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Writing Qualitative IS Literature Reviews – Guidelines for Synthesis, Interpretation, and Guidance of Research

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Abstract:

The literature review is an established research genre in many academic disciplines, including the IS discipline. Although many scholars agree that systematic literature reviews should be rigorous, few instructional texts for compiling a solid literature review, at least with regard to the IS discipline, exist. In response to this shortage, in this tutorial, I provide practical guidance for both students and researchers in the IS community who want to methodologically conduct qualitative literature reviews. The tutorial differs from other instructional texts in two regards. First, in contrast to most textbooks, I cover not only searching and synthesizing the literature but also the challenging tasks of framing the literature review, interpreting research findings, and proposing research paths. Second, I draw on other texts that provide guidelines for writing literature reviews in the IS discipline but use many examples of published literature reviews. I use an integrated example of a literature review, which guides the reader through the overall process of compiling a literature review.

Keywords: Literature Review, Methodology, Tutorial, Literature Synthesis, Research Gaps, Research Agenda.

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1 Introduction

The literature review is both an established research genre and an important research method itself in many academic disciplines, including the IS discipline¹. Reviews are beneficial for academics at different stages of their career and for different purposes: first, “a literature review is the genre of paper that every researcher looks for when starting a research study” (Rowe, 2014, p. 242). Knowledge on what other researchers have achieved in a particular research discipline is essential for enhancing the body of knowledge in the respective discipline for at least two reasons. It “help(s) scholars avoid ‘reinventing the wheel’” (Zorn & Campbell, 2006, p. 173) and, thereby, marginalizing their work. Even more importantly, it allows them to perform incremental research by building on what other researchers have done. As Baker (2000, p. 219) notes, [t]he evolution and creation of new knowledge proceeds generally by a process of accumulation. Thus, in presenting his new theories, Isaac Newton observed, ‘If I can see further it is because I am standing on the shoulders of giants.’”. Boote and Beile (2005, p. 3) put it in a nutshell: “A researcher cannot perform significant research without first understanding the literature in the field”. The particular importance of literature reviews is highlighted by IS researchers who argue that they facilitate theory development and research landscaping, reveal research gaps and unrecognized assumptions (Rowe, 2012, 2014), and provide the foundation for research in IS (Webster & Watson, 2002, p. xiv).

Second, literature reviews are important for students both at graduate and doctoral level (Boote & Beile, 2005; Okoli, 2012, p. 2f, 36ff) in two regards. Reading scholars’ literature reviews helps students become familiar with the topic of their theses in an efficient way, and they usually need to write a literature review themselves to demonstrate knowledge on a domain. As Rowe (2014, p. 242) notes, “all PhD students do one when developing their monograph, and many of those who opt for the three essays genre, more prevailing in North America than in Europe, also perform one, albeit one, which is publishable and generally more systematic”.

Literature reviews’ importance and their potential leverage have started to increase across all academic disciplines due to rapidly evolving technical developments. First, the digitization of literature and enhanced online search capabilities have improved access to publications. Second, qualitative data analysis tools, such as CATMA, NVivo, and MAXQDA, have enabled powerful analysis capabilities. These technical developments have globalized literature reviews and substantially widened their scale and scope.

Literature reviews occur in different forms related to different purposes (Boell & Cecez-Kecmanovic, 2014, p. 260; Okoli, 2012, p. 10ff; Okoli & Schabram, 2010, p. 2ff). One dimension for classifying literature reviews draws on the document’s purpose. A literature review can be a) part of a paper reporting a specific research study, b) an important type of publication in their own right (standalone reviews) when they are more than the sum of its parts (reviewed research papers) (Schwarz, Mehta, Johnson, & Chin, 2007), c) part of project proposals (Baker, 2000), and d) part of a thesis (cf. comments above). These different kinds of literature follow different purposes that involve the different time and space that authors have available. In a research study (a), a literature review is usually a relatively small part of the overall paper and is not given as much time as the data collection and analysis (Okoli & Schabram, 2010, p. 5). It usually comes before the methods section, the presentation of results, and their discussion (Boell & Cecez-Kecmanovic, 2014, p. 260). Often, it is embedded in a section (most commonly labeled “literature review”, “theoretical background”, or something similar) that gives the theoretical foundations and (the context of) the research questions (Okoli & Schabram, 2010, p. 2). Other options for positioning the literature review in a research study are including it in the introduction or in the discussion. The appropriateness of the position depends on the role of the literature review in the study and on the convention of the targeted outlet. In this tutorial, I focus on the standalone review (b) and provide detailed recommendations in the succeeding sections. When a literature review is presented as part of a research thesis (c), again, it usually comes before the methods section, the presentation of results, and their discussion (Boell & Cecez-Kecmanovic, 2014, p. 260). Okoli and Schabram (2010, p. 5) provide a list of guides for students. In project proposals (d), a literature review’s position and length vary and they are often precisely described in the guidelines of the targeted organization and/or program. Regardless of a literature review’s particular purpose, rigor should be present through a systematic literature review. The difference between standalone reviews and other kinds is only a pragmatic matter (Okoli & Schabram, 2010, p. 5f).

¹ Cooper and Hedges (2009, p. 7ff) and Chalmers, Hedges, and Cooper (2002) overview the history of literature reviews.

A second dimension for classifying literature reviews addresses the methodology and the writing style. A literature review can be purely quantitative. Typical examples are scientometric and bibliometric studies (e.g., Sellitto, 2007; Serenko, Bontis, Booker, Sadeddin, Hardie, 2010). I do not consider these types of literature reviews in this tutorial. Instead, I cover literature reviews with a focus on the content and methodologies used in the literature. Such literature reviews can include both qualitative and quantitative elements. King and He (2005) distinguishes narrative reviews, descriptive reviews, vote counting, and meta-analysis. A narrative review (e.g., Powell, Piccoli, & Ives, 2005) presents verbal descriptions of studies focusing on theories and frameworks, elementary factors, and their roles and/or research outcomes regarding a hypothesized relationship. A descriptive review (e.g., Riedl, Leimeister, & Krcmar, 2011) analyzes to what extent the existing literature supports a particular proposition or reveals an interpretable pattern. Because both types are mainly qualitative, I refer to these literature reviews as “qualitative literature reviews”. Vote counting (e.g., Topi & Ramesh, 2002) is used for drawing qualitative inferences about a focal relationship based on the outcomes of tests of hypothesis reported in individual studies. When vote counting is complemented by the consideration of effect sizes and construct reliabilities, it is regarded as meta-analysis (e.g., Kohli & Devaraj, 2003). I cover neither vote counting nor meta-analysis. To sum up, this tutorial addresses the composition of qualitative (IS) literature reviews.

The importance of literature reviews in the IS discipline has been acknowledged in various forms. For example, many renowned academic journals include the literature review as a welcomed genre: MIS Quarterly has even launched a “theory and review department”, and IS scholars have published some papers on literature review methodology (e.g., Webster & Watson, 2002; Okoli & Schabram, 2010). However, writing literature reviews is a challenging task for a variety of reasons. First, as Fink (2010, p. xi) notes, “each year, the results of tens of thousands of studies are printed in journals, books, magazines, and on the Web. ...How can an individual identify and make sense of the voluminous amount of currently available information...?”. Second, structuring and presenting literature findings is difficult (Webster & Watson, 2002, p. xiix). Third, beyond some synthesis capabilities, authors are required to have classic systematic and analytical skills to, for example, identify missing knowledge and to have even more advanced speculative abilities and intuition to propose paths for closing the knowledge gap (Rowe, 2012, p. 471). Finally, compiling literature reviews in the IS discipline is a particularly challenging process because its interdisciplinary nature requires authors to often draw on theories from a variety of disciplines (Webster & Watson, 2002, p. xii f).

Undertaking a literature review is an important research method in itself (Green, Johnson, & Adams, 2006, cited in Boell & Cecez-Kecmanovic, 2014, p. 260), which does not require less academic rigor than other genres (Okoli & Schabram, 2010, p. 2). With regard to the IS discipline, Levy and Ellis (2006) and Webster and Watson (2002) have lamented the fact that IS researchers tend to be unaware of the need for structure in reviews. Indeed, I conclude that we have a strong need for methodological guidelines on how to conduct literature reviews in the IS discipline. However, I share Wolfswinkel, Furtmueller, and Wilderom’s (2013) observation that few instructional texts for compiling a solid literature review exist, at least with regard to the IS discipline.

Responding this shortage, I provide practical guidance for both students and researchers in the IS community who want to conduct a literature review. In the presence of other literature on how to conduct literature reviews, I avoid “reinventing the wheel” (i.e., reproducing what others have already published). Instead, I draw on their contributions; more precisely, this tutorial differs from other sources in two regards: a) several good textbooks on how to write literature reviews exist. For example, Cooper, Hedges, and Valentine (2009), Cooper (1998), and Hart (1988) provide excellent handbooks that focus on behavioral and social scientists, and Fink (2010) suggests guidelines for a general audience. In contrast to most of these textbooks, I cover not only the task of literature search and synthesis but also the even more challenging tasks of framing the literature review, interpreting research findings, and proposing research paths; b) Other IS scholars have already provided guidelines for writing literature reviews in the IS discipline (e.g., Webster & Watson, 2002; Okoli & Schabram, 2010; Levy & Ellis, 2006). Again, I draw on these sources but provide an example of a literature review that was published by the author in the *European Journal of Information Systems (EJIS)*. I use this example to guide the reader through the overall process of compiling a literature review, to illustrate general principles, and to share the experience that the author had when compiling, revising, and publishing the review over a period of more than three years. I complement the aforementioned literature review with examples of other literature reviews to provide diversity with regard to topics, journals, and authors.

This tutorial does not apply only the IS discipline but can also be used in other disciplines, including applied business disciplines with a focus on IS. However, because the tutorial is published in an IS journal, I have tailored how I describe the literature search to IS scholars' needs by listing databases and rankings that are particularly useful for IS scholars. Furthermore, I gathered the examples of literature reviews I use throughout this tutorial from the IS literature.

Before suggesting practical guidelines, I discuss the aspired benefits of this tutorial for the reader. I provide general advice and practical examples of how to synthesize knowledge, interpret it, and guide future research in terms of providing a research agenda. As mentioned above, these tasks and related capabilities are required in the IS community. I address all kinds of reviews, be they standalone reviews or integrated parts of papers. However, I do not discuss literature reviews from a philosophical approach as done by Boell and Cecez-Kecmanovic (2014), who suggest a hermeneutic approach, for example. I also do not provide or apply a specific theory as done by Wolfswinkel et al. (2013), who apply grounded theory as methodology. Instead, I suggest a methodological framework.

The remainder of this tutorial is structured as follows. In Section 2, I show the literature review's essence. In Section 3, I introduce the literature review (on IS business value), which I use as a guiding example. In Section 4, I show how one can frame and structure a literature review in terms of phases, tasks, and sections. In Sections 5 to 10, I describe the framing and each of the phases in detail with several examples. Finally, in Section 11, I conclude the tutorial with some recommendations and the tutorial's limitations.

2 The Essence of Literature Reviews

When writing a literature review, authors should carefully make decisions in advance about its focus, types of outcomes, framing, and phases (see Figure 1).

<u>Focus</u>	<u>Outcome</u>	<u>Framing</u>	<u>Phase</u>
Topic	Synthesis	Ad hoc	Search and assessment
Domain	Interpretation	Incremental	Synthesis
Discipline	Guidance	Conceptual	Interpretation
			Guidance
			Conclusion

Figure 1. Ontology of Literature Reviews

2.1 Focus

In ascending order of scope, a literature review can cover a chosen topic, chosen domain, or chosen discipline. For example, Powell et al. (2004) review the literature on the topic of “virtual teams”, Melville, Kraemer, and Gurbaxani (2004) review the literature on the well-accepted IS domain of “IS business value”, and Steiniger, Riedl, Roithmayr, and Mertens (2009) conduct a literature analysis on fads and trends in business and information systems engineering and information systems research. The quantity of effort required for the literature review will differ depending on the focus. This tutorial is applicable to all three types of focus.

2.2 Outcome

When writing a literature review, authors should be aware of their review's outcome. The literature does not provide a unique definition or understanding of what a literature review should do in this regard. Table 1 provides definitions of scholars with experience in literature reviews in alphabetical order. I use the various understandings to condense possible outcomes of literature reviews.

