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A Knowledge Development Perspective on Literature Reviews: Validation of a new Typology in the IS Field

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Abstract:

Literature reviews (LRs) play an important role in developing domain knowledge in all fields. Yet, we observe insufficient insights into the activities with which LRs actually develop knowledge. To address this important gap, we 1) derive knowledge-building activities from the extant literature on LRs, 2) suggest a knowledge-based LR typology that complements existing typologies, and 3) apply the typology in an empirical study that explores how LRs with different goals and methodologies have contributed to knowledge development. In analyzing 240 LRs published in 40 renowned information systems (IS) journals between 2000 and 2014, we draw a detailed picture of knowledge development that one of the most important genres in the IS field has achieved. With this work, we help to unify extant LR conceptualizations by clarifying and illustrating how they apply different methodologies in a range of knowledge-building activities to achieve their goals with respect to theory.

Keywords: Literature Review, Knowledge Development, Knowledge-building Activities, Knowledge-based Typology, Information Systems Research.

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1 Introduction

The standalone literature review (LR) is an established research genre in many academic fields. As Garfield (1987, p. 113) notes, "[i]t is not an accident that so many of our greatest scientists have used, created, and contributed to the review literature". Researchers usually draw on this paper genre when they start an empirical study (Rowe, 2014) as "[a] researcher cannot perform significant research without first understanding the literature in the field" (Boote & Beile, 2005, p. 3). We can see the need for knowledge development through LRs both in and outside the IS field. Indeed, the editorial boards of many IS journals explicitly welcome LRs as a research genre in their editorial statements. Beyond the theory and review genre that *MIS Quarterly* publishes, LRs have received attention in editorials, special issues, and debates in (among others) the *Data Base for Advances in Information Systems* (Chin & Leidner, 2002), the *European Journal of Information Systems* (Rowe, 2012, 2014), the *Journal of Information Technology* (Boell & Cecez-Kecmanovic, 2015a, 2015b), and the *Journal of the Association for Information Systems* (Leidner 2018). IS authors have responded to the call for LRs by publishing a plethora of review papers, some of which have achieved a remarkable impact (Wagner, Prester, Roche, Benlian, & Schryen, 2016).

Typologies that classify LRs along their research goals and methods that researchers apply to achieve those goals have captured the genre's diversity. Rowe (2014) distinguishes four goals (describing, explaining, understanding, and theory testing) and methodologies in order to set the scope, assess quality, describe sources, and provide an argumentative strategy. In line with these goals, Paré, Trudel, Jaana, and Kitsiou (2015) distinguish nine LR types that summarize prior knowledge, aggregate or integrate data, build explanations, or assess extant literature critically. One can also classify LRs according to methodological characteristics, such as the scope of questions and nature of primary sources, search strategy, explicit study selection, quality appraisal, and data-synthesis methods. In summary, these typologies valuably conceptualize which methodology combinations occur in LRs to achieve different goals.

In our work, we adopt a complementary perspective by focusing on how the methodologies that LRs apply (methodology level) contribute to developing (domain, disciplinary, or methodological) knowledge (knowledge level), which enables LRs to achieve their goals. Thereby, we add a new perspective to the perspectives in prior research (see Figure 1 in Section 2.2). The literature on LRs widely highlights their importance to developing knowledge. For example, Blaxter, Hughes, and Tight (2006) argue that a LR should provide "a critical summary and assessment of…knowledge and understanding in a given field" (p. 123), while Webster and Watson (2002) require a LR to create "a firm foundation for advancing knowledge" (p. xiii) and "to make sense of the accumulated knowledge on a topic" (p. xviii). Furthermore, Paré et al. (2015) stress that "conducting effective literature reviews is essential to advance the knowledge" (p. 183) and that LRs enable "knowledge accumulation" (p. 184) and "contribute to the development of vast knowledge and theories" (p. 193). Rowe (2014) argues that a LR "synthesizes past knowledge…, identifies important biases and knowledge gaps in the literature" (p. 243), and provides "concepts to integrate the knowledge" (p. 244). While these authors emphasize that LRs can develop knowledge with a large diversity of activities, no study in the literature has systematically analyzed *how* LRs develop knowledge in order to achieve their research goals. We condense this research gap in the following research question (RQ):

> **RQ**: Which types of knowledge-building activities do literature reviews provide to achieve their research goals?

Answering this question has benefits in many regards. First, it adds a new, knowledge-based perspective on LRs that systematically accounts for the various ways and intensities with which LRs develop knowledge. This perspective complements the methodological and goal perspectives that the extant literature has adopted. Second, it provides the conceptual foundation for empirically analyzing how LRs contribute to knowledge development. Third, by using (sets of) knowledge contributions, we develop a knowledge-based typology that classifies LRs according to the activities they use to develop knowledge. By drawing on this typology in addition to the ones in the literature, scholars can jointly use complementary typologies to plan and situate their contributions and journal editors can use them to clarify their expectations.

This paper proceeds as follows. In Section 2, we frame LRs as our unit of analysis and derive knowledge-building activities from prior literature. Based on these knowledge-building activities, we develop a knowledge-based typology of LRs in Section 3. In Section 4, we present our empirical study in the IS field. In Section 5, we discuss our key findings and their implications. Finally, in Section 6, we conclude the paper.

2 Knowledge Development through Literature Reviews

In this section, we present how previous studies have classified LRs, analyze how different LR types develop knowledge, and identify six distinct knowledge contributions that LRs have made. We also propose a conceptual framework that aligns our knowledge-based perspective on LRs with the methodological and goal perspectives.

2.1 Types of Literature Reviews and Knowledge Development

To structure the LR landscape, IS scholars have identified numerous dimensions based on which they have developed several LR classifications. For example, these classifications distinguish narrative, developmental, cumulative, and aggregative reviews (Templier & Paré, 2015) or different foci on knowledge development (Schryen, Wagner, & Benlian, 2015). For our purposes, we refer to Paré et al.'s (2015) typology, which comprises nine LR types that we can categorize according to the overarching research goals (i.e., describing, understanding, explaining, theory testing) that Rowe (2014) proposed (see Templier & Paré 2018). Building on Gregor's (2006) theory types, Rowe (2014) distinguishes LRs according to their goals: 1) reviews for "map[ping] the territory" "with little or no contribution to theory" (p. 243, 244); () reviews for understanding that tend to focus "more on interpretation than on deductive logic", "adopt generally a broader perspective", and "aim at understanding the phenomenon as a whole, its overall meaning and its relationships from the parts to the whole and reciprocally, as in the hermeneutic circle" (p. 243); 3) reviews for explaining that focus on "why, how and when things happen in a phenomenon, and thus focus on causal relationships with certain outcomes" (p. 243); and 4) reviews for theory testing exclusively adopt "a quantitative approach to empirical papers" and that use such papers as an "input of a model that takes all this previous knowledge into account to statistically test and examine what remains robust overall" (p. 246).

We analyzed the methodological literature on all nine LR types (see review types column in Table 1) and identified six fundamental knowledge-building activities. Table 1 describes this disaggregation into backward- and forward-oriented building activities, which, to our best knowledge, the previous literature has not yet conceptualized. Generally, we conceive knowledge-building activities that focus on "what we already know" (Schryen, 2013) as backward-oriented. Such knowledge-building activities can summarize state-of-the-art knowledge, critically analyze extant knowledge contributions' strengths and weaknesses, and analyze published empirical work in aggregate. In contrast, forward-oriented knowledge-building activities focus on "what we still need to know, and how we can get there" (Schryen, 2013), which includes new theoretical conjectural knowledge that requires empirical testing, general recommendations for unexplored research territory, and more specific charts for future research.

Table 1. Deriving Knowledge-building Activities in Literature Reviews from Methodological Papers

Goals*	Review types **	Knowledge-building activity ***	
		Backward oriented	Forward oriented
Describing	**Narrative review:** Levy & Ellis (2006), Hart (2009)	• Narratively summarizing prior findings on a topic (SYN)	• Identifying research gaps (RG) • Developing an agenda for research and practice (RA)
	Descriptive review: King & He (2005)	• Quantitatively and narratively summarizing what we know about a topic (SYN) • Identify trends over time (SYN)	• Developing recommendations to influence the development of a topic, domain, or method (RA)
	Scoping review: Arksey & O'Malley (2005), Levac, Colquhoun, & O'Brien (2010)	• Narratively summarizing the size and nature of extant literature (SYN)	• Identifying research gaps (RG) • Developing a research agenda with potential implications for research and practice (RA)
Understanding	**Critical review**: Rowe (2014), Alvesson & Sandberg (2011)	• Summarizing past knowledge on a domain of interest (SYN) • Critically describing extant literature to reveal weaknesses or inconsistencies (CRI)	• Providing a focus or a new direction to studies (RA)
Explaining	**Theoretical review**: Rivard (2014), Rowe (2014), Torraco (2005), Walker & Avant (2011), Webster & Watson (2002)	• Synthesizing prior literature (SYN)	• Theory derivation: developing a theory from the explanations in another field (TB) • Theory synthesis: developing a theory from pulling together prior evidence about a phenomenon (TB) • Theory analysis: examining a theory and identify the need for additional refinement (TB) • Developing a research agenda (RA)
	Realist review: Pawson, Greenhalgh, Harvey, & Walshe (2005)	• Synthesizing evidence and dissemination of findings (SYN)	• Develop a theory to explain what about an intervention works, for whom, in what circumstances, and why (TB)
Theory testing	**Meta-analysis**: King & He (2005), Rosenthal & DiMatteo (2001), Card (2011)	• Integrating knowledge gained in empirical studies (SYN) • Statistically aggregate empirical findings (AE)	• Exploring moderators to provide forward-looking ideas for future research (RA)
	Qualitative systematic review: Gough, Thomas, & Oliver (2012), Petticrew & Roberts (2008)	• Synthesizing evidence (SYN) • Narratively aggregating possibly heterogeneous empirical findings (AE)	• Developing implications for policy, practice, and further research (RG)
	Umbrella Review: Thomson, Russell, Becker, Klassen, & Hartling (2010)	• Synthesizing the findings from prior reviews (SYN) • Narratively and/or statistically aggregating prior review findings (AE)	• identifying areas where more research is needed (RG)

* Goals based on Rowe (2014). ** Based on Paré et al. (2015) who distinguish and illustrate the review types based on nine dimensions. *** SYN: Synthesizing, AE: Aggregating evidence, CRI: Criticizing, TB: Theory building, RG: Identifying research gaps, RA: Developing a research agenda.

In this section, we describe each knowledge-building activity[1] and provide examples.

Synthesizing (SYN) the extant research refers to summarizing and organizing published knowledge, establishing an order in prior research, and making transparent how research contributions relate to each other. A backward-oriented knowledge-development type, synthesizing provides a foundation for every LR. It either occurs as the main knowledge-building activity (e.g., in narrative reviews) or it complements other knowledge-building activities (e.g., in theory development reviews). This observation concurs with the extant literature (e.g., Blumberg, Cooper, & Schindler, 2005; Hart, 2009; Webster & Watson, 2002), which commonly refers to synthesizing as a mandatory knowledge-building activity. Synthesizing the body of domain knowledge can occur in different forms and it can involve different degrees of interpretation (Blumberg et al., 2005; Boell & Cecez-Kecmanovic, 2014). A synthesis might begin by clarifying fundamental aspects, such as definitions (Webster & Watson, 2002), variables relevant to the domain (Hart, 2009), relationships between concepts (Okoli, 2015a), and subject vocabulary in general (Hart, 2009). In addition, LRs uncover central issues (Cooper & Hedges, 2009; Cooper, 1998; Garfield, 1987) and research streams (Okoli, 2015b). Synthesizing should follow a systematic approach and provide transparency with regard to the state and progress of domain knowledge (e.g., Paré, Tate, Johnstone, & Kitsiou, 2016; vom Brocke et al., 2015). Schultze and Leidner (2002) provide an example of this knowledge-building activity in analyzing the discourse and the underlying theoretical assumptions in the knowledge-development domain.

Aggregating evidence (AE) takes (established) theoretical models as a frame, gathers empirical studies, extracts the evidence, and performs statistical aggregation (e.g., meta-analysis or vote counting) to evaluate the degree to which the evidence supports existing theoretical models. This knowledge-building activity focuses on aggregating effect sizes in relatively homogeneous models and might include qualifications in the form of moderator analyses. Therefore, it represents a backward-oriented and applicable way to build knowledge when enough empirical research has accumulated. Meta-analyses constitute the most common review type that aggregates empirical evidence; they require authors to gather existing studies, appraise the evidence's quality, determine aggregated effect sizes, and test their significance. Meta-analyses also provide an opportunity to evaluate hypotheses that researchers did not build into existing primary studies and, thereby, inform theory building, such as by testing mediated models (Hwang, 1996). Though not as prominent as in other fields (Cohn & Becker, 2003; Green & Hall, 1984; Petticrew & Roberts, 2008), researchers have also suggested aggregating empirical evidence as a LR knowledge-building activity in IS. King and He (2006) provide an example of this knowledge-building activity in conducting a meta-analysis on the technology acceptance model.

Criticizing (CRI) shows that knowledge related to a problem in some ways prevents a domain from progressing. It can occur in different forms by problematizing assumptions (Alvesson & Sandberg, 2011; Boell & Cecez-Kecmanovic, 2014) or by identifying methodological (including tools and techniques), logical, or conceptual problems (Cooper & Hedges, 2009; Cooper, 1998; Rowe, 2014). By criticizing prior work, LR authors refer to "doing things correctly". We need to distinguish this critique from arguments that point to the issue of "doing the correct things", which has gap-spotting as its essence and which we discuss below as a separate knowledge-building activity (i.e., identifying research gaps). Criticizing is not a hypothesis test with a negative outcome. It means that researchers need to conduct research differently before they can aggregate and test results. In contrast to work that cumulatively extends existing knowledge, criticism suggests a revolutionary path that will not likely reconcile with existing knowledge. Lacity, Khan, Yan, and Willcocks (2010) provide a criticizing example in reviewing the effects that different variables have on IT outsourcing decisions and challenge the common assumption that outsourcing decisions depend on client size or the size of the IT department.

Theory building (TB), a major knowledge-building activity, appears in several LR types, particularly those that focus on explaining. This activity develops knowledge from a forward-oriented perspective by providing provisional, possibly conjectural knowledge in the form of new hypotheses and theoretical models that subsequent research needs to test. Specifically, theory building encompasses developing new theories (e.g., realist review), and refining or synthesizing theories (e.g., theory development review). The methodological literature has also prominently emphasized theory building (e.g., Petticrew & Roberts 2008, Webster & Watson 2001). Soh and Markus (1995) provide an example of this knowledge-building

[1] Some building activities might be considered as overlapping (such as syntheses and aggregating evidence), especially when they are interwoven in the same sections or paragraphs. However, we conceptualize them as separate activities since their essence in the context of knowledge development is distinct.

activity in reviewing models on IT business value, analyzing them with regard to process and variance theory characteristics, and suggesting a new process theory by integrating the existing models.

Identifying research gaps (RG) refers to describing a mismatch between knowledge that extant research provides and knowledge that one requires or expects. A forward-oriented way to develop knowledge, this knowledge-building activity should stimulate other authors by substantiating a need for research and motivating researchers to close the gaps (e.g., Schwarz, Mehta, Johnson, & Chin 2007; Webster & Watson, 2002). Although any LR can identify research gaps, methodologists emphasize that this knowledge-building activity appears most eminently in narrative reviews and scoping reviews. Identifying research gaps corresponds to the process of spotting gaps in the existing body of knowledge (Alvesson & Sandberg, 2011; Sandberg & Alvesson, 2011). Dahlberg, Mallat, Ondrus, and Zmijewska (2008) provide an example of this knowledge-building activity in reviewing the literature on mobile payments and identifying underexplored factors. By defining corresponding research questions that refer to the effects that certain environmental factors have on whether mobile payments succeed, the authors encourage researchers to incrementally extend existing knowledge.

Beyond identifying research gaps, LRs can also contribute to knowledge development by **developing a research agenda (RA)**, which refers to elaborating on how researchers should conduct future research to achieve meaningful progress and possibly suggesting specific research designs, empirical settings, or offering strategic recommendations. This forward-oriented knowledge-building activity requires researchers to identify research gaps or a critique prior research. Several scholars have advocated for research agendas as a strong knowledge-building activity (e.g., Rowe 2014; Webster & Watson, 2002). Researchers have suggested scoping reviews and theory-development reviews as review types that should provide detailed directions for further research. To provide a research agenda, authors need to go beyond compiling research gaps and sketch out a landscape for subsequent research (Rowe, 2014). Editorial commentaries commonly suggest that a research agenda requires authors to propose a vision that focuses on a promising research goal (Rivard, 2014; Webster & Watson, 2002) and a corresponding forward-thinking chart for further research (Webster & Watson, 2002). Among the various ways authors can close research gaps, an agenda should make specific and actionable recommendations that can even take the form of a detailed deployment plan (Rowe, 2014), which could include specific research propositions, suggestions on research designs, and empirical methods. Smith, Dinev, and Xu (2011) provide an example of this knowledge-building activity in distinguishing different levels at which to analyze information privacy. As Smith et al. found few studies that analyzed information privacy at the group level, they identified a substantial research gap. By providing further insights into the difficulties of corresponding research by discussing different research settings and by suggesting adequate research designs, they transform this gap into an actionable research agenda, which allows others to tackle more transparent research gaps and, thereby, to extend information privacy research to the group level.

2.2 Conceptual Framework

Having substantiated our knowledge-based perspective on LRs by deriving knowledge-building activities from the literature, we now present our conceptual framework. Figure 1 visualizes the six knowledge-building activities and aligns our knowledge-based perspective on LRs with the methodological and goal perspectives. It shows that one can perceive knowledge-development activities as an “intermediate layer” that explains how LRs achieve goals by applying different methodologies. Therefore, the knowledge-building activities build on established methodologies. For example, one may implement the concept-centric approach that Webster and Watson (2002) suggest to synthesize prior knowledge or implement the meta-analysis methodology to test a theory. Our research framework shows that positioning an additional knowledge level between the methodology level and the goal level complements and concurs with the notion in the literature that a LR’s goals and methodologies relate to one another (Paré et al., 2015; Rowe, 2014).

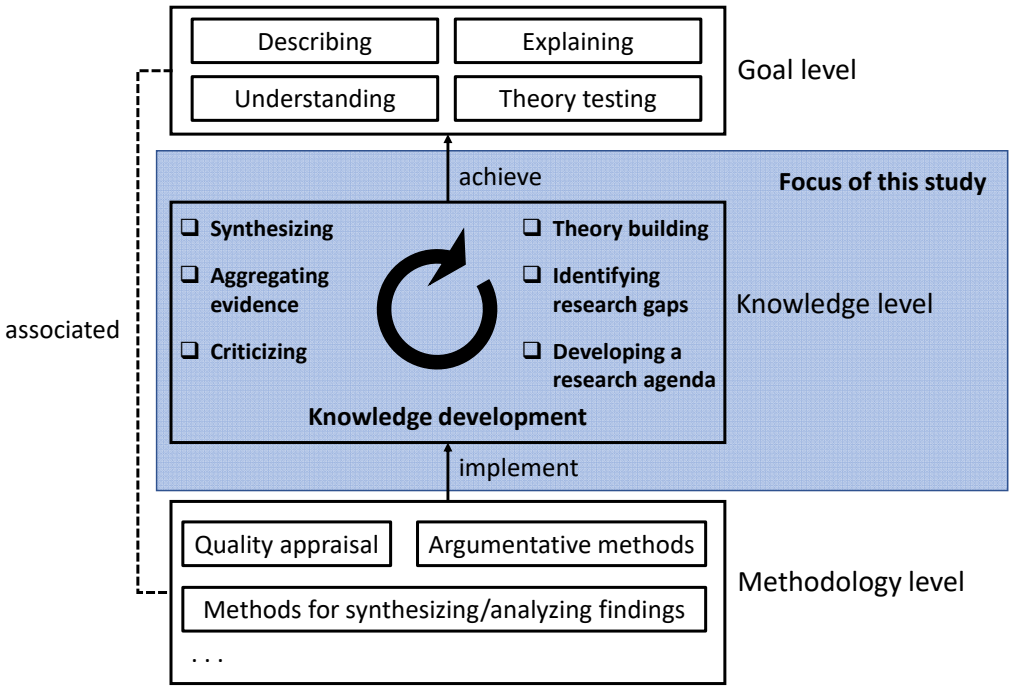


Figure 1. Conceptual Framework

3 Knowledge-based Typology of Literature Reviews

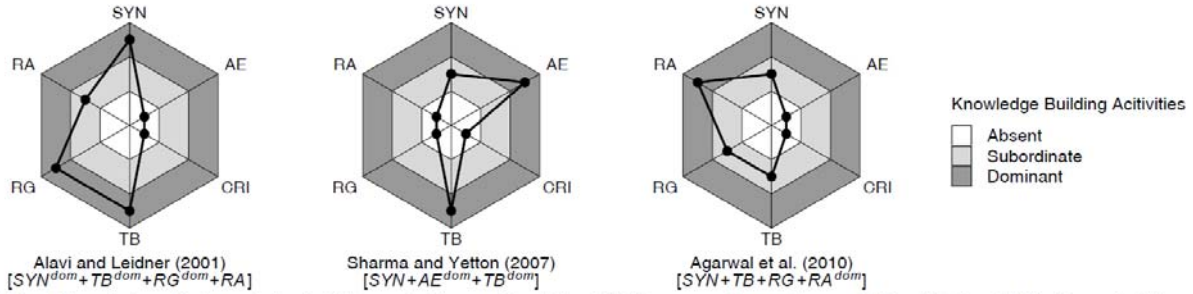
LRs' knowledge-building activities not only allow one to specify different ways in which a review papers can develop knowledge but also serve as a basis for a knowledge-based LR typology[2] when one perceives review papers as a set of knowledge-building activities that jointly contribute to developing knowledge. For example, Bose and Luo (2011) go beyond purely synthesizing (SYN) the literature (on green IT initiatives via virtualization) by developing an integrative theoretical framework (TB), identifying corresponding research gaps (RG), and articulating a future research agenda (RA). As such, we can classify this LR as a "SYN+TB+RG+RA" review.

