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Past Lessons, Future Directions: An Author-Informed Review of Design Science Research in Information Systems

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Abstract. This paper explores the foundational insights and evolving perspectives within Design Science Research (DSR) by analyzing the reflections of authors who contributed some of the most pivotal and cited works in the field. Through in-depth interviews with 14 DSR experts, each representing a seminal and impactful publication, we investigate the motivations, challenges, and retrospective viewpoints that shaped their research contributions. Key themes include the authors' reflections on the original aims and main contributions of their work, considerations on what they might alter if revisiting their studies today, and advice for aspiring DSR researchers. These perspectives provide a unique lens into the evolution of DSR, highlighting both enduring principles and areas ripe for innovation. This study chronicles significant milestones in DSR as well as offers guidance for future research and practice, charting a path forward for scholars navigating this dynamic and impactful paradigm.

Keywords: Design Science Research · Expert Interviews · Philosophy of DSR · Research Challenges · Trends in DSR

1 Introduction

Design Science Research (DSR) has received significant attention as a vital research paradigm in the field of Information Systems (IS) ever since its widespread establishment [16,22,29]. It provides a structured approach to designing and evaluating artifacts that can be applied to the solution of real-world

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problems. As the field matured, seminal works shaped and defined its trajectory, influencing both how research is conducted and how findings are applied [13,16,23]. However, less is known about how the field and philosophy of DSR have changed over time. A recent study sheds light on the characteristics of DSR research based on a bibliometric analysis [3]. Our study aims to illuminate the development and enduring impact of influential DSR contributions by examining the insights and reflections of its prominent authors. Through their reflections, we gain a nuanced and more personalized perspective than standard literature reviews of the field's foundational principles, current challenges, and fresh perspectives in DSR.

In this work, we investigate the long-term relevance of original methods or frameworks regarding whether they still effectively address the initial challenges in light of technological and methodological advancements. Another consideration involves unintended applications, wherein contributions are used beyond their intended scope, prompting exploration of how authors perceive these adaptations.

We conducted 14 in-depth interviews with authors[1] of some of the most cited and widely referenced papers[2] in DSR. The findings of this study reveal recurring themes across the interviews, including the authors' emphasis on complexity, transdisciplinary research, and the role of DSR in bridging theoretical growth with practical impact. By charting the collective experiences of these authors, this paper contributes to the ongoing discourse on the future directions of DSR. Following a qualitative research approach, we propose directions for the future of DSR and seek to provide emerging researchers and practitioners with guidance grounded in the field's legacy. Moreover, this study underscores the adaptability and transdisciplinary nature of DSR as it continues to respond to contemporary challenges in IS and beyond.

2 A History of Design Science Research

DSR is an important research paradigm in the field of IS [13]. It is rooted in engineering and the science of the artificial [26]. Over the past decades, the recognition of DSR has grown due to the practical nature of IS problems and its relevance to research outcomes while maintaining scientific rigor. DSR aims to solve real-world problems by designing innovative artifacts [15]. One of the main purposes of DSR is to generate design knowledge and contribute to the scientific knowledge base by providing descriptive explanations of "how to do something to achieve a goal" [12, p. 1622]. DSR projects typically produce design knowledge describing the means-end relationship between the problem and the solution space while novel artifacts are represented in the form of constructs, models, methods, and instantiations [13,16]. Because of its problem-solving nature, DSR has a central role in disciplines such as engineering, architecture, and IS as well as information technology-related disciplines, promoting the development of

[1] Cumulative citation count of 227,947 on Google Scholar [25.03.2025].
[2] Cumulative citation count of 42,902 on Google Scholar [25.03.2025].

innovative solutions. However, the application of DSR methodology is not limited to these fields. It can be applied in many disciplines to solve real-world problems, for instance, in operations management [2] or in the field of entrepreneurship [24].

The methodological discourse of DSR has advanced over the past few years. There exist many frameworks, guidelines, and process models supporting design science researchers in conducting DSR projects and structuring the design process (e.g., Sein et al. [25], Kuechler and Vaishnavi [17], Gregor and Jones [14], Peffers et al. [23], Tuuanen et al. [28] and more). However, these guidelines support researchers on the meta level. On the instantiation level, DSR is highly context dependent and does not follow a cookbook [7]. With the growth of the DSR knowledge base and constant change, the complexity of DSR projects is increasing [28]. Due to emerging technologies and the advancing prevalence of DSR, new challenges are arising that need to be addressed. In order to better understand the past and what is missing to address future challenges we present future DSR themes based on the authors' perspectives of the most pivotal and cited works.

