2016

Design Science Research

METODA VÝZKUMU V IS/IT A JAK JI ZVLÁDNOUT

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Verze 8

Obsah

1/ Úvod 3
Sekce I..... 5
2/ DSR v IS/IT- organizace, komunity..... 5
3/ DSR v IS/IT- konference..... 5
4/ DSR v IS/IT- knihy 6
5/ DSR v IS/IT- publikace 7
Sekce II..... 22
6/ DSR v IS/IT- jak metodu zvládnout..... 22
Příloha M1 – DSR v IS/IT- vybrané články

Elektronická příloha obsahuje plné texty publikací uvedených v kapitole 5 ve formátu *.pdf

1/ Úvod

1.1. Úvod

Metoda DSR (Design Science Research) je uznávaným nástrojem pro výzkum v oblasti IS/IT (Information Systems/Information Technology). Jako taková je využívána i na KIT/VŠE (Katedra Informačních Technologií/ Vysoká Škola Ekonomická v Praze).

Cílem tohoto dokumentu je pomoci studentům doktorského studia KIT zvládnout tuto metodu. Za tímto účelem je dokument rozdělen do dvou částí (sekcí).

Sekce I obsahuje odkazy na vybrané informační zdroje (případně plné texty – viz příloha M1), vztahující se k problematice využití DSR pro výzkum v oblasti IS/IT. Odkazy jsou uvedeny ve struktuře dané "obsahem" (viz výše). Informační zdroje, zejména publikace, jsou vybrány z toho hlediska, aby jejich rozumným počtem bylo možno pokrýt uceleně danou problematiku. Mým původním záměrem bylo najít jen několik publikací pro moje doktorandy, které by jim umožnily snadno uchopit tento nástroj. Tento záměr se mi však, z hlediska rozsahu, poněkud vyknul z rukou ☺.

Zvládnutí metody DSR pro výzkum v oblasti IS/IT – k čemuž má tento dokument přispět - tedy seznámení se s ní do té míry, aby bylo možno s ní začít pracovat, lze provést v následujících krocích:

S1/ Celkové rámcové seznámení s DSR pro IS/IT

S2/ Seznámení s metodikou/procesem DSR pro IS/IT

S3/ Seznámení s artefakty metody DSR pro IS/IT

S4/ (detailnější) seznámení s kroky/fázemi metody DSR pro IS/IT

Struktura tohoto dokumentu a zejména pak výběr informačních zdrojů – zejména článků a knih – jsou voleny tak, aby toto zvládnutí svým obsahem podpořily.

Sekce II obsahuje základní doporučení postupu, jak problematiku zvládnout.

1.2. DSR – co to je?

DSR - definition

Jednotná široce akceptovaná definice DSR patrně neexistuje. Z možných definic uvádíme Iivariho definici:
„DSR is research with design as a method of investigation …. which can be summarized in three interrelated points:
1. DSR produces new innovative (meta-)artefacts as its constitutive and distinctive research outputs.
2. Constructive research on building new innovative (meta-)artefacts is the core research activity of DSR.

3. New innovative (meta-)artefacts follow the epistemology of utility rather than the epistemology of truth (likeness).“ (P 10)

Pozn.: meta-artefacts nebo artefacts závisí na zaměření DSR dle P 10

DSR process

Dle první metodologie DSR prezentované v P 17 „The DS process includes six steps: problem identification and motivation, definition of the objectives for a solution, design and development, demonstration, evaluation, and communication. „ (P 17)

„Ideally, design-oriented IS research follows an iterative process comprising four basic phases: analysis (problem identification in P 16), design, evaluation, diffusion“. (P 29).

Pozn.: počet a přesný obsah fází se u jednotlivých autorů liší.

DSR result types (artifacts)

„Design-oriented IS research aims at the development of artifacts, namely constructs (e.g., concepts, terminologies, and languages), models, methods, and instantiations (i.e., concrete solutions implemented as prototypes or production systems).“ (P 29)

Pozn.: v průběhu rozvoje DSR se též typy výsledků (artefaktů) rozšiřují, např. o teorii (jako výsledek výzkumu) – viz P11, P 23.

1.3. Proč se DSR zabývat?

Důvodů proč se DSR na KIT/FIS-VŠE zabývat lze najít několik. Za hlavní lze považovat následující:

a/ DSR je považován za základní přístup k výzkumu v oblasti IS, jak je zřejmé z P 29 a P 30. Toto stanovisko je podpořeno 111 profesory předních evropských univerzit.

b/ na FIS VŠE je DSR považován za převažující typ výzkumu, pro výzkum v oblasti aplikované informatiky v doktorském studiu

viz http://fis.vse.cz/wp-content/uploads/2014/05/artefakty-FIS-final.pdf

Sekce I

2/ DSR v IS/IT- organizace, komunity

O1/ Komunita DSR v IS/IT se soustředí kolem portálu www.desrist.org (design science research in information systems and technology).