As Table 1 shows, most authors agree that a literature review should not only synthesize but also interpret literature. If we consider identifying research gaps as a specific type of interpretation, we can condense the possible outcomes of literature reviews to three types: a) synthesis of literature, b) interpretation of literature, and c) guidance for (future) research. I do not (and could not) resolve the conflicting perspective on whether outcomes b) and c) are mandatory elements of a literature review. I leave it to the authors of

prospective literature reviews to decide which outcomes they would like to assign to their review. In this tutorial, I cover all three types of outcomes.

Table 1. Definitions and Understandings of Literature Reviews

Reference	Definition/Understanding	Key function(s)
Blaxter, Hughes, & Tight (1997, p. 110)	<i>“a critical summary and assessment of the range of existing materials dealing with knowledge and understanding in a given field ”</i>	(Critical) synthesis
Blumberg, Cooper, & Schindler (2005, p. 11)	<i>“an appropriate summary of previous work. But it needs an added dimension – your interpretation.”</i>	Synthesis, interpretation
Boell & Cecez-Kecmanovic, 2014 (p. 258, 260)	<i>“literature reviews examine and critically assess existing knowledge in a particular problem domain, forming a foundation for identifying weaknesses and poorly understood phenomena, or enabling problematization of assumptions and theoretical claims in the existing body of knowledge.”</i> <i>“A review of the literature in any given field shows us both where we have been and where we need to go.” (citing Neely & Cook, 2011, p. 82)</i>	(Critical) synthesis, identification of research gaps, guidance of future research
Fink (2010, p. 3)	<i>“A research literature review is a systematic, explicit and reproducible method for identifying, evaluating and synthesizing the existing body of completed and recorded work produced by researchers, scholars, and practitioners.”</i>	(Critical) synthesis
Hart (1998, p. 27f)	Review serves the following purposes: <i>“1 distinguishing what has been done from what needs to be done; 2 discovering important variables relevant to the topic; 3 synthesizing and gaining a new perspective; 4 identifying relationships between ideas and practice; 5 establishing the context of the topic or problem; 6 rationalizing the significance of the problem; 7 enhancing and acquiring the subject vocabulary; 8 understanding the structure of the subject; 9 relating ideas and theory to applications; 10 identifying the main methodologies and research techniques that have been used; 11 placing the research in a historical context to show familiarity with state-of-the-art developments.”</i>	Synthesis, identification of research gaps
Levy & Ellis, 2006 (p. 183)	<i>“An effective literature review accomplishes [the task of knowing the current status of the body of knowledge] by: 1. Helping the researcher understand the existing body of knowledge including where excess research exists (i.e. what is already know?) and where new research is needed (i.e. what is needed to be known?). [...]”</i>	Synthesis, identification of research gaps
Rowe (2014)	<i>“A literature review synthesizes past knowledge on a topic or domain of interest and identifies important knowledge gaps and directions. [...]Literature reviews should strive at least to identify gaps and propose some research directions and not just stop at the summarizing/synthesizing stage.” [...] “Its synthetic character should entail an interpretation of this existing knowledge.”</i>	Synthesis, identification of research gaps, guidance of future research
Schwarz et al. (2007, p. 35)	<i>Purposes of review articles include: “to summarize prior research”, “to critically examine contributions of past research”, “to explain the results of prior research found within research streams”, “to clarify alternative views of past research (not necessarily integrative)”</i>	(Critical) synthesis

2.3 Framing

Framing a literature review refers to defining its scale, scope, the granularity, and the sensitivity. In general, framing can be “ad hoc”, incremental, or conceptual in ordinal order of abstraction. An “ad hoc” literature review does not select a concept in advance, such as a framework, model, or theory, to organize the presentation of literature findings. It also does not include a structured literature search. An example is a literature review that includes a simple Google search on a topic and provides the author-centric presentation of results. In an incremental literature review, each step determines the next. For example, the result of the literature search determines the way in which the presentation of findings is structured. In a conceptual literature review, one or more concepts, such as models, frameworks, or theories, are motivated and used to structure the presentation and the interpretation of findings. In this tutorial, I focus only on this type of literature reviews.

2.4 Phase

Framing a literature review has a fundamental impact on the various phases of conducting a literature review. I distinguish five phases: the phase “search and assessment” (1) relates to how relevant literature can be acquired, the phases “synthesis” (2), “interpretation” (3), and “guidance” (4) relate to how to achieve the corresponding outcomes of the literature review, and the phase “conclusion” (5) relates to how to finish the literature review.

Before I provide detailed recommendations for how to conduct a literature review, in Section 3, I provide a sample literature review that serves as “running example” throughout the remainder of this tutorial.

3 Running Example: Review of IS Business Value Literature

To illustrate the guidelines I provide in the following sections, I use one literature review that covers all three outcomes (synthesis of knowledge, interpretation of knowledge, and guidance of further research) as a running example. Thereby, I strive to coherently illustrate all outcomes. I decided to draw on a literature review that I wrote that the *European Journal of Information Systems (EJIS)* published in 2013. More precisely, I draw on Schryen (2013). I chose this review not because it is in any way superior to others in terms of quality but rather because I not only know the product—the literature review itself—but also am familiar with the process of compiling it. I use this familiarity to share experience on the “dos and don’ts” when compiling, revising, and publishing a literature review.

Schryen (2013) synthesizes the body of knowledge on IS business value, identifies gaps in research as one type of interpretation, and suggests a research agenda, including research thrusts and research path, as one type of guidance. Schryen (2013) is structured as follows (cf. Figure 2): after the introduction, it frames IS business value research through defining the concepts of “information systems (IS)” and “IS business value” and describing the theoretical paradigms used in IS business value research. The next section synthesizes literature findings with regard to performance measures, impact on productivity, impact on market performance, impact on accounting performance, contextual factors, and lag effects. The following section on research gaps discusses ambiguity and fuzziness of the “IS business value” construct, the neglected disaggregation of IS investments, and IS business value creation process as a grey box. The next section presents the research agenda by suggesting and discussing research thrusts along the previously identified research gaps. Then, the sample literature review describes the potential for further research before concluding.

4 Structuring the Literature Review

A key question when compiling a literature review is how to structure it in terms of both procedure and the final artefact (i.e., the actual literature review paper). Procedure and artefact are not independent, and I make suggestions for both.

I found that the literature (e.g., Webster & Watson, 2002; Cooper, 1998, Fink, 2010, Wolfswinkel et al., 2013; Rowe, 2014) largely agrees that the process of conducting a literature review should include the following tasks, which I either assign to the overall framing process or to one of the phases.

4.1 Framing

Although framing is a process that has a fundamental impact on all phases, literature reviews should have a dedicated part that describes it. In the beginning, one should state their motivation for writing a literature review on the selected topic(s) and how their literature review differs from other reviews that have been published (uniqueness), their literature review's goal(s), their literature review's scope and boundaries, and their literature review's eventual structure (Webster & Watson, 2002, p. xv; Wolfswinkel et al., 2013, p. 47; Okoli & Schabram, 2010, pp. 7,14). Defining and describing these attributes: 1) helps authors focus on those parts of the topic and of the literature they consider to be central for the work, 2) overviews the literature review and illustrates what one can expect to get and not get, and 3) demonstrates that the literature review shows both relevance for scholars and/or practitioners and rigor in terms of review methodology. I describe the process of framing the literature review in detail in Section 5.

4.2 Search and Assessment Phase

This phase includes searching literature and assessing collected papers. While the literature search process (cf. first subsection in Section 6) can be described largely independently of the literature review's topic and goal(s), the assessment (cf. second subsection in Section 6) depends on the particular literature review and can, thus, be described only in a generic way.

4.3 Synthesis Phase

The overall task of synthesizing what other researchers have found and published on a topic is mandatory regardless of the particular type of literature review. It includes both describing the concepts used to structure how one presents findings and the actual presentation. I describe both tasks in detail in Section 7.

4.4 Interpretation Phase

A literature review's benefits should extend beyond a synthesis of research findings: the literature review should be critical (Schwarz et al., 2006). As Boell and Cecez-Kecmanovic (2014, p. 267) note, "[c]ritical assessment...not only reveals but also, and more importantly, challenges the horizon of possible meanings and understanding of the...established body of knowledge". A look at various understandings of literature reviews (cf. Table 1) shows that, often, one needs to identify research gaps. However, it is not necessary to reveal what is missing in the literature to be critical. Some authors (e.g., LePine & Wilcox-King, 2010, p. 1f; Webster & Watson, 2002, p. xix) suggest that literature reviews draw on the body of knowledge to extend current theories or to look for new theories. Both types of contributions can be merged, as Wolfswinkel et al. (2013) note, when the literature analysis leads to the "discovery of gaps in knowledge that are important for research explorations with a theory-building focus". I identify a third type of contribution when the body of literature is viewed from a new perspective, which can (but does not have to) lead to new explanations of domain phenomena.

I subsume any of the above kinds of contributions as tasks of interpretation. While providing a precise description of how to accomplish the interpretation task is difficult, I present guidelines and show sample literature reviews in Section 8.

<p>Introduction</p> <p>IS Business Value Research</p> <ul style="list-style-type: none"> - Information Systems - IS Business Value <ul style="list-style-type: none"> • Notions and Scope • Level of Examination • Object of Evaluation • Time of Evaluation • Definition of IS business value - Theoretical Paradigms Used in IS Business Value Research <p>Synthesising Research Findings</p> <ul style="list-style-type: none"> - Performance Measures - Impact on Productivity - Impact on Market Performance - Impact on Accounting Performance - Contextual Factors - Lag Effects - Summary of Literature Findings <p>Identifying Research Gaps</p> <ul style="list-style-type: none"> - Ambiguity and Fuzziness of the “IS Business Value” Construct - Neglected Disaggregation of IS Investments - IS Business Value Creation Process as Grey Box - Summary of identified deficiencies in research <p>Research Agenda</p> <ul style="list-style-type: none"> - Ambiguity and Fuzziness of the “IS Business Value” Construct - Neglected Disaggregation of IS Investments - IS Business Value Creation Process as Grey Box - Summary of Research Agenda <p>Potential for Further Research</p> <p>Concluding Remarks</p> <p>Annex A: Statistics on IS Business Value Papers Published</p> <p>Annex B: Identifying Relevant Literature</p> <p>References</p>
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Figure 2. Structure of the Sample Literature Review (Schryen, 2013)

4.5 Guidance Phase

The literature does not agree on whether and how a literature review should guide further research. One perspective is mirrored in the Journal of Database Management’s editorial statement², which notes that “[r]esearch reviews are insightful and carefully crafted articles that conceptualize research areas, synthesize previous innovative findings, advance the understanding of the field, and identify and develop future research directions”. Similarly, Webster and Watson (2002, p. xix) argue that “writing a review not only requires an examination of past research, but means making a chart for future research”. In contrast, Rowe (2014, p. 243) states that “[t]he same paper does not have to explain how we can get there literally.... [T]his is not the essence of a literature review.” I do not adopt a normative perspective on this question. Instead, I provide recommendations and examples on how authors literature reviews can achieve such a doubtlessly valuable contribution (see Section 9).

4.6 Conclusion Phase

The last phase when compiling a literature review summarizes key insights, draws implications for research and practice, including “limitations and the unavoidable biases that may have occurred in one or more steps of the entire process” (Wolfswinkel et al., 2013, p. 53) and that eventually motivate future research in a particular field. I provide guidelines for drawing conclusions in Section 10.

² See <http://www.igi-global.com/calls-for-papers/journal-database-management-jdm/1072>.

Table 2 summarizes phases, tasks, and suggestions for how to structure a literature review. Note that the content is not prescriptive but descriptive in terms of what I found in many literature reviews and in papers and books on the review methodology. Although the authors of a literature review might want to adapt some of the elements, the framework shown in Table 2 serves as a framework that has been adopted by many authors of literature reviews.

Table 3 provides some examples of how reviews in the literature have been structured. It also shows that the concrete structure in terms of particular chapters of literature reviews can look different.

