendations for eDSR as a new method. Building on Kane et al. [1], we clarify that eDSR is a subtype of DSR that:

1. is built on a critical or ethical kernel theory, and
2. involves developing theory-based design principles and/or IT artifacts to solve problems of human constraint by promoting emancipation.

We draw from humanism to argue that humans are distinct from non-humans and a failure to make this distinction in a system will lead to oppressive conditions. The distinction between humans and non-humans can be surfaced through redesign of the system. The critical methods of deconstruction and reconstruction are helpful for evaluating whether a system is emancipatory or oppressive. If critique of the system reveals a need for redesign, either VSD or eDSR is an option. The choice between VSD and eDSR should depend on whether the goal is to promote outcomes in line with users' values (in which case VSD is most appropriate) or to promote outcomes in line with the values of a particular philosopher or critical theorist (in which case eDSR is most appropriate).

There are many critical social theories and theories of ethics from which eDSR authors may draw. The prominent lineages of emancipatory research are: Habermas, Bourdieu, Foucault, and Freire [5,18]. Bourdieu emphasizes on discriminatory social stratification while Foucault focuses on tools for self-emancipation and explaining how to liberate one's mind to recognize power dynamics. Habermas focuses on individual emancipation. Freire complements Habermas and goes beyond theorizing to prescription of normative processes for enacting emancipation in the real world.

Competing theorists offer different definitions of emancipation, emphasize different components of emancipation, and consider emancipation at different levels. In eDSR the kernel theory determines which philosophers' or theorists' values are prioritized. While no kernel theory is perfect, established theories that have been vetted promote philosophical consistency and provide transparency in terms of who developed the underlying values framework being applied in the design process. Merits and criticisms of established critical social theories are well known. Though critical social theories are diverse, most critical social theorists agree that there is a tendency toward an oppressive status quo that can only be overcome with an active struggle toward emancipation. This suggests that failure to choose a definition of emancipation and work toward emancipation will result in the privileging of power holders' values and a status quo of constraint for those with relatively less power.

3 Evaluating the Emancipatory Impact of a System

One criticism often faced by critical researchers trying to act out emancipation is that measuring emancipation is tricky and it is difficult to evaluate whether a proposed emancipatory effort is, in fact, emancipatory [19]. The critical method of deconstruction

offers promise in addressing this challenge of evaluating emancipatory efforts and systems. Deconstruction is a critical method for analyzing statements in a systematic way to understand the different ways the statement could be interpreted. Deconstruction is a powerful method for revealing "ideological assumptions in a way that is particularly sensitive to the suppressed interests of members of disempowered, marginalized groups" [20 pp. 340]. Reconstruction is "a kind of proactive deconstruction" [20 pp. 350]. We propose the method of reconstruction as a tool for identifying oppression in an existing system and ultimately evaluating the effectiveness of an eDSR solution.

While deconstruction picks apart statements to identify potential meanings, reconstruction identifies meanings through "an iterative process of rewriting that alters-using substitutions-only a few phrases of the text at any one time" [20 pp. 350]. When one or a few words are altered in a way that fundamentally changes the meaning of a statement, these small changes "in wording can make adjacent phrases seem "unnatural"" [20 pp. 350]. For example, it would be natural to say a firm purchased a computer to increase efficiency. It would *not* be natural to say that a firm purchased a worker to increase efficiency. Implicit in the unnaturalness of the latter statement is value of human dignity and the notion that humans should not be bought and sold. Reconstruction allows the surfacing of tacit values and meanings and reveals areas for concern. Exercises of reconstruction help the interpreter identify situations of human constraint and imagine "increasingly emancipatory visions" to work toward [20 pp. 342]. This process can be used to determine whether a system needs to be redesigned. We propose a reconstruction process, as outlined in Table 1.

Table 1. Emancipatory design and evaluation process

Step	Purpose	Outcome	Next step
Step 1: Identify design priorities and use a kernel theory to develop emancipatory design principles and rules.	Emancipatory design theories allow understanding of what should be done, normatively, through design to promote gradients of emancipation.	The outcomes of step 1 are identification of relevant components of emancipation and design principles and rules for achieving those components of emancipation.	After identifying components of emancipation to pursue and developing initial design principles and rules, proceed to step 2.
Step 2: Create a statement describing the condition of the environment fostered by the system.	Expressing the condition makes it more concrete and makes visible implicit biases.	The outcome of step 2 is understanding of the initial condition and the technology that fosters the condition.	Once you are familiar with the focal system and the condition it fosters, proceed to step 3.
Step 3: Reconstruct the statement by substituting key words or phrases describing humans with words or phrases describing objects.	Reconstruction reveals whether humans are circulating as objects in their environment.	The outcome of step 3 is a determination of whether the initial condition is oppressive. This is done by asking – does the reconstructed sentence sound unnatural?	If you determine that the statement does not sound unnatural, proceed to step 4. If you determine that the statement does sound unnatural, the condition is not deemed oppressive,

			and redesign is not recommended at this time. Proceed to step 6.
Step 4: Apply the emancipatory design principles and rules developed in step 1 to develop emancipatory design condition statements.	These statements can guide designers as they create designs that progress toward gradients of emancipation.	The outcome of step 4 is a more concrete understanding of the emancipatory conditions that are being pursued.	Once you have a concrete understanding of the more emancipatory conditions you will pursue, proceed to step 5.
Step 5: Reconstruct the emancipatory design condition statement.	Reconstruction reveals whether humans are circulating as objects in their environment.	The outcome of step 5 is understanding of whether the emancipatory design condition is oppressive.	If you determine that the statement does sound unnatural, the condition is not deemed oppressive, and redesign is not recommended at this time. Proceed to step 6. If you determine that the statement does not sound unnatural, go back to step 4.
Step 6: Revisit the reconstruction process at regular intervals to promote sustained emancipation.	Revisiting this process over time hedges against tendencies toward oppression.		

4 Conclusion

We propose eDSR as an alternative to VSD when the goal is to promote outcomes associated with emancipation rather than outcomes emphasized by users. eDSR is a method for developing theory-driven, value-laden design principles that promote emancipation and radically disrupt the status quo. eDSR outcomes include but are not limited to social justice, dignity, humanization, inclusion, voice-giving, fairness, peace, transparency, democratization, community enhancement, creativity, and mental and physical health and safety. eDSR provides a new way of thinking about design to promote new types of designs for the emancipation of users and society.

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