„The purposes of this portal are:

- promoting design science research in the information system and technology community;
- promoting and document DESRIST conferences;
- providing information and resources for DESRIST education and research;
- facilitating community communication and collaboration.“

Několik detailů:

Je zde uveden mj. přehled DESRIST konferencí pořádaných každoročně od r. 2006.

Je zde dostupný článek P23/ Vaishnavi 2015 (umístěný dříve na AIS).

Portál je provozován Kennesaw State University, Georgia USA

O2/ The International Association of Societies of Design Research (www.iasdr.org), founded in 2005, is comprised of member societies of design research from around the world. The purpose of the IASDR is to promote research or study into or about the activity of design in all its many fields of application also by organisation of biennial International Congresses of Design Research.

O3/ The **Design Research Society (**www.designresearchsociety.org **)** is a multi-disciplinary learned society for the design research community worldwide. The DRS was founded in 1966 and facilitates an international design research network in around 40 countries as well as own conferences. **DRS** is a founder member of the IASDR **Journal Design Studies (impact factor 1,354)** is published by Elsevier Science in co-operation with the **Design Research Society**.

Pozn.: O2 a O3 pokrývají DSR v IS/IT pouze velmi okrajově. Jejich výstupy nebyly v rámci tohoto dokumentu zpracovávány.

3/ DSR v IS/IT- konference

Dvěmi mezinárodními konferencemi zaměřenými na DSR v IS/IT jsou:

C1/ každoroční konference DESRIST např. „Seventh International Conference on Design Science Research in Information Systems and Technology, DESRIST 2012.

Vybrané (doplněné a upravené) příspěvky (cca 14) z daného ročníku konference jsou knižně vydány nakladatelstvím Springer v řadě Lecture Notes in Computer Science. Tyto knižní publikace nejsou na VŠE dostupné.

C2/ evropská obdoba C1/ konference tj. European Design Science Symposium (EDSS)

Vybrané (doplněné a upravené) příspěvky (cca 14) z daného ročníku konference jsou knižně vydány nakladatelstvím Springer v řadě Communications in Computer and Information Science. Tyto knižní publikace nejsou na VŠE dostupné.

4/ DSR v IS/IT- knihy

V této kategorii lze, kromě knižních publikací uvedených v kapitole 3, uvést

B1/ Design Science Research Methods and Patterns: Innovating Information and Communication Technology, 2nd Edition (2015)

Vaishnavi B.K, Kuechler W.

ISBN-13: 9781498715256, ISBN-10: 1498715257

CRC Press, cena cca 71 USD

Kniha je jedinečná v tom, že uvádí kromě metodiky DSR pro IS/IT i pro jednotlivé fáze DSR řadu best-pratices vzorů i řadu praktických příkladů DSR projektů. Na VŠE není k dispozici. Viz

www.amazon.com, www.crc.com .

B2/ Design Science Methodology for Information Systems and Software Engineering (2014)

Wieringa, R.

ISBN 978-3-662-43838-1,

Springer-Verlag Berlin Heidelberg, cena cca 70 Euro

Kniha je zaměřením velmi blízká problematice KIT. Na VŠE není k dispozici. Viz

www.springer.com/in/book/9783662438381 , http://wwwhome.cs.utwente.nl/~roelw/ .

5/ DSR v IS/IT- publikace

Tato kapitola obsahuje odkazy na vybrané publikace, tj. články z odborných časopisů a příspěvky z konferencí, jejichž plné texty jsou (ve formátu *.pdf) uvedeny v příloze M1.

Formát popisu jednotlivých publikací v této kapitole je následující (na příkladu):

P1/ pořadí plného textu v příloze M1, Akhlaghpour – název souboru (nebo jeho jednoznačná část) v příloze M1 , název publikace, jména autorů, rok publikování, abstrakt (nebo jeho část), případně klíčová slova. Abstrakt je uveden proto, aby čtenář tohoto dokumentu mohl dle něj v zásadě zhodnotit, zda je příslušná publikace pro něho relevantní. Rok publikování je uveden proto, aby čtenář mohl dle něj rozhodnout, zda se jedná o starší publikaci, která typicky obsahuje základní kameny disciplíny, nebo o novější publikaci, která typicky obsahuje současný stav a je tedy rozšířením (daným vývojem) nad základními kameny.

Popis neobsahuje zdroj publikace (konference či časopis), který je však uveden v řadě souborů, ani příslušný web-link.