Schryen's (2013) review bears the same knowledge-building activities but, in contrast to Bose and Luo's (2011) review, emphasizes these blocks differently. Indeed, while Bose and Luo (2011) focus on building their theoretical model and substantiating it with specific propositions (TB), Schryen (2013) focuses on identifying research gaps and suggesting a research agenda. To account for this subtle yet important difference, we further qualify each knowledge-building activity in a LR as either dominant or subordinate compared to its other knowledge-building activities. Qualifying a knowledge-building activity as dominant requires a LR to have a strong focus on this knowledge-building activity by explicitly positioning it as a core contribution, highlighting its importance in the abstract, and dedicating one or more substantial sections to it. In contrast, when a LR provides a knowledge-building activity but does not represent an essential activity to achieve its goals, we refer to this knowledge-building activity as a subordinate one. We provide illustrative examples of dominant and subordinate knowledge-building activities in Appendix C. Adding the superscript "dom" to the dominant knowledge-building activities, we classify Bose and Luo's (2011) LR as "SYN + TB^{dom} + RG + RA" and Schryen's (2013) LR as "SYN + TB + RG^{dom} + RA^{dom}".

We define our LR knowledge typology as six knowledge-building activities (SYN, AE, CRI, TB, RG, RA) with each of these activities being qualified as absent, subordinate, or dominant and with the condition that all LRS must include synthesis in at least a subordinate role. Figure 2 illustrates how one can classify LRs with different knowledge-building activity combinations as distinct types using the suggested typology.

[2] We follow Bailey (1994) who distinguishes taxonomies as classification systems that one derives empirically from typologies as classification systems that one derives conceptually.

Consistent with how we analyze archetypal knowledge-building activities (see Table 1), the typology uses SYN as a natural and mandatory first activity and arranges further backward-oriented activities in a clockwise order followed by the forward-oriented activities. Emphasizing the importance of the six knowledge-building activities, we define review types according to combinations of their knowledge-building activities rather than introducing new labels. Thus, the typology, which provides a general classification scheme[3] for describing existing and novel LR types, raises the question: how frequently do different types of LRs appear in the IS field and how do they use the six knowledge-building activities? Accordingly, we conducted an empirical study to identify the most prevalent, archetypal review types in our field.



Note: Abbreviations for knowledge building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).

Figure 2. Illustrations Based on the Knowledge-based LR Typology

4 Empirical Validation

Building on the typology we propose above, we conducted a study in the IS literature to: a) analyze which types of knowledge-building activities characterize IS review papers, 2) identify the LR types that appear prevalently in the IS field, and 3) jointly apply Paré et al.'s (2015) goal-based typologies and our typology to demonstrate the added value when one applies a knowledge-based perspective.

4.1 Methodology

To identify review papers, we considered the 40 IS journals that Lowry et al. (2013) identify. While we acknowledge that other high-quality IS journal lists exist, Lowry et al.'s list reflects both IS scholars' preferences and scientometric measures (see Appendix A for a more detailed discussion and the complete journal list).

To identify LR candidates that appeared between 2000 and 2014, we checked these 40 journals' tables of contents (approx. 15,000 papers) and abstracts. We needed to conduct this manual procedure because, in major IS journals, authors commonly do not explicitly refer to their paper as a literature review (Paré et al., 2015). To reduce the risk that we missed LRs, we asked three senior scholars to review our list. From these scholars, we obtained an additional two missing papers. We contend that covering 40 pertinent IS journals provides a comprehensive overview of LRs that appear in IS journals. Overall, we identified 522 LR candidates.

Applying a multi-coder procedure, we first analyzed the set of 522 candidates according to the compliance with how we defined LRs ("A literature review synthesizes the body of knowledge of a specified domain or topic of interest."). In total, we excluded 282 papers. We describe this identification process in detail in Appendix B. As a second step, we the 240 LRs regarding attributes as we explain in Appendix C. We provide the final LR set in Appendix D.

[3] In our viewpoint, a synthesis is mandatory and there are no restrictions for the remaining five building blocks, resulting in $3^5 * 2 = 486$ combinations. This number is an upper bound of knowledge types of LRs as some combinations seem practically infeasible; for example, we may not expect to see a LR [*SYN+RA*] that provides a research agenda (subordinate or even dominant) but does neither identify research gaps nor criticize the literature. However, our typology can even be used to classify combinations that seem unlikely.

4.2 Results

4.2.1 Descriptive Statistics of Literature Reviews

As we say above, we identified 240 LRs that appeared between 2000 and 2014 in 38 journals; two journals (*MISQ Executive* and the *Scandinavian Journal of Information Systems*) did not publish any LR. Figure 3 shows that 1) the number of literature reviews that have appeared in the set of the top 40 IS journals each year since 2000 has fluctuated, and 2) LR publications in the top 40 journals have evolved in a way that resembles the way that the AIS Senior Scholars' basket of journals has evolved.

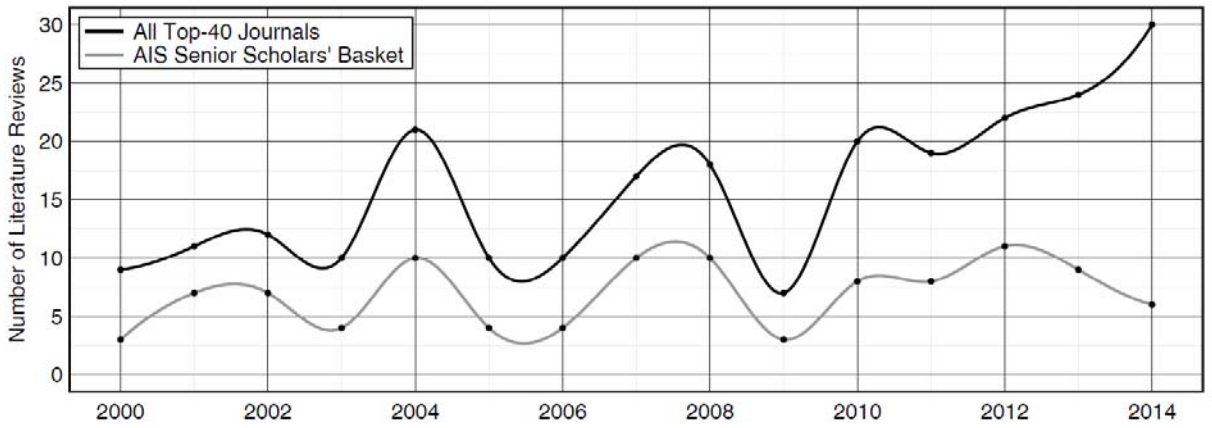


Figure 3. Distribution of Literature Reviews from 2000 to 2014

Figure 4 indicates that 11 journals published more than 50 percent of all LRs in our sample and that four journals (*MIS Quarterly*, *Journal of the Association for Information Systems*, *Communications of the Association for Information Systems*, *Journal of Strategic Information Systems*) accounted for more than one third of them.

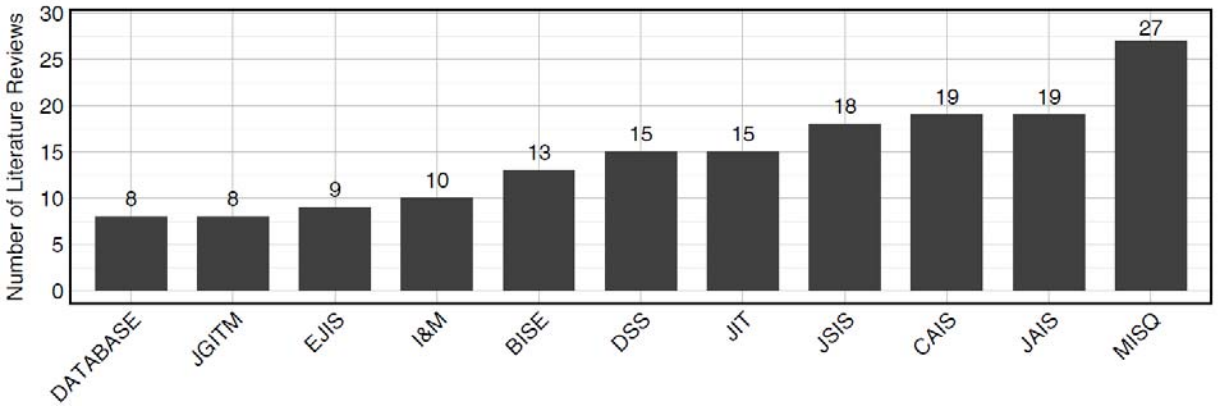


Figure 4. Distribution of Literature Reviews over Journals[4]

Regarding the proportion of LRs compared to the total number of papers published per journal (Figure 5), we found a few noteworthy trends. Specifically, we consider the 11 journals that account for more than 50 percent of LRs as data observed at journals that publish fewer LRs do not necessarily indicate meaningful trends. Most strikingly, the proportion of LRs that *MIS Quarterly* has published has halved over the last 15 years. The rise in the total number of papers that the journal has published mainly explains this trend given that it has not similarly increased the number of LRs it has published. Conversely, other journals in the AIS Senior Scholars' basket, such as the *Journal of the Association for Information Systems* and the *Journal of Information Technology,* have increased their proportion of LRs more than twofold. We

[4] We provide journal abbreviations in Table A1 in Appendix A.

observed similar increase in some IS journals that do not appear in the AIS Senior Scholars' basket of journals, such as the *Communications of the Association for Information Systems*, *Business & Information Systems Engineering*, and the *DATABASE for Advances in Information Systems*.

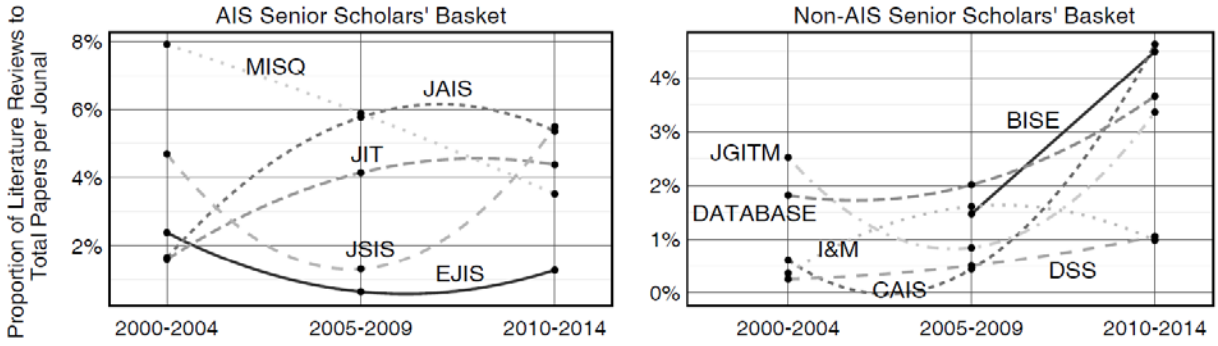
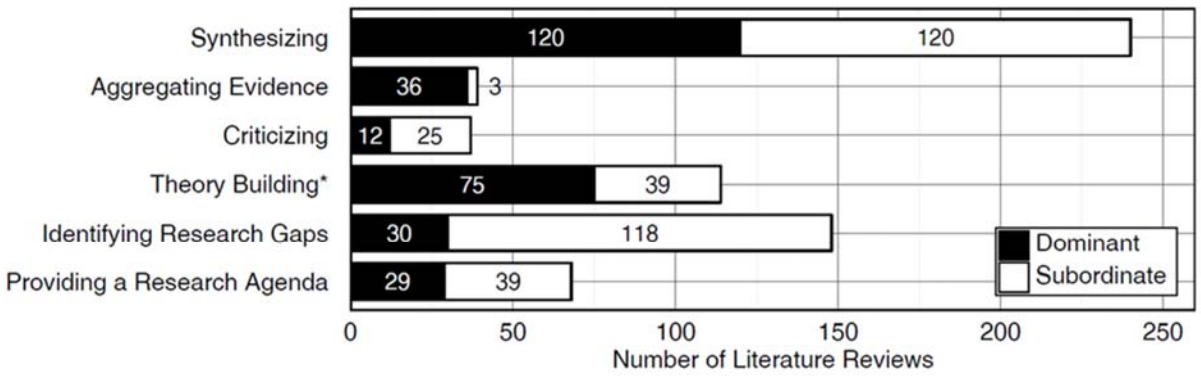


Figure 5. Proportion of Literature Reviews to Total Papers Published per Journal

4.2.2 Literature Reviews' Knowledge-building Activities

We analyzed each paper in our sample regarding its knowledge-building activities. Figure 6 shows the distribution of knowledge-building activities and whether they appeared in a dominant or subordinate role.

While all 240 papers synthesized literature, about half did so only as a subordinate activity and, thus, conducted other activities as well. Among the LRs that tested a theory, almost all reviews (92%—74% of which were meta-analyses) focused on aggregating evidence as their dominant knowledge-building activity. A considerably high portion (47%) of LRs in our sample contributed to theory building. Based on the theory typology that Gregor (2006) suggests, we found a strong focus on theory for analysis and theory for explaining, which account for almost all LRs that contributed to theory building regardless of whether this knowledge-building activity had a dominant or subordinate role. In particular, we did not identify any LR that created value by suggesting a theory for predicting, and we identified only six LRs that suggested a theory for design. The LRs also widely focused on identifying research gaps: it constituted the dominant knowledge-building activity in more than 30 LRs. Further, 37 LRs criticized prior research; of that number, 12 did so as a dominant activity. A remarkably high number of LRs (68) not only identified research gaps but also provided a research agenda. Almost half these reviews made their research agenda a dominant activity. These results indicate that the IS field values not only LRs that answer what we still need to know but also of how to get there. We found that, overall, the 240 LRs provided 646 contributions to knowledge development. That number represents, on average, about 2.7 contributions per LR.



Note: * Types of theories (contributing to multiple types of theories is possible) when theory building is:
- dominant: analysis (18), explaining (56), predicting (0), explaining and predicting (3), or design science (4).
- subordinate: analysis (18), explaining (18), predicting (0), explaining and predicting (3), or design science (0).

Figure 6. Distribution of Knowledge-building Activities

4.2.3 Knowledge-based Types of Literature Reviews

Based on how we coded single knowledge-building activities, we applied the suggested LR typology to the papers we identified. We present the results of this application with knowledge-based LR maps in Figures 7 and 8. To map the underlying six-dimensional knowledge-based typology on two-dimensional maps, we applied the following dimension-reduction techniques:

- Since all LRs must synthesize literature according to our definition, we qualify it as either subordinate or dominant. We distinguish both values by using two different figures (Figure 7 for SYN^{dom} and Figure 8 for SYN).
- We mark the activity identifying research gaps in each LR with three symbols (a square, a plus, and an asterisk).
- We observed that, except for five LRs (Dennis, Wixom, & Vandenberg, 2001; Joseph, Ng, Koh, & Ang, 2007; Lacity et al., 2010; Lacity, Solomon, Yan, & Willcocks, 2011a; Xiao & Benbasat, 2007), they all lacked at least one of the two activities developing a research agenda and aggregating evidence. Thus, we visualize these knowledge-building activities as different directions of the horizontal axis. Consequently, Figures 7 and 8 do not include these five LRs.
- Similarly, we observed that, except for ten LRs (Bélanger & Crossler, 2011; Elliot, 2011; Fettke & Loos, 2004; Lacity et al., 2010, 2011a; Leidner & Kayworth, 2006; Mantena, Tilson, & Zheng, 2012; Piccoli & Ives, 2005; Riemer & Vehring, 2012; Schryen, 2013), all LRs lacked at least one of the activities criticizing and theory building. Thus, we visualize these activities as different directions of the vertical axis. Hence, Figures 7 and 8 do not include these ten LRs.

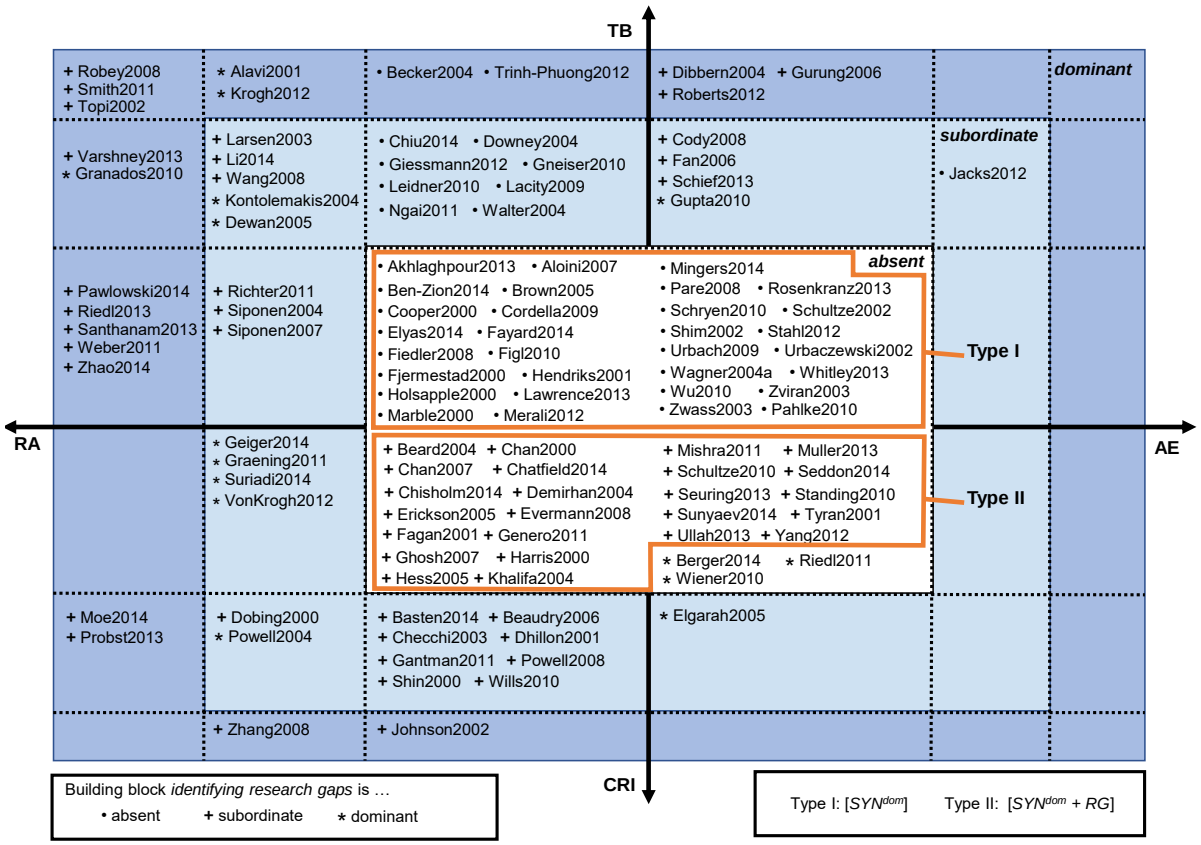


Figure 7. Knowledge-based Map of IS LRs (Synthesizing Dominant)

