A set of ethical principles for design science research in information systems

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A R T I C L E I N F O

A B S T R A C T

Over the past decade, design science research (DSR) has re-emerged as an important research paradigm in the field of information systems. However, the approaches currently recommended for conducting design science research do not include an ethical component. Thus, the objective of this paper is to initiate a debate about the need for ethical principles for DSR in Information Systems (IS). To launch this debate, we suggest that a set of ethical principles for DSR in IS must be created. Although the interpretation and application of these principles might not always be straightforward, our argument is that all DSR practitioners in IS should devote at least some time to consider ethical principles.

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1. Introduction

In recent years, design science research (DSR) [14,17,31] has re-emerged as an important research paradigm in the field of information systems. One indication of this development is the appointment of DSR practitioners as editors of IS journals such as *MIS Quarterly* (Paolo Goes), *Journal of the AIS* (Suprateek Sarker), *Communications of the AIS* (Matti Rossi), and *Journal of Information Technology Theory and Application* (Marcus Rothenberger).

Venable and Baskerville [36] define design science research as "Research that invents a new purposeful artefact to address a generalized type of problem and evaluates its utility for solving problems of that type" (p. 142). Unlike the social science or behavioral science paradigms that had come to dominate IS research—where the main objective of the researcher is to understand the world—DSR builds on the engineering tradition of research in which the driving idea is to invent new technologies or artifacts that can be used to change (and hopefully improve) the world. Design science researchers create new artifacts (e.g., new software, processes, and systems) that are intended to improve the effectiveness or efficiency of an organization [14], to improve people's health, education or quality of life [26,37], and to improve community interaction and well-being [7]. Thus, the explicit purpose of DSR is to create new artifacts and knowledge about

these artifacts that people can utilize to change and improve the world in which we live.

Over the past decade, a rich literature in design science research in IS has developed. Many processes and methods for conducting DSR have been proposed, from the simple "build-evaluate" cycle [14,17] to more elaborate linear processes (with feedback loops) [31,24], flexible processes [32], methods supporting participation and researcher–user interaction [7,27,6], and methods combining DSR with Action Research [27,15]. Several studies have developed and debated the content and form of design theories as formalizations of the knowledge created in DSR [11,12,39,40,33,35,5]. However, the seminal work that is frequently credited with reinvigorating DSR in IS is from Hevner et al. [14], which suggests guidelines for conducting DSR and has become one of the most cited papers in the IS field.

However, we believe there is one notable omission in all the current recommended approaches to conducting design science research. The guidelines and methods proposed thus far focus on the viability, efficiency, and effectiveness of artifacts but do not engage in ethical considerations. In other words, the current guidelines simply assume that efficiency and effectiveness are always "good" and that the design science researcher knows what is best for improving business or society. However, what if people and researchers disagree about what is "good"? For instance, what if the artifact improves the effectiveness and efficiency of spying on all citizens? We suggest that the lack of any ethical guidelines for design science researchers in information systems might lead to future problems and might harm the reputation of the IS field as a whole. We believe that the lack of any ethical guidelines is a

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significant omission in contemporary theory and practice of design science research in information systems.

Thus, this paper is intended to initiate a dialog and debate about the need for ethical principles in DSR in information systems. At the outset, we suggest a set of ethical principles for DSR, although we wish to emphasize the tentative nature of these principles at this stage.

1.1. Motivation and purpose

Ethics can be defined as 'the moral principles governing or influencing conduct' or 'the branch of knowledge concerned with moral principles' [29]. We suggest there are at least four reasons why ethical principles should be considered by design science researchers: (1) the dual potential of IT, (2) the increased attention to teaching ethics in business schools, (3) the increased focus by institutional review boards on the ethical principles that must be followed in research projects, and (4) the different ethical priorities that design science researchers have compared with behavioral researchers in IS.

First, in his seminal article written almost 30 years ago, Mason [18] noted the dual potential of information technology. Mason showed that IT can be used to enhance or destroy human dignity. IT can improve people's lives, but it also has the potential to make them much worse. For example, IT can be used to improve patient outcomes in medicine, but the increased surveillance capabilities of IT might seriously threaten privacy. Given this dual potential of IT, Mason argued that IS scholars have a responsibility to ensure that information systems are used for the right reasons and said, "We must assume some responsibility for the social contract that emerges from the systems that we design and implement" and to make sure that IT is used "to create the kind of world in which we wish to live" [18].