P1/ Akhlaghpour

The ongoing quest for the IT artifact: Looking back, moving forward (2013)

Saeed Akhlaghpour, Jing Wu, Liette Lapointe, Alain Pinsonneault

Abstract
More than 10 years ago, Orlikowski and Iacono (2001) examined the conceptualization of Information Technology (IT) in Information Systems Research (ISR) articles published in the 1990s. Their main conclusion was that the majority of these articles did not properly conceptualize the IT artifact. They recommended that IS researchers start to theorize about the IT artifact and employ rich conceptualizations of IT. The Orlikowski and Iacono paper provides a strong anchor point from which to analyze the evolution of the IS discipline. In order to obtain an up-to-date image of contemporary IS research, and to assess how the IS field has evolved since the 1990s, we carried out a similar analysis on amore recent and broader set of articles, that is, the full set (NĽ644) of papers published between 2006 and 2009 by six top North American (ISR, MISQ, JAIS) and European(JIT, ISJ, EJIS) journals. The statistics in our results reveal no drastic advance in terms of deeper engagement with the IT artifact; more than 39% of the articles in our set are virtually mute about the artifact, and less than 16% employ an ensemble view of IT. Moreover, we note differences among the North American and European journals. Implications of the findings for two perspectives central to the IS research legitimacy debate are discussed.
Keywords: IT artifact; technology conceptualization; evolution of the IS disciplines

P2/ Alturki validating

Validating The Design Science Research Roadmap: Through The Lens Of "The Idealised Model For Theory Development" (2012).

Alturki, Ahmad; G. Gable, Guy; Bandara, Wasana; and Gregor, Shirley,

Abstract
Design Science Research (DSR) has emerged as an important approach in Information Systems (IS) research. However, DSR is still in its genesis and has yet to achieve consensus on even the fundamentals, such as what methodology / approach to use for DSR. While there has been much effort to establish DSR methodologies, a complete, holistic and validated approach for the conduct of DSR to guide IS researcher (especially novice researchers) is yet to be established. Alturki et al. (2011) present a DSR 'Roadmap', making the claim that it is a complete and comprehensive guide for conducting DSR. This paper aims to further assess this Roadmap, by positioning it against the 'Idealized Model for Theory Development' (IM4TD) (Fischer & Gregor, 2011). The IM4TD highlights the role of discovery and justification and forms of reasoning to progress in theory development. Fischer and Gregor (2011) have applied IM4TD's hypothetico-deductive method to analyze DSR methodologies, which is adopted in this study to deductively validate the Alturki et al. (2011) Roadmap. The results suggest that the Roadmap adheres to the IM4TD, is reasonably complete, overcomes most shortcomings identified in other DSR methodologies and also highlights valuable refinements that should be considered within the IM4TD.
Key words: Design Science Research Methodology, Roadmap for Design Science Research, Idealized Model for Theory Development, Information Systems.

Pozn: tento příspěvek navazuje na P3/ ve smyslu abstraktu.

P3/ Alturki- DRS Roadmap

A Design Science Research Roadmap (2012)

Ahmad Alturki

Abstract
Design science research (DSR) has become an accepted approach for research in the Information Systems discipline. Although, DSR literature reflects healthy discussion, it reveals a lack of consensus on methodology for conducting DSR. Views and prescriptions on the methodology of DSR appear particularly disparate. Little effort has been made thus far to consolidate and synthesize a comprehensive DSR methodology. Thus, pragmatic guidance for novice DSR researchers is spotty and often conflicting. The need for detailed, more specific guidance, becomes stark in comparison with research methodology in different paradigms. This study is motivated by this lack and the perceived need for a structured DSR Roadmap to guide researchers across the DSR lifecycle. Therefore, this doctoral research is aiming to develop a detailed, integrated, and complete methodology (Roadmap) for conducting DSR. This goal is pursued through two main phases: (1) Roadmap construction and (2) Roadmap evaluation. In this research report, we demonstrate

how we addressed the first phase of his doctoral research by depicting DSR Roadmap construction process. Furthermore, in progress and planned DSR Roadmap validation are expressed.
Key words: Design Science Research Methodology, Roadmap for Design Science Research, Idealized Model for Theory Development, Information Systems.

Pozn.: na tento příspěvek navazuje příspěvek P2/ ve smyslu jeho abstraktu.

P4/ Amrollahi

From Artefact to Theory: Ten Years of Using Design Science in Information Systems Research (2014)

Alireza Amrollahi1, Amir Hossein Ghapanchi1 and Amir Talaei-Khoei2

Abstract (část).:

The current research aims to investigate the theoretical background, topics, context, output and research techniques in papers which used a DSR approach. This paper employs a systematic literature review approach to study 14 top ranking journals in the field of IS. After an in-depth study of 569 papers, our search resulted in a final set of 72 papers which used this approach. Based on comprehensive analysis of these papers, their main theoretical foundations are identified and compared according to different components in DSR (problem, artefact, evaluation, result). This study indicates that although a DSR approach has been used for a variety of topics, there is still opportunity for using it in many others. The results may be beneficial to show new researchers the benefits, current status and future opportunities to use the DSR approach. Moreover this paper can show practitioners how to benefit from the DSR approach in solving their problems.
Keywords: design science, research, systematic literature review, problem solving, IT artefact