Table 2. Overview of Literature Reviews' Phases, Tasks, and Structure

		Tasks	Structure (recommended sections)
Framing		Motivation, uniqueness, goal(s), structure (MUGS)	Introduction
		Scope and boundaries (SB)	Introduction or framing section
	Phase		
	Search and assessment	Literature search (LS)	Appendix or methodology section
		Literature assessment (LA)	
	Synthesis	Description of concepts (DC)	Synthesis section(s) or concept section
		Literature presentation(LP)	Synthesis section(s)
	Interpretation	Identification of research gaps, adoption of a new perspective, and/or theory building	Interpretation section(s)
Guidance	Research agenda, research propositions/questions and related paths	Guiding section(s)	
Conclusion	Summary, implications for research and practice, limitations	Conclusion section(s)	

Table 3. Structure of Sample Literature Reviews

		Tasks	Structure	Schryen (2013)	(Dibbern, Goles, Hirschheim, & Jayatilaka, 2004)	(Roberts, Galluch, Dinger, & Grover, 2012)	(Muller & Ulrich, 2013)	
Framing		MUGS	Introduction	1. Introduction	1. Introduction	1. Introduction	1. Introduction	
		SB	Introduction or framing section	2. IS business value research	2. Conceptualization of IS outsourcing	2. What is absorptive capacity?	1. Introduction 2. Theoretical framing	
	Phase							
	Search and assessment	LS	Appendix or methodology section	Annex B	3. Research approach of the review	3. Research approach of the review	3. Absorptive Capacity in IS Research Appendix A	3. Review methodology
		LA	Appendix or methodology section	Annex B	3. Research approach of the review	3. Research approach of the review	3. Absorptive Capacity in IS Research	3. Review methodology
	Synthesis	DC	Synthesis section(s) or concept section	3. Synthesizing research findings	4. Literature review and analysis	4. Literature review and analysis	3. Absorptive Capacity in IS Research	2. Theoretical framing
		LP	Synthesis section(s)	3. Synthesizing research findings	4. Literature review and analysis	4. Literature review and analysis	3. Absorptive Capacity in IS Research	4. Analysis results
	Interpretation		Interpretation section(s)	4. Identifying research gaps	4. Literature review and analysis 5. Discussion	4. Literature review and analysis 5. Discussion	3. Absorptive capacity in IS research	
	Guidance		Guiding section(s)	5. Research agenda	n/a	n/a	4. A framework for investigating the inter-action of information technology and absorptive capacity	n/a
	Conclusion		Conclusion section(s)	6. Potential for further research 7. Concluding remarks	6. Summary and conclusions	6. Summary and conclusions	5. Conclusion	5. Discussion 6. Conclusion

5 Framing

One can motivate a literature review in many ways. For example, one could perform a literature review for topics with a substantial body of literature³ that lack preexisting literature reviews; this is an excellent motivation. The question of whether a body of literature is “substantial” might be hard to answer clearly but the following indicators suggest maturity: a topic has been covered 1) for several years by (tracks of) renowned IS conferences, 2) by one or more special issues of renowned IS journals, 3) by several papers published in regular issues of renowned IS journals, and 4) by several funding organizations or project calls. Furthermore, briefly querying literature databases (see Table 4) shows the magnitude of papers published on a topic. One can also support the need for writing a first literature review by citing scholars who have expressed such a need. In most cases, however, literature reviews have already been published and one needs to explain in what regard their own literature review differs from other literature reviews. Uniqueness is given, for example, when a review provides a new perspective on a topic and/or focusses on new or unsolved research questions. The following examples show how two authors have adopted these arguments:

By and large, our knowledge has resulted from an organization-centric perspective based on internal business processes, organizational structure, and workplace practices (Bharadwaj 2000; Lichtenberg 1995; Mata et al. 1995).... To continue advancing knowledge, however, an expanded conceptualization of IT business value is required.... This raises new questions about how IT can be applied to improve organizational performance. For example, how do electronically connected trading partners impact a firm's ability to execute IT-based strategies for improved efficiency and competitive advantage? How does the evolving competitive environment shape IT business value? ...The review is unique among other reviews of the IT business value literature in its application of resource-based theory to analyze how IT impacts organizational performance. ...The review is also unique in its extension of the locus of IT business value to the external competitive and macro environment. (Melville et al., 2004, p. 284).

The business value of investments in Information Systems (IS) has been, and is predicted to remain, one of the major research topics for IS researchers.... However, as Baker et al. (2008) argue, the fundamental question of the causal relationship between IS investments and business value remains partly unexplained. In addition, new IS and new IS phenomena lead to more questions over time that require addressing. IS researchers have not fully managed to identify and explain the economic relevance of IS (Fink, 2011) so that business executives and researchers continue to question the value of IS investments (Kohli & Grover, 2008). However, finding an answer to this question is regarded as fundamental to the contribution of the IS discipline (Agarwal & Lucas, 2005). (Schryen, 2013, p. 139f)

In addition, one can support writing a literature review by adopting a quantitative perspective. For example, one could note that no literature reviews on a topic has been published in many years despite the presence of many research papers. Or, if the number of papers published has declined in the presence of still-unsolved important research questions, a literature review could re-stimulate researchers' efforts to solve the questions. For example:

Despite this epistemological deficiency in IS business value research, statistics on papers published in pertinent academic outlets show that after a publication peak in 2000 the numbers of published articles on IS business value declined... (Schryen, 2013, p. 140)

Having motivated compiling a literature review, one should precisely describe their literature review's goals and contributions. I use the two literature reviews referenced above as further examples:

The purpose of this review is to add to knowledge accumulation and creation in the IS academic discipline by summarizing what we know about IT business value and suggesting how we might learn more about what we don't know. Specifically, the objectives of this review are to (1) develop a model of IT business value based in theory and informed by existing IT business value research; (2) use the model to synthesize what is known about IT business value; and (3)

³ Schryen (2010b) provides examples of IS (business value) fields where research needs to get intensified before literature reviews can be applied to synthesize findings.

guide future research by developing propositions and putting forward a research agenda. (Melville et al., 2004, p. 284f)

In order to reactivate researchers' interest and activities in the central field of IS business value, this paper provides a fresh perspective on the question of how IS investments create business value.... Its contribution is threefold: it provides a synthesis of key research findings, it identifies gaps in research, and it shows paths for overcoming the current research limitations by providing a research agenda." (Schryen, 2013, p. 140)

One should also inform readers about the literature review's structure because it is a common practice in IS research papers. I graphically represent such a structure at the end of this section. In this regard, literature reviews do not differ from other research papers. However, for the sake of comprehensiveness, I provide two examples:

[W]e begin by introducing terminology and delineating the scope of the research stream. Next, we review theoretical paradigms and modeling approaches employed in prior research. We then develop an integrative model of IT business value using the resource-based view of the firm as a principal theory base. The model provides a basis for structuring our review of accumulated knowledge, for identifying gaps in knowledge, and for developing propositions to guide future research. We conclude by summarizing the findings and limitations of our analysis and by proposing an agenda for future research. (Melville et al., 2004, p. 284f)

The next section frames IS business value research, as it is understood in this work. Subsequently, we synthesise key research findings before we identify research gaps. This is followed by the presentation of a detailed agenda for future IS business value research. Then we discuss the potential for further research and present concluding remarks. (Schryen, 2013, p. 140)

Either before explaining the structure of a literature review or afterwards in a separate section, researchers should state their literature review's scope and boundaries. As Webster and Watson (2002, p. xv) note, it is important to define key variables and constructs and to set boundaries (e.g., level(s) of analysis⁴, temporal⁵ and contextual limitations⁶, the review's scope, certain contexts (e.g., types of occupations, organizations, or countries), and time periods⁷). Researchers should also state what literature and fields they draw on (Schwarz et al., 2007, p. 29). In Schryen (2013), a separate section describes the constructs "information systems"; "IS business value" in terms of examination level (individual level, firm level, industry level, and economy level), object of examination (IS assets and non-IS assets), and time of evaluation ("ex post"); and, finally, the theoretical paradigms used in IS business value research. Schryen (2013, p. 141) defines IS business value as the central construct of the review:

Drawing on the aforementioned multiple facets of IS research, we define: IS business value is the impact of investments in particular IS assets on the multidimensional performance and capabilities of economic entities at various levels, complemented by the ultimate meaning of performance in the economic environment.

We can find another example in Fullerton & Ness (2010, p. 52), who, in a separate section, elaborate on "information technology flexibility" (ITF). They begin by stating:

Before discussing ITF, an understanding of the flexibility component of IT is required. Merriam-Webster [8] defined flexible as 'characterized by a ready capability to adapt to new, different, or changing requirements' (p. 1). Another commonly used term within the IT field is agility [14]. Merriam-Webster [1] described agile as 'having a quick resourceful and adaptable character' (p. 1). Since flexibility and agility are defined similarly, the two words will be used interchangeably."

In their literature review "Framing the Frameworks: A Review of IT Governance Research", Brown and Grant (2005) clearly acknowledge the importance of providing definitions of key concepts by naming their

⁴ The level of analysis can be individual, firm, branch, or/and national level.

⁵ For example, a literature review on the impact of IS investments on the stock market may consider only those studies that analyze short-term effects.

⁶ A contextual limitation occurs, for example, when only specific IS investments, such as those in customer relationship management systems, are analyzed.

⁷ Some reviews analyze only that part of the literature that has been published during a specific time period.

second section “What is IT Governance?”. I recommend researchers follow Melville et al. (2004) who conceptualize the construct “IT artifact” as Figure 3 shows.

<p>Tool</p> <p>IT is a tool intended to generate value, whether productivity enhancement, cost reduction, competitive advantage, improved supplier relationships, etc. Specific intention for IT is often unknown. Studies of specific system and implementation contexts enable examination of tool view assumptions.</p>
<p>Proxy</p> <p>IT is operationalized via proxies such as capital stock denominated in dollars. Wide range of potential proxies exists, but few have been adopted. Adoption of diverse proxies enables triangulation and enhances accumulated knowledge.</p>
<p>Ensemble</p> <p>Assessment of IT business value generation in rich contexts, often using case or field studies. Organizational structure and co-innovations such as workplace practices may be included as moderators or mediators of value.</p>
<p>Nominal</p> <p>IT is not conceptualized and appears in name but not in fact. Abstraction enables model precision at the expense of generality.</p>

*Adapted from Orlikowski and Iacono (2001). Computational conceptualization is not applicable to IT business value research and is omitted from the table.

Figure 3. Representation of the Key Concept “IT Artifact” (Melville et al., 2004, p. 286).

Although the literature reviews shown above use a separate section to define scope and boundaries, many literature reviews integrate this part into other sections, including the introductory section.

6 Search and Assessment Phase

The search and assessment phase includes the literature search task and the literature assessment task. These tasks can be performed largely sequentially, although it might become necessary to revisit phases based on results of a task completed later. For example, when reading a paper (evaluation), it might become useful to have a look at further references included in it that one did not regard as important when first scanning the reference section (backward search). I now describe each task.

Literature Search

The literature search belongs to those tasks of a literature review that are well described in the review methodology (Rowe, 2012, p. 470). I recommend the cyclic literature search process⁸ shown in Figure 4.

⁸ Cyclic literature search processes are also described by Wolfswinkel et al. (2013) and by Boell and Cecez-Kecmanovic (2014, p. 259), the latter of whom considers different aspects of the search process as an “inner hermeneutic loop”.