3 Method

We pursued a qualitative research approach to derive our insights from 14 in-depth, semi-structured interviews [10, 20].

3.1 Ensuring Validity and Reliability of Interview Data

To ensure the validity and reliability of the qualitative data, we followed the four widely established quality criteria [18]: credibility, transferability, dependability, and confirmability.

Credibility, measures how well the qualitative data aligns with reality [20]. To ensure the interview partners are "knowledgeable agents" [10], we selected and interviewed authors (A1–A14) who actively shaped DSR through purposive sampling [8]. We ensured the credibility of our informants by verifying that their papers were either published in highly ranked journals (e.g., MIS Quarterly for A2, 10, and 12), cited extensively (e.g., A3 and 7), or both. *Transferability* refers to the degree to which the generated knowledge can be abstracted to another context with different interview partners. We provide contextual information about our interview partners' papers in Table 1. *Dependability* concerns the replicability of research findings. By making all our data publicly available and presenting in-depth information on our methods, we promote replicability through systematism and transparency [20]. Lastly, *confirmability* regards the results' objectivity [18]. We proactively addressed potential biases throughout the research process, especially during the data analysis and coding. Foremost, through iterative discussions, we ensured that all researchers were aware of their potential biases (e.g., opinions on what constitutes DSR) and knew methods to counter them actively. Moreover, all of the current study's authors conducted the interviews to further prohibit systematic biases and ensure data diversity. In

the following, we provide detailed information on how we ensured confirmability in our data collection and analysis.

Table 1. Papers of Interviewed Authors

Acro.	Author	Title	Year
A1	Abbasi, A., Parsons, J., Pant, G., Sheng, O. R. L., & Sarker, S.	Pathways for Design Research on Artificial Intelligence	2024
A2	Gregor, S., & Hevner, A. R.	Positioning and presenting design science research for maximum impact	2013
A3	Maedche, A., Gregor, S., Morana, S., & Feine, J.	Conceptualization of the problem space in design science research	2019
A4	Mandviwalla, M.	Generating and justifying design theory	2015
A5	Mullarkey, M. T., & Hevner, A. R.	An elaborated action design research process model	2019
A6	Seckler, C., Mauer, R., & vom Brocke, J.	Design science in entrepreneurship: conceptual foundations and guiding principles	2021
A7	Tremblay, M. C., Hevner, A. R., & Berndt, D. J.	Focus groups for artifact refinement and evaluation in design research	2010
A8	Peffers, K., Tuunanen, T., Rothenberger, M. A., & Chatterjee, S.	A design science research methodology for information systems research	2007
A9	Venable, J., Pries-Heje, J., & Baskerville, R.	FEDS: A framework for evaluation in design science research	2016
A10	Tuunanen, T., Winter, R., & vom Brocke, J.	Dealing with Complexity in Design Science Research: A Methodology Using Design Echelons	2024
A11	vom Brocke, J., Winter, R., Hevner, A., & Maedche, A.	Accumulation and evolution of design knowledge in design science research: a journey through time and space	2020
A12	Baskerville, R. L., Kaul, M., & Storey, V. C.	Genres of inquiry in design-science research	2015
A13	Hevner, A. R., March, S. T., Park, J., & Ram, S.	Design science in information systems research	2004
A14	Zolbanin, H., & Aubert, B.	A process model for design-oriented machine learning research in information systems	2025

3.2 Data Collection and Analysis

Our qualitative data collection comprised 14 interviews with authors of some of the most influential DSR papers. Interviews had an average duration of around 30 min. We conducted the interviews online via digital video communication tools. Moreover, we interviewed only one author of each paper as to not skew the results to reflect one paper's views over others disproportionally. We used