P5/ Cleven

Design Alternatives for the Evaluation of Design Science Research Artifacts (2009)

Anne Cleven (University of St. Gallen), Philipp Gubler, Kai M. Hüner

Abstract
Within a consideration of cost effectiveness the evaluation of design science research artifacts is of major importance. In the past, a plenitude of approaches has been developed for this purpose– partly artifact-specific, partly artifact-neutral. Nonetheless, there is a lack of a comprehensive overview over existing methods as well as a systemization of those with regard to fundamental structuring criteria. The paper at hand surveys existing methods and introduces a framework that equally supports the designer and the user of artifact evaluation approaches. Subsequent to

the embedding of the framework into the design science research proces two exemplary application scenarios are described.
Keywords: design science research, evaluation, artifact, morphological analysis, Framework

P6/ Cole

Being Proactive: Where Action Research meets Design Research (2005)

Robert Cole, Sandeep Purao, Matti Rossi, Maung K. Sein

Abstract
IS research has been criticized for having little influence on practice. One approach to achieving more relevance is to conduct research using appropriate research methods that balance the interests of both researchers and practitioners. This paper examines the similarities between two methods that address this mandate by adopting a proactive stance to investigating information systems in organizations. These two approaches, action research and design research, both directly intervene in “real world” domains and effect changes in these domains. We investigate these similarities by examining exemplars of each type of research according to the criteria of the other. Our analysis reveals interesting parallels and similarities between the two suggesting that the two approaches have much to learn from each other. Based on our analysis, we propose ways to facilitate cross-fertilization between the two approaches that we believe will be useful for both and for IS research in general.
Keywords: Action research, Design research, Proactive research

P7/ Drechsler

Design Science as Design of Social Systems—Implications for Information Systems Research (2013)

Drechsler A.

Abstract

This paper summarizes the current literature on design science research (DSR) in the management field and shows how management DSR can further the DSR discourse in the information systems (IS) field through a novel perspective beyond a focus on the IT artifact and its application context. Based on a review of the management literature, the paper condenses current management DSR into a comprehensive approach. The paper illustrates the benefits of this approach for the IS field by applying it to two typical directions of IS research: traditional IT artifactcentric DSR and DSR for IS/IT management or IT project management organizations. In addition, the paper presents and discusses a novel approach to define IS DSR artifacts, more differentiated views of artifact relevance, and the impacts of artifact instantiations.

Keywords: Management Design Science, Organizational Design, Social Design, Socio-Technical Design, Artifact,

P8/ Gregor

POSITIONING AND PRESENTING DESIGN SCIENCE RESEARCH FOR MAXIMUM IMPACT (2013)

Gregor S., Hevner A.

Abstract
Design science research (DSR) has staked its rightful ground as an important and legitimate Information Systems (IS) research paradigm. We contend that DSR has yet to attain its full potential impact on the development and use of information systems due to gaps in the understanding and application of DSR concepts and methods. This essay aims to help researchers (1) appreciate the levels of artifact abstractions that may be DSR contributions, (2) identify appropriate ways of consuming and producing knowledge when they are preparing journal articles or other scholarly works, (3) understand and position the knowledge contributions of their research projects, and (4) structure a DSR article so that it emphasizes significant contributions to the knowledge base. Our focal contribution is the DSR knowledge contribution framework with two dimensions based on the existing state of knowledge in both the problem and solution domains for the research opportunity under study. In addition, we propose a DSR communication schema with similarities to more conventional publication patterns, but which substitutes the description of the DSR artifact in place of a traditional results section. We evaluate the DSR contribution framework and the DSR communication schema via examinations of DSR exemplar publications.
Keywords: Design science research (DSR), knowledge, design artifact, knowledge contribution framework, publication schema, information systems, computer science discipline, engineering discipline, DSR theory

P9/ Hevner

DESIGN SCIENCE IN INFORMATION SYSTEMS RESEARCH (2004)

Hever A. et al

Abstract
Two paradigms characterize much of the research in the Information Systems discipline: behavioral science and design science. The behavioral science paradigm seeks to develop and verify theories that explain or predict human or organizational behavior. The design-science paradigm seeks to extend the boundaries of human and organizational capabilities by creating new and innovative artifacts. Both paradigms are foundational to the IS discipline, positioned as it is at the confluence of people, organizations, and technology. Our objective is to describe the performance of design-science research in Information Systems via a concise conceptual framework and clear guidelines for understanding, executing, and evaluating the

research. In the design-science paradigm, knowledge and understanding of a problem domain and its solution are achieved in the building and application of the designed artifact. Three recent exemplars in the research literature are used to demonstrate the application of these guidelines. We conclude with an analysis of the challenges of performing high-quality design-science research in the context of the broader IS community.
Keywords: Information Systems research methodologies, design science, design artifact, business environment, technology infrastructure, search strategies, experimental methods, creativity.

