

# The Notion of Users in Design Science Research

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**Abstract:** Design Science Research (DSR) has since the last decade become a paradigm within the field of Information Systems (IS). It provides researchers and practitioners within IS with a rich set of tools in terms of methods, theoretical foundations, research validity and other characteristics. This paper investigates what the notion of users is in DSR. It presents results from a small literature review based on 31 DSR-papers. The results indicate a low presence of how DSR-papers conceptualize the concept of users. The paper suggests that DSR hasn't reached its full potentialities in terms of positioning an explicit notion of users, and that it can be a relevant task for further research for IS-researchers in general, and for DSR-researchers in particular.

**Keywords:** Users, Design Science Research, Notion, DSR, Information Systems

## 1 Introduction

Information Systems (IS) as a discipline has been unfolding for over 30 years [1]. Different scholars have had different views upon the identity of IS [2][3] and how research can generate knowledge about the effects of information systems on the behavior of individuals, groups and organizations [4][5]. One major aspect of IS deals with the concept of *the user*. The concept of the user is fundamental to much of the research and practice of information systems design, development and evaluation [6]. For instance, in the domain of software engineering, practitioners and researchers emphasize software quality as influenced and empowered through a mutual respect between the user's goals, and the designer's expertise [7][8]. Other more overarching approaches such as *User-Centered Design* [9] and *Empathic Design* [10] deals with how researchers and developers alter the world of users, by designing and developing artifacts *for* them. There are also examples on how users alter the world of researchers and developers, by actively participating together *with* the researchers and developers during several stages of design and innovation processes [11][12][13].

A common link between the user-oriented design approaches rests upon a philosophical contour and perception about people as users. Such perception creates opportunities for researchers and practitioners to work *with* or *for* users by actively involving them throughout the process of design, development and evaluation. The notion of users in IS-research encompasses a research approach's viability in terms of efficiency and sufficiency for researchers and practitioner's problem-solution space.

One example of such research approach is defined as a paradigm in the area of IS and does mainly emphasize activities and processes for building and evaluating IT-artifacts [14][15]. This approach has since Hevner et al's [16] seminal paper in MISQ, been formally conceived as the *Design Science Research* (DSR) approach. DSR enables researchers to develop a body of knowledge upon technology invention [17], which practitioners (e.g. software engineers) can use as technology application [18]. Researchers use DSR as an approach in their research domain to generate outcomes that practitioners can use in their professional domain (e.g. Routine Design) [18]. DSR emphasize methodological approaches [19][20], strategies for evaluation [21], approaches for theorizing/theory building [17][22][23][24], and communication of DSR-outcomes [25]. This has been the case since the early 90's [26][27][28]. But what does the DSR-literature say about the concept of users in DSR?

### **1.1 Problem**

This paper distinctively deals with investigating what the notion of users is in DSR. Inspired by works from researchers such as Orlikowski & Iacono [3], my investigation will be based on activities for search and conceptualization. Orlikowski & Iacono [3] proposed in the beginning of the millennium that IS-researchers should begin to theorize about IT-artifacts, and then incorporate those theories explicitly into their studies. Their work generated essential knowledge in terms of theorizing about the meanings, capabilities, and use of IT-artifacts [3]. The need of theories about IT-artifacts, the ways in which they emerge and evolve over time, and how they become independent with socio-economic contexts and practices, were at that time unresolved issues for the discipline of IS [3]. But now, the fact that DSR emphasizes activities and processes for building, evaluating and theorizing IT-artifacts [16][17][20][24] form a conception about DSR as a paradigm in IS, mainly focusing on the IT-artifact. The IT-artifact itself has, in terms of generating a dual portion of both practical and theoretical knowledge about the IT-artifact [16][19], become a more relevant and lucid component for IS-research. DSR has over the last decade provided IS-researchers methods and models for how to theorize meanings, capabilities and use of IT-artifacts [14][16][20]. But how does DSR position a notion of users in activities and processes for building and evaluating the IT-artifact? Does the DSR-community, as Orlikowski & Iacono [3] did about IT-artifacts, need to theorize about the concept and role of users within the cycles of DSR? And how can DSR as an approach evolve into becoming more user-centric without losing its focus on the IT-artifact? In order to answer questions such as these, I believe that one needs to grasp an understanding about what DSR has to offer in terms of literature and knowledge about users in general. Although I am inspired by the work of Orlikowski & Iacono [3], I am not so to say, *desperately seeking*, to find an answer upon specific questions such as aforementioned. Instead, I am interested in grasping a general understanding about what the notion of users is in DSR. Therefore, I propose the following research question for this paper:

- ***What is the notion of users in Design Science Research?***

## 2 Method

Systematic literature reviews are generally regarded and described as secondary studies used to map, find, critically evaluate, consolidate and aggregate the results of relevant primary studies on an certain issue or topic [29][30][31]. Systematic literature reviews identify gaps to be filled resulting into a coherent report or synthesis [29][32].