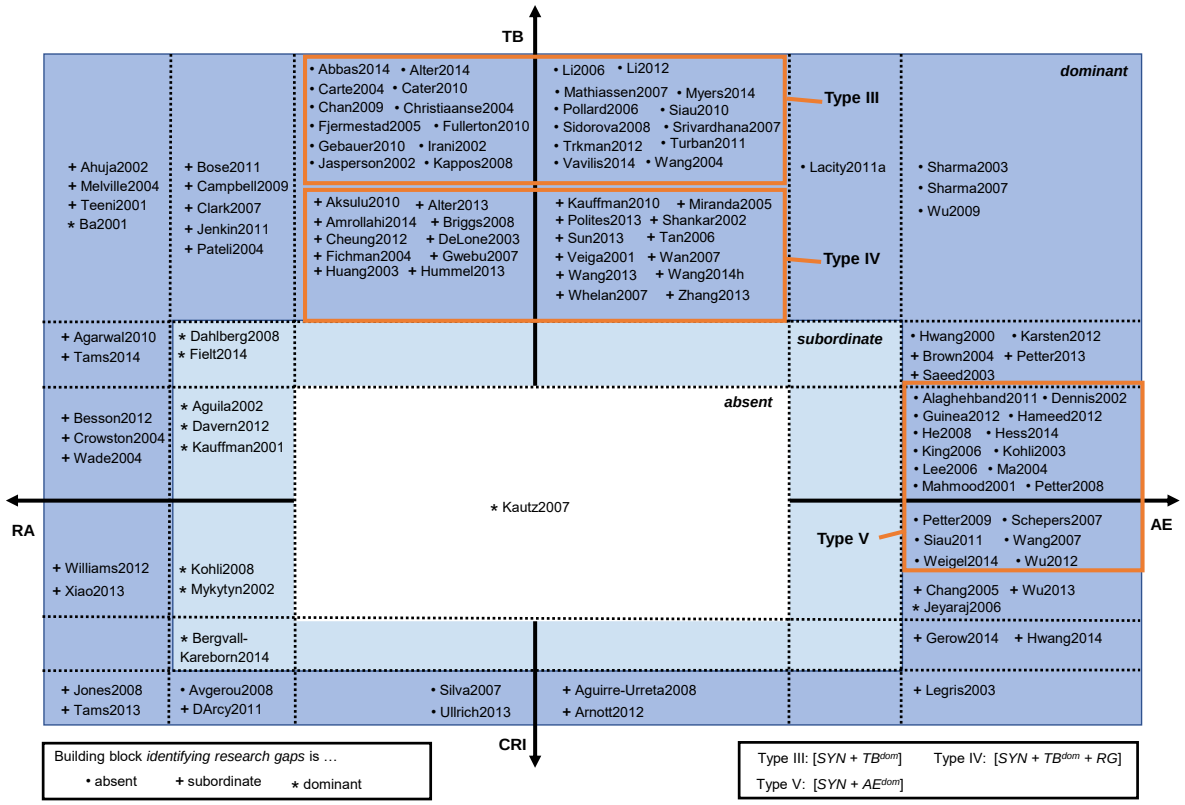
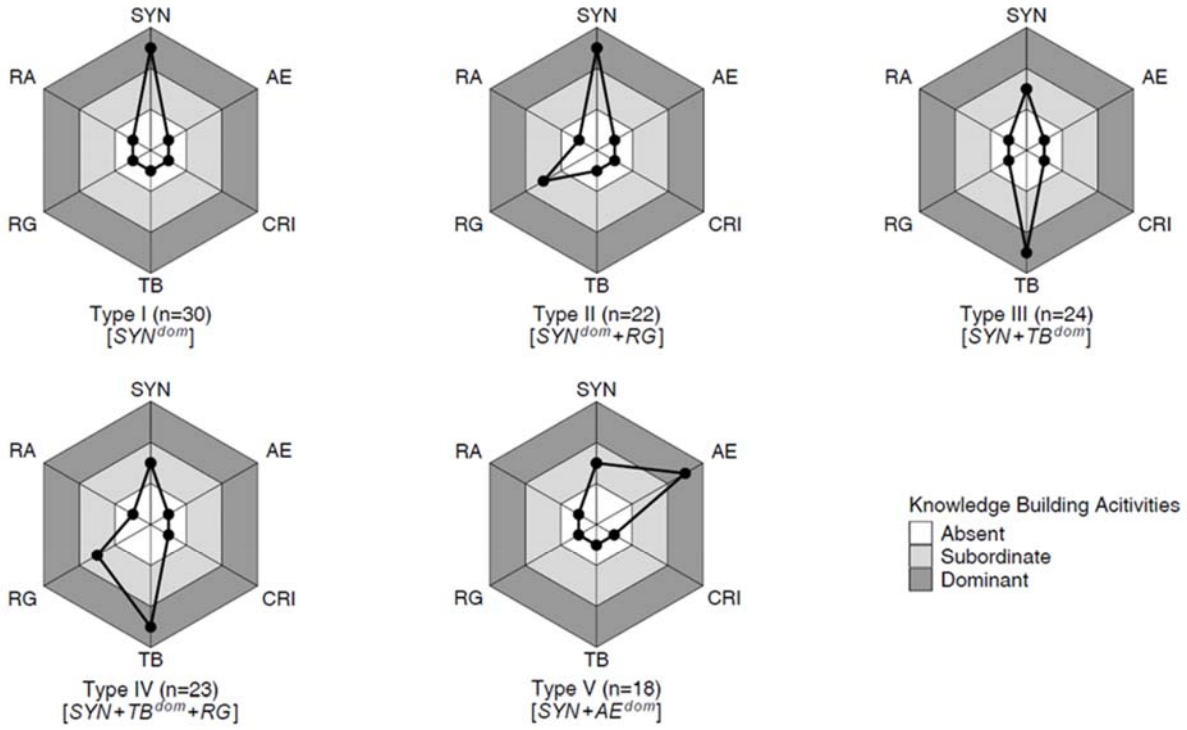


Figure 8. Knowledge-based Map of IS LRs (*Synthesizing* Subordinate)[5]

For the four knowledge-building activities that we represent as dimensions, the blank, bright, and dark areas indicate absent, subordinate, or dominant activities, respectively. For example, the LR labeled "+ Varshney2013" in Figure 7 indicates that this LR provides the following knowledge-building activities: synthesis (dominant), development of a research agenda (dominate), theory building (subordinate), and identification of research gaps (subordinate).

We identified five predominant LR types (i.e., "SYN^{dom}", "SYN^{dom} + RG", "SYN + TB^{dom}", "SYN + TB^{dom} + RG", and "SYN + AE^{dom}") that occurred most often and accounted for almost 50 percent of the LRs. We visualize these types as rectangles in Figure 7 and 8 and illustrate them in detail in Figure 9. We list each LR's type and how often they appeared in Appendix D (Table D1).

[5] We provide the references in Appendix D.



Abbreviations for knowledge building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).

Figure 9. Predominant Knowledge-based Types of IS LRs

4.2.4 Joint Application of Goal-based and Knowledge-based Typologies

The knowledge-based typology complements existing typologies, and researchers can jointly apply it with Paré et al.'s (2015) goal-based typology. As such, researchers can classify LRs not only according to their research goals but also according to the knowledge-development activities through which they achieve their goals. We analyze the main knowledge-building activities for each (goal-based) LR type. Figures F1 to Figure F4 in Appendix F show the three most often occurring knowledge-based review types for each overarching goal (describing, understanding, explaining, and theory testing) and related review types that Paré et al. (2015) define. For each theoretical review types that Paré et al. (2015) suggest, Table D1 in Appendix D shows a complete list of respective LRs with their knowledge-based types.

5 Discussion

In this section, we discuss our conceptual and empirical findings in the light of our initial research question. Adopting a knowledge-based perspective and adding an intermediary knowledge level between the methodology level and the goal level, both of which predominate the literature on LRs, we zoom into the association between LRs' methodologies and goals (Paré et al., 2015; Rowe, 2014) by understanding how LRs perform various knowledge-development activities by implementing methodologies to achieve their research goal(s) (see Figure 1). Specifically, we discuss the implications of the three contributions: deriving knowledge-building activities, developing the knowledge-based LR typology, and empirically applying this typology.

5.1 Conceptualizing Knowledge-building Activities

Our focus on knowledge development led to our identifying six knowledge-building activities (synthesizing, aggregating evidence, criticizing, theory building, identifying research gaps, and developing a research agenda), which represent the core activities that LRs use to develop knowledge and to achieve their research goals. In deriving these knowledge-building activities from nine (goal-based) LR types, we show

that LRs can go beyond a backward-oriented perspective (which synthesizing, criticizing prior findings in the literature, or aggregating evidence on existing theories represent) and instead look forward through building or extending theories (that researches would need to test), identifying research gaps (that researchers would need to close) and developing a research agenda (that researchers could follow). With this distinction, we systematize the diversity with which LRs can develop knowledge and show the spectrum of knowledge-building activities that scholars can draw on to compile and evaluate LRs. Thereby, we account for LRs' importance to develop knowledge that the literature has acknowledged (Blaxter et al., 2006; Paré et al., 2015; Rowe, 2014; Webster & Watson, 2002) yet not systematically analyzed.

LR authors can make their knowledge-developing activities explicit to demonstrate how they implemented which LR methodologies to achieve their research goals. In this regard, LRs' knowledge level in Figure 1 serves as an intermediate and mediating level between LRs' methodology and goal levels. By merging LRs' methodologies and goals perspectives with the (complementary) knowledge-based perspective on LRs, we gain an integrated view on LRs, which allows one to draw on all three levels in a consistent way. Thus, the knowledge-based perspective on LRs we suggest has both conceptual and practical usefulness.

5.2 Developing a Knowledge-based Typology

Our knowledge-based perspective accounts for our observations that LRs not only provide different types of knowledge-building activities but also place different emphasis on these activities. We distinguish knowledge-building activities according to whether they have an absent, subordinate, or dominant role and, thereby, suggest six knowledge-contribution dimensions with a qualifier at the ordinal scale level. We argue that the distinction between three qualifiers allows one to distinguish various intensities of knowledge contributions without needing to be too fine grained, which could easily lead to difficulties when analyzing a particular LR.

As LRs often develop knowledge via more than one knowledge-building activity, we can account for this joint knowledge development in a straightforward manner with a set of knowledge-building activities. Taking together the (co-)existence of six knowledge-contribution dimensions with three qualifiers, we suggest a multi-dimensional knowledge-based LR typology. Researchers can use this typology to classify LRs according to their knowledge contributions. Researchers should note that they can and should use the knowledge-based LR typology in addition to existing typologies, such as goal- and methodology-based typologies (e.g., Paré et al., 2015; Rowe, 2014).

Researchers can use the knowledge-based LR typology in several ways at the paper, journal, and field levels. LR authors can plan and describe the activities with which their review develops knowledge. In doing so, they can complement how their LRs describe their methodology and goals by revealing how they used the methodologies they applied to implement the set of (qualified) knowledge contributions, which, in turn, achieve their LRs' research goal(s). Explicitly describing these contributions helps authors to clarify how their contributions jointly develop knowledge and help to position their review from a knowledge-based perspective. In this regard, additionally applying our typology adds to how comprehensively researchers classify LRs.

We recommend LR authors not to stop after synthesizing but to add more knowledge-building activities and make their LRs more "comprehensive" and, thereby, exploit LRs' capabilities to develop knowledge. In particular, authors can draw on our typology and the empirical application that we show in Figure 7 and Figure 8 to identify combinations of knowledge-building activities that have occurred only rarely in the IS literature, such as LRs that criticize prior findings and suggest new theories based on their critique. In particular, early-career researchers can use our knowledge maps to identify and draw on LRs (as guiding examples) that provide those knowledge-building activities that they intend to develop.

At the journal level, editors can draw on our typology to frame what they expect from future submissions and, thereby, complement how they describe the LRs they would like to publish. For example, editors may prefer LRs that go beyond pure syntheses, such as by identifying research gaps and providing a research agenda (supporting a cumulative research tradition), by criticizing prior research (supporting a revolutionary research tradition), by contributing to theory building, or by testing theories. We recommend that editors draw on the set of knowledge-building activities and specify what knowledge they expect LRs to develop. These expectations may comply with their journals' overall policy, but editors also may want to look for LRs with knowledge types that their journals or even the whole IS field has neglected. For example, we found few LRs that criticize prior findings; accordingly, editors may find it attractive to look for

LRs that criticize prior findings and use their critique to develop new theories or to develop a research agenda.

Beyond the paper and journal levels, our typology has also benefits at the field level: the typology's empirical applicability allows researchers to systematically map how LRs of other fields have contributed to knowledge development. More specifically, researchers can use the knowledge-building activities and their qualifiers as dimensions to build and visualize multi-dimensional LR knowledge maps. By visualizing such knowledge maps, researchers and entire fields alike can better grasp the body of knowledge accumulated in LRs. The typology and resulting knowledge maps also enable researchers to compare how different fields have developed knowledge. They can use such comparisons to inform fields, how they differ or resemble other fields, and provide cross-field stimuli for performing specific types of LRs.

5.3 Analyzing Knowledge Contributions through Literature Reviews in the IS Field

5.3.1 Knowledge-building Activities

From analyzing individual knowledge-building activities in LRs (see Figure 6), we found that LRs in the IS field have equally used synthesizing in both a subordinate and dominant way. This balance shows that the IS field acknowledges both LRs that focus on synthesizing prior knowledge and LRs that emphasize other knowledge-development activities. We also note that LRs in our sample provided, on average, 2.7 knowledge-building activities (i.e., each review paper provided 1.7 additional knowledge contributions beyond the mandatory synthesis). We find this number remarkably high, and it shows that the body of LRs in the IS field has exploited the potential to develop different knowledge types in a comprehensive way. We speculate that this phenomenon may have arisen largely due to expectations of the editors of renowned IS journals (e.g., Webster & Watson 2002) that LRs do more than "only" synthesize prior findings.

Our analysis reveals some interesting insights. First, a remarkably high ratio of LRs contributed to theory building (more than 47%) with most of these reviews focusing on theory building as a dominant knowledge contribution. These insights mitigate Rowe's (2014, p. 243) observation that "many literature reviews do not strive to contribute to theory; their main goals are to describe, to classify what has been produced by the literature" and that "strictly speaking, they just map the territory and do not theorize".

More specifically, we found that LRs have strongly emphasized developing theories for analysis and explaining but barely contributed to developing theories for predicting, explaining and predicting, and design. This imbalance points to neglected theory-building areas through LRs that future work may want to explore. Second, compared to the extent to which LRs contribute to theory building, LRs rarely tested theories. Beyond this observation, we also found a strong focus on meta-analyses (74% of all testing reviews) and on several IS domains (technology acceptance and use; software development; outsourcing; IS success; and creativity, flexibility, innovativeness), which account for about 77 percent of all theory-testing LRs in total. These insights call for work that compiles theory-testing LRs in a more diverse set of domains using methodologies that can summarize evidence that allows for more formal approaches such as vote counting and meta-analyses (see Houy, Fettke, & Loos, 2015). Third, LRs have rarely criticized prior work (12 LRs in total). We interpret this observation in the sense that IS LRs have focused on fostering the cumulative nature of scientific progress while underemphasizing that LRs can also revive research by enabling scientific progress's revolutionary nature that occurs "by a method which destroys, changes, and alters" (Popper, 2014, p. 129). We recommend that IS researchers pay more attention to LRs' capability to contribute to scientific progress from both the cumulative and the revolutionary perspective (Kuhn, 1970). Fourth, we identified many LRs that identified research gaps and/or provided a research agenda. While the former contribution refers to "what we still need to know", the latter addresses "how we can get there" (Schryen, 2013). One should again notice that these two types of knowledge contributions concur with the cumulative perspective by referring to "doing the correct things" in contrast to criticizing prior findings, which addresses the revolutionary perspective by referring to "doing things correctly".

5.3.2 Knowledge-based Types

From applying the knowledge-based typology to the IS field, we created a knowledge-based map of 240 LRs. This map shows which LRs have provided which knowledge contributions (knowledge-development activities). It also exposes five predominant knowledge-based types that accounted for almost 50 percent

of the identified LRs. Figure 7 shows that, among the reviews that emphasized synthesizing the literature, two types occurred most often. While Type I reviews provided no contributions other than synthesis (SYN^{dom}), Type II reviews additionally identified research gaps but not as a designated contribution (SYN^{dom} + RG). The relatively high number of these review types reveals that IS values those LRs that have the primary (or even only) purpose to synthesize prior findings. Thus, our field acknowledges that synthesizing findings has a value in its own right.

Figure 7 also shows that a substantial number of LRs complemented synthesis and the identification of research gaps with a research agenda and, thereby, did not simply answer *what* researchers still need to do but also clarified *how* they may do so. An interesting research direction would involve analyzing to what extent succeeding research has adopted the guiding advice. Our map further shows that many LRs complement their synthesis with contributions to theory building in contrast to aggregating evidence, which barely appeared in our sample at all but constitutes a possible activity as Jacks, Wallace, and Nemati's (2012) LR shows. We argue that LRs that emphasize synthesizing literature have an excellent basis for testing suggested theories. Figure 7 further visualizes that several LRs used their synthesis to criticize the literature (at least as a subordinate contribution). Such LRs have particular importance as they contribute to IS research's revolutionary nature. Since we identified few reviews that used their synthesis to criticize the extant literature, we argue that future LRs research should exploit this potential.

Beyond the two types of LRs that we discuss above, we identified three additional types that occur often. One of these types (Type III) included LRs that focused on theory building exclusively (SYN +TB^{dom}), while another one (Type IV) additionally identified research gaps as a subordinate contribution (SYN + TB^{dom} + RG). Interestingly, the vast majority of both Type III and Type IV reviews developed theories for analysis or theories for explaining, while we identified only zero, two, and three LRs that developed theories for predicting, theories for explaining and predicting, or design science theories, respectively (see Appendix D). This strong focus on these two types of theories makes it appealing to also exploit LRs' potential to contribute to developing other theory types. Finally, Type V LRs (SYN + AE^{dom})—mostly meta-analyses—focused on aggregating evidence.

Furthermore, the map that Figure 8 shows identifies some LR types that occurred only rarely despite their acknowledged importance. First, we identified few LRs that emphasized identifying research gaps. Interestingly, even among the many LRs that developed a research agenda either as subordinate or dominant contribution, we found few LRs that also focused on identifying research gaps. This finding is interesting as the latter one, which refers to *what* researchers need to do, constitutes a precondition for the former one, which refers to *how* researchers can do so. Based on this empirical observation, we re-highlight the importance of identifying research gaps in LRs (Alvesson & Sandberg, 2011; Rowe, 2014; Sandberg & Alvesson, 2011). Second, few LRs focused on criticizing the body of literature. We find these LRs particularly useful as they contribute to IS research's revolutionary nature. While we can only speculate on the reasons (for example, does the IS field prefer the cumulative research tradition over the revolutionary one?), we argue that the IS field would benefit from more LRs with a revolutionary nature.

5.4 Limitations and Directions for Future Research

One should interpret our findings with caution due to some limitations. First, analyzing knowledge developed through LRs can identify only immediate progress in knowledge development. However, LRs' value also pertains to their capability to stimulate knowledge development in subsequent research. For example, research gaps that a LR identifies may be closed, or theories it proposes be confirmed or rejected through testing. Second, we selected 40 IS journals for our empirical analysis. Although this set included premier IS journals, our empirical results might not represent conference proceedings and other publication outlets in the IS field. Third, we concur that the presence of a knowledge-building activity in a LR and the qualification of an activity as dominant or subordinate may be subjective in some cases. We mitigated this coding issue by applying a multi-coder procedure. Furthermore, researchers could possibly more finely distinguish the quality of the knowledge-building activities.

Despite these limitations, our findings and contributions show further avenues for prospective research. First, future studies could analyze different publication outlets, including conference proceedings and books. Second, cross-field applicability of the knowledge model and LR typology invites studies in other fields. Third, in conceptualizing the knowledge-building activities, we pave the road for work that analyzes how papers that cite LRs draw on and enhance knowledge developed in review papers. Research that follows this direction addresses *whether* and *how* LRs have stimulated knowledge development in subsequent research. Thereby, research can go beyond answering the scientometric question of *how*

often studies have cited LRs. Finally, we do not discuss our perspective on knowledge development in the light of different epistemological paradigms, such as positivism and interpretivism (Chen & Hirschheim, 2004). Future work can analyze the suggested knowledge-building activities from different epistemological perspectives.

6 Conclusion

This study represents an initial step towards conceptualizing LRs as means to develop knowledge and adding a knowledge-based perspective to the prevailing methodological and goal perspectives on LRs. Overall, we propose several knowledge-building activities, suggest a multidimensional knowledge-based typology of LRs, and apply this typology to the IS field to create a knowledge-based map of 240 LRs that 40 IS journals have published over 15 years. Empirically applying the knowledge-based typology demonstrates the added value when adopting the suggested knowledge-based perspective, which complements and unifies extant conceptualizations of LRs by clarifying and illustrating how they apply different methodologies in a range of knowledge-building activities to achieve their goals with respect to theory. We hope that the proposed knowledge-based perspective on LRs provides a fertile foundation for further research on LRs as a research genre that all fields require.