a semi-structured interview guideline, maintaining researcher-participant reciprocity and reflexivity [9]. First, we asked interview partners about their expertise in the domain. Then, in the central part, we asked questions about the motivation, challenges, and contributions behind their publications. Notably, we also asked reflexive questions, such as, "Would you change something in the paper if you wrote it today?" We closed the interview by asking our interview partners about their future hopes and aspirations for the DSR discipline. Throughout the interview, interviewers were free to follow up on any comments. Once we completed the interviews, we transcribed each one[3]. Following the approach outlined by Gioia et al. [10], we initially conducted our inductive coding comparable to Strauss and Corbin's [27] open coding, which resulted in a dataset of 508 1st-order concepts while remaining faithful to our informants' wording. As we realized that many informants referred to similar concepts using different words, we aggregated our 1st-order concepts into 10 2nd-order themes corresponding to Strauss and Corbin's [27] axial coding within iterative discussions among this study's authors. In line with Strauss and Corbin's [27] notion of selective coding, we aggregated the discovered 2nd-order themes into three overarching dimensions. These groupings have enabled us and empower readers to identify, link, and interpret relevant themes in our data between interviewees and abstract these into novel knowledge. By adopting this approach, we were able to investigate multiple perspectives and gain a comprehensive understanding of the dataset's scope and depth [10,27]. Our data collection and analysis approach is illustrated in Fig. 1.

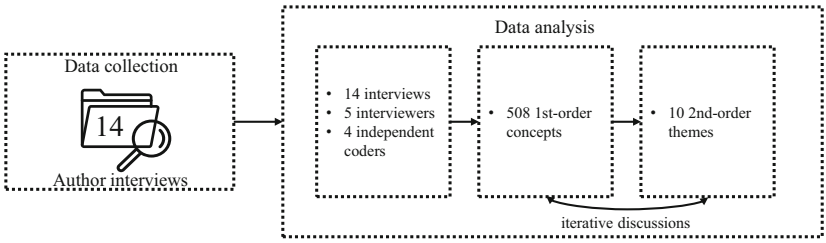

Fig. 1. Data Collection and Analysis

4 Author-Informed Review of Design Science Research

The author-informed review we conducted reveals a variety of relevant themes discussing DSR. By an author-informed review, we refer to engaging in interviews with the authors (A1–A14) to reflect on their research. The findings can be categorized into three overarching dimensions: the learnings from the past,

[3] Repository of all transcripts and videos: https://github.com/Ebas0/DESRIST25-P-L-F-D.

current challenges, and future directions. The adjacent 2nd-order themes are displayed in Table 2. The additional columns aggregate the sum of the 1st-order concepts for the respective theme as well as an exemplary 1st-order concept for this theme.

Table 2. 2nd-Order Themes and 1st-Order Concepts

2nd-Order	Exemplary 1st-Order	Sum 1st-Order
Complexity	Cannot plan the whole DSR process in the beginning of the project	110
Transdisciplinarity	DSR is a combination of different research streams	69
Maturity	Historically, DSR was not established as a scientific approach	55
Positioning	Different IS communities have different perspectives of what abstraction means	49
Rigor	Design process must be transparent	48
Guidance	Missing guidance for conducting DSR	48
Eligibility	DSR did not exist as a term but people were doing it	25
Clinical Inquiry	Build artifacts that are meaningful for practice	20
Value Creation	Change the world but change it for the better	19
Evolution	Use modern solutions for DSR and do not always rely on the "old" stuff	9
Total		508

4.1 Learning from the Past

Eligibility. The methodologies and approaches foundational to DSR were applied long before the term gained traction: "The term didn't exist at the time. Yet that was what I was doing" (A9). Reflecting on the roots, an author noted they performed "design-oriented research, even before it was called that name, back in the 80s and 90s" (A10). Despite the lack of explicit nomenclature, these efforts laid the groundwork for what would become a recognized IS research paradigm. A sense of perpetuity is captured in the assertion, "I sort of disagree that we're doing something new here. We're doing something that has been done [...] since the beginning of time" (A13).

The publication by Hevner and colleagues in 2004 marked a pivotal moment in the formalization of DSR for IS [16]. This was explicitly recognized by numerous scholars who credit it with crystallizing the domain. One interviewee noted, "I was a first-year PhD student when the Hevner et al. paper came out [...] and so that really just changed my life" (A1), signifying the profound impact it had on shaping academic trajectories. Overall, the contributions of the seminal paper provided much-needed clarity and eligibility [16]. It clarified the terminology of DSR, whose the principles and practices have deep and enduring origins. In doing so, they established "the tension that exists between scientific theory and [...] pragmatic design" (A13) which shapes the field to this day.