In order to build a wider understanding upon what the notion of users is in DSR, I have chosen to conduct a systematic literature review [43] allowing desired information to be mined from an increasing volume of published results in DSR. I will follow the guidelines of authors such as Gough & Jones [30], Khan et al [33], Cooper et al [34] and Smith et al [35] by including the following core steps for my systematic literature review:

1. **Review question** – I have already framed a research question by defining the central topic of this paper.
2. **Research strategy** – I will explicitly search for DSR-papers by combining exact search terms with search expressions. I will use the following terms and expressions:
  - a. *Design Science Research*
  - b. *Design Science Research Users*
  - c. *Users Design Science Research*

I will use Google Scholar as the database for my research strategy, and I will select between 30-35 papers that have a clear connection to DSR. If the search results provide papers with ambiguous content and no clear connection to DSR, I will disregard those papers as irrelevant. The concept of DSR must be present in the selected papers; otherwise it is not relevant for the frame of my research question. Furthermore, because I have already mentioned some of the more seminal papers within DSR [14][16][17][19][26][27][28], I will use these papers for building an overview of DSR. For example, Indulska & Recker's [14] paper provides a great deal of literature analysis on Design Science in IS research. Their paper can be used to backtrack essential references for works within DSR. Another paper is Hevner et al's [16] paper, which is regarded to be one of the most seminal papers within the context of coining DSR as an paradigm in IS. Their paper can serve as an essential paper to allocate other well-cited DSR-papers that have cited Hevner et al's [16] paper.

3. **Synthesis of results** – I will develop a synthesis by using the meta-narrative technique [36]. I will use this technique to map the main characteristics of DSR, such as its epistemological underpinnings, research methods and theoretical foundation, together with a notion of users in DSR. This synthesis will be presented in open textual form and summarized through a synthesis table. The table will provide information about the DSR-contribution of each paper, together with an indicator that

indicates the strength of how present the notion of users is or not. The indicator is divided into three different alternatives of absence and presence:

- a. **Highly Present** – the notion of users is highly present in the DSR-paper. The contribution of the paper provides explicit information about how the concept of users is related to DSR and its characteristics. The contribution of the paper includes users explicitly.
- b. **Present** – the notion of users is present in the DSR-paper. The contribution of the paper provides implicit information about how the concept of users is related to DSR and its characteristics. The contribution of the paper includes users implicitly.
- c. **Absent** – the notion of users is absent and not included with the contribution of the paper.

### 3 Systematic Literature Review

This section presents the systematic literature review. I have searched for relevant DSR-papers based on criteria's presented in the previous section. I have chosen 31 papers, including the aforementioned DSR-papers [14][16][17][19][26][27][28]. I will begin with a general overview of DSR, and then provide its philosophical and epistemological underpinnings, theoretical foundation and research methods.

#### 3.1 Design Science Research

*Design Science* is the epistemological basis for the study of what is regarded as artificial. *Design Science Research* is an approach that inaugurates and operationalizes research for desired goals as an artifact or guideline [37]. Vaishnavi & Kuechler [38] expressed DSR as a novel idea or set of analytical techniques, which enable the development of research in several areas, such as IS, engineering, health care and computer science. It is a rigorous process of designing artifacts that solves real problems in real environments (as opposed to isolated experiments). At the same time, DSR-researchers can study, conduct research and investigate artifacts, and its behaviors, from an academic and organizational point of view [37]. Therefore, the diverse properties of DSR provide researchers a rich methodology of process models [16][19][20][26][39] for conducting DSR.