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[6] http://gepris.dfg.de/gepris/projekt/315925033?language=en
[7] http://gepris.dfg.de/gepris/projekt/321298175?language=en
[8] http://gepris.dfg.de/gepris/projekt/327130595?language=en

References

Abbas, R., Michael, K., & Michael, M. G. (2014). The regulatory considerations and ethical dilemmas of location-based services (LBS): A literature review. *Information Technology & People*, *27*(1), 2-20.

Agarwal, R., Gao, G., DesRoches, C., & Jha, A. K. (2010). Research commentary—the digital transformation of healthcare: current status and the road ahead. *Information Systems Research*, *21*(4), 796-809.

Aguirre-Urreta, M. I., & Marakas, G. M. (2008). Comparing conceptual modeling techniques: A critical review of the EER Vs. OO empirical literature. *ACM SIGMIS Database*, *39*(2), 9-32.

Ahuja, M. K. (2002). Women in the information technology profession: A literature review, synthesis and research agenda. *European Journal of Information Systems*, *11*(1), 20-34.

Akhlaghpour, S., Wu, J., Lapointe, L., & Pinsonneault, A. (2013). The ongoing quest for The IT artifact: Looking back, moving forward. *Journal of Information Technology*, *28*(2), 150-166.

Aksulu, A., & Wade, M. (2010). A comprehensive review and synthesis of open source research. *Journal of the Association for Information Systems*, *11*(11), 576-656.

Alavi, M., & Leidner, D. E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS Quarterly*, *25*(1), 107-136.

Aloini, D., Dulmin, R., & Mininno, V. (2007). Risk management in ERP project introduction: Review of the literature. *Information & Management*, *44*(6), 547-567.

Alter, S. (2013). Work system theory: Overview of core concepts, extensions, and challenges for the future. *Journal of the Association for Information Systems*, *14*(2), 72-121.

Alter, S. (2014). Theory of workarounds. *Communications of the Association for Information Systems*, *34*, 1041-1066.

Alvesson, M., & Sandberg, J. (2011). Generating research questions through problematization. *Academy of Management Review*, *36*(2), 247-271.

Amrollahi, A., Ghapanchi, A. H., & Talaei-Khoei, A. (2014). Three decades of research on strategic information system plan development. *Communications of the Association for Information Systems*, *34*, 1439-1467.

Appleford, S. J., Bottum, J. R., & Thatcher, J. B. (2014). Understanding the social Web: Towards defining an interdisciplinary research agenda for information systems. *ACM SIGMIS Database*, *45*(1), 29-37.

Arksey, H., & O'Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social Research Methodology*, *8*(1), 19-32.

Arnott, D., & Pervan, G. (2012). Design Science in decision support systems research: An assessment using the Hevner, March, Park, and Ram guidelines. *Journal of the Association for Information Systems*, *13*(11), 923-949.

Avgerou, C. (2008). Information systems in developing countries: A critical research review. *Journal of Information Technology*, *23*(3), 133-146.

Avison, D. E., Dwivedi, Y. K., Fitzgerald, G., & Powell, P. (2008). The beginnings of a new era: Time to reflect on 17 years of the ISJ. *Information Systems Journal*, *18*(1), 5-21.

Ba, S., Stallaert, J., & Whinston, A. B. (2001). Research commentary: Introducing a third dimension in information systems design—the case for incentive alignment. *Information Systems Research*, *12*(3), 225-239.

Bailey, K. D. (1994). *Typologies and taxonomies: An Introduction to classification techniques*. Newbury Park, CA: Sage.

Balijepally, V., Mangalaraj, G., & Iyengar, K. (2011). Are we wielding this hammer correctly? A reflective review of the application of cluster analysis in information systems research. *Journal of the Association for Information Systems*, *12*(5), 375-413.

Basten, D., & Sunyaev, A. (2014). A systematic mapping of factors affecting accuracy of software development effort estimation. *Communications of the Association for Information Systems*, *34*, 51-86.

Beard, J. W., & Sumner, M. (2004). Seeking strategic advantage in the post-net era: Viewing ERP systems from the resource-based perspective. *The Journal of Strategic Information Systems*, *13*(2), 129-150.

Beaudry, A., & Carillo, K. D. (2006). The customer-centered B2C literature through the lens of activity theory: A review and research agenda. *Communications of the Association for Information Systems*, *17*, 428-503.

Becker, J., & Knackstedt, R. (2004). Referenzmodellierung im data-warehousing—state-of-the-art und konfigurative ansätze für die fachkonzeption. *Wirtschaftsinformatik*, *46*(1), 39-49.

Bélanger, F., & Crossler, R. E. (2011). Privacy in the digital age: A review of information privacy research in information systems. *MIS Quarterly*, *35*(4), 1017-1041.

Ben-Zion, R., Pliskin, N., & Fink, L. (2014). Critical success factors for adoption of electronic health record systems: Literature review and prescriptive analysis. *Information Systems Management*, *31*(4), 296-312.

Berger, K., Klier, J., Klier, M., & Probst, F. (2014). A review of information systems research on online social networks. *Communications of the Association for Information Systems*, *35*, 145-172.

Bergvall-Kåreborn, B., Howcroft, D., & Ståhlbröst, A. (2014). Disregarding history: contemporary IS contexts and participatory design. *Communications of the Association for Information Systems*, *34*, 1319-1332.

Besson, P., & Rowe, F. (2012). Strategizing information systems-enabled organizational transformation: A transdisciplinary review and new directions. *The Journal of Strategic Information Systems*, *21*(2), 103-124.

Blaxter, L., Hughes, C., & Tight, M. (2006). *How to research* (3rd ed.). New York, NY: Open University Press.

Blumberg, B., Cooper, D. R., & Schindler, P. S. (2005). *Business research methods* (2nd ed.). New York, NY: McGraw-Hill Education.

Boell, S. K., & Cecez-Kecmanovic, D. (2014). A hermeneutic approach for conducting literature reviews and literature searches. *Communications of the Association for Information Systems*, *34*, 257-286.

Boell, S. K., & Cecez-Kecmanovic, D. (2015a). On being "systematic" in literature reviews in IS. *Journal of Information Technology*, *30*(2), 161-173.

Boell, S. K., & Cecez-Kecmanovic, D. (2015b). Debating systematic literature reviews (SLR) and their ramifications for IS: A rejoinder to Mike Chiasson, Briony Oates, Ulrike Schultze, and Richard Watson. *Journal of Information Technology*, *30*(2), 188-193.

Boote, D. N., & Beile, P. (2005). Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, *34*(6), 3-15.

Bose, R., & Luo, X. (2011). Integrative framework for assessing firms' potential to undertake green IT initiatives via virtualization—a theoretical perspective. *The Journal of Strategic Information Systems*, *20*(1), 38-54.

Brenner, W., Karagiannis, D., Kolbe, L., Krüger, J., Lamberti, H.-J., Leifer, L., Leimeister, J. M., Österle, H., Petrie, C., Plattner, H., Schwabe, G., Uebernickel, F., Winter, R., & Zarnekow, R. (2014). User, use & utility research: The digital user as new design perspective in business and information systems engineering. *Business & Information Systems Engineering*, *6*(1), 55-61.

Briggs, R. O., Reinig, B. A., & Vreede, G.-J. de. (2008). The yield shift theory of satisfaction and its application to the IS/IT domain. *Journal of the Association for Information Systems*, *9*(5), 267-293.

Brown, A. E., & Grant, G. G. (2005). Framing the frameworks: A review of IT governance research. *Communications of the Association for Information Systems*, *15*, 696-712.

Brown, I. T. J. (2004). Testing and extending theory in strategic information systems planning through literature analysis. *Information Resources Management Journal*, *17*(4), 19-47.

Campbell, D. E., Wells, J. D., & Valacich, J. S. (2009). Diagnosing and managing online business-to-consumer (B2C) relationships: Toward an ecommerce B2C relationship stage theory. *AIS Transactions on Human-Computer Interaction*, *1*(4), 108-132.

Card, N. A. (2011). *Applied meta-analysis for social science research*. New York, NY: The Guilford Press.

Carte, T., & Chidambaram, L. (2004). A capabilities-based theory of technology deployment in diverse teams: Leapfrogging the pitfalls of diversity and leveraging its potential with collaborative technology. *Journal of the Association for Information Systems*, *5*(11), 448-471.

Carter, P. E. (2010). IT service value creation in a global environment. *Journal of Global Information Technology Management*, *13*(4), 4-27.

Chan, F. K. Y., & Thong, J. Y. L. (2009). Acceptance of agile methodologies: A critical review and conceptual framework. *Decision Support Systems*, *46*(4), 803-814.

Chan, Y. E. & Greenaway, K. E. (2005). Theoretical explanations for firms' information privacy behaviors. *Journal of the Association for Information Systems*, *6*(6), 171-198.

Chan, Y. E. (2000). IT value: The great divide between qualitative and quantitative and individual and organizational measures. *Journal of Management Information Systems*, *16*(4), 225-261.

Chan, Y. E., & Reich, B. H. (2007). IT alignment: What have we learned? *Journal of Information Technology*, *22*(4), 297-315.

Chang, M. K., Cheung, W., & Lai, V. S. (2005). Literature derived reference models for the adoption of online shopping. *Information & Management*, *42*(4), 543-559.

Chatfield, A. T., Shlemoon, V. N., Redublado, W., & Darbyshire, G. (2014). Creating value through virtual teams: A current literature review. *Australasian Journal of Information Systems*, *18*(3), 257-269.

Checchi, R. M., Hsieh, J. J. P.-A., & Straub, D. W. (2003). Public IT policies in less developed countries: A critical assessment of the literature and a reference framework. *Journal of Global Information Technology Management*, *6*(4), 45-64.

Chen, L., & Holsapple, C. W. (2013). Evaluating journal quality: Beyond "expert" journal assessments in the IS discipline. *Journal of Organizational Computing and Electronic Commerce*, *23*(4), 392-412.

Chen, W., & Hirschheim, R. (2004). A paradigmatic and methodological examination of information systems research from 1991 to 2001. *Information Systems Journal*, *14*(3), 197-235.

Cheung, C. M. K., & Thadani, D. R. (2012). The impact of electronic word-of-mouth communication: A literature analysis and integrative model. *Decision Support Systems*, *54*(1), 461-470.

Chin, W. W., & Leidner, D. E. (2002). From the editors. *ACM SIGMIS Database*, *33*(1), 4.

Chisholm, J. F. (2014). Review of the status of cyberbullying and cyberbullying prevention. *Journal of Information Systems Education*, *25*(1), 77-87.

Chiu, C.-M., Liang, T.-P., & Turban, E. (2014). What can crowdsourcing do for decision support? *Decision Support Systems*, *65*, 40-49.

Christiaanse, E., van Diepen, T., & Damsgaard, J. (2004). Proprietary versus internet technologies and the adoption and impact of electronic marketplaces. *The Journal of Strategic Information Systems*, *13*(2), 151-165.

Clark, T. D. J., Jones, M. C., & Armstrong, C. P. (2007). The dynamic structure of management support systems: Theory development, research focus, and directions. *MIS Quarterly*, *31*(3), 579-615.

Cody, E., Sharman, R., Rao, H. R., & Upadhyay, S. J. (2008). Security in grid computing: A review and synthesis. *Decision Support Systems*, *44*(4), 749-764.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, *20*(1), 37-46.

Cohn, L. D., & Becker, B. J. (2003). How meta-analysis increases statistical power. *Psychological Methods*, *8*(3), 243.

Cooper, H. M. (1998). *Synthesizing research: A guide for literature reviews*. New York, NY: Sage.

Cooper, H. M., & Hedges, L. V. (2009). Research synthesis as a scientific process. In H. Cooper, L. V. Hedges, & J. C. Valentine (Eds.), *The handbook of research synthesis and meta-analysis* (pp. 3-16). New York, NY: Russell Sage Foundation.

Cooper, W. W., & Muench, M. L. (2000). Virtual organizations: Practice and the literature. *Journal of Organizational Computing and Electronic Commerce*, *10*(3), 189-208.

Cordella, A. (2009). Transaction costs and information systems: Does IT add up? *Journal of Information Technology*, *21*(3), 386-400.

Cox, G. (2003). Business computing 2001—the state of the art. *The Journal of Strategic Information Systems*, *12*(4), 285-294.

Crowston, K., & Myers, M. D. (2004). Information technology and the transformation of industries: Three research perspectives. *The Journal of Strategic Information Systems*, *13*(1), 5-28.

D'Arcy, J., & Herath, T. (2011). A review and analysis of deterrence theory in the IS security literature: Making sense of the disparate findings. *European Journal of Information Systems*, *20*(6), 643-658.

Dahlberg, T., Mallat, N., Ondrus, J., & Zmijewska, A. (2008). Past, present and future of mobile payments research: A literature review. *Electronic Commerce Research and Applications*, *7*(2), 165-181.

Davern, M., Shaft, T., & Te'eni, D. (2012). Cognition Matters: Enduring questions in cognitive IS research. *Journal of the Association for Information Systems*, *13*(4), 273-314.

del Águila, A. R., Bruque, S., & Padilla, A. (2002). Global information technology management and organizational analysis: Research issues. *Journal of Global Information Technology Management*, *5*(4), 18-37.

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9-30.

Demirhan, D. (2004). Factors affecting investment in IT: A critical review. *Journal of Information Technology Theory and Application*, *6*(4), 1-13.

Dennis, A. R., & Wixom, B. H. (2002). Investigating the moderators of the group support systems use with meta-analysis. *Journal of Management Information Systems*, *18*(3), 235-257.

Dennis, A. R., Wixom, B. H., & Vandenberg, R. J. (2001). Understanding fit and appropriation effects in group support systems via meta-analysis. *MIS Quarterly*, *25*(2), 167-193.

Dewan, S. & Riggins, F. J. (2005). The digital divide: Current and future research directions. *Journal of the Association for Information Systems*, *6*(12), 298-336.

Dhillon, G., & Backhouse, J. (2001). Current directions in IS security research: Towards socio-organizational perspectives. *Information Systems Journal*, *11*(2), 127-153.

Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: A survey and analysis of the literature. *ACM SIGMIS Database*, *35*(4), 6-102.

Dobing, B., & Parsons, J. (2000). Understanding the role of use cases in UML: A review and research agenda. *Journal of Database Management*, *11*(4), 28-36.

Downey, J. P. (2004). Toward a comprehensive framework: EUC research issues and trends (1999-2000). *Journal of Organizational and End User Computing*, *16*(4), 1-16.

Dwivedi, Y. K., & Kuljis, J. (2008). Profile of IS research published in the European Journal of Information Systems. *European Journal of Information Systems*, *17*(6), 678-693.

Elgarah, W., Falaleeva, N., Saunders, C. S., Ilie, V., Shim, J. T., & Courtney, J. F. (2005). Data exchange in interorganizational relationships: Review through multiple conceptual lenses. *ACM SIGMIS Database*, *36*(1), 8-29.

Elliot, S. (2011). Transdisciplinary perspectives on environmental sustainability: A resource base and framework for IT-enabled business Transformation. *MIS Quarterly*, *35*(1), 197-236.

Elyas, M., Maynard, S. B., Ahmad, A., & Lonie, A. (2014). Towards a systemic framework for digital forensic readiness. *Journal of Computer Information Systems*, *54*(3), 97-105.

Erickson, J., Lyytinen, K., & Siau, K. (2005). Agile modeling, agile software development, and extreme programming: The state of research. *Journal of Database Management*, *16*(4), 88-100.

Evermann, J. (2008). Theories of meaning in schema matching: A review. *Journal of Database Management*, *19*(3), 55-82.

Fagan, M. H. (2001). Global information technology transfer: A framework for analysis. *Journal of Global Information Technology Management*, *4*(3), 5-26.

Fan, H., & Poole, M. S. (2006). What Is personalization? Perspectives on the design and implementation of personalization in information systems. *Journal of Organizational Computing and Electronic Commerce*, *16*(3), 179-202.

Fayard, A.-L., & Weeks, J. (2014). Affordances for practice. *Information and Organization*, *24*(4), 236-249.

Fettke, D.-W.-I. P., & Loos, P. (2004). Referenzmodellierungsforschung. *Wirtschaftsinformatik*, *46*(5), 331-340.

Fichman, R. G. (2004). Real options and IT platform adoption: Implications for theory and practice. *Information Systems Research*, *15*(2), 132-154.

Fiedler, M., & Gallenkamp, J. (2008). Virtualisierung der kommunikation—der beitrag von informationsreichhaltigkeit für kooperation. *Wirtschaftsinformatik*, *50*(6), 472-481.

Fielt, E., Bandara, W., Miskon, S., & Gable, G. (2014). Exploring shared services from an IS perspective : A literature review and research agenda. *Communications of the Association for Information Systems*, *34*, 1001-1040.

Figl, K. (2010). A systematic review of developing team competencies in information systems education. *Journal of Information Systems Education*, *21*(1), 323-337.

Fjermestad, J., & Hiltz, S. R. (2000). Group support systems: A descriptive evaluation of case and field studies. *Journal of Management Information Systems*, *17*(3), 115-159.

Fjermestad, J., & Saitta, J. A. (2005). A strategic management framework for IT outsourcing: A review of the literature and the development of a success factors model. *Journal of Information Technology Case and Application Research*, *7*(3), 42-60.

Fullerton, T., & Ness, L. (2010). Information technology flexibility: A synthesized model from existing literature. *Journal of Information Technology Management*, *21*(3), 51-59.

Gantman, S. (2011). IT outsourcing in the public sector: A literature analysis. *Journal of Global Information Technology Management*, *14*(2), 48-83.

Garfield, E. (1987). Reviewing review literature: Part 1: Definitions and uses of reviews. *Essays of an Information Scientist*, *10*, 113-116.

Gebauer, J., Shaw, M. J., & Gribbins, M. L. (2010). Task-technology fit for mobile information systems. *Journal of Information Technology*, *25*(3), 259-272.

Geiger, D., & Schader, M. (2014). Personalized task recommendation in crowdsourcing information systems—current state of the art. *Decision Support Systems*, *65*, 3-16.

Genero, M., Fernández-Saez, A. M., Nelson, H. J., Poels, G., & Piattini, M. (2011). Research review: A systematic literature review on the quality of UML models. *Journal of Database Management*, *22*(3), 46-70.

Gerow, J. E., Grover, V., Thatcher, J., & Roth, P. L. (2014). Looking toward the future of IT-business strategic alignment through the past: A meta-analysis. *MIS Quarterly*, *38*(4), 1159-1185.

Ghosh, D., Sharman, R., Rao, H. R., & Upadhyay, S. J. (2007). Self-healing Systems—survey and synthesis. *Decision Support Systems*, *42*(4), 2164-2185.

Giessmann, A., & Stanoevska-Slabeva, K. (2012). Business models of platform as a service (PaaS) Providers: Current state and future directions. *Journal of Information Technology Theory and Application*, *13*(4), 31-55.

Gneiser, M. S. (2010). Value-based CRM. *Business & Information Systems Engineering*, *2*(2), 95-103.

Gough, D., Thomas, J., & Oliver, S. (2012). Clarifying differences between review designs and methods. *Systematic Reviews*, *1*(1), 1-28.

Grahlmann, K. R., Helms, R. W., Hilhorst, C., Brinkkemper, S., & van Amerongen, S. (2012). Reviewing enterprise content management: A functional framework. *European Journal of Information Systems*, *21*(3), 268-286.

Granados, N., Gupta, A., & Kauffman, R. J. (2010). Information transparency in business-to-consumer markets: Concepts, framework, and research agenda. *Information Systems Research*, *21*(2), 207-226.

Gräning, A., Felden, C., & Piechocki, M. (2011). Status quo and potential of XBRL for business and information systems engineering. *Business & Information Systems Engineering*, *3*(4), 231-239.

Green, B. F., & Hall, J. A. (1984). Quantitative methods for literature reviews. *Annual Review of Psychology*, *35*(1), 37-54.

Gregor, S. (2006). The nature of theory in information systems. *MIS Quarterly*, *30*(3), 611-642.

Gupta, S., Bostrom, R. P., & Huber, M. (2010). End-user training methods: What we know, need to know. *ACM SIGMIS Database*, *41*(4), 9-39.

Gurung, A., & Prater, E. (2006). A research framework for the impact of cultural differences on IT outsourcing. *Journal of Global Information Technology Management*, *9*(1), 24-43.

Gwebu, K. L., Wang, J., & Troutt, M. D. (2007). A conceptual framework for understanding trust building and maintenance in virtual organizations. *Journal of Information Technology Theory and Application*, *9*(1), 43-63.

Hameed, M. A., Counsell, S., & Swift, S. (2012). A meta-analysis of relationships between organizational characteristics and IT innovation adoption in organizations. *Information & Management*, *49*(5), 218-232.