Maturity. There was considerable debate surrounding DSR's fundamental nature. As one interviewee noted, "there were multiple views of what this design science research was" (A12). This uncertainty was compounded by fundamental ambiguity among scholars who questioned whether theory should precede or follow practice and whether the discipline retained its pragmatic essence: "Does theory come first or second? [...] Are we still a pragmatic discipline?" (A5). Furthermore, the very core of the emerging paradigm was scrutinized, with critical inquiries such as, "is this science or is this just consulting?" (A6).

Multiple researchers reflected that the idea for their own influential paper was born from a personal and collective academic journey. As one author noted, the paper began "in my head, at least when I was working on my PhD" (A4). The goals were to "clarify why design science is a scientific approach" (A6) while still signifying "how it is related but different from practice or consulting" (A6). Further, there was a need to clarify why "design science is a distinct scientific approach on par and complementary to explanatory research" (A6). In that regard, DSR evolved as a "paradigm with multiple methodologies within it and multiple approaches" (A12).

The pivotal aim, as articulated by the researchers, was to "legitimize doing design-oriented research" (A10) within IS, recognizing DSR as a "scientific approach" (A10) that leverages the "scientific method" (A6). The validation was especially crucial given that in the early 2000s many young scholars faced difficulties when their work was evaluated by reviewers unfamiliar with or biased against this emerging paradigm. Prior to the aforementioned milestone, "thousands of researchers did design-oriented research in the 1980s and 1990s, especially in Europe" (A10), but they faced challenges in gaining recognition in top IS journals. Authors hoped to provide a theoretical foundation that could be easily recognized by reviewers and editors alike, who previously struggled with a lack of expertise in the area. One interviewee noted the initial resistance and the need for a concerted effort to educate and convince the academic community of DSR's validity. The challenge was further compounded by the novelty of DSR, as it "required a lot of expertise from the editors, and in many cases, it was new. The expertise in the editors just wasn't there" (A12). Therefore, the quest to establish DSR as a recognized scientific discipline was as much about advancing research practices as it was about fostering understanding and acceptance within the academic publishing landscape.

Guidance. DSR evolved through the efforts of scholars grappling with its methodological foundations. One researcher reflected, "I was struggling a bit because there was no guidance for doing design science research" (A9). Others noted challenges of existing approaches: "I don't really like this model. It was too, too abstract, too high level, and it was difficult to sort of think about how would I plan my PhD study if I would start with this figure" (A10). This situation inspired the development of new articles, particularly for novices, where a "part was needed, that is a set of steps. First do this, then do this, then do this, then do that" (A9). The aim has been to foster a shared language in the DSR community without imposing unnecessary gatekeeping. These reflections highlight the ongoing dialogue in DSR about balancing structure, flexibility, and inclusivity.

Reflecting on whether the authors would change their works in hindsight, most concluded their work represents "a product of its time" (A8) encapsulating contemporary thinking. One author articulated, "I don't think we'd change anything. [...] I think it provided the right, if you will, foundation for additional thinking" (A13). Another noted, "I'm not sure there's anything I would change at this point in time in the paper. It seems to be enduring" (A12). Furthermore, the timeless nature of conceptual papers is underscored by the thought that they are "independent of technology and time, more or less" (A3). As another interviewee reflected, "I wouldn't change the paper that much [...] it sort of captures our thinking in years 2005, 2007 [...] and it has lasted quite well" (A8).

4.2 Current Challenges

Complexity. The complexity of the design process is a diverse theme. It can be further split into the topics planning & organizing, intermediate artifacts, iterative, agility, and stopping. These individual topics are illustrated in the following.

Planning and Organizing. While planning is critical, it must be flexible enough to accommodate the unpredictability of real-world dynamics. One scholar highlighted this balance, noting, "I mean, you have to have a discipline of planning. But as Mike Tyson would say, once you get punched in the face, the plan goes out the window. Well, it doesn't really go out the window because the discipline of planning is still there. However, you need to be cognizant of the emergent capabilities of the real world" (A13). The complexity increases when planning over extended timelines. As one researcher reflected, "if I need to set out the layout for design research, which goes through all those phases, and today I plan how I am going to evaluate it in two years or three years' time [...] I have hardly understood [the problem] in the very beginning. And of course, I have no clue of the solution, really" (A11). This underscores the need to blend structured methods with openness to change, allowing researchers to align their work with objectives, constraints, and emerging opportunities: "I've always been a great fan of doing design science research the way you would like to do it [...] Regarding your objective, your constraints, and the opportunities you also face in a certain project" (A11).