DSR-outcomes were originally categorized into four general outputs for DSR: *constructs*, *models*, *methods* and *instantiations* [40]. Each and every category serves a specific aspect of the artifact. Separately, a category can range from conceptualizing a vocabulary for a problem-solution space to operationalizing the constructs through an instantiation of a designed artifact. At the same time, outcomes from a DSR-project can address new solutions for known problems, new solutions for new problems and non-trivial extension of known solutions for new problems [25]. The outcomes are therefore divided as abstract and practical knowledge, where the first-mentioned deals

with development of design principles and theories, and the last-mentioned deal with building and evaluating artifacts. There are also examples on how intermediate knowledge can be produced and communicated through mid-range theories and nascent design knowledge [24][41]. This kind of intermediate knowledge transforms into mature design knowledge through iterative cycles of evaluation and reflection.

Altogether, DSR is positioned as a multi-faceted research approach with a rich set of methodological elements that provides researchers, and practitioners, a great amount of techniques and tools for conducting relevant and rigor research. Knowledge is generated for both researchers and practitioners that solve real problems in real organizations. Generic solutions are generally generated throughout the cycles of *relevance*, *design* and *rigor* [42]. The artifact is implemented for and used by actual people. But how does DSR position these people in terms of users? Are there any methods that emphasize a notion of users and their involvement throughout the process of conducting DSR?

### 3. 1. 1 Design Science Research Methods

Throughout the process of conducting DSR, researchers have formalized different methods for operationalizing DSR. These methods vary in terms of nomenclature, such as *design science research* [18][43][44][45], *design science research methodology* [20], *design cycle* [26][38][46], and *design research* [47][48]. The differences in nomenclature can be observed in the definitions of specific concepts and in the manner that DSR is operationalized. But the majority of them have one thing in common: they derive from the field of IS.

There are several examples on specific methods that authors have formalized and can be categorized as DSR-methods. Table 1 shows a backtracking on authors and their formalized methods in DSR:

**Table 1.** Formalized methods within Design Science Research

<b>AUTHOR(S)</b>	<b>CATEGORY/NAME OF METHOD</b>	<b>YEAR</b>
Takeda et al [26]	<i>Design Cycle</i>	1990
Eekels & Roozenburg [46]	<i>Design Cycle</i>	1991
Nunamaker et al [27]	<i>Systems Development Research Process</i>	1991
Walls et al [28]	<i>Developing Information Systems Design Theory</i>	1992
Van Aken et al [45]	<i>Problem Solving Cycle</i>	2004
Vaishnavi & Kuechler [38]	<i>Design Cycle</i>	2004
Cole et al [47]	<i>Synthesized Research Method</i>	2005
Manson [48]	<i>Outputs of Design Science Research</i>	2006
Peppers et al [20]	<i>Design Science Research Methodology</i>	2007
Gregor & Jones [23]	<i>Method for Theory Building</i>	2007
Baskerville et al [49]	<i>Soft Design Science Research Method</i>	2009
Alturki et al [18]	<i>Design Science Research Cycle</i>	2011

Table 1 shows similarities and differences between formalized methods in DSR. Each author proposes different methods of conducting research based on Design Science (DS) as a paradigm. However, there are also similarities between categories of methods, such as *Design Cycle* [26][38][46]. Overall, all of the authors have proposed similar elements for conducting DSR. For example, each and every author in Table 1 suggests the need for a proper definition about the problem as a necessary step of artifact development [18][19][20][23][26][27][28][38][44][46][47][48][49]. The majority of authors have also proposed a stage in their formalized methods, where specific features and requirements of the artifact are to be identified for design and development [18][19][20][23][26][27][28][38][46][49]. They also propose an evaluation step, encouraging researchers to demonstrate concern for rigor in the implementation of additional research to the importance of developing relevant solutions for identified problems [18][20][25][26][27][38][45][46][47].

Other emerging elements deals with steps such as literature review and search for existing solutions to a particular class of problems, identifying well-established theories that can serve as a basis for DSR [18][23][28]. Another emerging element is indicated by some of the authors, and it deals with formal decision-making processes, where researchers define optimal solutions in terms of artifacts for solving problems [26][38][46][48]. Finally, a few authors suggest a step focused on learning, reflection and communication of the findings of a study, which can assure that other researchers (or practitioners such as IS-designers and developers) can apply the generated knowledge [18][19][20][38][47].