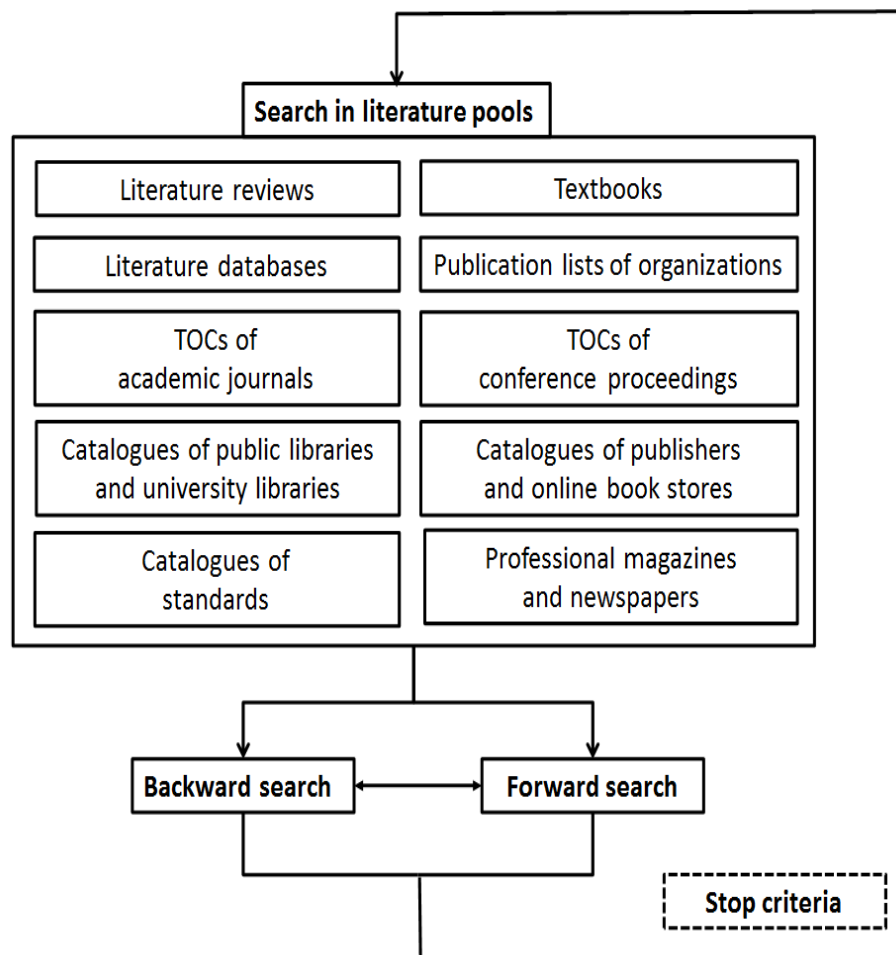


Figure 4. Cyclic Literature Search Process.

A good starting point for searching the literature includes textbooks and other scholars' literature reviews. These usually contain comprehensive reference sections and seminal works in a discipline. Other types of literature pools that one can use to search are literature databases, publication lists of organizations, catalogues of public and university libraries, online catalogues of various publishers and of online book stores, the table of contents of renowned academic journals and conference proceedings, catalogues of standards provided by standardization organizations, and articles and studies published in professional magazines (e.g., *Business Week*, *CIO Magazine*, *Computerworld*, *Forbes*, *Fortune*, *Harvard Business Review*, *Industry Leaders Magazine*, *Money Week Sloan Management Review*, *WIRED*), companies' magazines (e.g., those by IBM, Forrester Research, Gartner, SAP, Strategy& (formerly Booz & Company)), and newspapers (e.g., *Financial Times*, *Wall Street Journal*, *New York Times*, *Washington Post*). Subsequently, I describe how one can use each of these literature pools to search the literature.

Querying literature databases requires selecting appropriate bibliographic or paper databases and choosing search terms. While some databases (e.g., the AIS Electronic Library (AISeL)) are appropriate for most IS literature reviews, others, such as the IEEE Xplore Digital Library, may be more relevant for topics that are related to information and communication technology. Table 4 provides a list of online databases that I deem appropriate for the literature search in the IS discipline. Please note that this list is neither intended to be exhaustive nor intended to be a list of mandatory databases. I advise the authors of literature reviews to also identify and search further databases that cover papers from non-IS disciplines that are important for discussing the topic of the literature review. However, I believe that Table 4 covers those literature databases that are most relevant for the IS discipline.

Table 4. Literature Databases for IS Literature Reviews

Database	URL	Provider
AIS Electronic Library (AISeL)	http://aisel.aisnet.org/	Association for Information Systems (AIS)
INFORMS Conference Presentation Database, INFORMS ACI Database	https://www.informs.org/Find-Research-Publications/Searchable-Databases	Institute for Operations Research and the Management Sciences (INFORMS)
International Federation for Information Processing (IFIP) - Digital Library	http://dl.ifip.org/	International Federation for Information Processing
EBSCO host*	http://search.ebscohost.com http://www.ebscohost.com/	EBSCO Information Services
Web Of Science	http://wokinfo.com	Thomson Reuters
ScienceDirect	http://www.sciencedirect.com/	Elsevier
Scopus	http://www.scopus.com/	Elsevier
ABI/INFORM	http://www.proquest.com/products-services/abi_inform.html	ProQuest
JSTORE	http://www.jstor.org/	Ithaka Harbors
Google scholar	http://scholar.google.de/	Google
Microsoft Academic Search	http://academic.research.microsoft.com/	Microsoft
IEEE Xplore Digital Library	http://ieeexplore.ieee.org	Institute of Electrical and Electronics Engineers (IEEE)
ACM Digital Library	http://dl.acm.org/	Association for Computing Machinery (ACM)
*EBSCO host provides access to a variety of databases, including Business Source Premier, EconLit, and MLA International Bibliography		

In addition to the online databases listed in Table 4, catalogues of public libraries and university libraries should also be accessed; most of these are accessible online. As for books, the online catalogues of various publishers and online book stores can be searched.

Once appropriate literature databases are identified and selected, the next task is to define search strings that are appropriate to identify the relevant literature (Wolfswinkel et al., 2013, p. 48). Defining appropriate search strings is crucial because it determines to what extent relevant literature is not found and irrelevant literature is found. A good starting point is to take the keywords from already identified papers⁹. Another option is to draw on taxonomies that are appropriate for the topic of the literature review. For example, the IEEE (<http://www.computer.org/portal/web/publications/acmtaxonomy>) and the ACM (<http://www.acm.org/about/class/class/2012>) provide taxonomies of keywords. Researchers can also use the “Theories Used in IS Research Wiki” section on the AISworld website (Larsen, Allen, Vance, & Eargle, 2014), which provides numerous theories for the categories “main dependent construct(s)/factor(s)” and “main independent construct(s)/factor(s)”. The mentioned references are only starting points for keywords, and researchers should combine them appropriately to generate search strings. Many literature databases allow one to build logical search strings that include expressions of keywords joined with logical operators (e.g., and, or, not). For example, Schryen (2013, p. 168) uses the search string “(‘IT’ OR ‘information technology’ OR ‘IS’ OR ‘information systems’) AND (‘value’ OR ‘investment’ OR ‘productivity’ OR ‘competitive’ OR ‘performance’ OR ‘measurement’ OR ‘evaluation’ OR ‘profit’ OR ‘efficiency’)”. There is no correct or incorrect list of search strings, and researchers will probably have to play with it a bit until they find the final list of search strings. Asking more experienced scholars can help to identify these.

Beyond defining search strings, one also has to choose the time period of the search. Often, no convincing reason exists for why one should limit the period, but, in special cases, temporal constraints can help to limit the number of results. Such a special case occurs, for example, when one intends to provide a bibliographic study of papers published in a specific time period.

Finally, one has to choose the dimensions of the search: one can apply their search string(s) to titles, key words, abstracts and full texts of publications. One can also look for specific authors (cf. the discussion in the next paragraph). It can be useful to search for publications by authors who have published important

⁹ I assume that each author of a literature review is aware of some relevant paper even before starting to conduct a systematic literature search.

papers on the topic of the literature review. As in the case with defining search strings, researchers probably will have to play with combinations to identify appropriate search patterns.

During the search process, often several publications published by the same author(s) and their organization(s) show up. In particular, literature reviews and textbooks reveal corresponding names. These organizations presumably have expertise in the topic under review so that it can be promising to look up the publication lists of these organizations and of the affiliated authors.

One should also look up the table of contents of renowned academic journals and conference proceedings to not miss finding relevant literature for at least three reasons: first, catalogues may show errors, such as typographic errors in papers' titles. In such a case, applying one's search string will probably not result in identifying these papers. I refer to this kind of error as "syntactical error". Second, "semantic errors" can occur when publications that are important for a literature review do not show those keywords one used when searching for papers. Third, not all relevant papers are necessarily included in literature databases.

Several lists of renowned IS journals exist (see, e.g., AIS Senior Scholars' Basket of Journals (AIS, 2011; Liu & Myers, 2011); Hardgrave & Walstrom, 1997; Katerattanakul & Han, 2003; Lowry et al., 2004; Mylonopoulos & Theoharakis, 2001; Peffers & Ya, 2003; Rainer & Miller, 2005; Walstrom & Hardgrave, 2001; Whitman, Hendrickson, & Townsend, 1999). However, on the one hand, not all journals listed are relevant for a particular search. I recommend that researchers first have a look at the editorial statements and then decide whether to look up their tables of contents or not¹⁰. On the other hand, some journals that are relevant for a literature review are non-IS journals. As Webster and Watson (2002, p. 4) note, "Because IS is an interdisciplinary field straddling other disciplines, you often must look not only within the IS discipline when reviewing and developing theory but also outside the field". The respective list of non-IS journals that one deems relevant depends on the topic of the literature review and the academic disciplines covered. I suggest following two search paths: 1) draw on journal rankings, either on those that focus on the IS discipline but also non-IS journals (e.g., Rainer & Miller, 2005)¹¹ or on those of neighbor disciplines (e.g., German Handelsblatt ranking, Financial Times Survey of Top Business Schools 2006/2010, University of Queensland Journal Rating 2007)¹²; and 2) look up the references of papers already identified as appropriate. I discuss this element of literature search below as "backward search". For example, Schryen (2013), searched the following non-IS journals (p. 168f): *Academy of Management Review*, *American Economic Review*, and *Organization Science*. The first journal is included in Rainer and Miller's (2005) ranking, and the author selected the others because, when analyzing the reference sections of IS research papers, he identified several papers on IS business value published in these journals.

Similarly, researchers should also look up proceedings of IS conferences and non-IS conferences. For the former, Table 5 lists several often-cited rankings. However, I do not claim that this list is complete. For the latter, the appropriateness of conference rankings largely depends on the topic and the related academic disciplines of one's literature review. For example, an author of a literature review on human-computer interfaces might want to consult rankings of computer science and information technology journals, while an author of an literature review on the economics of IS might want to lookup economics and business rankings. Table 6 shows rankings of conferences on topics that are often discussed in IS literature reviews. Due to the many disciplines that are relevant for IS research, this list is incomplete. The authors of literature reviews are advised to look for more or other pertinent conference (and journal) rankings in those non-IS disciplines that are addressed in their literature review.

¹⁰ Unsurprisingly, most of the IS journals are covered by at least one literature database. Levy and Ellis (2006, p. 186) provide a list of ISWorld's top 50 ranked MIS journals and their electronic availability in terms of inclusion in literature databases.

¹¹ An overview of several IS journal rankings is provided on the AIS website (<http://aisnet.org/?JournalRankings>).

¹² An overview of many journal rankings with a focus on management is provided in the "Journal Quality List" (<http://www.harzing.com/jql.htm>).

Table 5. Rankings of IS Conferences

Provider/Author	URL
Chan, Kim, & Tan (2006)	--
Hardgrave & Walstrom (1997)	--
Walstrom & Hardgrave (2001)	--
John Lamp (School of Information and Business Analytics, Deakin University). Data is supplied by the Australian Research Council.	http://lamp.infosys.deakin.edu.au/era/?page=cfordet&selfor=0806
Fang Fang (School of Computing, National University of Singapore)	http://www.comp.nus.edu.sg/~fangfang/conference.htm
German VHB	http://vhbonline.org/service/jourqual/jq2/
German WKWI/GI	http://gcc.uni-paderborn.de/www/WI/WI2/wi2_lit.nsf/0/549991b84925b9d5c12573d200360077/\$FILE/Orientierungslisten_WKWI_GIFB5_ds41.pdf

Table 6. Rankings of Non-IS Conferences of Selected Disciplines

Provider/Author	Discipline	URL
School of Business and Economics, FAU, Germany	Information technology, computer science	http://www.wi2.uni-erlangen.de/_fileuploads/research/generic/ranking/index.html
John Lamp (School of Information and Business Analytics, Deakin University). Data is supplied by the Australian Research Council.	Information and computing sciences, engineering and technology	http://lamp.infosys.deakin.edu.au/era/?page=cforselfor=10
American Economic Association	Management, business, economic	http://www.aeaweb.org/rfe/conferences.php

Another stream of literature may come from catalogues of standards that standardization organizations provide. For example, the National Institute of Standards and Technology (NIST) provides standards for several domains including information security, cloud computing, and smart grids; the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C) develop Internet standards, and the Object Management Group (OMG) suggest standards for a wide range of technologies, such as business process modeling and software process engineering.