Intermediate Artifacts. Researchers struggle to package their work. As one scholar noted, if "you have a complex artifact, a complex process, lots of stakeholders, and a complex problem, it's really hard to document the complete process from problem analysis" (A10). Under this light, another author warned to not "lose the whole complexity and the whole interesting problem only because you cannot publish it in a simple conference paper" (A11). It is crucial to "not oversimplify and go the simple way and the easy way, because at the end, the simplistic and easy artifacts won't really help society and won't really help the discipline" (A11). The concept of intermediate artifacts emerged in our author-informed review to address these challenges. One scholar emphasized, "in our paper, we call this intermediate artifacts" (A10), advocating for their legitimacy in scholarly publications: "I [...] hope that this paper [...] legitimizes that people submit intermediate artifacts and portions of the design process" (A10). This approach not only accommodates the complexity of DSR but also encourages researchers to "cut out a piece of the design project and publish it as a separate contribution" (A10), thereby creating opportunities for cumulative knowledge building and reusing of knowledge. These pieces (also called "chunks" (A11) or "echelons" (A10)) allow researchers to focus on specific parts of the design process (e.g., problem understanding).

Iterative. As one scholar observed, "design science research really is not a linear process" (A11), emphasizing that "the real design science research in the real world is never that linear" (A11). This iterative nature allows researchers to adapt to emergent insights, revisiting earlier phases upon finding "that you're designing for the wrong thing" (A5). A central characteristic of this approach is the build-evaluate-intervene cycle, where each iteration transforms both the solution and its environment: "Once you build something, you evaluate it. You feel that it has potential to improve an environment. Once you intervene in that environment, you've changed the environment. You've changed the problem for the next cycle" (A13).

Agility. Iterative methods also enable researchers to integrate lessons learned from one phase into subsequent activities, fostering agility: "If you run through those phases in a linear way, you kind of do not learn much from the result of the one phase" (A11). Instead, the iterative approach encourages agility and responsiveness, embodying the philosophy that "design science is a journey through space and time" (A11). This perspective aligns with the principles of agile methods, which, as another scholar noted, contrasts sharply with the "waterfall-y" (A11) tendencies sometimes seen in DSR: "We teach agile methods in software engineering. I always thought, Why are we so non-agile?" (A11). One author remarked "you have to be also always agile with your feet when you're doing these DSR, because things will not go in the way that you have planned always. Sometimes they do, but most often not. Especially if you're working with industry, you know, surprising things happen, always" (A8).

Stopping. The complexity inherent in DSR extends not only to planning, iterative cycles, and intermediate artifacts but also to determining when to stop. As one

scholar noted, "I think it's still an opportunity for folks to work on the stopping rule. [...] When is [the artifact] ready to be unveiled? When is it ready to be tested? We don't know that. We all just guess right now" (A4). This uncertainty reflects the ongoing tension between achieving sufficient refinement and avoiding overinvestment in endless iterations.

Rigor. The challenge of rigorous evaluation reflects the dual nature of DSR, where design and evaluation must coexist in a productive tension. This tension was reflected by one author: "You've got to sometimes make a decision. Do you focus on the actual artifact, and then the people will say, Well, you haven't tested it properly. And if you go too much into the testing, then they'll start to look for a full-blown behavioral science experimental setup. And sometimes, for our people, it's hard for them to do that properly" (A2). As one scholar succinctly put it, "we try to design and evaluate concurrently innovative solutions to real-world problems" (A11), underscoring the importance of navigating this complexity to produce impactful, credible research outcomes. Evaluation is not merely a concluding step but an integral part of the entire research process. As one expert noted, "I found it very important to evaluate not only at the end of the process but also during the process" (A10). However, achieving this level of rigor often feels overwhelming: "In effect, [you] conduct two research projects: A design project and an evaluation project" (A9). Despite its importance, evaluation is resource-intensive and can strain researchers' capacity: "You can't just spend massive amounts of resources on conducting evaluations" (A9). It often becomes a balancing act, where compromises must be made between depth of evaluation and the practicality of conducting a comprehensive study. At the same time, building and testing are inherently interconnected, as "how much evaluation is built into [the building process]" (A4) can itself be a marker of rigor, showing that evaluation is not merely a separate phase but an embedded contribution.