**Table 2.** Main elements of methods within DSR

AUTHORS	FUNDAMENTAL STEPS IN THE METHOD							
	Problem definition	Literature review and search for existing theories	Suggestion for possible solutions	Development	Evaluation	Decision-making process	Reflection and learning	Communication of results
Takeda et al [26]	X		X	X	X			
Eekels & Rozenburg [46]	X		X	X	X	X		
Nunamaker et al [27]	X		X	X	X	X		
Walls et al [28]	X	X	X	X				

Van aken et al [45]	X		X	X	X		X	
Vaishnavi & Kuechler [38]	X		X	X	X	X		
Cole et al [47]	X			X	X		X	
Manson [48]	X		X	X	X	X		
Peppers et al [20]	X		X	X	X			X
Gregor & Jones [23]	X	X	X	X	X			
Baskerville et al [50]	X		X	X				
Alturki et al [18]	X	X	X	X	X			X
Sein et al [19]	X	X	X	X	X		X	X

### 3. 1. 2 Research Validity through Evaluation in Design Science Research

Evaluation is a crucial step in DSR. The validity of DSR must be established from the evaluation of designed and developed artifacts [21]. As a method for validation, DSR considers a multitude of procedures that ensures appropriate results deriving from the internal, and external designed environment for which it was developed [16]. Hevner et al [16] proposed five different ways to evaluate an artifact:

**Table 3.** Methods and techniques for the evaluation of artifacts by Hevner et al [16]

TYPE OF EVALUATION	PROPOSED METHODS AND TECHNIQUES
Observational	Case study elements: study the existing or created artifact in depth in the context of its business environment.
Analytical	Examine the structure of the artifact for static qualities. Study the fit of the artifact in the technical architecture. Demonstrate optimal attributes inherent to the artifact. Study the artifact during use to evaluate its dynamic qualities.
Experimental	Study the artifact in a controlled environment to determine its qualities.

	Execute the artifact with artificial data.
Testing	Implement the artifact interfaces to discover potential failures and identify defects. Perform coverage tests of some metrics for implementing the artifact.
Descriptive	Use the information of knowledge bases to construct a convincing argument about the quality of the artifact. Construct detailed scenarios for the artifact to demonstrate its utility.

Hevner et al's [16] evaluation techniques comprise a large set of methods for evaluating the artifact in its appropriate business context. But none of the actual techniques does explicitly mention or emphasize the role of users throughout the evaluation process. Neither does Hevner et al's [16] model suggest *explicit* techniques for evaluating desired artifacts together *with* users by involving them in DSR-activities.

Other authors such as Bruseberg & McDonagh-Philip [50] and Tremblay et al [51] emphasize how focus groups can be involved to support the development and evaluation of the artifact. Tremblay et al [51] present two different types of focus groups in DSR:

**Table 4.** Types of focus groups in Design Science Resesarch [51]

<b>EXPLORATORY FOCUS GROUP</b>	<b>CONFIRMATORY FOCUS GROUP</b>	<b>CHARACTERISTICS</b>
Achieve rapid incremental improvements in the creation of the artifact.	Demonstrate the utility of the developed artifacts applied in the field.	Objective
Provide information that can be used to change the artifact and the focus group script. Refine the focus group script and identify constructs to be used in other groups.	The previously defined interview script to be applied to the working group should not be modified over time to mediate comparisons between each participant focus group.	Role of focus group

Tremblay et al's [51] approach emphasizes a distinction between interim evaluations and final product evaluations. Interim evaluations are used to generate incremental evaluations, while final product evaluations are conducted when the artifact is ready to be tested in the field. But neither Tremblay et al [51] nor Bruseberg & McDonagh-Philip [50] explicitly emphasizes the participation of users throughout the cycles of DSR. Their emphasize is on how focus groups can comprise an appropriate technique for evaluating DSR, but not on how actual users of an artifact can be involved and participate together with practitioners and researchers in design and development phases.

Other authors such as Venable [52] considers stakeholders as witnesses of organizational goals and visions. Venable [52] recommends DSR-researchers to include witnesses to represent the interests of the future consumers of the outcomes of DSR (i.e. future clients, decision makers, professionals). Although Venable [52] discusses options for how witnesses might be included, whom the witnesses should be for and obstacles to implement the recommendations, Venable [52] doesn't articulate stakeholders as actual users in a DSR-project.