P10/ Iivari

Distinguishing and contrasting two strategies for design science research (2015)

Iivari J.

Abstract
This paper distinguishes and contrasts two design science research strategies in information systems. In the first strategy, a researcher constructs or builds an IT meta-artefact as a general solution concept to address a class of problem. In the second strategy, a researcher attempts to solve a client's specific problem by building a concrete IT artefact in that specific context and distils from that experience prescriptive knowledge to be packaged into a general solution concept to address a class of problem. The two strategies are contrasted along 16 dimensions representing the context, outcomes, process and resource requirements.
Keywords: design science research; design research; design science research strategies

P 11/ Kuechler

A Framework for Theory Development in Design Science Research: Multiple Perspectives (2012)

Kuechler W., Vaishavi V.

Abstract
One point of convergence in the many recent discussions on design science research in information systems (DSRIS) has been the desirability of a directive design theory (ISDT) as one of the outputs from a DSRIS project. However, the literature on theory development in DSRIS is very sparse. In this paper, we develop a framework to support theory development in DSRIS and explore its potential from multiple perspectives. The framework positions ISDT in a hierarchy of theories in IS design that includes a type of theory for describing how and why the design functions: Design-relevant explanatory/predictive theory (DREPT). DREPT formally captures the translation of general theory constructs from outside IS to the design realm. We introduce the framework from a knowledge representation perspective and then provide typological and epistemological perspectives. We begin by motivating

the desirability of both directive-prescriptive theory (ISDT) and explanatory-predictive theory (DREPT) for IS design science research and practice. Since ISDT and DREPT are both, by definition, mid-range theories, we examine the notion of mid-range theory in other fields and then in the specific context of DSRIS. We position both types of theory in Gregor's (2006) taxonomy of IS theory in our typological view of the framework. We then discuss design theory semantics from an epistemological view of the framework, relating it to an idealized design science research cycle. To demonstrate the potential of the framework for DSRIS, we use it to derive ISDT and DREPT from two published examples of DSRIS.
Keywords: Design Science Research, Theory Development, Mid-Range Theory, Framework

P12/ March 2008

DESIGN SCIENCE IN THE INFORMATION SYSTEMS DISCIPLINE: AN INTRODUCTION TO THE SPECIAL ISSUE ON DESIGN SCIENCE RESEARCH (2008)

March S.T., Storey V.C.

MIS Quarterly Vol. 32 No. 4, December 2008
Special Issue on Design Science Research

P13/ March 1995

Design and natural science research on information technology (1995)

March S.T., Smith G.F.

Abstract (intro)
Research in IT must address the design tasks faced by practitioners…. This paper presents two-dimensional Framework for research in information technology…….

P14/ Nunamaker

The Last Research Mile: Achieving Both Rigor and Relevance in Information Systems Research (2015)

Jay F. Nunamaker Jr., Robert O. Briggs, Douglas C. Derrick & Gerhard Schwabe

Abstract
From our desk chairs it may be tempting to work up an idea, build a quick prototype, test it in a lab, and say, "Our work here is done; the rest is merely details." More scholarly knowledge awaits discovery, however, by researchers who shepherd an information systems (IS) solution through the last research mile, that is, through successful transition to the workplace. Going the last research mile means using scientific knowledge and methods to address important unsolved classes of problems for real people with real stakes in the outcomes. The last research mile proceeds in

three stages: proof-of-concept research to demonstrate the functional feasibility of a solution; proof-of-value research to investigate whether a solution can create value across a variety of conditions; and proof-of-use research to address complex issues of operational feasibility. The last research mile ends only when practitioners routinely use a solution in the field. We argue that going the last research mile negates the assumption that one must trade off rigor and relevance, showing it to be it a false dilemma. Systems researchers who take their solutions through the last research mile may ultimately have the greatest impact on science and society. We demonstrate the last research mile with cases from our own workand the work of others spanning more than forty years.
KEY WORDS AND PHRASES: design science, prototypes, research methodology, research rigor, systems research.

P15/ Offermann DSR

Strategies for Creating, Generalising and Transferring Design Science Knowledge – A Methodological Discussion and Case Analysis (2011)

Offermann, P., Blom, S., Bub, U

Abstract
Design Science Research has been well accepted as part of Information Systems Research. The discussion about the research process and the structure of design theories has been going on for some time. While research has been done on the relation between design theories and other types of theories, not much has been said about how design knowledge can be re-used. Other disciplines refer to such re-use as “generalisation” and “transfer”. We define a three-level separation of design abstraction (short-, mid-, and long-range) and show how knowledge re-use strategies operate between and within them, as well as how they relate to generalisation and transfer. Each strategy is supported by a case from an existing publication, showing that the types of design theories and the research strategies can be found in practice. We argue that these research strategies can provide guidelines to researchers and reviewers for planning, performing and evaluation Design Science Research.
Keywords: Design science research, knowledge creation, knowledge transfer, generalisation, research strategies.