Positioning. Effective positioning begins with identifying where to start and how the research builds on existing work: "We argue towards starting somewhere where it makes sense, also where others have stopped, and kind of you stand on the shoulders of giants" (A11). This requires researchers to ground their work in prior knowledge, carefully defining the boundaries of their contributions and clearly articulating the advancements made. Positioning also involves moving from a specific problem toward generalizable insights. As one expert noted, "why we also did talk about abstraction a lot, which is a key theme here, where abstraction is important to help build a cumulative tradition" (A1). The process of defining and articulating the problem is foundational for effective positioning: "The first real artifact that you build is a representation of your problem with appropriate boundaries, with appropriate goals for your project" (A13). Understanding the problem deeply and aligning the research objectives with the intended contribution ensures that the resulting work is both relevant and impactful: "In the end, the contribution needs to be very clear and say, Okay, that's really the advancement this design research has made" (A11).

4.3 Future Directions

The future of DSR holds immense potential, with opportunities limited only by the ambition and creativity of its adjacent researchers. As one expert noted, "the sky is the limit in terms of what somebody starting out today can do" (A4). In the following section, we describe, through the lens of the interviewed authors, how the challenges of the previous chapter relate to potential advancements in the field of DSR. The future directions sourcing from these challenges are supplemented with comments from authors on the future of the field. They are presented in Table 3 with a short description.

Table 3. Themes for the Future of DSR

Direction	Description
Advance the Concept of Intermediate Artifacts	Promote the legitimacy of intermediate artifacts as scholarly contributions. It encourages publishing reusable components of the design process to foster cumulative knowledge building and broader applicability of findings.
Encourage Diversity in Research Approaches	Foundational works like [16,23] are pivotal but may limit innovation. Researchers should embrace diverse and modern approaches to advance DSR.
Foster Iterative and Adaptive Approaches	Iterative processes should be recognized and further explored as a core characteristic of DSR. By moving away from linear approaches, researchers can navigate the unpredictability of real-world projects and incorporate lessons learned at every stage of the research process.
Foster Transdisciplinarity Integration	Extend DSR beyond its traditional domains. By balancing explanatory and design-focused approaches, DSR can cross-fertilize with other disciplines.
Strengthen Clinical Inquiry	Prioritize clinical inquiry by fostering deeper collaborations with practitioners. Shift from theoretical discussions to impactful, hands-on projects, bridging the rich problem and solution spaces of today's socio-technical landscape.
Leveraging Technology for Societal Impact	Leverage emerging technologies to design artifacts addressing societal and business challenges, balancing specificity with generalizability.

Value Creation. DSR has transformative potential for driving meaningful change in society. As one expert passionately advocated, "let's do world domination with design" (A1), reflecting the ambition to extend DSR's influence. Central to this ambition is the goal of making a tangible difference, as another expert noted, "we want to make a difference in the world" (A13). This involves not just solving problems but addressing broader societal challenges—ethical considerations included. As one participant reflected, "we change the world, but do we always change it for the better?" (A13), emphasizing the responsibility inherent in DSR to contribute positively. "It's great to take tiny steps that eventually

lead to something bigger," one expert noted (A11), illustrating the cumulative impact of DSR initiatives. Beyond societal contributions, DSR holds promise for the IS field itself, as it has strong relevance and impact: "Can be more recognized for the great things we are doing" (A11). Ultimately, DSR is positioned as "a recipe for a future world" (A12), crafting pathways to a better, more equitable future while cementing its place as a pivotal research approach. Furthermore, DSR aligns naturally with global initiatives, such as the UN Sustainable Development Goals, providing a framework for improving health, education, poverty reduction, and environmental sustainability. A participant highlights its role in this context, stating, "Improving the quality of life [...] building and developing new artifacts for doing it is, of course, an important thing to do" (A9).

One of the defining strengths of DSR lies in its holistic approach, combining technological innovation with a deep understanding of environmental, behavioral, and organizational factors. "With the training that people in DSR get [...] we have the ability to create new things" (A4). The accelerating pace of technological change further amplifies the relevance and urgency of DSR. While technology can sometimes constrain creativity, it also offers unprecedented opportunities for innovation: "Technology is running at warp speed. Our work is never done" (A7); "There is so much you can do" (A4). This duality requires researchers to embrace both the challenges and possibilities of the technological landscape. As one participant emphasized, "I want to see more and more excitement about the creative nature of DSR [...] If we do that, we can start or continue or even more effectively influence the major trends that are happening in the world today" (A5).