## 4 Results

Originally inspired by works such as Orlikowski & Iacono's [3], my objective to answer the research question for this paper has moved me towards a process of searching and reviewing relevant DSR-literature. The results have generated a portion of written papers and generated knowledge in DSR. But how many of the papers have actually conceptualized or identified a notion of users in DSR?

Table 5 proposes a synthesis table based on the research question and results from the literature review. The purpose with the synthesis table is to provide an overview of exhibited results related to the reviewed DSR-papers. The content of the table uses the research question to illustrate if the reviewed papers conceptualize a notion of users or not. The specific purpose with the table is to show whether the reviewed papers indicate any explicit notion about users in DSR or not. Therefore, I have added a column that states the DSR-contribution of the papers, and a column indicating whether the notion of users is present in that contribution or not. Altogether, the table summarizes essential parts from the results in this paper and serves as a medium for further discussions.

**Table 5.** A proposed synthesis for what the notion of users is in DSR

<b>AUTHOR (S)</b>	<b>DSR-CONTRIBUTION</b>	<b>NOTION OF USERS</b>
[14]	The paper presents a literature analysis emphasizing articles published between 2004-2008 at five different IS conferences. The results indicate that DSR appears to be a growing stream of IS-research.	<i>Absent</i>
[15]	The paper is based on a book-chapter about DSR in IS providing concise overview of Hevner et al's [16] seminal paper, together with a section discussing the impacts of the seminal paper by expanding its content.	<i>Absent</i>
[16]	The paper describes and proposes methods for conducting DSR in IS via a conceptual framework and clear guidelines for understanding, executing, and evaluating the research.	<i>Absent</i>
[17]	The paper discusses the need and role for theory in DSR. It proposes ideas for standards for the form and	<i>Absent</i>

	level of detail needed for theories in DSR. The paper also develops a framework of activities for the interaction of DSR with research in other scientific paradigms.	
[18]	The paper proposes a DSR abstraction-layers framework that integrates, interrelates, and harmonizes key methodological notions in DSR.	<i>Absent</i>
[19]	The paper proposes Action Design Research as a new method. ADR reflects the premise that IT-artifacts are ensembles shaped by the organizational context during development and use.	<i>Highly Present</i>
[20]	The paper motivates, presents, demonstrate in use, and evaluates a methodology for conducting DSR in IS. The model proposed by the authors, incorporates principles, practices, and procedures required to carry out DSR.	<i>Present</i>
[21]	The paper presents and suggests a strategic framework for DSR-evaluation in IS. The framework encompasses both ex ante and ex post orientations as well as naturalistic settings (e.g. case studies) and artificial settings (e.g. lab experiments) for DSR-evaluation.	<i>Highly Present</i>
[22]	The paper presents a developed theory-generating DSR approach that integrates methods of grounded theory development, with established DSR methodology.	<i>Absent</i>
[23]	The paper proposes the anatomy of a design theory. The anatomy focus on the structural components of design theories in IS as a special class of theory.	<i>Absent</i>
[24]	The paper presents a developed framework to support theory development in DSR for IS.	<i>Absent</i>
[25]	The paper presents a DSR knowledge contribution framework together with a DSR communication schema.	<i>Absent</i>
[26]	The paper presents a computable design process model for realizing intelligent computer-aided design systems by introducing a general design theory.	<i>Absent</i>
[27]	The paper presents a framework that describes and defends the use of systems development as a methodology. A systems development research process is presented from a methodological perspective.	<i>Present</i>
[28]	The paper defines an information systems design theory to be a prescriptive theory that integrates normative and descriptive theories into design paths intended to produce more effective information systems.	<i>Present</i>