Second, on the heels of the scandals associated with the global financial crisis, the deans and faculties of almost all business schools have recognized the increased importance of ethics. The Bloomberg BusinessWeek ranking of the best undergraduate business schools, for example, now includes a section in the online survey given to students that asks them to rank their program's offerings in ethics [9]. Business school accrediting bodies such as AACSB and EQUIS also look for a focus on ethics in the curriculum. Because most design science researchers in IS are located in business schools, we suggest that this locational issue is another reason for ethical principles to be considered when designing IT artifacts.

Third, most universities and research institutions currently require researchers to obtain permission from their own institutional review board or human subjects' ethics committee if they intend to conduct a research project that involves real people. Many academic and professional associations, including those relevant to IS researchers, have ethical codes that members must follow. For example, the ethical code for the Academy of Management includes 'enforced standards' that all individuals must adhere to if they are undertaking the work of the academy [3]. The code of research conduct for the Association for Information Systems (AIS) includes items that all members of AIS must follow and different guidelines that are merely "recommended ethical behaviour" [4].

Fourth, the ethical priorities for design science researchers must be different from those of behavioral researchers in IS. As a general rule, social science and behavioral researchers in most disciplines prioritize the people being studied. For example, the ethical guidelines for the American Anthropological Association state the following:

> Anthropologists must weigh competing ethical obligations to research participants, students, professional colleagues,

employers and funders, among others, while recognizing that *obligations to research participants are usually primary* (our emphasis). In doing so, obligations to vulnerable populations are particularly important [1].

If there are competing ethical obligations to various stakeholders, anthropologists, like most other social and behavioral researchers, are supposed to give priority to the people being studied. However, researchers in engineering and computer science do not prioritize the people being studied; instead, the most important ethical obligation of an engineer is to the public. The first principle in the Code of Conduct for members of the British Computer Society, for example, concerns the "public interest" [36]. The ACM Code of Ethics is similar, with the first principle stating that an ACM member must contribute to society and human well-being. The first principle in the ACM code states the following:

> This principle concerning the quality of life of all people affirms an obligation to protect fundamental human rights and to respect the diversity of all cultures. An essential aim of computing professionals is to minimize negative consequences of computing systems, including threats to health and safety. When designing or implementing systems, computing professionals must attempt to ensure that the products of their efforts will be used in socially responsible ways, will meet social needs, and will avoid harmful effects to health and welfare [2].

Given that the artifacts developed by design science researchers may be used long after the research project has finished—and by people who were not involved at the time (the wider public)—the ethical principles and the priority of these principles in DSR must be significantly different from those oriented toward social science and behavioral researchers in IS. If there is conflict between principles, most computing and engineering professional bodies assert that the public interest should take priority over responsibility to the people or organization being studied. We believe this prioritization applies equally to design science researchers in IS.

Given these four reasons, we believe it is important for all design science researchers in IS to consider the ethical dimensions of the artifacts they are creating. Do we want to leave the world in a better or worse state at the end of our research project? As IS researchers, do we want to have a reputation for integrity and competence, or a reputation for using questionable practices? This last statement may seem somewhat extreme, but it is clear that the reputation of the accounting profession was affected by the collapse of Enron. Carnegie and Napier note that public confidence in the accounting profession after the Enron scandal was significantly undermined [8]. With concerns raised about the accounting profession's integrity and competence, governments around the world legislated certain enforceable ethical standards by accountants.

Thus, the purpose of this paper is to suggest a set of ethical principles for design science research in information systems. Our argument is that all design science researchers in IS should consider the ethical dimensions of the artifacts they are creating. We should be proactive and agree on a set of ethical principles for DSR ourselves and not wait until there is some type of public event that threatens our reputation. This paper is an attempt to initiate a debate on what these ethical principles might be.

The paper is organized as follows. In Section 2 we review some of the literature immediately relevant to the development of ethical principles for the conduct of design science research (DSR) in information systems. In Section 3, we propose a set of ethical principles for the conduct of DSR in IS. In Section 4, we provide a few examples of how the ethical principles can be applied. Section 5 is the discussion and conclusions.