Harris, R. W. (2000). Schools of thought in research into end-user computing success. *Journal of Organizational and End User Computing*, *12*(1), 24-34.

Hart, C. (2009). *Doing a literature review: Releasing the social science research imagination*. Thousand Oaks, CA: Sage.

He, J., & King, W. R. (2008). The role of user participation in information systems development: Implications from a meta-analysis. *Journal of Management Information Systems*, *25*(1), 301-331.

Hendriks, P. H. J. (2001). Many rivers to cross: From ICT to knowledge management systems. *Journal of Information Technology*, *16*(2), 57-72.

Hess, T. J., McNab, A. L., & Basoglu, K. A. (2014). Reliability generalization of perceived ease of use, perceived usefulness, and behavioral intentions. *MIS Quarterly*, *38*(1), 1-28.

Hess, T., Figge, S., Hanekop, H., Hochstatter, I., Rauscher, B., Hogrefe, D., Riedel, A., Zibull, M., Kaspar, C., & Richter, M. (2005). Technische Möglichkeiten und Akzeptanz mobiler Anwendungen. *Wirtschaftsinformatik*, *47*(1), 6-16.

Holsapple, C. W., & Singh, M. (2000). Electronic commerce: From a definitional taxonomy toward a knowledge-management view. *Journal of Organizational Computing and Electronic Commerce*, *10*(3), 149-170.

Houy, C., Fettke, P., & Loos, P. (2015). Stylized facts as an instrument for literature review and cumulative information systems research. *Communications of the Association for Information Systems*, *37*, 225-256.

Huang, W., Chen, Y., & Hee, J. (2006). STP technology: An overview and a conceptual framework. *Information & Management*, *43*(3), 263-270.

Huang, W., Wei, K.-K., & Lim, J. (2003). Using a GSS to support virtual teambuilding: A theoretical framework. *Journal of Global Information Management*, *11*(1), 72-89.

Hummel, M., Rosenkranz, C., & Holten, R. (2013). The role of communication in agile systems development. *Business & Information Systems Engineering*, *5*(5), 343-355.

Hwang, M. I. (1996). The use of meta-analysis in MIS research: Promises and problems. *The DATA BASE for Advances in Information Systems*, *27*(3), 35-48.

Hwang, M. I. (2014). Disentangling the effect of top management support and training on systems implementation success: A meta-analysis. *Communications of the Association for Information Systems*, *35*, 19-37.

Hwang, M. I., Windsor, J. C., & Pryor, A. (2000). Building a knowledge base for MIS research: A meta-analysis of a systems success model. *Information Resources Management Journal*, *13*(2), 26-32.

Irani, Z., & Love, P. E. D. (2002). Developing a frame of reference for ex-ante IT/IS investment evaluation. *European Journal of Information Systems*, *11*(1), 74-82.

Jacks, T., Wallace, S., & Nemati, H. (2012). Impact of culture on knowledge management: A meta-analysis and framework. *Journal of Global Information Technology Management*, *15*(4), 8-42.

Jasperson, J. S., Carte, T., Saunders, C. S., Butler, B. S., Croes, H. J. P., & Zheng, W. (2002). Power and information technology research: A metatriangulation review. *MIS Quarterly*, *26*(4), 397-459.

Jenkin, T. A., Webster, J., & McShane, L. (2011). An agenda for "green" information technology and systems research. *Information and Organization*, *21*(1), 17-40.

Jeyaraj, A., Rottman, J. W., & Lacity, M. C. (2006). A review of the predictors, linkages, and biases in IT Innovation adoption research. *Journal of Information Technology*, *21*(1), 1-23.

Johnson, R. A. (2002). Object-oriented systems development: A review of empirical research. *Communications of the Association for Information Systems*, *8*, 65-81.

Jones, M. R., & Karsten, H. (2008). Giddens's structuration theory and information systems research. *MIS Quarterly*, *32*(1), 127-157.

Joseph, D., Ng, K.-Y., Koh, C., & Ang, S. (2007). Turnover of information technology professionals: A narrative review, meta-analytic structural equation modeling, and model development. *MIS Quarterly*, *31*(3), 547-577.

Joseph, D., Ng, K.-Y., Koh, C., & Ang, S. (2007). Turnover of information technology professionals: A narrative review, meta-analytic structural equation modeling, and model development. *MIS Quarterly*, *31*(3), 547-577.f

Kappos, A., & Rivard, S. (2008). A three-perspective model of culture, information systems, and their development and use. *MIS Quarterly*, *32*(3), 601-634.

Karimi Alaghehband, F., Rivard, S., Wu, S., & Goyette, S. (2011). An assessment of the use of transaction cost theory in information technology outsourcing. *The Journal of Strategic Information Systems*, *20*(2), 125-138.

Karsten, R., Mitra, A., & Schmidt, D. (2012). Computer self-efficacy: A meta-analysis. *Journal of Organizational and End User Computing*, *24*(4), 54-80.

Katerattanakul, P., & Han, B. (2003). Are European IS journals under-rated? An answer based on citation analysis. *European Journal of Information Systems*, *12*(1), 60-71.

Kauffman, R. J., & Lee, D. (2010). A multi-level theory approach to understanding price rigidity in internet retailing. *Journal of the Association for Information Systems*, *11*(6), 303-338.

Kauffman, R. J., & Walden, E. A. (2001). Economics and electronic commerce: Survey and directions for research. *International Journal of Electronic Commerce*, *5*(4), 5-116.

Kautz, K., Madsen, S., & Nørbjerg, J. (2007). Persistent problems and practices in information systems development. *Information Systems Journal*, *17*(3), 217-239.

Khalifa, M., & Liu, V. (2004). The state of research on information systems satisfaction. *Journal of Information Technology Theory and Application*, *5*(4), 37-49.

King, W. R., & He, J. (2005). Understanding the role and methods of meta-analysis in IS research. *Communications of the Association for Information Systems*, *16*, 665-686.

King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. *Information & Management*, *43*(6), 740-755.

Kohli, R., & Devaraj, S. (2003). Measuring information technology payoff: A meta-analysis of structural variables in firm-level empirical research. *Information Systems Research*, *14*(2), 127-145.

Kohli, R., & Grover, V. (2008). Business value of IT: An essay on expanding research directions to keep up with the times. *Journal of the Association for Information Systems*, *9*(1), 23-39.

Kontolemakis, G., Kanellis, P., & Martakos, D. (2004). Software agents for electronic marketplaces: Current and future research directions. *Journal of Information Technology Theory and Application*, *6*(1), 43-60.

Kuhn, T. S. (1970). *The structure of scientific revolutions* (2nd ed.). Chicago, IL: University of Chicago Press.

Kuriyan, R., Kitner, K., & Watkins, J. (2010). ICTs, development and trust: An overview. *Information Technology & People*, *23*(3), 216-221.

Lacity, M. C., Khan, S. A., & Willcocks, L. P. (2009). A review of the IT outsourcing literature: Insights for practice. *The Journal of Strategic Information Systems*, *18*(3), 130-146.

Lacity, M. C., Khan, S. A., Yan, A., & Willcocks, L. P. (2010). A review of the IT outsourcing empirical literature and future research directions. *Journal of Information Technology*, *25*(4), 395-433.

Lacity, M. C., Solomon, S., Yan, A., & Willcocks, L. P. (2011a). Business process outsourcing studies: A critical review and research directions. *Journal of Information Technology*, *26*(4), 221-258.

Lacity, M. C., Willcocks, L. P., & Khan, S. A. (2011b). Beyond transaction cost economics: Towards an endogenous theory of information technology outsourcing. *The Journal of Strategic Information Systems*, *20*(2), 139-157.

Lamp, J. (2013). *IS journal ranking and analysis.* Retrieved from http://lamp.infosys.deakin.edu.au/journals/?page=rankanalysis

Larsen, K. R. T. (2003). A taxonomy of antecedents of information systems success: Variable analysis studies. *Journal of Management Information Systems*, *20*(2), 169-246.

Lawrence, C. (2013). A holistic narrative of culture's mediation of information systems innovation: A qualitative meta-synthesis. *Journal of Global Information Technology Management*, *16*(3), 31-52.

Lee, G., & Xia, W. (2006). Organizational size and IT innovation adoption: A meta-analysis. *Information & Management*, *43*(8), 975-985.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information & Management*, *40*(3), 191-204.

Leidner, D. E. (2010). Globalization, culture, and information: Towards global knowledge transparency. *The Journal of Strategic Information Systems*, *19*(2), 69-77.

Leidner, D. E. (2018). Review and theory symbiosis: An introspective retrospective. *Journal of the Association for Information Systems*, *19*(6), 552-567.

Leidner, D. E., & Kayworth, T. (2006). Review: A review of culture in information systems research: Toward a theory of information technology culture conflict. *MIS Quarterly*, *30*(2), 357-399.

Levac, D., Colquhoun, H., & O'Brien, K. K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, *5*(1), 1-9.

Levy, Y., & Ellis, T. J. (2006). A systems approach to conduct an effective literature review in support of information systems research. *Informing Science*, *9*, 181-212.

Li, L., Gao, P., & Mao, J.-Y. (2014). Research on IT in China: A call for greater contextualization. *Journal of Information Technology*, *29*(3), 208-222.

Li, Y. (2012). Theories in online information privacy research: A critical review and an integrated framework. *Decision Support Systems*, *54*(1), 471-481.

Li, Y., & Kettinger, W. J. (2006). An evolutionary information-processing theory of knowledge creation. *Journal of the Association for Information Systems*, *7*(9), 593-617.

Lowry, P. B., Moody, G. D., Gaskin, J., Galletta, D. F., Humpherys, S. L., Barlow, J. B., & Wilson, D. W. (2013). Evaluating journal quality and the association for information systems senior scholars' journal basket via bibliometric measures: Do expert journal assessments add value? *MIS Quarterly*, *37*(4), 993-1012.

Lowry, P. B., Romans, D., & Curtis, A. (2004). Global journal prestige and supporting disciplines: A scientometric study of information systems journals. *Journal of the Association for Information Systems*, *5*(2), 29-77.

Ma, Q., & Liu, L. (2004). The technology acceptance model: A meta-analysis of empirical findings. *Journal of Organizational and End User Computing*, *16*(1), 59-72.

Mahmood, M. A., Hall, L., & Swanberg, D. L. (2001). Factors affecting information technology usage: A meta-analysis of the empirical literature. *Journal of Organizational Computing and Electronic Commerce*, *11*(2), 107-130.

Mantena, R., Tilson, V., & Zheng, X. (2012). Literature survey: Mathematical models in the analysis of durable goods with emphasis on information systems and operations management issues. *Decision Support Systems*, *53*(2), 331-344.

Mantena, R., Tilson, V., & Zheng, X. (2012). Literature survey: Mathematical models in the analysis of durable goods with emphasis on information systems and operations management issues. *Decision Support Systems*, *53*(2), 331-344.

Marble, R. P. (2000). Operationalising the implementation puzzle: An argument for eclecticism in research and in practice. *European Journal of Information Systems*, *9*(3), 132-147.

Mathiassen, L., Saarinen, T., Tuunanen, T., & Rossi, M. (2007). A contingency model for requirements development. *Journal of the Association for Information Systems*, *8*(11), 569-597.

Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Review: Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly*, *28*(2), 283-322.

Merali, Y., Papadopoulos, T., & Nadkarni, T. (2012). Information systems strategy: Past, present, future? *The Journal of Strategic Information Systems*, *21*(2), 125-153.

Mingers, J., & Willcocks, L. P. (2014). An integrative semiotic framework for information systems: The social, personal and material worlds. *Information and Organization*, *24*(1), 48-70.

Miranda, S. M., & Kavan, C. B. (2005). Moments of governance in IS outsourcing: Conceptualizing Effects of contracts on value capture and creation. *Journal of Information Technology*, *20*(3), 152-169.

Mishra, A., & Mishra, D. (2011). E-government—exploring the different dimensions of challenges, implementation, and success factors. *ACM SIGMIS Database*, *42*(4), 23-37.

Moe, C. E. (2014). Research on public procurement of information systems: the need for a process approach. *Communications of the Association for Information Systems*, *34*(1), 1319-1335.

Müller, S. D., & Ulrich, F. (2013). Creativity and information systems in a hypercompetitive environment: A literature review. *Communications of the Association for Information Systems*, *32*, 175-200.

Myers, M. D., & Venable, J. R. (2014). A set of ethical principles for design science research in information systems. *Information & Management*, *51*(6), 801-809.

Mykytyn, K., Mykytyn, P. P., Bordoloi, B., McKinney, V., & Bandyopadhyay, K. (2002). The role of software patents in sustaining IT-enabled competitive advantage: A call for research. *The Journal of Strategic Information Systems*, *11*(1), 59-82.

Neuendorf, K. A. (2002). *The content analysis guidebook*. Thousand Oaks, CA: Sage.

Ngai, E. W. T., Hu, Y., Wong, Y. H., Chen, Y., & Sun, X. (2011). The application of data mining techniques in financial fraud detection: A classification framework and an academic review of literature. *Decision Support Systems*, *50*(3), 559-569.

Okoli, C. (2015a). *The view from giants' shoulders: Developing theory with theory-mining systematic literature reviews.* Retrieved from http://dx.doi.org/10.2139/ssrn.2115818

Okoli, C. (2015b). A guide to conducting a standalone systematic literature review. *Communications of the Association for Information Systems*, *37*, 879-910.

Ortiz de Guinea, A., Webster, J., & Staples, D. S. (2012). A meta-analysis of the consequences of virtualness on team functioning. *Information & Management*, *49*(6), 301-308.

Pahlke, I., Beck, R., & Wolf, M. (2010). Enterprise mashup systems as platform for situational applications. *Business & Information Systems Engineering*, *2*(5), 305-315.

Paré, G., Bourdeau, S., Marsan, J., Nach, H., & Shuraida, S. (2008). Re-examining the causal structure of information technology impact research. *European Journal of Information Systems*, *17*(4), 403-416.

Paré, G., Tate, M., Johnstone, D., & Kitsiou, S. (2016). Contextualizing the twin concepts of systematicity and transparency in information systems literature reviews. *European Journal of Information Systems*, *25*(6), 493-508.

Paré, G., Trudel, M.-C., Jaana, M., & Kitsiou, S. (2015). Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management*, *52*(2), 183-199.

Pateli, A. G., & Giaglis, G. M. (2004). A research framework for analysing ebusiness models. *European Journal of Information Systems*, *13*(4), 302-314.

Pawlowski, J. M., Bick, M., Peinl, R., Thalmann, S., Maier, R., Hetmank, L., Kruse, P., Martensen, M., & Pirkkalainen, H. (2014). Social knowledge environments. *Business & Information Systems Engineering*, *6*(2), 81-88.

Pawson, R., Greenhalgh, T., Harvey, G., & Walshe, K. (2005). Realist review—a new method of systematic review designed for complex policy interventions. *Journal of Health Services Research & Policy*, *10*, 21-34.

Petter, S., & McLean, E. R. (2009). A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level. *Information & Management*, *46*(3), 159-166.

Petter, S., DeLone, W. H., & McLean, E. R. (2008). Measuring information systems success: Models, dimensions, measures, and interrelationships. *European Journal of Information Systems*, *17*(3), 236-263.

Petter, S., DeLone, W. H., & McLean, E. R. (2013). Information systems success: The quest for the independent variables. *Journal of Management Information Systems*, *29*(4), 7-62.

Petticrew, M., & Roberts, H. (2008). *Systematic reviews in the social sciences: A practical guide*. Malden, MA: Blackwell.

Piccoli, G., & Ives, B. (2005). IT-dependent strategic initiatives and sustained competitive advantage: A review and synthesis of the literature. *MIS Quarterly*, *29*(4), 747-776.

Polites, G. L., & Karahanna, E. (2013). The embeddedness of information systems habits in organizational and individual level routines: Development and disruption. *MIS Quarterly*, *37*(1), 221-246.

Pollard, C., Young, J., & Gregg, P. (2006). Towards a simplified framework of CRM for use in public and private sectors. *Journal of Information Technology Case and Application Research*, *8*(2), 24-38.

Popper, K. R. (2014). *Conjectures and refutations—conjectures and refutations: The growth of scientific knowledge* (3rd ed.). London, UK: Routledge Classics.

Powell, A., Piccoli, G., & Ives, B. (2004). Virtual teams: A review of current literature and directions for future research. *ACM SIGMIS Database*, *35*(1), 6-36.

Powell, S. G., Baker, K. R., & Lawson, B. (2008). A critical review of the literature on spreadsheet errors. *Decision Support Systems*, *46*(1), 128-138.

Probst, F., Grosswiele, L., & Pfleger, R. (2013). Who will lead and who will follow: Identifying influential Users in online social networks. *Business & Information Systems Engineering*, *5*(3), 179-193.

Reinecke, K., & Bernstein, A. (2013). Knowing what a user likes: A design science approach to interfaces that automatically adapt to culture. *MIS Quarterly*, *37*(2), 427-453

Richter, D., Riemer, K., & vom Brocke, J. (2011). Internet social networking. *Business & Information Systems Engineering*, *3*(2), 89-101.

Riedl, C., Leimeister, J. M., & Krcmar, H. (2011). Why e-service development is different: A literature review. *e-Service Journal*, *8*(1), 2-22.

Riedl, R. (2013). On the biology of technostress: Literature review and research agenda. *ACM SIGMIS Database*, *44*(1), 18-55.

Riemer, K., & Vehring, N. (2012). Virtual or vague? A literature review exposing conceptual differences in defining virtual organizations in IS research. *Electronic Markets*, *22*(4), 267-282.

Rivard, S. (2014). Editor' s comments: The ions of theory construction. *MIS Quarterly*, *38*(2), iii-xiv.

Roberts, N., Galluch, P. S., Dinger, M., & Grover, V. (2012). Absorptive capacity and information systems research: Review, synthesis, and directions for future research. *MIS Quarterly*, *36*(2), 625-648.

Robey, D., Im, G., & Wareham, J. D. (2008). Theoretical foundations of empirical research on interorganizational systems: Assessing past contributions and guiding future directions. *Journal of the Association for Information Systems*, *9*(9), 497-518.

Rosenkranz, N., Eckhardt, A., Kühne, M., & Rosenkranz, C. (2013). Health information on the Internet. *Business & Information Systems Engineering*, *5*(4), 259-274.

Rosenthal, R., & DiMatteo, M. R. (2001). Meta-analysis: Recent developments in quantitative methods for literature reviews. *Annual Review of Psychology*, *52*(1), 59-82.

Rowe, F. (2012). Toward a richer diversity of genres in information systems research: New categorization and guidelines. *European Journal of Information Systems*, *21*(5), 469-478.

Rowe, F. (2014). What literature review is not: Diversity, boundaries and recommendations. *European Journal of Information Systems*, *23*(3), 241-255.

Saeed, K. A., Hwang, Y., & Yi, M. Y. (2003). Toward an integrative framework for online consumer behavior research: A meta-analysis approach. *Journal of Organizational and End User Computing*, *15*(4), 1-26.

Sandberg, J., & Alvesson, M. (2011). Ways of constructing research questions: Gap-spotting or problematization? *Organization*, *18*(1), 23-44.

Santhanam, R., Yi, M. Y., Sasidharan, S., & Park, S.-H. (2013). Toward an integrative understanding of information technology training research across information systems and human-computer interaction: A comprehensive review. *AIS Transactions on Human-Computer Interaction*, *5*(3), 134-156.

Schepers, J., & Wetzels, M. (2007). A meta-analysis of the technology acceptance model: Investigating subjective norm and moderation effects. *Information & Management*, *44*(1), 90-103.

Schief, M., Buxmann, P., & Schiereck, D. (2013). Mergers and acquisitions in the software industry. *Business & Information Systems Engineering*, *5*(6), 421-431.

Schryen, G. (2010). Preserving knowledge on IS business value: What literature reviews have done. *Business & Information Systems Engineering*, *2*(4), 233-244.

Schryen, G. (2013). Revisiting IS business value research: What we already know, what we still need to know, and how we can get there. *European Journal of Information Systems*, *22*(2), 139-169.

Schryen, G., Wagner, G., & Benlian, A. (2015). Theory of knowledge for literature reviews: An epistemological model, taxonomy and empirical analysis of IS literature. In *Proceedings of the 36th International Conference on Information Systems*.

Schultze, U. (2010). Embodiment and presence in virtual worlds: A review. *Journal of Information Technology*, *25*(4), 434-494.

Schultze, U., & Leidner, D. E. (2002). Studying knowledge management in information systems research: Discourses and theoretical assumptions. *MIS Quarterly*, *26*(3), 213-242.

Schwarz, A., Mehta, M., Johnson, N., & Chin, W. W. (2007). Understanding frameworks and reviews: A commentary to assist us in moving our field forward by analyzing our past. *ACM SIGMIS Database*, *38*(3), 29-50.