I recommend considering the websites of publishers and online book stores. A search in their catalogues often results in a list of textbooks that are excellent starting points for both literature research and introduction into a domain or topic.

Finally, I suggest considering professional magazines and newspapers if they are appropriate. However, as Levy and Ellis (2006, p. 185) note, “[a]lthough not totally unacceptable, use of such sources (i.e. professional magazines, newspapers, etc.) should be restricted to factual information due to the low theoretical background and application dependency”.

Having searched for literature in the previously described way, one will get a first list of publications, which is probably incomplete in terms of publications that are highly relevant for your literature review. For example, papers written by scholars in domains not considered in the search might be missing. To mitigate this deficiency, I recommend conducting a forward search and a backward search. Webster and Watson (2002, p. xvi) describe these processes as follows: “Go backward by reviewing the citations for the articles identified...to determine prior articles you should consider. Go forward...to identify articles citing the key articles identified”. The forward search is supported by some literature databases, including Google Scholar and Web of Science. One can find additional information on forward and backward search in Levy and Ellis (2006, p. 190ff).

Both search types usually lead to additional publications, and, therefore, they trigger continuing forward searches and backward searches. They can also trigger revisiting previously used literature pools and/or

searching additional ones. For example, after finding a review paper on the topic of a literature review whose reference section includes references to a particular conference series or journal, then one might want to look up the conference proceedings or table of contents, respectively. Overall, the literature search process becomes cyclic (see Figure 4).

The final question I address in describing the literature search process is when to stop the cyclic literature search. A literature review will probably never be complete in terms of relevant¹³ publications as other scholars have noted:

“Of course, you will miss some articles. If these are critical to the review, however, they are likely to be identified by colleagues who read your paper either prior to or after your submission.” (Webster & Watson, 2002, p. xvi)

“[A] literature review is indeed never complete: ...That being said, a good review must be a richly competent coverage of a well-carved out niche in the literature.” (Wolfswinkel et al., 2013, p. 47)

Although one's literature review paper will never be complete in the aforementioned sense, this insight does not help much from an operational perspective¹⁴. Levy and Ellis (2006, p. 192) provide a good recommendation on when to stop your literature search process:

Leedy and Ormrod (2005) noted that one common rule of thumb is that the search is near completion when one discovers that new articles only introduce familiar arguments, methodologies, findings, authors, and studies. Thus, when reading a new literature piece, if one will get the feeling that I've seen this (or something similar to it) before (Leedy & Ormrod, 2005, p. 82), it may suggest that the literature search is near completion. The end of the search can also be indicated when no new citations are discovered and articles cited in newly discovered literature have already been reviewed.

Finally, researchers should describe their literature search process. They do not need to describe each single iteration of the process, but they should describe which literature pools, keywords, time periods, journals, proceedings, and so on they used and how many documents they finally selected for further investigation. This description makes the search process “reproducible by others who would follow the same approach in reviewing the topic” (Okoli & Schabram, 2010, p.1). A literature review's level of documentation precision should be aligned with this goal. I suggest that researchers provide the information in the Appendix (see, e.g., Melville et al., 2004; Schryen, 2013) or in a separate methodology section (see, e.g., Aguirre-Urreta & Marakas, 2008; Aksulu & Wade, 2010¹⁵; Arnott, Pervan, & Dodson, 2005; Beaudry & Carillo, 2006; Corley, Jourdan, & Ingram, 2013; Grahlmann, Helms, Hilhorst, Brinkkemper, & van Amerongen, 2012; Miaskiewicz & Monarchi, 2008). Readers can find a good example of a detailed description of the literature search process in Muller & Ulrich (2013) (cf. Figure 5), although the description does not explicitly show the cycles of the search process.

¹³ The decision of when a reference is relevant or not for a specific literature review is largely subjective. I suggest the following procedure that considers both the relevance and quality of a research paper: if a paper is not in the scope of the review because it should have been defined prior to searching the literature, then don't include it. Often, this decision can be made after reading the abstract. Otherwise, one should further inspect the paper to see if it is really in the scope of the literature review and if it shows a high quality in terms of rigorous methodology, soundness of the results, and clarity of the results' presentation. Usually, papers published in highly renowned journals show high quality.

¹⁴ Baker (2000, p. 219) provides an economically based suggestion on when to stop the literature search process: “one should invest in acquiring a new information relevant to the solution of a problem to the point where the marginal cost of another ‘bit’ of information is equal to the marginal value of the enhanced knowledge and understanding acquired”.

¹⁵ The authors use both a separate methodology subsection and the appendix to describe the literature search methodology.

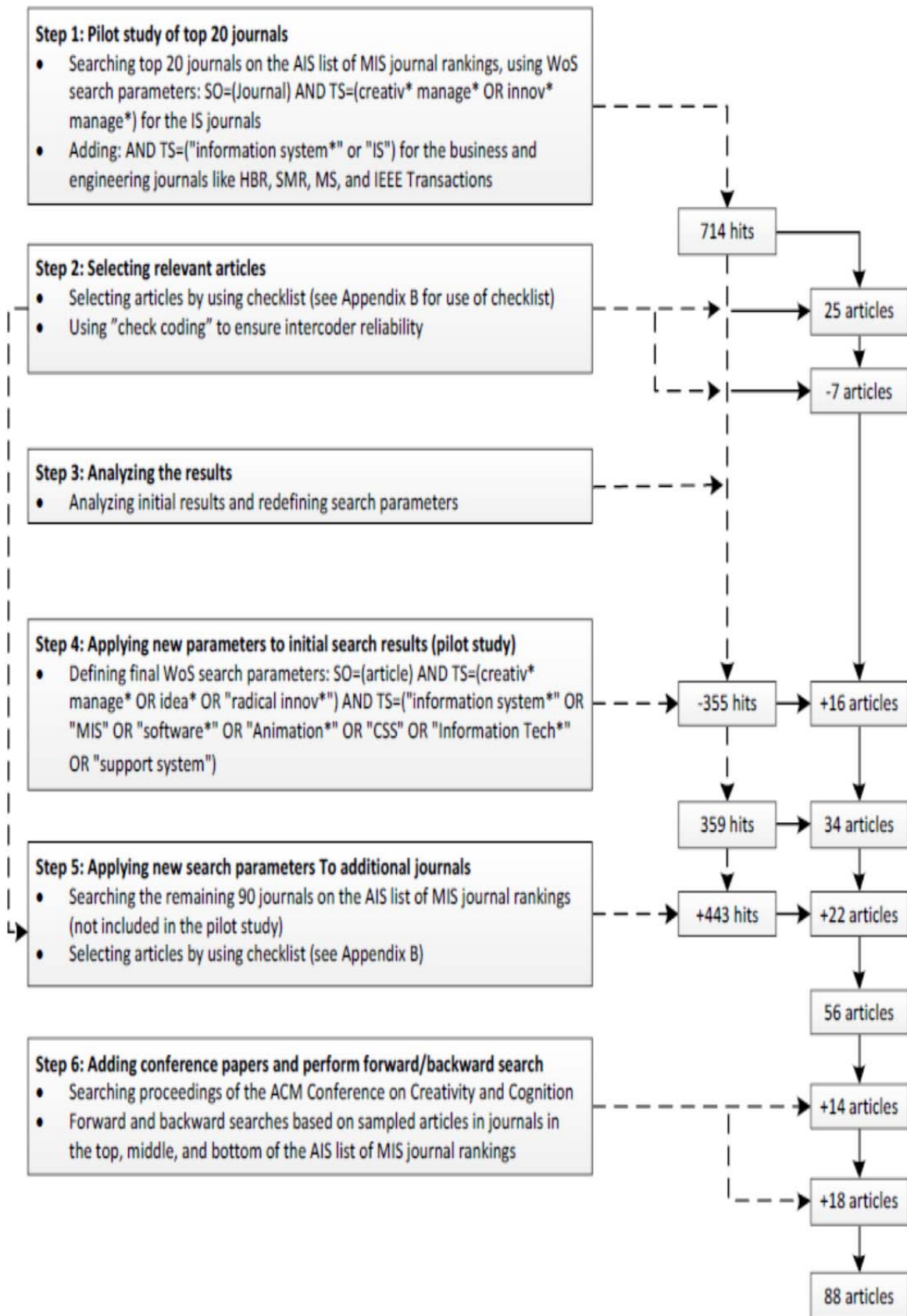


Figure 5. Description of the Literature Search Process (Muller & Ulrich, 2013, p. 179)

6.1 Literature Assessment

After the literature search process, researchers need to acquire and evaluate the literature. While one should have stored much of the relevant literature during the search process, a certain part of the literature is usually not available, for example, because of access rights or because books are neither available online nor in local libraries. However, papers' abstracts and summaries, table of contents, or excerpts of books (e.g., on books.google.com) are usually available. Based on this piece of information, researchers should decide whether to acquire the literature or not. With regard to books, universities usually cooperate with other national or university libraries, which may require waiting few days or weeks to get the literature. As for papers, white papers, standards, and so on, I recommend contacting colleagues and friends at other organizations. One can also purchase selected papers either from the publishers (which is often expensive) or order them from literature services, such as subito (www.subito-doc.de). A further option is to directly contact the author(s) of publications and ask for their manuscripts. From my own experiences, I have been able to acquire most of the relevant literature via using the aforementioned options.

Acquiring literature can be conducted in parallel with the evaluation in terms of quality and fit. Especially when working in a team of authors, researchers should define practical screening criteria to strive for consistency.

With regard to quality, researchers need to define quality criteria, which is often difficult because quality is hard to define sharply. However, setting up a catalogue of minimal requirements is useful and often possible. For example, one can require surveys to use samples with a minimum size (data requirement). One can also require laboratory experiments to describe the laboratory setting reproducibly; case studies to completely describe the relevant factors in their units of analysis, such as organizations, cities, and nations; and econometric studies to test the validity of assumptions of used statistical tests (methodology requirements). One can also define more formal quality requirements on publications, such as the availability of a separate literature review or of a separate and lengthy discussion of results. To sum up, I recommend that researchers working in teams agree on a set of requirements classified along data requirements, methodology requirements, and formal requirements, among others. It might be useful to define different quality criteria or/and different levels of quality criteria depending on the type of publication. For example, studies published in journals or in conference proceedings should demonstrate rigor in terms of methodology and/or theory, while publications in magazines should focus on applicability and relevance in practice.

Beyond quality requirements, publications also need to have a good fit with the scope of one's literature review (adequacy). This scope should have been defined prior to searching literature (cf. Section 5 ("Framing")). For example, one can use the levels of analysis (e.g., individual, organizational, industrial, national), temporal constraints (e.g., if reviewing the literature with regard to empirical findings of a specific time period), or contextual limitations (e.g., inter-organizational focus, geographical focus, gender focus). When multiple persons are involved in the evaluation, it might be useful to apply a pilot test (e.g., on a subset of the identified literature) to achieve a consistent understanding of what "fit" means. In the presence of more than one evaluator, the evaluation team should finally apply an inter-coder reliability check¹⁶. Wolfswinkel et al. (2013, p. 49) suggest that "a minimum of 90% overlap as a standard of article selection among at least two coders" should occur; however, to our best knowledge, the literature has not reached a consensus about how large the value should be. I suggest defining three classes by means of two limits: 1) literature where less than a particular percent of the evaluators argue for inclusion should not be included, and 2) literature where more than a particular percent of the evaluators argue for inclusion should be included; all other contributions need further discussion.

To assess the quality and the fit of the found literature, I recommend that researchers first read the abstract and then decide whether the paper should be excluded or whether this decision is postponed until they analyze the full paper.

¹⁶ An inter-coder reliability check ensures to achieve a predefined level of consistency. For example, a reference may finally be included only if at least two out of three authors agree that the reference should be included.

7 Synthesis Phase

Once the literature has been searched and evaluated, the selected publications contain the body of knowledge that one needs to present to the readers. This task is regarded as one of the key contributions of literature reviews as Okoli (2012, p. 34) notes: “[B]y far the most important step in any literature review is the synthesis of the studies that have been located and included for review”. Conducting this part is not straightforward and, according to my experience, often done in an inappropriate way, especially when less experienced scholars or students write a literature review. In synthesizing the literature, one should classify and make sense of various research pieces in broad categories (Rowe, 2014), or, as Levy and Ellis (2006, p. 20) remark, “assemble the literature being re-viewed for a given concept into a whole that exceeds the sum of its parts”. There is certainly not only one single way to accomplish this task. The way one synthesizes the literature is always written from a particular perspective (Hart, 1998, p. 25) and, thus, inherently includes interpretation. However, from my point of view, this part of the literature review should be mainly descriptive.