P 16/ Offermann Outline

Outline of a Design Science Research Process (2009)

Offermann, P., Levina O., Schoenherr M., Bub, U

Abstract
Discussions about the body of knowledge of information systems, including the research domain, relevant perspectives and methods have been going on for a long time. Many researchers vote for a combination of research perspectives and their respective research methodologies; rigour and relevance as requirements in design science are generally accepted. What has been lacking is a formalisation of a detailed research process for design science thattakes into account all requirements.

We have developed such a research process, building on top of existing processes and findings from design research. The process combines qualitative and quantitative research and references well-known research methods. Publication possibilities and self-contained work packages are recommended. Case studies using the process are presented and discussed.

Keywords: Research process, design science, qualitative research, quantitative research.

P 17/ Peffers 2008

A Design Science Research Methodology for Information Systems Research (2008)

Peffers K., Tuunanen T., Rothenberger M., Chatterjee S.

Abstract
The paper motivates, presents, demonstrates in use, and evaluates a methodology for conducting design science (DS) research in information systems. DS is of importance in a discipline oriented to the creation of successful artifacts. Several IS researchers have pioneered DS research in IS, yet over the last 15 years little DS research has been done within the discipline. The lack of a methodology to serve as a commonly accepted framework for DS research and of a template for its presentation may have contributed to its slow adoption. The design science research methodology (DSRM) presented here incorporates principles, practices, and procedures required to carry out such research and meets three objectives: it is consistent with prior literature, it provides a nominal process model for doing DS research, and it provides a mental model for presenting and evaluating DS research in IS. The DS process includes six steps: problem identification and motivation, definition of the objectives for a solution, design and development, demonstration, evaluation, and communication. We demonstrate and evaluate the methodology by presenting four case studies in terms of the DSRM, including cases that present the design of a database to support health assessment methods, a software reuse measure, an Internet video telephony application, and an IS planning method. The designed methodology effectively satisfies the three objectives and has the potential to help aid the acceptance of DS research in the IS discipline.
Keywords: Design science, design science research, design theory,

P 18/ Peffers Artefacts

Design Science Research Evaluation (2012)

Peffers K., Tuunanen T., Rothenberger M., Vaezi R.

Abstract
The consensus view is that the rigorous evaluation of design science (DS) artifacts is essential. There are many types of DS artifacts and many forms of evaluation; what is missing is guidance for how to perform the evaluation, more specifically, what evaluation methods to use with specific DS research outputs. Here we find and review 148 DS research articles published in a selected set of information systems

(IS), computer science (CS) and engineering journals. We analyze the articles to develop taxonomies of DS artifact types and artifact evaluation methods; we apply these taxonomies to determine which evaluation methods are associated in the literature with particular artifacts. We show that there are several popular “artifact - evaluation method” combinations in the literature. The results inform DS researchers of usual and customary
combinations of research artifacts and evaluation methods, potentially providing them with rationale and justification for an evaluation method selection.
Keywords: Design Science, evaluation, artifacts

P19/ Pries- Heie

Strategies for Design Science Research Evaluation (2008)

Pries-Heje, J., Baskerville, R., Venable, J.

Abstract
Seminal works in the application of design science research (DSR) in IS emphasize the importance of evaluation. However, discussion of evaluation activities and methods is limited and typically assumes an ex post perspective, in which evaluation occurs after the construction of an IS artifact. Such perspectives can assume that the evaluation is an empirical process and its methods can be selected in the same way as empirical research methods. In this paper, we analyze a broader range of evaluation strategies, which includes ex ante (prior to artifact construction) evaluation. This broader view is developed as a strategic DSR evaluation framework, which expands evaluation choices for IS DSR researchers, and also adds emphasis to strategies for evaluating design processes in addition to design products, using well-known quality criteria as an important asset. 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. The framework proposed offers a strategic view of DSR evaluation that is useful in analyzing published studies, and also in surfacing the evaluation opportunities that present themselves to IS DSR researchers.
Keywords: Design Science Research, Research Methodology, Information Systems Evaluation, Research Criteria.

P 20/ Purao

Design Research in the Technology of Information systems: Truth or Dare (2002)

Purao S.

This essay develops the philosophical foundations for design research
in the Technology of Information systems.

P 21/ Sein

ACTION DESIGN RESEARCH (2011)

Sein M.K., Hendfrisson O., Purao S., Rossi M., Lindgren R.