[38]	The paper provides a general overview of DSR, together with its methods, theoretical foundations, and outputs of DSR. The contribution is large in terms of defining DSR in IS. The paper provides the IS-community with useful information on DSR, both in and outside of IS.	<i>Present</i>
[38]	The paper presents and summarizes Design Research from a historical point of view, emphasizing design methodologies as well as Design Science as a comprehensive subject that needs additional extensive research.	<i>Present</i>
[39]	The paper proposes and presents an artifact-centric creation and evaluation methodology for DSR.	<i>Absent</i>
[40]	The paper presents a two dimensional framework for research in IT. The authors introduce four categories of DSR-artifacts: constructs, methods, models and instantiations.	<i>Present</i>
[41]	The paper presents an extension of an existing publication scheme for DSR-papers.	<i>Absent</i>
[42]	The paper presents a model of DSR-cycles for relevance, rigor and design in DSR.	<i>Absent</i>
[43]	The paper argues that typical research products in Management Theory should be inspired by the Design Sciences and field-tested rules.	<i>Absent</i>
[44]	The paper discusses the nature of technological rules in management, as well as their development and use in actual management practice.	<i>Absent</i>
[45]	The book introduces and presents design-oriented and theory-informed methodology of problem solving in real organizations.	<i>Present</i>
[46]	The paper contributes with an understanding that science and engineering are interwoven and mutually dependent on each other, but on the other hand that there are fundamental distinctions between scientific research and engineering design.	<i>Absent</i>
[47]	The paper reveals interesting parallels and similarities between Action Research and Design Research, suggesting that the two approaches have much to learn from each other.	<i>Absent</i>
[48]	The paper discusses Design Research from a philosophical perspective, grasping the essence of what research is by presenting seven guidelines for understanding, executing and evaluating Design Research.	<i>Absent</i>

[49]	The paper proposes and evaluates a soft systems approach to DSR.	<i>Present</i>
[50]	The paper reviews the scope of application of focus group techniques, with a focus on the suitability of focus groups for designers.	<i>Present</i>
[51]	The paper discusses the adaptation of focus groups to design research projects. The paper presents and demonstrates how exploratory focus group techniques and confirmatory focus groups techniques can be used.	<i>Present</i>
[52]	The paper recommends that DSR-researchers should include witnesses to represent interest of the future consumers of the DSR-outcomes.	<i>Present</i>

## 5 Concluding Discussion

In this paper, I have conducted a small-systematized literature review upon the search for the notion of users in DSR. I have reviewed 31 DSR-papers, emphasizing DSR; it's methods, philosophy, research validity and essential characteristics. The results shows that there are only two DSR-papers with a *highly present* notion about users in DSR, 11 DSR-papers with a *present* notion about users in DSR, and 18 papers with a *absent* notion about users in DSR-papers. These results imply that the majority of the reviewed papers provide an *absent* notion about users in DSR. Many of those papers are well-cited papers, with a focus on DSR-epistemology, DSR-methods and other emerging themes within DSR. Several of them are also published in high-ranked journals. But still, the concept of users doesn't seem to be a central component of DSR. Could this be interpreted that the DSR-approach doesn't necessarily have to emphasize any explicit notions about users and their nature of existence during the activities and processes of a DSR-project? I find this question relevant, and not impossible to answer: the fact that DSR is originally grounded in Design Science and engineering, may suggest that it is governed by a techno-centric and problem-solving philosophy. The IT-artifact is, and has been, in focus as units of analysis for conducting DSR, for maybe nearly two decades (though with different nomenclature) [14]. The notion of users has not been the main issue for theorizing and generating prescriptive knowledge for building, intervening and evaluating IT-artifacts. Rather, different methods and emerging themes have emphasized the nature of the IT-artifact, abstracted knowledge for research based on the artifact, and outcomes that may serve both practitioners and researchers. The DSR-community seems to be open for suggestions about the evolvement of DSR, but would it take another 10 years to establish a wider view upon the notion of users in DSR, or has DSR already reached its full potentials?

DSR has evolved throughout the last decade. It has grown and become a fully accepted paradigm within the field of IS. The rich set of features for researchers and practitioners, has created an arena for DSR-researchers. But I believe that DSR is still evolving, and has the potentials to expand its knowledge base. One way of doing so,

would perhaps be to theorize about the notion of users in DSR by asking questions such as: how can we position the role of users in existing methodologies? Would the end product in terms of DSR-outcomes become more sufficient if users were to be involved throughout the process of DSR-methods? How can practitioners and researchers benefit from involving users in a DSR-project? Questions such as these could open up for relevant discussions in the DSR-community. The fact that DSR emphasizes the intervention of IT-artifacts in organizational settings [19] implies that the organizational entity is dependent on its organizational members, which may be the same as the artifact-users. Wouldn't it then be relevant to conceptualize an explicit notion about users in DSR, their roles, their attributes and nature of being from a DSR-perspective? I believe that this could be a question for further research. This paper implies a smaller understanding upon the notion of users in DSR. Therefore, I hope that IS-researchers in general, and DSR-researchers in particular, become inspired to conduct further studies that could expand this notion into a wider understanding about the notion of users in DSR.

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