Transdisciplinarity. DSR evolved as a combination of different research streams and has immense potential to transcend its traditional boundaries and contribute to a wide range of disciplines: "DSR has the opportunity to make contributions across multiple disciplines" (A5). One expert emphasizes the need for an ambidextrous approach, blending explanation with design: "With explanation, you can analyze a problem or a solution. But it is the design bit that actually gives you another means and relationship" (A6). This balance is critical to addressing the current imbalance in fields such as entrepreneurship, which are "dominated by descriptive and explanatory research" (A6). As one participant noted, "The concepts and ideas of design science research are relevant to all applied disciplines" (A9). The future of DSR lies in embracing transdisciplinarity by extending its methodologies and insights to diverse applied disciplines and fostering collaboration for sharing design and process knowledge across social sciences and beyond: "I think we're here to work and collaborate effectively to make an impact. So, you know, I don't think we dominate other methodologies. I think we collaborate with other methodologies very well. It's [...] not an either or decision" (A13). This approach not only enhances the relevance of DSR but also positions it as a critical enabler of impactful research across fields. As one expert noted, "there's a lot to learn from other applied disciplines, and there's a lot that we can cross-fertilize with other applied disciplines" (A9).

Clinical Inquiry. The future of DSR increasingly emphasizes clinical inquiry—engaging directly with real-world problems through collaborative, hands-on approaches [6]. One expert highlighted the value of co-creation: "Experimental processes and really co-create and co-deliver, co-evaluate with customers, both an understanding of the discovery of the problem customers are facing and the co-creation, co-development, and co-evaluation with customers of a novel product or service" (A5). This partnership-driven approach not only aligns with industry needs but also empowers researchers and students alike, demonstrating their ability to effect tangible change. Scholars are encouraged to focus on complex, practical challenges and actively work alongside practitioners. Moreover, DSR offers a unique opportunity to infuse rigor into industry innovation, with one practitioner remarking, "the industry is more than willing to engage with us. But we have to show up" (A4). By creating socio-technical solutions, scholars can bridge a "super-rich solution space" (A11) with a "super-rich [...] problem space" (A11) to address pressing societal and organizational challenges. Clinical inquiry also calls for a shift in academic practice. As one scholar suggested, "we should do more projects, not only papers [...] talking about how to do it, but actually do[ing] it" (A11). This vision for DSR is not merely aspirational—it represents a call to action for the community to deepen its impact, expand its engagement with industry, and deliver transformative innovations that resonate across society: "I would like to recommend everybody: stand up, leave your desk, go out there in the wild, engage with real people, and try to contribute what you can to joint solutions. And that, of course, also includes very many other disciplines and other regions around the world. The more, the merrier" (A11).

Evolution. While foundational works like [16,23] have provided crucial frameworks, there is a concern that they constrain innovation in DSR methodologies. As one expert highlighted, "most of the work that's done in design science research really anchors itself to about, I don't know, maybe four different methods" (A12), suggesting the need to explore beyond these commonly utilized approaches. Another added, "we don't have to have one method or even four methods. I think there's room for more than that" (A12). This recognition opens the door for experimentation and acceptance of new ways to conduct DSR. As one author put it, "I think it's about time for us to grow out of that and begin to accept that there are many different ways to do design science research" (A12). Circling back, one author commented "don't always look at Hevner et al. (2004) and Peffers et al. (2007). There is more modern stuff that we need and that we should use" (A10). Thus, the evolution of DSR requires researchers to move beyond relying on a limited set of methodologies, which will encourage diversity and adaptability in research approaches.

5 Discussion

The increase of emergent technologies and the growing adoption of DSR methodologies present novel methodological and theoretical challenges that require systematic investigation [7]. To establish a comprehensive understanding of how

to address these future challenges, we conducted interviews with the authors of highly cited seminal DSR literature. We synthesized key themes and research directions based on the authors' perspectives. The comments and issues raised during the interviews often overlap, meaning they cannot be neatly categorized as specific to the past, present, or future. One of the pressing issues raised in our author-informed review relates to the dynamics of the author-editor-reviewer triangle [1]. This construct represents the vigorous and interdependent relationship among these roles in the academic publishing process.