Abstract
Design research (DR) positions information technology artifacts at the core of the Information Systems discipline. However, dominant DR thinking takes a technological view of the IT artifact, paying scant attention to its shaping by the organizational context. Consequently, existing DR methods focus on building the artifact and relegate evaluation to a subsequent and separate phase. They value technological rigor at the cost of organizational relevance, and fail to recognize that the artifact emerges from interaction with the organizational context even when its initial design is guided by the researchers' intent. We propose action design research (ADR) as a new DR method to address this problem. ADR reflects the premise that IT artifacts are ensembles shaped by the organizational context during development and use. The method conceptualizes the research process as containing the inseparable and inherently interwoven activities of building the IT artifact, intervening in the organization, and evaluating it concurrently. The essay describes the stages of ADR and associated principles that encapsulate its underlying beliefs and values. We illustrate ADR through a case of competence management at Volvo IT.
Keywords: Action design research, action research, design research, emergence, ensemble artifact,organizational intervention, research method

P 22/ Sonnenberg

Evaluation Patterns for Design Science Research Artefacts (2012)

Sonnenberg, C., vom Brocke, J.

Abstract
Artefact evaluation is regarded as being crucial for Design Science Research (DSR) in order to rigorously proof an artefact's relevance for practice. The availability of guidelines for structuring DSR processes notwithstanding, the current body of knowledge provides only rudimentary means for a design researcher to select and justify appropriate artefact evaluation strategies in a given situation. This paper proposes patterns that could be used to articulate andjustify artefact evaluation strategies within DSR projects. These patterns have been synthesised from priorDSR literature concerned with evaluation strategies.They distinguish both ex ante as well as ex post evaluations and reflect current DSR approaches and evaluation criteria.
Keywords: Design Science Research, Evaluation, Artefact, Patterns

P 23/ Vaishnavi

Design Science Research in Information systems (2015)

Vaishnavi V., Kuechler B.

Základní text k problematice na stránkách www.desrist.org

P 24/ Venable

A Comprehensive Framework for Evaluation in Design Science Research (2012)

Venable, J., Pries-Heje, J., Baskerville, R.

Abstract
Evaluation is a central and essential activity in conducting rigorous Design Science Research (DSR), yet there is surprisingly little guidance about designing the DSR evaluation activity beyond suggesting possible methods that could be used for evaluation. This paper extends the notable exception of the existing framework of Pries-Heje et al [11] to address this problem. The paper proposes an extended DSR evaluation framework together with a DSR evaluation design method that can guide DSR researchers in choosing an appropriate strategy for evaluation of the design artifacts and design theories that form the output from DSR. The extended DSR evaluation framework asks the DSR researcher to consider (as input to the choice of the DSR evaluation strategy) contextual factors of goals, conditions, and constraints on the DSR evaluation, e.g. the type and level of desired rigor, the type of artifact, the need to support formative development of the designed artifacts, the properties of the artifact to be evaluated, and the constraints on resources available, such as time, labor, facilities, expertise, and access to research subjects. The framework and method support matching these in the first instance to one or more DSR evaluation strategies, including the choice of ex ante (prior to artifact construction) versus ex post evaluation (after artifact construction) and naturalistic (e.g., field setting) versus artificial evaluation (e.g., laboratory setting). Based on the recommended evaluation strategy(ies), guidance is provided concerning what methodologies might be appropriate within the chosen strategy(ies).
Keywords: Design Science Research, Research Methodology, Information Systems Evaluation, Evaluation Method, Evaluation Strategy

P 25/ Weber

Comparing Key Characteristics Of Design Science Research As An Approach And Paradigm (2012)

Weber S.

Abstract
The development of scientifically grounded IT artefacts significantly increased in the last decades. As a consequence, design science research emerged in the scientific field as a new research direction to explore the development of such IT artefacts. Thereby, design science research ensures to solve a realworld problem and to develop a theoretical contribution. The current literature differs by sorting design science research into specific research paradigms. As a consequence, some literature equalizes design science research with a new and innovative paradigm (developmentalist paradigm). However, in this paper we conduct a systematic comparison of the most salient characteristics of design science research and especially how they differ related to design science research as an approach or as a paradigm. Thereby, we stimulate a scholarly debate what the differences as well as possible similarities between both perceptions are.

Keywords: Design Science Research, Research Paradigm, Research Approach.

P 26/ Wieringa

Design Science Methodology: Principles and Practice (2010)

Wieringa R.

Abstract není.

P 27/ Winter

Design science research in Europe (2008)

Guest editorial
European Journal of Information Systems (2008) 17,
special issue on design science research

P28/ X01_Hevner 2007

A Three Cycle View of Design Science Research (2007)

Hevner A.