The literature largely agrees that one should present their synthesis of the body of knowledge in a concept-centric, rather than a chronological or author-centric, manner. The used concepts determine the review’s organizing framework (Webster & Watson, 2002). Adapting Salipante et al.’s (1982) matrix approach, Webster and Watson (2002) compare and visualize the author-centric and the concept-centric approaches (Table 7 and Table 8).

Table 7. Author-centric vs. Concept-centric Presentations (Webster & Watson, 2002, p. xvii)

Concept-centric	Author-centric
Concept X ... [author A, author B, ...]	Author A ... concept X, concept Y, ...
Concept Y ... [author A, author C, ...]	Author B ... concept X, concept W, ...

Table 8. Concept Matrix (Webster & Watson, 2002, p. xvii)

Papers	Concepts				
	A	B	C	D	...
1		x	x		X
2	x	x			
...			x	x	

The disadvantage of adopting an author-centric approach lies in the “he said/she said” problem; that is, “the writer tells us what each source says but does not convey the relationships among the sources” (Zorn & Campbell, 2006, p. 175). Being consistent with the above suggestion, Rowe (2014) stresses that “a literature review does not have to integrate all the knowledge elements provided by the literature into an overall logic”, “but a set of coherent macro-concepts”. The literature has suggested various interpretations and instantiations of concepts, including theories, models, and theoretical frameworks¹⁷. Levy and Ellis (2006, p. 196f) provide a long list of constructs that authors can use as concepts or as components to build concepts. A list of theories used in IS research can be found in the “Theories Used in IS Research Wiki” (Larsen et al., 2014). Boell and Cecez-Kecmanovic (2014, p. 266) provide further suggestions for using or building concepts. Many literature reviews embed their descriptions of used concepts in a separate section. For example, Beaudry and Carillo (2006) provide a separate section to describe activity theory, and Melville, Kraemer, and Gurbaxani (2004) provide a section on a resource-based IT business model.

To sum up, literature findings should be synthesized around concepts, which can either be new or used and which can be coherent and follow an overall logic or be not fully connected to each other. One can also synthesize the literature from different perspectives to provide complementary views on the literature. For example, Jasperson et al. (2002) use technology lenses and power lenses to examine the interrelationships among power on one side and IT impacts, deployment or development, management or use on the other side.

I now provide examples of concepts that have been used in literature reviews to structure the presentation of literature findings. I first provide the concept used in Schryen (2013): a synthesized IS business value

¹⁷ These notions and their differences have been discussed intensively (and inconsistently) in the literature. Schryen (2010a) briefly overviews them.

model (see Figure 6). This model synthesizes four models suggested in the literature and is an example of a new concept used to structure a literature review. The paper presents and summarizes the literature's findings along model constructs; that is, (see Table 9) along the constructs "performance measures", "impact on productivity" as most intensively studied process performance measure, "impact on market performance", "impact on accounting performance", "contextual factors", and "lag effects".

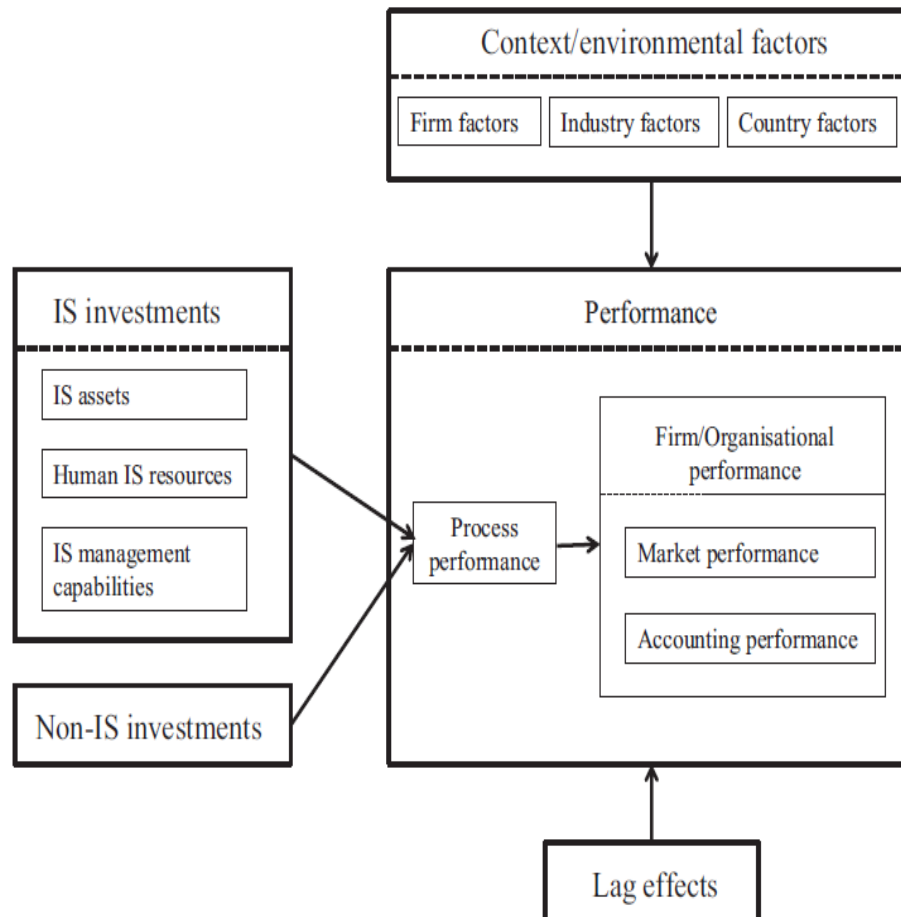


Figure 6. IS Business Value Model (Schryen, 2013, p. 144)

Melville et al. (2004) adopt a different perspective on the same topic (IS business value) and use a resource-based view (see Figure 7). The authors present literature findings along the model constructs "focal firm", "competitive environment", and "macro environment" and summarize findings in terms of propositions. Figure 8 shows an excerpt of the findings, with 1A, 1B, 2A, and 2B being focal firm propositions.

Zhang and Li's (2005) literature review on the intellectual development of human-computer interaction research exemplifies how to structurally present literature findings along research questions as concepts. Figure 9 shows an excerpt of the research questions. The presentation of literature findings is comprehensive (26 pages) and not summarized in tables or figures. Thus, I leave it to the interested reader to look up this paper and find out the detailed results for each of the research questions.

Table 9. Summary of Literature Findings Grouped by Constructs of IS Business Value Model (Schryen, 2013, p. 145)

Area	Key literature findings	Literature
Performance measures	Many empirically investigated economic measures, including productivity, capacity utilization, product quality, consumer welfare, various profit ratios, and market-oriented measures.	Brynjolfsson & Hitt (1996), Brynjolfsson & Hitt (2000), Barua et al. (1995), Thatcher & Oliver (2001), Thatcher & Pingry (2004a), Thatcher & Pingry (2004b), Thatcher & Pingry (2007), Barua et al. (1995), Bharadwaj et al. (1999), Lin (2009), Chen & Lin (2009)
	Widely adopted classifications are (1) the model of DeLone and McLean and (2) the classification that distinguishes between process performance and firm performance.	(1) DeLone & McLean (1992), Seddon (1997), DeLone & McLean (2003), (2) Barua et al. (1995), Dehning & Richardson (2002), Melville et al. (2004)
	The impact of IS investments on firm performance is intermediated by process performance.	Barua et al. (1995), Dehning & Richardson (2002), Kim et al. (2006), Lee et al. (2004), Mooney et al. (1995), Shin (1997), Soh & Markus (1995)
Impact on productivity	Early studies did not find a positive correlation between IS and productivity at firm level, industry level, or economy level.	Brynjolfsson & Yang (1996), Baily (1986) Jorgenson & Stiroh (1995), Roach (1987), Berndt & Morrison (1995), Roach (1991), Loveman (1994)
	More recent studies draw a more positive picture of the impact on productivity: productivity paradox has been resolved at firm level; major impact of IS investments on national productivity and economic growth.	Aral et al. (2007), Brynjolfsson & Hitt (1996), Brynjolfsson & Hitt (2000), Kelley (1994), Lin & Shao (2006)a, Neirotti & Paolucci (2007), Menon et al. (2000), Shin (1997), Stiroh (2002), & Swierczek & Shrestna (2003), Devaraj & Kohli (2000), Dedrick et al. (2003), Jorgensen (2001), Jorgenson & Stiroh (2000), Oliner & Sichel (2000), Lee et al. (2011)
Impact on market performance	No positive correlation between IS investments and TSR.	Tam (1998), Brynjolfsson & Hitt (1996)
	Impact of IS investments on stock market reactions is largely determined by the particular type of IS.	Dos Santos et al. (1993), Im et al. (2001), Richardson & Zmud (2002), Dehning et al. (2003)
Impact on accounting performance	Positive correlation between IS investments and Tobin's q.	Bharadwaj et al. (1999), Brynjolfsson & Yang (1999), Brynjolfsson et al. (2002)
	IS investments positively affect (1) return on sales and (2) operating income to employees.	(1) Bharadwaj (2000), Dehning & Stratopoulos (2002), Kim et al. (2009), Santhanam & Hartono (2003), Zhang (2005); (2) Bharadwaj (2000), Santhanam & Hartono (2003)
Contextual factors	Positive impact on (1) return on assets, (2) return on investment, and (3) return on equity seems to depend largely on lag effects, contextual factors, and the level of IS investments compared to total assets.	(1) Bharadwaj (2000), Dehning & Stratopoulos (2002), Hitt & Brynjolfsson (1996), Kim et al. (2009), Peslak (2003), Rai et al. (1997), Santhanam & Hartono (2003), Stratopoulos & Dehning (2000), Tam (1998); (2) Hayes et al. (2001), Mahmood & Mann (2005), Peslak (2003), Stratopoulos & Dehning (2000); (3) Alpar & Kim (1990), Beccalli (2007), Peslak (2003), Rai et al. (1997), Shin (2006), Stratopoulos & Dehning (2000), Tam (1998)
	Contextual factors can be divided into firm, industry, and economic factors.	Barua et al. (1996), Bharadwaj (2000), Davern & Kauffman (2000), Dehning & Richardson (2002), Ko & Osei-Bryson (2004), Melville et al. (2004), Zhu et al. (2004)
Lag effects	Alignment of IS with a firm's core competencies and business planning and close ties between IS investments and upper management are crucial for enhanced firm performance.	Chari et al. (2008), Dos Santos et al. (1996), Floyd & Wooldridge (1990), Li & Ye (1999), Ravichandran & Lertwongsatien (2005)
	(1) Industry factors and (2) macro-economic factors are addressed only rarely.	(1) Lin & Shao (2006)a, Sircar et al. (2000), Lim et al. (2004), Melville et al. (2007), (2) Kim et al. (2009), Swierczek & Shrestha (2003), Zhu et al. (2004)
Lag effects	Mismeasurement of IS investment impact may be rooted in the ignorance of effects delayed by years.	Kauffman & Weill (1989), Stiroh (2002), Weill & Olson (1989), Brynjolfsson & Hitt (1998), Jain (2005), Mahmood & Mann (2005), Oz (2005), Santhanam & Hartono (2003), Das et al. (2011)

One can find more examples in Aksulu and Wade (2010), who analyze proprietary and open source systems through the lens of systems theory, in Beaudry and Carillo (2006), who review the customer-centered B2C literature through the lens of activity theory, in Brown and Grant (2005), who use a conceptual framework for IT governance research, in Demirhan (2005), who applies an IT investment framework in the literature review, in Dibbern et al. (2004), who draw on a stage model of IS outsourcing, and in Jetu and Riedl (2012), who apply a conceptual model of project team success to review the literature.

8 Interpretation Phase

Interpreting the body of knowledge belongs to the most creative tasks of a literature review. Most common types include interpreting research gaps, adopting a new perspective on the body of literature, and analyzing literature in terms of suggesting of or contributing to a new theory. These types of contributions sometimes overlap.