Seddon, P. B. (2014). Implications for strategic IS research of the resource-based theory of the firm: A reflection. *The Journal of Strategic Information Systems*, *23*(4), 257-269.

Serenko, A., Bontis, N., Booker, L., Sadeddin, K., & Hardie, T. (2010). A scientometric analysis of knowledge management and intellectual capital academic literature (1994-2008). *Journal of Knowledge Management*, *14*(1), 3-23.

Seuring, S. (2013). A review of modeling approaches for sustainable supply chain management. *Decision Support Systems*, *54*(4), 1513-1520.

Shankar, V., Urban, G. L., & Sultan, F. (2002). Online trust: A stakeholder perspective, concepts, implications, and future directions. *The Journal of Strategic Information Systems*, *11*(3-4), 325-344.

Sharma, R., & Yetton, P. (2003). The contingent effects of management support and task interdependence on successful information systems implementation. *MIS Quarterly*, *27*(4), 533-555.

Sharma, R., & Yetton, P. (2007). The contingent effects of training, technical complexity, and task interdependence on successful information systems implementation. *MIS Quarterly*, *31*(2), 219-238.

Shim, J. P., Warkentin, M., Courtney, J. F., Power, D. J., Sharda, R., & Carlsson, C. (2002). Past, present, and future of decision support technology. *Decision Support Systems*, *33*(2), 111-126.

Shin, B., Liu Sheng, O. R., & Higa, K. (2000). Telework: Existing research and future directions. *Journal of Organizational Computing and Electronic Commerce*, *10*(2), 85-101.

Siau, K., Long, Y., & Ling, M. (2010). Toward a unified model of information systems development success. *Journal of Database Management*, *21*(1), 80-101.

Siau, K., Nah, F. F.-H., & Cao, Q. (2011). A meta-analysis comparing relational and semantic models. *Journal of Database Management*, *22*(4), 57-72.

Sidorova, A., Evangelopoulos, N., Valacich, J. S., & Ramakrishnan, T. (2008). Uncovering the intellectual core of the information systems discipline. *MIS Quarterly*, *32*(3), 467-482.

Silva, L. (2007). Post-positivist review of technology acceptance model. *Journal of the Association for Information Systems*, *8*(4), 255-266.

Siponen, M. T., & Oinas-Kukkonen, H. (2007). A review of information security issues and respective research contributions. *ACM SIGMIS Database*, *38*(1), 60-80.

Siponen, M. T., & Vartiainen, T. (2004). Unauthorized copying of software and levels of moral development: A literature analysis and its implications for research and practice. *Information Systems Journal*, *14*(4), 387-407.

Smith, H. J., Dinev, T., & Xu, H. (2011). Information privacy research: An interdisciplinary review. *MIS Quarterly*, *35*(4), 989-1015.

Soh, C., & Markus, M. L. (1995). How IT creates business value: A process theory synthesis. In *Proceedings of the 16th International Conference on Information Systems.*

Srivardhana, T., & Pawlowski, S. D. (2007). ERP systems as an enabler of sustained business process innovation: a knowledge-based view. *The Journal of Strategic Information Systems*, *16*(1), 51-69.

Stahl, B. C. (2012). Morality, ethics, and reflection: A categorization of normative IS research. *Journal of the Association for Information Systems*, *13*(8), 636-656.

Standing, S., Standing, C., & Love, P. E. D. (2010). A review of research on e-marketplaces 1997- 2008. *Decision Support Systems*, *49*(1), 41-51.

Sun, Y., Lim, K. H., & Peng, J. Z. (2013). Solving the distinctiveness-blindness debate: A unified model for understanding banner processing. *Journal of the Association for Information Systems*, *14*(2), 49-71.

Sunyaev, A. (2014). Consumer facing health care systems. *e-Service Journal*, *9*(2), 1-23.

Suriadi, S., Weiß, B., Winkelmann, A., Hofstede, A. H. M. ter, Adams, M., Confoti, R., Fidge, C., La Rosa, M., Ouyang, C., Pika, A., Rosemann, M., & Wynn, M. T. (2014). Current research in risk-aware business process management-overview, comparison, and gap analysis. *Communications of the Association for Information Systems*, *34*, 933-984.

Tams, S. (2013). Moving cultural information systems research toward maturity: A review of definitions of the culture construct. *Information Technology & People*, *26*(4), 383-400.

Tams, S., Grover, V., & Thatcher, J. (2014). Modern information technology in an old workforce: Toward a strategic research agenda. *The Journal of Strategic Information Systems*, *23*(4), 284-304.

Tan, C., & Sia, S. K. (2006). Managing flexibility in outsourcing. *Journal of the Association for Information Systems*, *7*(4), 179-206.

Te'eni, D. (2001). Review: A cognitive-affective model of organizational communication for designing IT. *MIS Quarterly*, *25*(2), 251-312.

Templier, M., & Paré, G. (2015). A framework for guiding and evaluating literature reviews. *Communications of the Association for Information Systems*, *3*, 112-137.

Templier, M., & Paré, G. (2018). Transparency in literature reviews: An assessment of reporting practices across review types and genres in top IS journals. *European Journal of Information Systems*, *27*(5), 503-550.

Thomson, D., Russell, K., Becker, L., Klassen, T., & Hartling, L. (2010). The evolution of a new publication type: Steps and challenges of producing overviews of reviews. *Research Synthesis Methods*, *1*(3-4), 198-211.

Topi, H., & Ramesh, V. (2002). Human factors research on data modeling: A review of prior research, an extended framework and future research directions. *Journal of Database Management*, *13*(2), 3-19.

Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Review*, *4*(3), 356-367.

Trinh-Phuong, T., Molla, A., & Peszynski, K. (2012). Enterprise systems and organizational agility: A review of the literature and conceptual framework. *Communications of the Association for Information Systems*, *31*, 167-193.

Trkman, P., & Desouza, K. C. (2012). Knowledge risks in organizational networks: An exploratory framework. *The Journal of Strategic Information Systems*, *21*(1), 1-17.

Turban, E., Bolloju, N., & Liang, T.-P. (2011). Enterprise social networking: Opportunities, adoption, and risk mitigation. *Journal of Organizational Computing and Electronic Commerce*, *21*(3), 202-220.

Tyran, C. K., & Shepherd, M. (2001). Collaborative technology in the classroom: A review of the GSS research and a research framework. *Information Technology and Management*, *2*(4), 395-418.

Ullah, A., & Lai, R. (2013). A systematic review of business and information technology alignment. *ACM Transactions on Management Information Systems*, *4*(1), 1-30.

Ullrich, C. (2013). Valuation of IT investments using real options theory. *Business & Information Systems Engineering*, *5*(5), 331-341.

Urbach, N., Smolnik, S., & Riempp, G. (2009). The state of research on information systems success. *Business & Information Systems Engineering*, *1*(4), 315-325.

Urbaczewski, A., Jessup, L. M., & Wheeler, B. (2002). Electronic commerce research: A taxonomy and synthesis. *Journal of Organizational Computing and Electronic Commerce*, *12*(4), 263-305.

Varshney, U. (2013). Mobile health: Four emerging themes of research. *Decision Support Systems*, *66*, 20-35.

Vavilis, S., Petkovi, M., & Zannone, N. (2014). A reference model for reputation systems. *Decision Support Systems*, *61*, 147-154.

Veiga, J. F., Floyd, S., & Dechant, K. (2001). Towards modelling the effects of national culture on IT implementation and acceptance. *Journal of Information Technology*, *16*(3), 145-158.

Venters, W., & Whitley, E. A. (2012). A critical review of cloud computing: Researching desires and realities. *Journal of Information Technology*, *27*(3), 179-197.

vom Brocke, J., Simons, A., Riemer, K., Niehaves, B., Plattfaut, R., & Cleven, A. (2015). Standing on the shoulders of giants: Challenges and recommendations of literature search in information systems research. *Communications of the Association for Information Systems*, *37*, 205-224.

von Krogh, G. (2012). How does social software change knowledge management? Toward a strategic research agenda. *The Journal of Strategic Information Systems*, *21*(2), 154-164.

von Krogh, G., Haefliger, S., Spaeth, S., & Wallin, M. W. (2012). Carrots and rainbows: Motivation and social practice in open source software development. *MIS Quarterly*, *36*(2), 649-676.

Wade, M., & Hulland, J. (2004). The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly*, *28*(1), 107-142.

Wagner, C. (2004). Enterprise strategy management systems: Current and next generation. *The Journal of Strategic Information Systems*, *13*(2), 105-128.

Wagner, G., Prester, J., Roche, M., Benlian, A., & Schryen, G. (2016). Factors affecting the scientific impact of literature reviews: A scientometric study. In *Proceedings of the 37th International Conference on Information Systems*.

Walker, L. O., & Avant, K. C. (2011). *Strategies for theory construction in nursing* (6th ed.). Upper Saddle River, NJ: Pearson.

Walter, S. G., & Spitta, T. (2004). Approaches to the ex-ante evaluation of investments into information systems. *Wirtschaftsinformatik*, *46*(3), 171-180.

Wan, Z., Fang, Y., & Neufeld, D. J. (2007). The role of information technology in technology-mediated learning: A review of the past for the future. *Journal of Information Systems Education*, *18*(2), 183-192.

Wang, C., & Kaarst-Brown, M. L. (2014). The IT compensation challenge: Theorizing the balance among multi-level internal and external uncertainties. *Journal of the Association for Information Systems*, *15*(3), 111-146.

Wang, J., & Keil, M. (2007). A meta-analysis comparing the sunk cost effect for IT and non-IT projects. *Information Resources Management Journal*, *20*(3), 1-18.

Wang, Q. E., Myers, M. D., & Sundaram, D. (2013). Digital natives and digital immigrants. *Business & Information Systems Engineering*, *5*(6), 409-419.

Wang, S., Zheng, S., Xu, L., Li, D., & Meng, H. (2008). A literature review of electronic marketplace research: Themes, theories and an integrative framework. *Information Systems Frontiers*, *10*(5), 555-571.

Wang, T.-W., & Murphy, K. E. (2004). Semantic heterogeneity in multidatabase systems: A review and a proposed meta-data structure. *Journal of Database Management*, *15*(4), 71-87.

Weber, D. M., & Kauffman, R. J. (2011). What drives global ICT adoption? Analysis and research directions. *Electronic Commerce Research and Applications*, *10*(6), 683-701.

Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS Quarterly*, *26*(2), xiii-xxiii.

Weigel, F. K., Hazen, B. T., Cegielski, C. G., & Hall, D. J. (2014). Diffusion of innovations and the theory of planned behavior in information systems research: A metaanalysis. *Communications of the Association for Information Systems*, *34*, 619-636.

Whelan, E. (2007). Exploring knowledge exchange in electronic networks of practice. *Journal of Information Technology*, *22*(1), 5-12.

Whitley, E. A., Willcocks, L. P., & Venters, W. (2013). Privacy and security in the cloud: A review of guidance and responses. *Journal of International Technology & Information Management*, *22*(3), 75-92.

Wiener, M., Vogel, B., & Amberg, M. (2010). Information systems offshoring—a literature review and analysis. *Communications of the Association for Information Systems*, *27*, 455-492.

Williams, R., & Pollock, N. (2012). Research commentary-moving beyond the single site implementation study: How (and why) we should study the biography of packaged enterprise solutions. *Information Systems Research*, *23*(1), 1-22.

Wills, M. J., Sarnikar, S., El-Gayar, O. F., & Deokar, A. V. (2010). Information systems and healthcare XXXIV: Clinical knowledge management systems—literature review and research issues for information systems. *Communications of the Association for Information Systems*, *26*, 565-598.

Wu, J., & Du, H. (2012). Toward a Better Understanding of Behavioral Intention and System Usage Constructs. *European Journal of Information Systems*, *21*(6), 680-698.

Wu, J., & Lederer, A. (2009). A meta-analysis of the role of environment-based voluntariness in information technology acceptance. *MIS Quarterly*, *33*(2), 419-432.

Wu, J., & Lu, X. (2013). Effects of extrinsic and intrinsic motivators on using utilitarian, hedonic, and dual-purposed information systems: A meta-analysis. *Journal of the Association for Information Systems*, *14*(3), 153-191.

Wu, L.-C., & Wu, L.-H. (2010). Service engineering : An interdisciplinary framework. *Journal of Computer Information Systems*, *51*(2), 14-23.

Xiao, B., & Benbasat, I. (2007). E-commerce product recommendation agents: Use, characteristics, and impact. *MIS Quarterly*, *31*(1), 137-209.

Xiao, X., Califf, C. B., Sarker, S., & Sarker, S. (2013). ICT innovation in emerging economies: A review of the existing literature and a framework for future research. *Journal of Information Technology*, *28*(4), 264-278.

Yang, H., & Tate, M. (2012). A descriptive literature review and classification of cloud computing research. *Communications of the Association for Information Systems*, *31*, 35-60.

Zhang, D., & Lowry, P. B. (2008). Issues, limitations, and opportunities in cross-cultural research on collaborative software in information systems. *Journal of Global Information Management*, *16*(1), 61-84.

Zhang, P. (2013). The affective response model: A theoretical framework of affective concepts and their relationships in the ICT context. *MIS Quarterly*, *37*(1), 247-274.

Zhao, Y., & Zhu, Q. (2014). Evaluation on crowdsourcing research: Current status and future direction. *Information Systems Frontiers*, *16*(3), 417-434.

Zviran, M., & Erlich, Z. (2003). Measuring IS user satisfaction: Review and implications. *Communications of the Association for Information Systems*, *12*(5), 81-103.

Zwass, V. (2003). Electronic commerce and organizational innovation: Aspects and opportunities. *International Journal of Electronic Commerce*, *7*(3), 7-37.

Appendix A: Selecting IS Journals

As for how we identified the literature reviews, we considered publications in pertinent academic IS journals. All three attributes (i.e., pertinent, academic, and IS) are subjective to some extent: pertinent refers to what scholars perceive as "high quality". While some scholars draw on impact measures, such as the ISI impact factor and the h-index, others use power measures, which indicate "how powerful a journal is in attracting and displaying the research produced by scholars who have achieved a particular threshold" (Chen & Holsapple, 2013, p. 403). The IS literature provides many studies on IS journals' quality (e.g., Lamp, 2013), and their results reflect different perspectives and methodologies. Researchers often use the attribute academic as the counterpart to practice oriented. This distinction is fuzzy and subject to personal attitudes as, first, some journals publish studies that both scholars and practitioners find relevant[9] and, second, some journals publish both academic papers and papers for practitioners (e.g., *Communications of the ACM*). Finally, it is not always obvious what makes a journal an IS journal. For example, the journal *Management Science* publishes, among others, IS studies. While scholars might argue that the journal's high reputation means one should consider it an IS journal, others might argue that one should not because it only minorly focuses on IS studies. We sought journals that garnered a high level of consensus in the IS community with regard to their classification as pertinent academic IS journals. We argue that Lowry et al.'s (2013) study, which identifies and ranks the best IS journals, met this requirement. Although each journal ranking has its limitations, we believe that Lowry et al.'s (2013) study has the potential to become widely accepted in the IS community for four reasons. First, it considers prior studies on IS journals' quality (Katerattanakul & Han, 2003; Lowry, Romans, & Curtis, 2004). Second, the authors evaluated "the editorial mission and stated goals of the supporting organization for every journal" (p. 997) in order to justify whether they classified a journal as being both academic and related to IS. Third, the authors account for both scholars' preferences and scientometric measures and provide empirical evidence that expert-based methods provide very similar results to bibliometric measures, such as the ISI impact factor and the h-index. In this regard, the study shows robust findings. Fourth, it includes the widely acknowledged AIS Senior Scholars' basket of journals. We refer to this set of 40 IS journals as *ISJOUR*; we provide the complete list of these journals in Table A1 below.

Table 1. ISJOUR: Set of 40 IS Journals

Journal	Abbreviation
ACM SIGMIS Database	*DATABASE*
ACM Transactions on Management Information Systems	*ACM TMIS*
AIS Transactions on Human-Computer Interaction	*AIS THCI*
Australasian Journal of Information Systems	*AJIS*
Business & Information Systems Engineering/Wirtschaftsinformatik	*BISE/WI*
Communications of the Association for Information Systems	*CAIS*
Decision Support Systems	*DSS*
Electronic Commerce Research and Applications	*ECRA*
Electronic Markets	*EM*
e-Service Journal	*e-SJ*
European Journal of Information Systems	*EJIS*
Information & Management	*I&M*
Information and Organization	*I&O*
Information Resources Management Journal	*IRMJ*
Information Systems Frontiers	*ISF*
Information Systems Journal	*ISJ*
Information Systems Management	*ISM*
Information Systems Research	*ISR*

[9] For example, the CIONET, a European network of 4,300 CIOs, awards research papers that are, from a practitioner's point of view, excellent in terms of rigor and relevance. In 2014, CIONET awarded Reinecke and Bernstein's (2013) paper in *MISQ*.

Table 1. ISJOUR: Set of 40 IS Journals

Information Technology & People	*IT&P*
Information Technology and Management	*IT&M*
International Journal of Electronic Commerce	*IJEC*
Journal of Computer Information Systems	*JCIS*
Journal of Database Management	*JDM*
Journal of Global Information Management	*JGIM*
Journal of Global Information Technology Management	*JGITM*
Journal of Information Systems Education	*JISE*
Journal of Information Technology	*JIT*
Journal of Information Technology Case and Application Research	*JITCAR*
Journal of Information Technology Management	*JITM*
Journal of Information Technology Theory and Application	*JITTA*
Journal of International Technology & Information Management	*JITIM*
Journal of Management Information Systems	*JMIS*
Journal of Organizational and End User Computing	*JOEUC*
Journal of Organizational Computing and Electronic Commerce	*JOCEC*
Journal of the Association for Information Systems	*JAIS*
MIS Quarterly	*MISQ*
MIS Quarterly Executive	*MISQE*
Revista Latinoamericana y del Caribe de la Asociación de Sistemas de Información	*RELCASI*
Scandinavian Journal of Information Systems	*SJIS*
The Journal of Strategic Information Systems	*JSIS*

Appendix B: Screening IS Literature Reviews

We analyzed each literature review candidate with regard to whether it conformed to how we defined a literature review. After we conducted a training phase and developed a coding scheme (Neuendorf, 2002, p. 160), the first and second authors coded the set of 522 candidates. From this set, we excluded 91 candidates (e.g., Appleford, Bottum, & Thatcher 2014) since they did not provide a synthesis (Property 1). We removed 93 candidates (e.g., Balijepally, Mangalaraj, & Iyengar, 2011) because they did not focus on domain knowledge (Property 2), although we adopted a broad understanding of what a domain is, including a whole field (e.g., IS field) and also a theme-specific part of a field, such as IT business value or business-IT alignment. We acknowledge that other literature studies provide valuable ways to develop knowledge, though we do not focus on them in this paper. For example, we excluded scientometric studies (which analyze metadata, such as journals, years, research methodologies, and research paradigms), such as Serenko, Bontis, Booker, Sadeddin, and Hardie's (2010) study. We removed two editorials (e.g., Kuriyan, Kitner, & Watkins, 2010) and 25 research commentaries and research notes (e.g., Brenner et al., 2014). We excluded 45 papers that collected primary data (e.g., Grahlmann, Helms, Hilhorst, Brinkkemper, & van Amerongen, 2012; Venters & Whitley, 2012), 15 papers that did not review academic literature primarily (e.g., Cox, 2003; Huang, Chen, & Hee, 2006), 10 papers that focused on a journal's history (e.g., Avison, Dwivedi, Fitzgerald, & Powell, 2008; Dwivedi & Kuljis, 2008) and one paper that developed an artifact (Wang & Murphy, 2004). In total, we excluded 282 candidates (we can provide the excluded reviews on request) and identified 240 literature reviews, which we list in Appendix D.

We measured the reliability of the inclusion decisions based on a random subsample of 69 candidates, which the first and second authors coded using the coding scheme in Table C1 in Appendix C. As such, we followed common recommendations for both coders to code 10 to 25 percent of the data. Cohen's kappa (Cohen, 1960), which quantifies inter-rater reliability while controlling for agreement by chance, was 0.94, which indicates a very high level of agreement. These authors separately coded the remaining candidates. The third and fourth authors reconciled disagreements.