Abstract
As a commentary to Juhani Iivari's insightful essay, I briefly analyze design science research as an embodiment of three closely related cycles of activities. The Relevance Cycle inputs requirements from the contextual environment into the research and introduces the research artifacts into environmental field testing. The Rigor Cycle provides grounding theories and methods along with domain experience and expertise from the foundations knowledge base into the research and adds the new knowledge generated by the research to the growing knowledge base. The central Design Cycle supports a tighter loop of research activity for the construction and evaluation of design artifacts and processes. The recognition of these three cycles in a research project clearly positions and differentiates design science from other research paradigms. The commentary concludes with a claim to the pragmatic nature of design science.
Keywords: design science, relevance cycle, rigor cycle, design cycle.

P 29/ X02_MemorandumE

Memorandum on design-oriented information systems research (2011)

Oesterle H. et al.

Abstract

Information Systems Research (“Wirtschaftsinformatik”) basically follows two research approaches: the behavioristic approach and the design-oriented approach. In this memorandum, 10 authors propose principles of design-oriented information systems research. Moreover, the memorandum is supported by 111 full professors from the German-speaking scientific community, who with their signature advocate the principles specified therein.

Tento dokument je velmi zajímavý i z širšího hlediska.

P 30/ X03_MemorandumG

Memorandum zur gestaltungsorientierten Wirtschaftsinformatik (2011)

Oesterle H. et al.

Německá verze dokumentu P 29. Navíc obsahuje jména všech profesorů, kteří memorandum podepsali.

Pozn.: desítky dalších odkazů na informační zdroje lze nalézt mj. ve výše uvedených publikacích. Dále např. na www.deris.org, ve dvou zvláštních číslech časopisů (viz P27/ a P12/) nebo ve sbornících ze specialitzovaných konferencí DSR v IS/IT (viz kapitola 3) případně i v dalších časopisech a sbornících z konferencí.

Pro rychlou orientaci v obsahu vybraných publikací uvádíme přehledovou tabulku níže. I když u řady publikací, vzhledem k jejich širšímu záběru, není snadné jednoduše určit jejich hlavní orientaci. Ve vztahu ke krokům zvládnutí metodiky DRS pro IS/IT (viz Úvod) jsou v tabulce použita následující označení obsahu publikací:

S1 – C (celkový pohled)

S2 – M(metodika DSR), P (proces DSR), FW DSR, roadmap DSR

S3 – A – artefakty

S4 – E – evaluation (hodnocení) artefaktů. Jednotlivé kroky DSR jsou popsány zpravidla v publikacích ad S2. Zvláštní pozornost je věnována hodnocení, pro něž je řada specializovaných publikací. Hodnocení je zpravidla svázáno s artefakty, takže v konečném doporučení (viz Sekce II) uvedeme doporučenou publikaci pro „A+E“, která pokrývá kroky S3 a S4.

Pozn.: Publikace, které nejsou v tabulce označeny výše uvedenými označeními, slouží pro ujasnění některých specifických otázek souvisejících s DSR v IS/IT.

Číslo dokum.	Rok vydání	Obsah publikace
P1	2013	A – journals analysis
P2	2012	M/P
P3	2012	M/P
P4	2014	A - journals analysis
P5	2009	E
P6	2005	Design Research vers. Action Research analysis
P7	2013	P,A – socio-technical systems
P8	2013	A (design knowledge, design theory)
P9	2004	FW- IS research, E
P10	2015	A (meta vers. concerete A)
P11	2012	A (theory development)
P12	2008	Editorial
P13	1995	FW for IS/IT research, A
P14	2015	P extension by „last research mile“ activities
P15	2011	A (DS knowledge)
P16	2009	P
P17	2008	M, P
P18	2012	A, E – journals analysis
P19	2008	A, E
P20	2002	DR in TIS – philosophical foundations, A
P21	2011	A, ADR (Action Design Research)
P22	2012	A, E
P23	2015	C
P24	2012	A,E – FW for evaluation selection
P25	2012	DSR as approach vsers. DSR as paradigm
P26	2010	M
P27	2008	Editorial EJIS
P28	2007	M
P29	2011	MemorandumE, C
P30	2011	MemorandumG, C

Sekce II

6/ DSR v IS/IT- jak metodu zvládnout

Jednotlivé kroky S1 až S4 zvládnutí metody DSR pro IS/IT, uvedené výše, lze s uvažováním současné dostupnosti informačních zdrojů zajistit v základní míře níže uvedenými publikacemi. Tj. doporučuji těmito publikacemi studium začít a v dalším postupu dle potřeby navázat dalšími publikacemi dané skupiny.

S1 – P23, P29

S2 – P16, pak např. P3, P17, P26, P9,P28

S3 + S4 – P24, P22, P18, P13

Byl bych rád, pokud by vám, doktorandům na KIT – případně i na jiných katedrách - tento dokument pomohl ve vaší práci.

At se vám daří ☺ !

JJ, 9.2.2016 (verze 7) , 16.4.2016 (verze 8)

Verze 8 – proti verzi 7 jsou přidány subkapitoly 1.2 a 1.3 a doplněny P 28, P 29, P30.