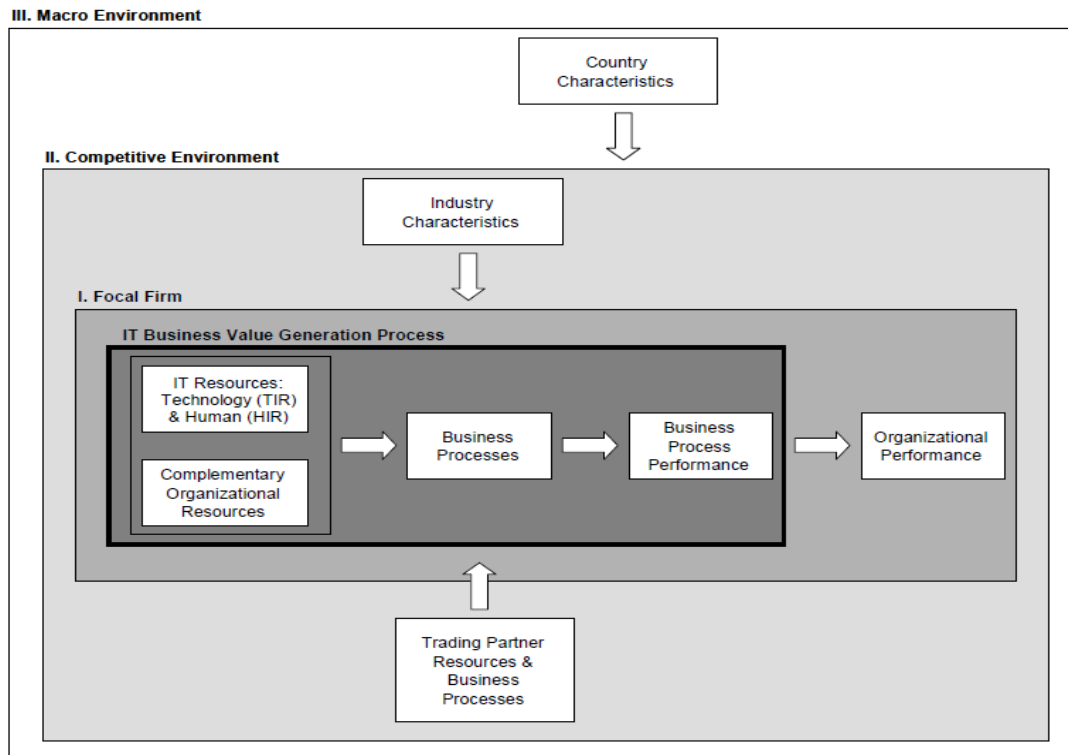


Figure 7. Resource-Based View as Concept in a Literature Review on IS Business Value Model (Melville et al., 2004, p. 293)

1A	The IT resource—including both technology and human expertise—creates economic value for a focal firm by conferring operational efficiencies that vary in magnitude and type depending upon the organizational and technological context.
1B	Human IT expertise complementary to technological IT resources may create temporary competitive advantages that underlie performance differences among firms.
2A	Certain organizational resources are complementary to the IT resource in the generation of IT business value for the focal firm; the existence and magnitude of the complementarity between any two specific instantiations of these resources varies depending upon the organizational and technological contexts.
2B	The greater the inimitability of rare organizational resources that are complementary to IT and lacking substitutes, the greater the degree to which the focal firm can obtain a sustained competitive advantage.

Figure 8. Summary of Literature Findings Grouped by Constructs of IT Business Value Model (Excerpt) (Melville et al., 2004, pp. 300, 305, 309)

8.1 Identification of Research Gaps

Identifying research gaps helps locate uncharted territories of research and, thereby, goes a step beyond synthesizing research. While the former refers to what needs to be done, the latter is related to what has been done (Hart, 1998, p. 27, cited in Baker, 2000, p. 221). By identifying and presenting these gaps, one ultimately points to possible future research directions (cf. Zorn & Campbell, 2006, p. 173) and

motivates researchers to close the gaps (Webster & Watson, 2002, p. xix). Research gaps can appear in different forms; for example, certain aspects/phenomena may have been overlooked, research results may be inconclusive or contradictory, and knowledge related to the targeted problem may be inadequate (Boell & Cecez-Kecmanovic, 2014, p. 267).

RQ1	What constitutes the intellectual substance?
	RQ11: What are the contexts of studies? RQ12: What are the research areas or subject topics? RQ13: What topics are often co-studied? RQ14: What are the research methods? RQ15: What methods are often used to study what topics? RQ16: What are the levels of analysis? RQ17: To what extent does the HCI sub-discipline consider IT as a research component? RQ18: To what extent does the HCI sub-discipline consider individual characteristics?*
RQ2	What are the relationships with other disciplines?
	RQ21: What are the disciplines contributing to the HCI studies? RQ22: What contributing disciplines are often co-cited in HCI studies? RQ23: What disciplines are often used to support what subject topics?

Figure 9. Research Questions as Concepts in a Literature Review (excerpt) (Zhang & Li, 2005, p. 234)

Two challenges occur when authors focus on research gaps: (1) identifying gaps in a methodological way, and (2) expressing and presenting them. As for the first question, I could not find explicit recommendations in the literature. Based on my own experience in writing literature reviews, I suggest that, analogously to synthesizing literature, researchers select and apply a concept-centric perspective. The concept(s) used to identify research gaps can be identical to those used for the literature synthesis but may also be different as Rowe (2014, p. 248) notes: “there are two types of categories related to two types of structural dimensions: those that help mapping the literature and those that help analyzing it. They are not necessarily the same”. As for the second question, it has become good practice to condense research gaps in research questions, hypotheses, or propositions. I now provide some exemplar papers that identify and present research gaps and explain how each of the cited literature reviews addresses the two challenges mentioned above.

Table 10. Research Gaps (Schryen, 2013, p. 150)

Research gaps	Deficiencies in research	References
Ambiguity and fuzziness of the “IS business value” construct	Discussion on IS business value frays into many lines of thought and loses track of the “IS value” construct”. Market-oriented capabilities and internal capabilities are out of the scope of value consideration. Understanding of value lacks the consideration of the environment. Subjective preferences of stakeholders are disregarded.	Alshawi (2003), Ayal & Seidmann (2009), Barua et al. (1995), Bhatt & Grover (2005), Bresnahan et al. (2002), Davern & Wilkin (2010), Dedrick et al. (2003), Dehning & Richardson (2002), Kohli & Grover (2008), McAfee (2002), Oz (2005), Soh & Markus (1995), Sylla & Wen (2002)
Neglected disaggregation of IS investments	Only little is known about the relative performance contributions of different types of IS investments and whether different IS investments impact different aspects of firm performance. Empirical results of different studies are hard to compare (danger of comparing apples with pears). Impact of specific IS assets on firms’ strategic and resource-oriented position is hardly understood. Synergies and complementarities of IS assets are not identified.	Aral & Weill (2007), Bharadwaj et al. (1999), Cho (2009), Mahmood & Mann (1993), Melville et al. (2004), Mutch (2010), Orlikowski & Iacono (2001), Rai et al. (1997), Sircar et al. (2000), Weill (1992)
IS business value creation process as grey box	Time-variant relationships between IS assets and complementary capabilities remain unclear. Value-generation process still needs to be uncovered. Time issues in creating competitive value are not sufficiently addressed. Explanations of unanticipated consequences of IS are still required. No theory on IS business value exists.	Aral & Weill (2007), Avison et al. (2006), Avgerou (2000), Avgerou (2001), Bhatt & Grover (2005), Dedrick et al. (2003), DeSanctis & Poole (1994), Kane & Alavi (2007), Leonardi (2007), Markus & Robey (2004), Mutch (2010), Nelson (2007), Orlikowski (1996), Pinsonneault & Kraemer (2002), Rai & Tanf (2007), Rowe (1994), Whittington et al. (1999), Zammuto et al. (2007)

Again, I start with the literature review of Schryen (2013). He uses the same model (cf. Figure 6) to both synthesize literature findings and identify research gaps. He identifies three areas in which further research is required and details these with specific deficiencies in research and related literature (cf. Table 10). Based on these deficiencies, the author develops research questions along the research gaps (cf. Table 11).

Table 11. Research Questions (Based on Schryen, 2013, p. 159)

Research gaps	Research questions
Ambiguity and fuzziness of the "IS business value" construct	How can we yield a comprehensive, consistent and precise understanding of the multifaceted construct "IS business value"?
	How can the assessment of (internal and competitive) business value account for the context of evaluation, and, in particular, the firm, industry, and country environment and the preferences of evaluators?
Neglected disaggregation of IS investments	How can total IS investments be disaggregated conceptually and empirically such that the impact of different types of investments on a firm's economic performance can be determined?
	How can the disaggregation of total IS investments account for synergies and complementarities of IS assets?
IS business value creation process as grey box	How, why and when do IS assets, IS capabilities, and socio-organizational capabilities affect each other and jointly create internal value?
	How, why and when do IS assets, IS capabilities, and socio-organizational capabilities jointly create competitive value and, thus, perform a value-creation process?

As a second example, I use Powell et al.'s (2004) literature review on virtual teams. They identify important areas that have remained under-researched by drawing on the same framework that they use to synthesize the literature. The framework is structured around inputs, socio-emotional processes, task processes, and outputs (cf. Figure 10).

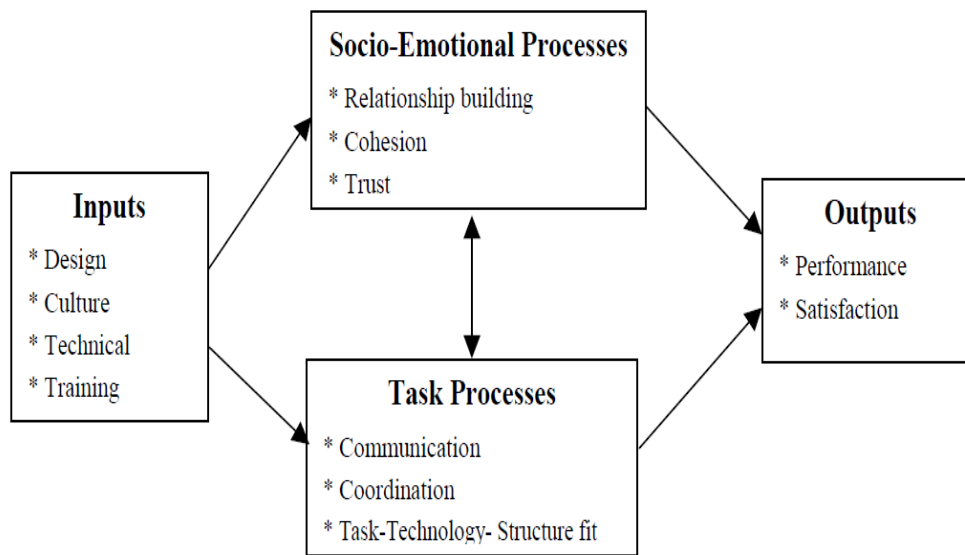


Figure 10. Framework to both Synthesize Literature and Identify Research Gaps (Powell et al., 2004, p. 8)

Based on the four under-researched areas, the authors suggest many partially connected research questions (cf. Table 12).