Appendix C: Coding Process

Beyond the basic information (e.g., year of publication, journal), the first and second authors coded the theoretical review type[10], the domain, and the knowledge-building activities (including the resulting type of literature review). We coded the domain (Cooper, 1988; Rowe, 2014) on which the literature review focused without a predefined scheme. After we completed the open coding, we refined the domain descriptions via discussion. In coding the knowledge-building activities (i.e., synthesizing, aggregating evidence, criticizing, theory building, identifying research gaps, and developing a research agenda), we considered the review's contributions in a holistic way without narrowly focusing on particular keywords. We coded differences in type, not in quality (e.g., for the first activity, some reviews summarized a limited number of existing papers, while others more comprehensively synthesized the literature). Similarly, we coded theory building when papers met the minimum requirements (e.g., they included a variety of contributions whose theoretical value one may judge differently depending on the observer and the observer's criteria). For reviews that developed knowledge through theory building, we coded the type of theory as analyzing, explaining, predicting, explaining and predicting, or design and action (Gregor, 2006). These categories do not mutually exclude the others (i.e., reviews can combine multiple knowledge-building activities). We measured inter-rater reliability based on a random subsample of 38 reviews. The agreement was high with kappa-values above 0.8. The third and fourth authors reconciled remaining disagreements. We depict the coding scheme in Table C1.

Table C1. Coding Scheme for Literature Reviews

Dimension	Coding attribute	Coding values
Theoretical review type		Narrative review, descriptive review, scoping review, meta-analysis, qualitative systematic review, umbrella review, theoretical review, realist review, critical review, hybrid review
Type of knowledge development (and resulting type of literature review)	Knowledge-building activities	{synthesizing, aggregating evidence, criticizing, theory building*, identifying research gaps, developing a research agenda} We qualified each element as dominant, subordinate, or absent
Theme	Domain(s)	Theme
Journal	Basket of ISJOUR	Journal
Year	2000,…,2014	Year

To illustrate how we coded the knowledge-development types (activities), we outline how we coded five exemplary LRs below.

Example of the review type "SYN^{dom}": Shim et al. (2002)

Shim et al. (2002) review decision support systems technologies and applications. They outline the DSS concept, describe essential tools, discuss new roles of DSS in supporting collaboration and group processes, provide insights into optimization-based DSS, and speculate on future trends in decision support technologies. In summary, they predominantly focus on synthesizing knowledge in the DSS domain.

Example of the review type "SYN +TB^{dom}": Jasperson et al. (2002)

In their review, Jasperson et al. (2002) explore the relationship between power and IT impacts, development or deployment, and management or use. In a meta-triangulation approach, they apply two sets of lenses to identify uncover similarities and differences that occur in the literature. By simultaneously analyzing the literature through technology lenses (technological, organizational and emergent perspectives) and power lenses (rational, pluralist, interpretive and radical perspectives), the authors bridge different paradigms and develop meta-conjectures that one can interpret from multiple perspectives. As the review's dominant activity, the authors develop eight theoretical, meta-conjectural

[10] Templier and Pare (2018) already coded some theoretical review types. These authors coded the reviews in the Senior Scholars' basket of eight journals between 2000 and 2014. As we could not assign some reviews unambiguously to a single theoretical review type (according to Pare et al.'s (2015) typology), we coded some literature reviews as hybrid reviews.

hypotheses, which they supplement by briefly synthesizing conceptualizations of power in the extant literature.

Example of the review type "SYN + TB^{dom} + RG": Shankar, Urban, and Sultan (2002)

Shankar et al. (2002) synthesize extant research on online trust in electronic business environments. The authors overview the literature while considering various stakeholders and identifying summarizing factors related to online trust. These insights from the literature serve as an input for the review's focal contribution: a broad conceptual framework that explains online trust's antecedents and consequences. They complement the theoretical framework with structurally overviewing research gaps that subsequent research needs to address.

Example of the review type "SYN^{dom} + RG": Chan and Reich (2007)

Chan and Reich (2007) focus on IT alignment. They discuss the need for alignment research, the question "what is alignment", and theoretical models of IT alignment. In synthesizing and analyzing extant research, they focus on what we have learned in order to "spark helpful conversation on the merits of continued investigation of IT alignment" (p. 297). In the concluding section, the authors provide a structured but subordinate overview of research gaps that should be explored further.

Example of the review type "SYN + AE^{dom}": King and He (2006)

In their exemplary meta-analysis, King and He (2006) focus on aggregating evidence. In the technology acceptance domain, they aggregate empirical evidence and shows "TAM to be a valid and robust model that has been widely used, but which potentially has wider applicability" (p. 740). After presenting a scant and subordinate synthesis and a modified research model, they primarily focus on transparently presenting details of their research methodology and findings. Aggregating evidence is the review's dominant knowledge-building activity.

Appendix D: Dataset of IS Literature Reviews and Knowledge Development

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Reference	Domain	Knowledge-building Activity*					
		SYN	AE	CRI	TB (Type*)	RG	RA
Critical reviews							
Aguirre-Urreta & Marakas (2008)	Software development	Sub		Dom		Sub	
Avgerou (2008)	IS in developing countries	Sub		Dom			Sub
Bélanger & Crossler (2011)	Security	Dom		Dom	Sub (i)	Sub	Sub
Checchi, Hsieh, & Straub (2003)	IS in developing countries	Dom		Dom		Sub	
Cordella (2009)	Electronic data interchange	Dom					
D'Arcy & Herath (2011)	Security	Sub		Dom		Sub	Sub
Dobing & Parsons (2000)	Software development	Dom		Sub		Sub	Sub
Jones & Karsten (2008)	Theory in IS	Sub		Dom		Sub	Dom
Legris, Ingham, & Collerette (2003)	Technology acceptance, and use	Sub	Dom	Dom		Sub	
Myers & Venable (2014)	Ethics and IS	Sub			Dom (v)		
Powell, Baker, & Lawson (2008)	Decision support systems	Dom		Sub		Sub	
Probst, Grosswiele, & Pfleger (2013)	Online social networks	Dom		Sub		Sub	Dom
Riemer & Vehring (2012)	Virtual teams	Dom		Sub	Sub (i)	Sub	
Roberts, Galluch, Dinger, & Grover (2012)	Knowledge management	Dom			Dom (ii)	Sub	
Schryen (2013)	IS value	Sub		Sub	Sub (ii)	Dom	Dom
Silva (2007)	Technology acceptance, and use	Sub		Dom			
Tams (2013)	Culture	Sub		Dom		Sub	Dom
Ullrich (2013)	Economics of IS	Sub		Dom			
Walter & Spitta (2004)	IS value	Dom			Sub (i)		
Zhang & Lowry (2008)	Virtual teams	Dom		Dom		Sub	Sub
Descriptive reviews							
Akhlaghpour, Wu, Lapointe, & Pinsonneault (2013)	Conceptualization of the IT artifact	Dom					
Aloini, Dulmin, & Mininno (2007)	Risk management	Dom					
Amrollahi, Ghapanchi, & Talaei-Khoei (2014)	Software development	Sub			Dom (i)	Sub	
Arnott & Pervan (2012)	Decision support systems	Sub		Dom		Sub	
Basten & Sunyaev (2014)	Software development	Dom		Sub		Sub	

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Berger, Klier, Klier, & Probst (2014)	Online social networks	Dom				Dom	
Chan (2000)	IS value	Dom				Sub	
Chatfield, Shlemoon, Redublado, & Darbyshire (2014)	Virtual teams	Dom				Sub	
Dahlberg et al. (2008)	E-commerce	Sub			Sub (i)	Dom	Sub
Downey (2004)	End user computing	Dom			Sub (i)		
Genero, Fernández-Saez, Nelson, Poels, & Piattini (2011)	Software development	Dom				Sub	
Li, Gao, & Mao (2014)	Technology acceptance, and use	Dom			Sub (ii)	Sub	Sub
Mishra & Mishra (2011)	IT governance	Dom				Sub	
Moe (2014)	Economics of is	Dom		Sub		Sub	Dom
Ngai, Hu, Wong, Chen, & Sun (2011)	Fraud detection	Dom			Sub (i)		
Paré, Bourdeau, Marsan, Nach, & Shuraida (2008)	IT impact research	Dom					
Rosenkranz, Eckhardt, Kühne, & Rosenkranz (2013)	Health IT	Dom					
Seuring (2013)	Supply chain management	Dom				Sub	
Sidorova, Evangelopoulos, Valacich, & Ramakrishnan (2008)	Identity of IS	Sub			Dom (i)		
Standing, Standing, & Love (2010)	E-commerce	Dom				Sub	
Urbach, Smolnik, & Riempp (2009)	IS success	Dom					
Wang, Zheng, Xu, Li, & Meng (2008)	E-commerce	Dom			Sub (ii)	Sub	Sub
Wiener, Vogel, & Amberg (2010)	Outsourcing	Dom				Dom	
Yang & Tate (2012)	Shared services / cloud computing	Dom				Sub	
Meta-analysis							
Brown (2004)	Software development	Sub	Dom		Sub (ii)	Sub	
Dennis, Wixom, & Vandenberg (2001)	Decision support systems	Sub	Dom		Sub (ii)	Sub	Dom
Dennis & Wixom (2002)	Technology acceptance, and use	Sub	Dom				
Gerow, Grover, Thatcher, & Roth (2014)	IS value	Sub	Dom	Sub		Sub	
Ortiz de Guinea, Webster, & Staples (2012)	Virtual teams	Sub	Dom				

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Hameed, Counsell, & Swift (2012)	Creativity, flexibility, innovativeness	Sub	Dom				
He & King (2008)	Software development	Sub	Dom				
Hess, McNab, & Basoglu (2014)	Technology acceptance, and use	Sub	Dom				
Hwang, Windsor, & Pryor (2000)	IS success	Sub	Dom		Sub (ii)		
Hwang (2014)	Software development	Sub	Dom	Sub		Sub	
Jacks et al. (2012)	Knowledge management	Dom	Sub		Sub (ii)		
Karsten, Mitra, & Schmidt (2012)	Human-computer interaction	Sub	Dom		Sub (ii)		
King & He (2006)	Technology acceptance, and Use	Sub	Dom				
Kohli & Devaraj (2003)	IS value	Sub	Dom				
Lee & Xia (2006)	Creativity, flexibility, innovativeness	Sub	Dom				
Ma & Liu (2004)	Technology acceptance, and use	Sub	Dom				
Mahmood, Hall, & Swanberg (2001)	Technology acceptance, and use	Sub	Dom				
Petter & McLean (2009)	IS success	Sub	Dom				
Saeed, Hwang, & Yi (2003)	E-commerce	Sub	Dom		Sub (iv)	Sub	
Schepers & Wetzels (2007)	Technology acceptance, and use	Sub	Dom				
Sharma & Yetton (2003)	Software development	Sub	Dom		Dom (ii)		
Sharma & Yetton (2007)	Software development	Sub	Dom		Dom (ii)		
Siau, Nah, & Cao (2011)	Software development	Sub	Dom				
Wang & Keil (2007)	Economics of IS	Sub	Dom				
Weigel, Hazen, Cegielski, & Hall (2014)	Creativity, flexibility, innovativeness	Sub	Dom				
Wu & Lederer (2009)	Technology acceptance, and use	Sub	Dom		Dom (ii)		
Wu & Du (2012)	Technology acceptance, and use	Sub	Dom				
Wu & Lu (2013)	Technology acceptance, and use	Sub	Dom			Sub	
Narrative review							
Abbas, Michael, & Michael (2014)	Ethics and IS	Sub			Dom (i)		
Alavi & Leidner (2001)	Knowledge management	Dom			Dom (ii)	Dom	Sub
Beard & Sumner (2004)	ERP systems	Dom				Sub	
Ben-Zion, Pliskin, & Fink (2014)	Technology acceptance, and use	Dom					

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Brown & Grant (2005)	IT governance	Dom					
Chan & Reich (2007)	IT alignment	Dom				Sub	
Chisholm (2014)	Ethics and IS	Dom				Sub	
Cooper & Muench (2000)	Virtual organizations	Dom					
Demirhan (2004)	Economics of IS	Dom				Sub	
Dewan & Riggins (2005)	E-commerce	Dom			Sub (ii)	Dom	Sub
Erickson, Lyytinen, & Siau (2005)	Software development	Dom				Sub	
Evermann (2008)	Software development	Dom				Sub	
Fayard & Weeks (2014)	Human-computer interaction	Dom					
Fiedler & Gallenkamp (2008)	Virtual teams	Dom					
Figl (2010)	Virtual teams	Dom					
Gantman (2011)	Outsourcing	Dom		Sub		Sub	
Geiger & Schader (2014)	Crowdsourcing, open innovation, open source	Dom				Dom	Sub
Giessmann & Stanoevska-Slabeva (2012)	E-commerce	Dom			Sub (i)		
Gneiser (2010)	Customer relationship management	Dom			Sub (i)		
Hendriks (2001)	Knowledge management	Dom					
Holsapple & Singh (2000)	E-commerce	Dom					
Irani & Love (2002)	IS value	Sub			Dom (i)		
Kauffman & Walden (2001)	E-commerce	Sub				Dom	Sub
Kautz, Madsen, & Nørbjerg (2007)	Software development	Sub				Dom	
Khalifa & Liu (2004)	Technology acceptance, and use	Dom				Sub	
Kohli & Grover (2008)	IS value	Sub				Dom	Sub
Lawrence (2013)	Culture	Dom					
Mantena, Tilson, & Zheng (2012)	Durable goods	Dom		Sub	Sub (i)	Sub	Sub
Marble (2000)	Software development	Dom					
Merali, Papadopoulos, & Nadkarni (2012)	Strategic IS	Dom					
Mingers & Willcocks (2014)	Human-computer interaction	Dom					
Müller & Ulrich (2013)	Creativity, flexibility, innovativeness	Dom				Sub	
Pollard, Young, & Gregg (2006)	Customer relationship management	Sub			Dom (i)		

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Robey, Im, & Wareham (2008)	Electronic data interchange	Dom			Dom (ii)	Sub	Dom
Schultze (2010)	Human-computer interaction	Dom				Sub	
Seddon (2014)	IS value	Dom				Sub	
Shim et al. (2002)	Decision support systems	Dom					
Shin, Liu Sheng, & Higa (2000)	Virtual teams	Dom		Sub		Sub	
Siponen & Vartiainen (2004)	Ethics and IS	Dom				Sub	Sub
Siponen & Oinas-Kukkonen (2007)	Security	Dom				Sub	Sub
Stahl (2012)	Ethics and IS	Dom					
Ullah & Lai (2013)	IT alignment	Dom				Sub	
Vavilis, Petkovi, & Zannone (2014)	Software development	Sub			Dom (i)		
von Krogh (2012)	Knowledge management	Dom				Dom	Sub
Wagner (2004)	Software development	Dom					
Whitley, Willcocks, & Venters (2013)	Privacy	Dom					
Zviran & Erlich (2003)	IS success	Dom					
Zwass (2003)	E-commerce	Dom					
Qualitative systematic review							
Karimi Alaghehband, Rivard, Wu, & Goyette (2011)	Outsourcing	Sub	Dom				
Chang, Cheung, & Lai (2005)	Technology acceptance, and use	Sub	Dom			Sub	
Jeyaraj, Rottman, & Lacity (2006)	Creativity, flexibility, innovativeness	Sub	Dom			Dom	
Johnson (2002)	Software development	Dom		Dom		Sub	
Lacity et al. (2010)	Outsourcing	Sub	Dom	Sub	Sub (iv)	Dom	Sub
Lacity et al. (2011a)	Outsourcing	Sub	Dom	Sub	Sub (ii)	Dom	Sub
Lacity, Willcocks, & Khan (2011b)	Outsourcing	Sub	Sub		Dom (ii)		
Petter, DeLone, & McLean (2008)	IS success	Sub	Dom				
Scoping review							
Agarwal, Gao, DesRoches, & Jha (2010)	Health IT	Sub			Sub (i)	Sub	Dom

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Beaudry & Carillo (2006)	E-commerce	Dom		Sub		Sub	
Bergvall-Kåreborn, Howcroft, & Ståhlbröst (2014)	User participation	Sub		Sub		Dom	Sub
Besson & Rowe (2012)	Organizational transformation	Sub				Sub	Dom
Chiu, Liang, & Turban (2014)	Crowdsourcing, open innovation, open source	Dom			Sub (ii)		
Cody, Sharman, Rao, & Upadhyay (2008)	Security	Dom			Sub (i)	Sub	
Crowston & Myers (2004)	Transformation of industries	Sub				Sub	Dom
Davern, Shaft, & Te'eni (2012)	Human-computer interaction	Sub				Dom	Sub
Dhillon & Backhouse (2001)	Security	Dom		Sub		Sub	
Fettke & Loos (2004)	Software development	Dom		Sub	Sub (i)	Sub	Dom
Fielt, Bandara, Miskon, & Gable (2014)	Shared services / cloud computing	Sub			Sub (i)	Dom	Sub
Ghosh, Sharman, Rao, & Upadhyay (2007)	Security	Dom				Sub	
Gräning, Felden, & Piechocki (2011)	IT governance	Dom				Dom	Sub
Granados, Gupta, & Kauffman (2010)	E-commerce	Dom			Sub (i)	Dom	Dom
Hess et al. (2005)	E-commerce	Dom				Sub	
Kontolemakis, Kanellis, & Martakos (2004)	E-commerce	Dom			Sub (i)	Dom	Sub
Mykytyn, Mykytyn, Bordoloi, McKinney, & Bandyopadhyay (2002)	Software patents	Sub				Dom	Sub
Pateli & Giaglis (2004)	E-commerce	Sub			Dom (i)	Sub	Sub
Pawlowski et al. (2014)	Knowledge management	Dom				Sub	Dom
Powell, Piccoli, & Ives (2004)	Virtual teams	Dom		Sub		Dom	Sub
Richter, Riemer, & vom Brocke (2011)	Online social networks	Dom				Sub	Sub
Riedl, Leimeister, & Krcmar (2011)	Software development	Dom				Dom	
Riedl (2013)	Human-computer interaction	Dom				Sub	Dom
Santhanam, Yi, Sasidharan, & Park (2013)	Human-computer interaction	Dom				Sub	Dom

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Schultze & Leidner (2002)	Knowledge management	Dom					
Smith et al. (2011)	Security	Dom			Dom (iv)	Sub	Dom
Sunyaev (2014)	Healthcare IS	Dom				Sub	
Suriadi et al. (2014)	Risk management	Dom				Dom	Sub
Tams, Grover, & Thatcher (2014)	Human-computer interaction	Sub			Sub (ii)	Sub	Dom
Urbaczewski, Jessup, & Wheeler (2002)	E-commerce	Dom					
Varshney (2013)	Healthcare IS	Dom			Sub (ii)	Sub	Dom
Weber & Kauffman (2011)	Technology acceptance, and use	Dom				Sub	Dom
Williams & Pollock (2012)	ERP systems	Sub				Sub	Dom
Wills, Sarnikar, El-Gayar, & Deokar (2010)	Knowledge management	Dom		Sub		Sub	
Wu & Wu (2010)	Software development	Dom					
Xiao, Califf, Sarker, & Sarker (2013)	IS in developing countries	Sub				Sub	Dom
Zhao & Zhu (2014)	Crowdsourcing, open innovation, open source	Dom				Sub	Dom
Umbrella							
Schief, Buxmann, & Schiereck (2013)	Transformation of industries	Dom			Sub (ii)	Sub	
Schryen (2010)	IS value	Dom					
Theoretical review							
Ahuja (2002)	Culture	Sub			Dom (ii)	Sub	Dom
Aksulu & Wade (2010)	Crowdsourcing, open innovation, open source	Sub			Dom (ii)	Sub	
Alter (2013)	Theory in IS	Sub			Dom	Sub	
Alter (2014)	IT governance	Sub			Dom (i,ii)		
Ba, Stallaert & Whinston (2001)	Software development	Sub			Dom (ii)	Dom	Dom
Becker & Knackstedt (2004)	Software development	Dom			Dom (v)		
Bose & Luo (2011)	Sustainability	Sub			Dom (ii)	Sub	Sub

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Briggs, Reinig, & de Vreede (2008)	IS success	Sub			Dom (ii)	Sub	
Campbell, Wells, & Valacich (2009)	E-commerce	Sub			Dom (ii)	Sub	Sub
Carte & Chidambaram (2004)	Software development	Sub			Dom (ii)		
Carter (2010)	Software development	Sub			Dom (ii)		
Chan & Greenaway (2005)	Security	Sub			Dom (ii)	Sub	
Chan & Thong (2009)	Software development	Sub			Dom (ii)		
Cheung & Thadani (2012)	E-commerce	Sub			Dom (ii)	Sub	
Christiaanse, van Diepen, & Damsgaard (2004)	Electronic data interchange	Sub			Dom (ii)		
Clark, Jones, & Armstrong (2007)	Decision support systems	Sub			Dom (ii)	Sub	Sub
DeLone & McLean (2003)	IS Success	Sub			Dom (ii)	Sub	
Dibbern, Goles, Hirschheim, & Jayatilaka (2004)	Outsourcing	Dom			Dom (ii)	Sub	
Elliot (2011)	Sustainability	Dom		Sub	Dom (ii)	Dom	Sub
Elyas, Maynard, Ahmad, & Lonie (2014)	Security	Sub			Dom (i)		
Fagan (2001)	Electronic data interchange	Dom			Dom (i)	Sub	
Fan & Poole (2006)	E-commerce	Dom			Sub (i)	Sub	
Fichman (2004)	Economics of IS	Sub			Dom (ii)	Sub	
Fjermestad & Saitta (2005)	IT outsourcing	Sub			Dom (i)		
Fullerton & Ness (2010)	Creativity, flexibility, innovativeness	Sub			Dom (ii)		
Gebauer, Shaw, & Gribbins (2010)	Technology acceptance, and use	Sub			Dom (ii)		
Gupta, Bostrom, & Huber (2010)	Human-computer interaction	Dom			Sub (ii)	Dom	
Gurung & Prater (2006)	Outsourcing	Dom			Dom (ii)	Sub	
Gwebu, Wang, & Troutt (2007)	Virtual teams	Sub			Dom (i,ii)	Sub	
Harris (2000)	End user computing	Dom				Sub	