DSR papers face diverse and, at times, inappropriate feedback during the review process [13]. This often stems from the varying levels of familiarity reviewers have with the methodological foundations and goals of DSR [11]. Even two decades after Hevner et al.'s [16] seminal paper on design science, authors still risk having their work evaluated by individuals who lack an understanding of its unique methodological underpinnings [1]. This pattern seems to reoccur as the field evolves. Authors proposing novel DSR approaches face similar issues to those encountered during the early days of the field [30]. Just as in the past, editors and reviewers unfamiliar with the innovation, e.g., design-oriented machine learning, struggle to evaluate it fairly, highlighting a persistent gap in understanding new methodologies [21]. This disconnect creates a cycle where innovative contributions are undervalued or misunderstood, hindering the field's growth [1]. Furthermore, there is a need for dedicated editorials or special issues in journals to establish and legitimize emerging research approaches, enabling others to build on them [5]. In turn, authors must familiarize themselves with these editorials and seminal papers of the field to avoid repeating the mistakes outlined within them [1,7,13].

In our review, the interviewed authors frequently emphasized that our world is not becoming simpler; rather, it is constantly changing and becoming increasingly complex, causing applicability issues of design knowledge in real-world settings [19,28]. Despite this, there is a noticeable trend within the field toward producing simpler, more easily publishable research. This trend is compounded by efforts to make DSR more accessible to young scholars, aiming to lower barriers and reduce complexity, which creates an intriguing ambivalence and duality: while simplification can open up the field, it risks oversimplifying complex realities. Historically, the mantra "complexity is death" (Chuck Thacker) notably echoed by Microsoft, has suggested that we avoid complexity at all costs. However, the current paradigm has shifted to embracing the intricacies of contemporary issues, suggesting that we must now design for complexity [7,28]. To address the potential drawbacks of oversimplification, it will become essential to foster a cumulative tradition within DSR. Embracing intermediate contributions can mitigate the risk of reducing complex societal and disciplinary challenges to oversimplified solutions [1]. These intermediate artifacts enable researchers to build a robust body of work that captures the complexity of issues and solutions over time, rather than compressing them into a single, simplified narrative [1].

This work is not free of limitations. Our study focuses primarily on authors of seminal and impactful DSR publications. While the selected experts represent

influential contributions, the findings might not fully generalize to all DSR communities. Thus, we emphasize a potential selection bias, particularly relevant for less cited but innovative domains or emerging areas of research. While the advice shared by experts is valuable, it may reflect the career trajectories and contexts of seasoned scholars, which might not fully align with the challenges faced by early career researchers today. Further, authors might have rationalized or reinterpreted their past decisions based on current knowledge, rather than accurately recalling their original motivations and challenges. Hence, the retrospective nature of the interviews might be influenced by hindsight bias. We tried to counter this constraint by integrating recent works as well, but this limitation might still be present.

Based on the identified limitations, future research could broaden the scope of participant selection to include a wider array of DSR authors, especially those from less cited or emerging domains. Incorporating methodological triangulation by utilizing additional data sources, like bibliometric analyses or surveys, could enhance the robustness of findings by providing diverse perspectives and quantitative data [3,4,21]. Lastly, reflecting on the practical application of design science in IS could reveal the practical challenges and strategies involved in implementing DSR theories [11].

6 Conclusion

This study contributes to the ongoing evolution of DSR by engaging directly with the authors of these seminal works. By treating seminal works as evolving "artifacts," this review extends the iterative philosophy of DSR, ensuring these foundational contributions adapt over time. Through in-depth interviews, this research highlights the enduring relevance of past contributions as well as anticipates future developments, serving as a resource for understanding DSR's trajectory. We contribute to the field by identifying and synthesizing 10 key themes representing lessons from the past, current challenges, and future directions of DSR. We highlight that contemporary advancements of DSR are deeply rooted in the seminal contributions of pioneering thinkers. Many foundational papers in DSR emerged from scholars who, during their early academic careers, encountered significant hurdles in publishing their innovative ideas. The resulting seminal papers were motivated by a desire to help others navigate the intricacies of conducting and publishing in the field. Further, we offer a structured lens through which others can address the inherent challenges of DSR, from managing transdisciplinary collaboration to ensuring rigor and transparency in the design process. Moreover, the identified themes emphasize the importance of creating practical value and adapting to evolving methods. Looking to the future, explicit pathways for DSR include advancing the concept of intermediate artifacts to foster cumulative knowledge, encouraging diversity in research approaches to promote innovation, and fostering iterative and adaptive approaches for navigating real-world unpredictabilities.

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