

Introduction to the Advances in Design Science Research Minitrack

Richard Baskerville
Georgia State University
Curtin University
baskerville@gsu.edu

Matti Rossi
Aalto University
matti.rossi@aalto.fi

Tuure Tuunanen
University of Jyväskylä
Faculty of IT
tuure@tuunanen.fi

This minitrack provides a venue for design science researchers (DSR) to share their work and interact with likeminded scholars. DSR is a prominent form of engaged scholarship, which combines inquiry with a potential for action and intervention. DSR may be viewed as having three related subfields:

- Science of design, which focuses on creating ‘new-to-the-world’ artifacts [1-3]. We try to provide an outlet for researchers doing novel artifact driven research in information systems, but also in other fields such as industrial engineering or service design.
- Design theory studies, which focus on the development of theories about creating new or improved systems based on kernel or grand theories. The design theory concept was first articulated two decades ago [4, 5] and continues to be developed [6].
- Design Research, which focuses on the study of how designers actually conduct design activities, e.g., science of design research. Papers in this subfield could potentially come not only from information systems, but also from architecture and design studies.

All three subfields are often (but not always) tightly engaged with design practice. Accordingly, they frequently embody participative forms of research that rest on the advice and perspectives of multiple stakeholders in understanding a complex social problem.

While specific interest is placed upon DSR and design theorizing with respect to the three subfields described above, our minitrack welcomes submissions from the entire range of alternatives that deal with the question of integrating inquiry with the potential of creating and shaping alternative futures. Such work extends the boundaries of human and organizational capabilities by theorizing and/or creating new and innovative artifacts. The building and application of these designed artifacts produces knowledge and understanding

of a problem domain and its solutions, which is then potentially transferable to other domains. In design science, the engagement is primarily focused on the design and evaluation of an artifact; learning through building with the aim to generate theoretical insights. This is often an iterative research process and sometimes capitalizes on learning via both researcher and subject expertise within the context of the participants' social system. It can be a clinical method that puts information system researchers in an active supporting role for advanced practice. To this end we also seek implementable and grounded action frames for engaging in such generalizable inquiries.

Accordingly, the scope of this minitrack includes research contributions that arise from all three subfields of DSR described above. This includes engaged approaches, studies of the practical use of DSR approaches, the use of such approaches to expand theory, and conceptual foundations that significantly and cogently expand our understanding of the epistemology and methodology of such approaches and their philosophical underpinnings. These include:

- Developing design artifacts and design theories
- Evaluating and testing design artifacts and design theories
- Different approaches to the design of artifacts and design theorizing
- Design as a creative act in development for systems etc.
- Advancing theory and practice in designing for systems etc.
- Design experiences in organizational systems and technology etc.

This year we received eleven submissions, of which four were accepted to the minitrack (acceptance rate of ca. 36%). The papers included in this year's minitrack cover the topics of DSR project characteristics, empirical-based design theory building, ontology-based DSR for knowledge accumulation and evolution, and 3D

food printing for people with swallowing disorders. The articles are summarized in below:

“Exploring Design Science Research Project Characteristics - An Initial Empirical Investigation” by Michael Werner:

- This study provides data about DSR project characteristics. The results show that DSR projects are heterogeneous in terms of size, complexity, duration, budget and research outputs. They have in common that they focus on relevance, the design of artifacts, evaluation and the involvement of industry partners. A comparison with other studies reveals that research methods employed in DSR projects differ significantly from those mentioned in produced publications.

“Beyond Intuition: Towards a Framework for Empirical-Based Design Theory Building in Design Science Research” by Marius Mueller, Oliver Heger, Bastian Kordyaka, Henrik Kampling, and Bjoern Niehaves:

- While DSR researchers put effort into theorizing on IT design and its effects on users, design theory studies often lack empirical investigations on the identification of appropriate design features. We argue that the development of a theoretical model in connection with design features can further profit from empirical investigations by exploring the design realm of a specific context. We therefore propose a five-step approach suitable for inducing design features and theoretical constructs by engaging experienced stakeholders.

“Towards Ontology-Based Design Science Research for Knowledge Accumulation and Evolution” by Andy Nguyen, Lesley Gardner, and Don Sheridan:

- The potential of DSR to contribute to real-world problems solving and innovation has been considered as an opportunity for researchers to demonstrate the relevance and significance of DSR paradigm. While most DSR studies have been informed on single design and development projects, future research needs to consider knowledge sharing and accumulation across multiple projects. This paper argues for combining the forces of DSR and ontology studies to foster knowledge creation and evolution. We propose a new approach to DSR by adopting ontology engineering as a knowledge sharing mechanism.

“3D Food Printing for People With Swallowing Disorders (Dysphagia): A Call for User-Centred Co-Design Research” by Bronwyn Hemsley, Stuart Palmer, Abbas Kouzani, Scott Adams, and Susan Balandin:

- Our aim was to examine 3D food printing literature, its focus on problems and solutions, and its capacity for problem-solving in relation to the provision of texture-modified food for people with swallowing disorders (dysphagia). In total, 16 papers were included, and examined for: (a) problems, solutions, and potential for problem-solving capacity expressed in 3D food printing literature to date, and (b) applications of 3D printed foods in specific populations with swallowing disorders.

This year we welcome professor Matti Rossi from Aalto University as a new co-chair to the minitrack. Matti will bring his expertise in action design research [3], in addition to his wide knowledge of DSR in general, to the minitrack. We are also grateful to professor Roman Beck for his excellent service as a co-chair for the track for the past years. Thank you! Next year, we look forward to receiving your submissions. We especially welcome submissions from the areas of industrial engineering, operations management, service research pedagogy and others that apply DSR. You are warmly welcome!

References

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