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Huang, Wei, & Lim (2003)	Virtual teams	Sub			Dom (ii)	Sub	
Hummel, Rosenkranz, & Holten (2013)	Software development	Sub			Dom (i)	Sub	
Jasperson et al. (2002)	Power and IT	Sub			Dom (ii)		
Jenkin, Webster, & McShane (2011)	Sustainability	Sub			Dom (ii)	Sub	Sub
Kappos & Rivard (2008)	Culture	Sub			Dom (ii)		
Kauffman & Lee (2010)	E-commerce	Sub			Dom (ii)	Sub	
von Krogh, Haefliger, Spaeth, & Wallin (2012)	Crowdsourcing, open innovation, open source	Dom			Dom (ii)	Dom	Sub
Leidner & Kayworth (2006)	Culture	Dom		Sub	Dom (ii)	Sub	
Leidner (2010)	Culture	Dom			Sub (ii)		
Li & Kettinger (2006)	Knowledge management	Sub			Dom (ii)		
Li (2012)	Security	Sub			Dom (iv)		
Mathiassen, Saarinen, Tuunanen, & Rossi (2007)	Software development	Sub			Dom (v)		
Melville, Kraemer, & Gurbaxani (2004)	IS value	Sub			Dom (ii)	Sub	Dom
Miranda & Kavan (2005)	Outsourcing	Sub			Dom (ii)	Sub	
Petter, DeLone, & McLean (2013)	IS success	Sub	Dom		Sub (iv)	Sub	
Piccoli & Ives (2005)	IS value	Sub		Sub	Dom (ii)	Sub	Sub
Polites & Karahanna (2013)	Human-computer interaction	Sub			Dom (ii)	Sub	
Shankar, Urban, & Sultan (2002)	E-commerce	Sub			Dom (i,ii)	Sub	
Siau, Long, & Ling (2010)	Software development	Sub			Dom (i,ii)		
Srivardhana & Pawlowski (2007)	ERP systems	Sub			Dom (ii)		
Sun, Lim, & Peng (2013)	E-commerce	Sub			Dom (ii)	Sub	
Tan & Sia (2006)	Outsourcing	Sub			Dom (ii)	Sub	
Te'eni (2001)	Software development	Sub			Dom (ii)	Sub	Dom

Table D1. IS Literature Reviews, Domains, and Knowledge-building Activity (Grouped by Review Type)

Topi & Ramesh (2002)	Human-computer interaction	Dom			Dom (ii)	Sub	Dom
Trinh-Phuong, Molla, & Peszynski (2012)	ERP systems	Dom			Dom (ii)		
Trkman & Desouza (2012)	Knowledge management	Sub			Dom (i)		
Turban, Bolloju, & Liang (2011)	Virtual teams	Sub			Dom (ii)		
Veiga, Floyd, & Dechant (2001)	Technology acceptance, and use	Sub			Dom (ii)	Sub	
Wade & Hulland (2004)	IS value	Sub				Sub	Dom
Wan, Fang, & Neufeld (2007)	Education and IT	Sub			Dom (ii)	Sub	
Wang, Myers, & Sundaram (2013)	Technology acceptance, and use	Sub			Dom (ii)	Sub	
Wang & Kaarst-Brown (2014)	IT governance	Sub			Dom (ii)	Sub	
Whelan (2007)	Knowledge management	Sub			Dom (i)	Sub	
Xiao & Benbasat (2007)	E-commerce	Sub	Sub		Dom (ii)	Sub	Dom
Zhang (2013)	Human-computer interaction	Sub			Dom (iv)	Sub	
Hybrid review							
del Águila, Bruque, & Padilla (2002)	Theory in IS	Sub				Dom	Sub
Elgarah et al. (2005)	Electronic data interchange	Dom		Sub		Dom	
Fjermestad & Hiltz (2000)	Group support systems	Dom					
Joseph, Ng, Koh, & Ang (2007)	Technology acceptance, and use	Sub	Dom		Sub (ii)	Sub	Sub
Lacity, Khan & Willcocks (2009)	Outsourcing	Dom			Sub (ii)		
Larsen (2003)	IS success	Dom			Sub (i)	Sub	Sub
Pahlke, Beck & Wolf (2010)	Software development	Dom					
Tyran & Shepherd (2001)	Education and IT	Dom			Sub (i)	Sub	

*Abbreviations used in the table: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).
Theory types for analyzing (Type I), explaining (Type II), predicting (Type III), explaining and predicting (Type IV), and design and action (Type V).

Appendix E: Statistics on IS Literature Reviews and Knowledge Development

Table E1. Knowledge-building Activities of IS LRs

Synthesizing	Aggregating evidence	Criticizing	Theory building	Identifying research gaps	Developing a research agenda	Freq.
Dominant						30
Subordinate			Dominant			24
Subordinate			Dominant	Subordinate		23
Dominant				Subordinate		22
Subordinate	Dominant					18
Dominant			Subordinate			8
Dominant		Subordinate		Subordinate		8
Dominant				Subordinate	Dominant	5
Subordinate				Dominant	Subordinate	5
Subordinate				Subordinate	Dominant	5
Subordinate			Dominant	Subordinate	Subordinate	5
Dominant				Dominant	Subordinate	4
Dominant			Dominant	Subordinate		4
Dominant			Subordinate	Subordinate		4
Dominant				Dominant		3
Dominant				Subordinate	Subordinate	3
Dominant			Dominant	Subordinate	Dominant	3
Dominant			Subordinate	Subordinate	Subordinate	3
Subordinate			Dominant	Subordinate	Dominant	3
Subordinate	Dominant		Dominant			3
Subordinate	Dominant		Subordinate	Subordinate		3
Dominant			Dominant			2
Dominant			Dominant	Dominant	Subordinate	2
Dominant			Subordinate	Dominant	Subordinate	2
Dominant		Subordinate		Subordinate	Dominant	2
Subordinate			Subordinate	Dominant	Subordinate	2
Subordinate			Subordinate	Subordinate	Dominant	2
Subordinate		Dominant				2
Subordinate		Dominant		Subordinate		2
Subordinate		Dominant		Subordinate	Dominant	2
Subordinate	Dominant			Subordinate		2
Subordinate	Dominant		Subordinate			2
Subordinate	Dominant	Subordinate		Subordinate		2
Subordinate	Dominant	Subordinate	Subordinate	Dominant	Subordinate	2
Dominant			Subordinate	Dominant		1
Dominant			Subordinate	Dominant	Dominant	1
Dominant			Subordinate	Subordinate	Dominant	1
Dominant		Dominant		Subordinate		1

Table E1. Knowledge-building Activities of IS LRs

Dominant		Dominant		Subordinate	Subordinate	1
Dominant		Dominant	Subordinate	Subordinate	Subordinate	1
Dominant		Subordinate		Dominant		1
Dominant		Subordinate		Dominant	Subordinate	1
Dominant		Subordinate		Subordinate	Subordinate	1
Dominant		Subordinate	Dominant	Dominant	Subordinate	1
Dominant		Subordinate	Dominant	Subordinate		1
Dominant		Subordinate	Subordinate	Subordinate		1
Dominant		Subordinate	Subordinate	Subordinate	Dominant	1
Dominant		Subordinate	Subordinate	Subordinate	Subordinate	1
Dominant	Subordinate		Subordinate			1
Subordinate				Dominant		1
Subordinate			Dominant	Dominant	Dominant	1
Subordinate		Dominant			Subordinate	1
Subordinate		Dominant		Subordinate	Subordinate	1
Subordinate		Subordinate		Dominant	Subordinate	1
Subordinate		Subordinate	Dominant	Subordinate	Subordinate	1
Subordinate		Subordinate	Subordinate	Dominant	Dominant	1
Subordinate	Dominant			Dominant		1
Subordinate	Dominant		Subordinate	Subordinate	Dominant	1
Subordinate	Dominant		Subordinate	Subordinate	Subordinate	1
Subordinate	Dominant	Dominant		Subordinate		1
Subordinate	Subordinate		Dominant			1
Subordinate	Subordinate		Dominant	Subordinate	Dominant	1

Appendix F: Theoretical and Knowledge-based Review Types

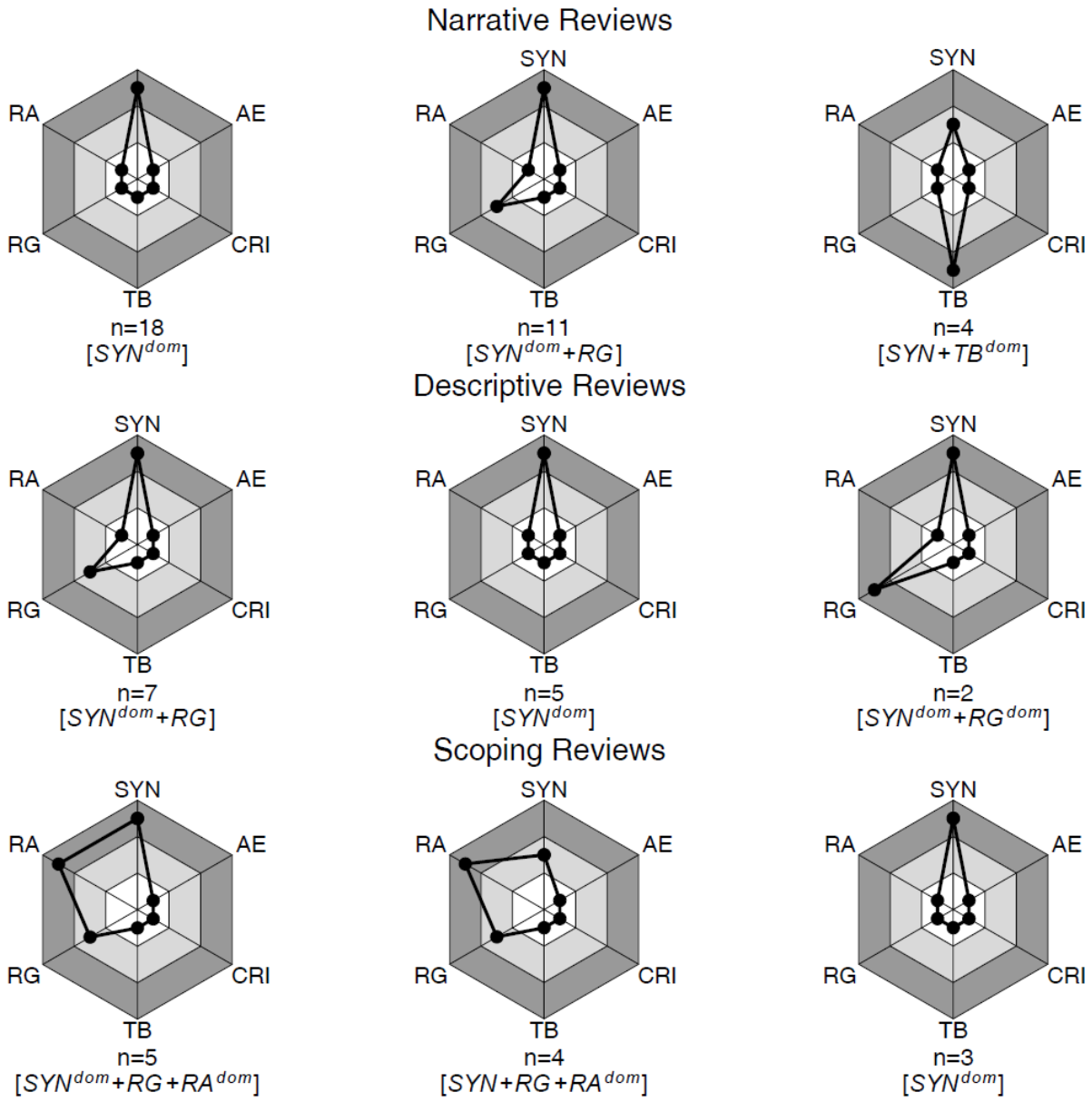

Figure F1. Predominant Knowledge-based Types Grouped by Theoretical Review Types (Paré et al., 2015) with Describing as Overarching Research Goal[11]

[11] Abbreviations for knowledge-building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).

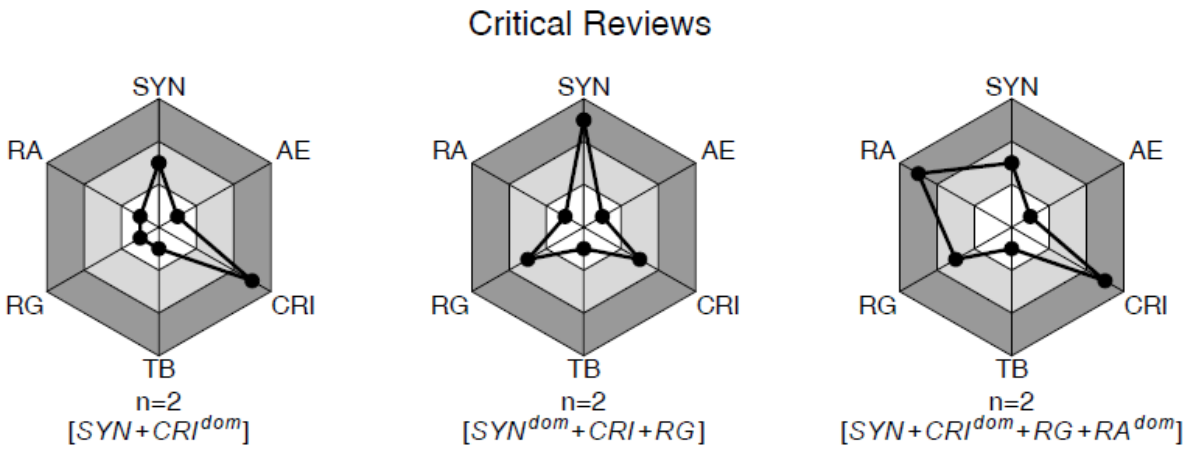

Figure F2. Predominant Knowledge-based Types Grouped by Theoretical Review Types (Paré et al., 2015) with Understanding as Overarching Research Goal[12]

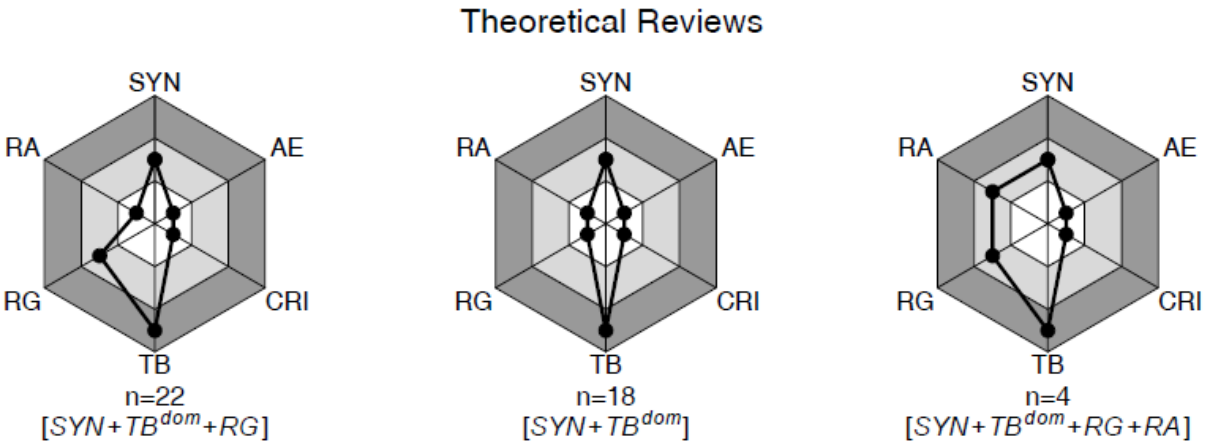

Figure F3. Predominant Knowledge-based Types Grouped by Theoretical Review Types (Paré et al., 2015) with Explaining as Overarching Research Goal[13]

[12] Abbreviations for knowledge-building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).
[13] Abbreviations for knowledge-building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).

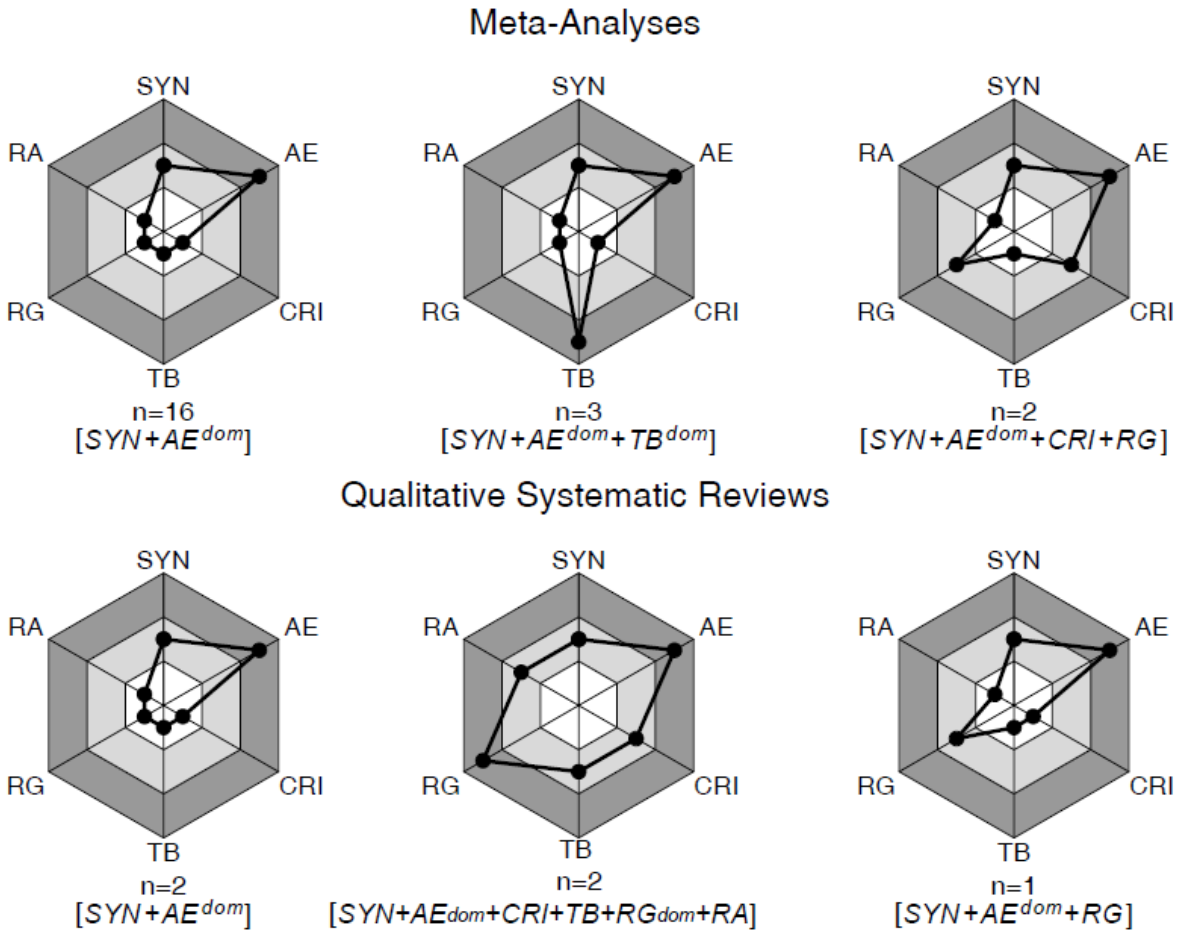

Figure F4. Predominant Knowledge-based Types Grouped by Theoretical Review Types (Paré et al., 2015) with Theory Testing as Overarching Research Goal[14]

[14] Abbreviations for knowledge-building activities: synthesizing (SYN), aggregating evidence (AE), criticizing (CRI), theory building (TB), identifying research gaps (RG), developing a research agenda (RA).

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