Table 12. Research Questions (Based on Powell et al., 2004)

Under-researched areas	Research questions
Inputs	What projects are virtual teams best suited to work on?
	What is the appropriate size and skills composition for virtual teams approaching different project types?
	Do task and socio-emotional processes develop differently in different types of virtual teams? If so, how?
	Are antecedents for team effectiveness different for long-term virtual teams versus short-term virtual teams?
	Are antecedents for team effectiveness different depending on the type of task the virtual team is accomplishing?
	Are autonomy and self-direction the team structures best suited for virtual teams?
	Under what circumstances (e.g., team size, type of project, duration and team composition) does autonomy hinder team effectiveness in the virtual environment?
	Do traditional managerial control mechanisms remain applicable in the virtual environment? If so, what are the most appropriate managerial controls (formal versus informal)?
	Can informal control mechanisms be used when teams rarely meet FtF and are short-lived?
	Can a set of behaviors that promote effectiveness of a wide range of virtual teams be identified? How can these behaviors be effectively enforced in virtual teams?
	Who should be a member of a virtual team? If a manager has several people to choose from, how does the manager decide which employee to place on the virtual team?
Socio-emotional processes	Which, if any, socialization activities foster trust in different types of virtual teams? What can a manager or team leader do to foster swift trust? Is swift trust observed or even needed in long-term virtual teams?
	How is diversity treated in virtual teams. In the leaner environment of virtual teams, where some diversity may not be known, will diversity affect virtual teams in the same way it does traditional teams? Can cohesion be manipulated successfully in a virtual team in a manner similar to that employed with a traditional team? Can team leaders minimize deep-level diversity to improve cohesion?
	What does social identity mean in virtual teams? Do virtual team members identify with their team as a social entity or do they remain tangential to it? What are the characteristics and behaviors of virtual teams that have been able to achieve significant levels of social identification? Are virtual team members able to perform satisfactorily even when they do not identify with the team? What types of managerial intervention foster increased social identity? Are there identifiable processes of adaptation that enable virtual teams to overcome the limitations of the virtual environment?
Task processes	Is it feasible to deconstruct virtual team projects so as to enable the object-oriented model? Does the decoupling process successfully reduce coordination challenges? What type of tasks and projects are most amenable to such deconstruction? What available technology can be used to enable the decoupling process without sacrificing the essence of teamwork?
	What interventions can be used to limit the negative effect of time dispersion? Is training and sensitizing of virtual team members sufficient to overcome the limitations associated with time dispersion?
	What team norms facilitate the reclaiming of time? What adaptive processes and structural work arrangements are best suited to incorporate time differences into the team's social structure?
	Under what circumstances a caretaker is instrumental in reducing process losses? What are the traits of successful caretakers? What portfolio of technologies do successful caretakers employ, and under what contingencies do they employ them? Does the role of the caretaker change based on the type of virtual team being assembled? Do the potential benefits of caretaker intervention differ depending on the timing of the intervention? Do early interventions contribute to improve virtual team trust? Can the caretaker contribute to create and enforce early norms that lead to effective interaction—enabling to depart the team after a time?
	What can a team leader or caretaker do to manage conflict in virtual teams? Besides the use of process structures, are their other strategies that can be implemented to increase positive conflict while decreasing negative conflict?
Outputs	What are the determinants of team viability in the virtual environment? What socio-emotional and task processes foster team viability? What is the process by which these antecedents of team viability operate?
	What are the determinants of virtual team member viability and the process by which it can be fostered?

Further literature reviews that identify research gaps are provided by Dibbern et al. (2004), who note unresolved issues and knowledge gaps in information systems outsourcing, Kohli and Grover (2008), who suggest four themes of future research on the business value of information technology, Roberts et al. (2012), who identify limitations in the IS discipline's use of absorptive capacity, and Alavi and Leidner

(2001), who suggest research questions on knowledge management and knowledge management systems.

8.2 Adoption of a New Perspective

One can also interpret literature findings by analyzing the literature from a previously not adopted, potentially completely new, perspective. Such a perspective is inherently concept-centric and can be based on concepts that are, in principle, appropriate for structuring a literature review. Similarly to reviews that identify research gaps, the concepts used for structuring literature findings and for interpreting them can be identical or different. Jasperson et al. (2002) exemplify a review with an identical concept: they review the literature on the relationships between power and information technology impacts, development or deployment, and management or use. The authors apply two sets of lenses separately to examine the literature findings: one set of lenses includes the technological imperative, organizational imperative, and emergent perspectives and is used to understand the causal structure between IT and organizational power. A second set of lenses includes the rational, pluralist, interpretive, and radical perspectives and is used to focus on the role of power and different IT outcomes. Table 13 shows these lenses. Then, the authors draw on the same sets of lenses to discuss the similarities and differences that occur when the two sets of lenses are simultaneously applied. Table 14 summarizes the results.

8.3 Theory Building

Some authors, such as LePine and Wilcox-King (2010), see reviews as vehicles for developing theory, which suggests or contributes to a new theory. Wolfswinkel et al. (2013, p. 52) concur and argue that “theory building is one of the increasingly important outcomes when using Grounded Theory to review a carved-out segment of literature”. Although the literature features little consensus on what exactly a theory is (Sutton & Staw, 1995), in the context of interpreting the literature, Gregor (2006, p. 620) is appropriate. She argues that all theories contain “means of representation” (physical representation by words, logic, diagrams, tables etc.), “constructs” (phenomena of interest), “statements of relationship”, and “scope” (degree of generality of the statements of relationships). This wide understanding does not require a theory to have an explanatory component. Gregor (2006) further suggests five different types of theories: theory for analyzing (type I), theory for explaining (type II), theory for predicting (type III), theory for explaining and predicting (type IV), and theory for design and action (type V).

A literature review can suggest or at least contribute to a new theory when it interprets the body of knowledge from a perspective that has not been adopted before. In this regard, contributing to a new theory can be considered a subtype of adopting a new perspective.

I now provide several examples of literature reviews that show how diverse literature reviews’ theoretical contributions can be. The first example is Jasperson et al. (2002) (cf. previous subsection). As I describe above, the authors adopt a new perspective on the literature by discussing similarities and differences that occur when different sets of lenses are simultaneously applied. Based on this discussion, the authors develop propositions that can be interpreted from multiple perspectives and refer to these as “metaconjectures” (cf. Table 15). A second example is Soh and Markus (2005). The authors review models on IT business value (cf. Figure 11), analyze the models with regard to process and variance theory characteristics (cf. Table 16), and suggest a new process theory (cf. Figure 12) by synthesizing the models and resolving some of their contradictions. The new process theory can serve as a platform for future research.

More examples of literature reviews that contribute to theory building are the reviews of Joseph, Ng, Koh, and Ang (2007), who propose a theoretical model of IT turnover, including propositions for future research, and Leidner and Kayworth (2006), who develop a theory of IT, values and conflict and propositions concerning three types of cultural conflict and the results of these conflicts.

Table 13. Technology Lenses and Power Lenses as Concepts (Jasperson et al., 2002, pp. 406f)

Lens	Definition
Technological	"Views technology as an exogenous force which determines or strongly constrains the behavior of individuals and organizations" (Markus & Robey 1988, p. 585). The technological imperative is also called technological determinism because technology is considered a determinant, or strong driver, of organizational outcomes (Orlikowski, 1992; Pinsonneault & Kraemer, 1993).
Organizational	"Assumes almost unlimited choice over technological options and almost unlimited control over the consequences...human actors design information systems to satisfy organizational needs for information. Thus, information technology is the dependent variable in the organizational imperative, caused by the organization's information processing needs and the manager's choices about how to satisfy them" (Markus & Robey, 1988, p. 587). The organizational imperative, also called managerial choice or strategic choice, emphasizes that individuals choose how and when to apply IT to accomplish work in the organization (Orlikowski, 1992; Pinsonneault & Kraemer, 1993).
Emergent	"The uses and consequences of information technology emerge unpredictably from complex social interactions" (Markus & Robey, 1988, p. 588). The emergent perspective is typified by studies applying the structurational model of technology (Orlikowski, 1992; Orlikowski & Robey, 1991). The emergent perspective views the introduction of IT into an organizational setting as a catalyst, initiating a series of reciprocal causes and effects from which the use of the technology and the organizational outcomes arise (Orlikowski, 1992; Pinsonneault & Kraemer, 1993).
Rational	Structural power that focuses on authority, information, and expertise as bases of power; emphasizes rational decision making. Power is viewed in terms of an objective reality in which there is an objectively identifiable, ordered set of optimal goals for the organization (Bradshaw-Camball & Murray, 1991).
Pluralist	Power that assumes objective definitions of power and that conflict is the norm; development, prioritization, and execution of organizational goals is an explicitly political process involving conscious negotiation based on control of resources and information. Power viewed in terms of an objective reality in which there are objectively identifiable sets of optimal goals for each participant in an organization (Bradshaw-Camball & Murray, 1991).
Interpretive	Power is based on the ability to control access to and direct the construction of organizational realities. Power that "assumes that reality is socially constructed...[and]that the parties involved exert influence by constructing the meaning of what others experience" (Bradshaw-Camball & Murray, 1991, p. 382).
Radical	Power and politics are outgrowths of social structures, such as class, racial, gender, or institutional structures, that exist outside any particular organization. Political activity, broadly defined, involves either maintaining or undermining (and ultimately overthrowing) existing power structures (Bradshaw-Camball & Murray, 1991).

Table 14. Summary of Differences Across Lenses as Result of Interpretation (Jasperson et al., 2002, p. 415)

Lens	Differences
Technological imperative	
Rational	Information technology use can alter short-term power bases and create greater equality of participation; however, there is no evidence of lasting effects on legitimate power. Information technology does not alter goals since it is fixed and superordinate.
Pluralist	Information technology use allows for the possibility of competing goals and leads to technology's potentially lasting impact on both formal and informal power.
Interpretive	Language and symbols are used to communicate the value of IT to the organization. The power outcomes are organizationally focused and long term. The manipulation of language and symbols creates a perception that there is a common goal.
Radical	Information technology is a powerful force that causes changes in organizational and societal structures.
Organizational imperative	
Rational	Information technology reinforces existing formal decision structure. Focus is on why managers make the choices they do about decision structures.
Pluralist	Organizational actors may use IT to subvert rational power processes or to maintain or enhance formal and informal power positions.
Interpretive	Manipulation of language and symbols to define IT and thereby exercise power and construct social reality about appropriate decisions, structures, and goals.
Radical	Information technology is the powerful driver that is used by a class to change the deep structures of society.

Table 14. Summary of Differences Across Lenses as Result of Interpretation (Jasperson et al., 2002, p. 415)

Emergent perspective	
Rational	Decision making structures change in response to IT use and IT supporting those structures change accordingly.
Pluralist	Focus on how the less powerful attain subgroup outcomes and resist IT implementation. The goals of the organizational stakeholders are important for understanding organizational power.
Interpretive	Proactive and reactive use of IT to construct social reality about the IT.
Radical	Information technology evolves over time to change society's deep structures and to have its use shaped by the dominant class in that society.

Table 15. Research Propositions (Metaconjectures) (Jasperson et al., 2002)

Area	Metaconjecture
IT impact	IT use can moderate the effects of externally based power differentials on the distribution of participation in a group, organizational, or inter-organizational decision making process.
	IT use can only moderate the effects of external power structures on participation in group, organization, or inter-organizational decision making on a temporary basis.
	Once power-altering IT has been introduced, it takes some time for the organization to reach a new equilibrium state. The indicators of IT's impact on a new equilibrium state are evidenced by new power structures, language, and symbols.
IT management	Top management's failure to exercise formal authority leads to more prevalent exercises of influence behavior in IT decisions by other parties.
	In situations where the IT function and/or developers lack formal authority or resources, there is greater emphasis placed upon generating acceptance of a formal methodology, which, in turn, alters the formal structures of authority.
	In organizations or groups where the IT function and/or developers have high levels of formal authority or resources, there is less emphasis on educating top management and more on negotiating.
IT development	Top management support has more impact on project success in development environments characterized by resource conflict.
	Top management support has more impact when there is uncertainty about the importance of IT generally or the project specifically.

9 Guidance Phase

Guiding future research can occur in different forms and levels of detail. Several authors provide some brief suggestions for further research in their concluding remarks. Others point to future research directions in more detail without embedding their recommendations in a coherent concept. For example, Zhang and Li (2005, p. 274ff) show future directions for the HCI sub-discipline by drawing on their previously proposed research questions. The authors group their recommendations by “ad hoc opportunistic research vs. long term, theoretically oriented research”, “pluralistic methods, dominating methods, and multi-methods”, and “general MIS journals, specific HCI in MIS journals, and general HCI journals”. Another example is Riedl (2013), who uses the previously identified research questions and underrepresented topics to suggest three domains for future research on the biology of technostress: theory and methods, design science and engineering, and health and coping strategies.

A third group of authors draw on a coherent concept, often labeled “framework” or “research agenda”, to guide future research. For example, Schryen (2013) suggests an IS business value research agenda (cf. Figure 13) based on the previously identified research gaps (cf. Table 10). The author details his research agenda by suggesting research thrusts and research paths regarding discussion about how these thrusts may be answered in future research (cf. Table 17). Roberts et al. (2012) use the limitations identified based on their literature synthesis (cf. Table 18) to propose a research agenda by providing a framework for investigating the interaction of information technology and absorptive capacity (cf. Figure 14) and to suggest research propositions (cf. Table 19).

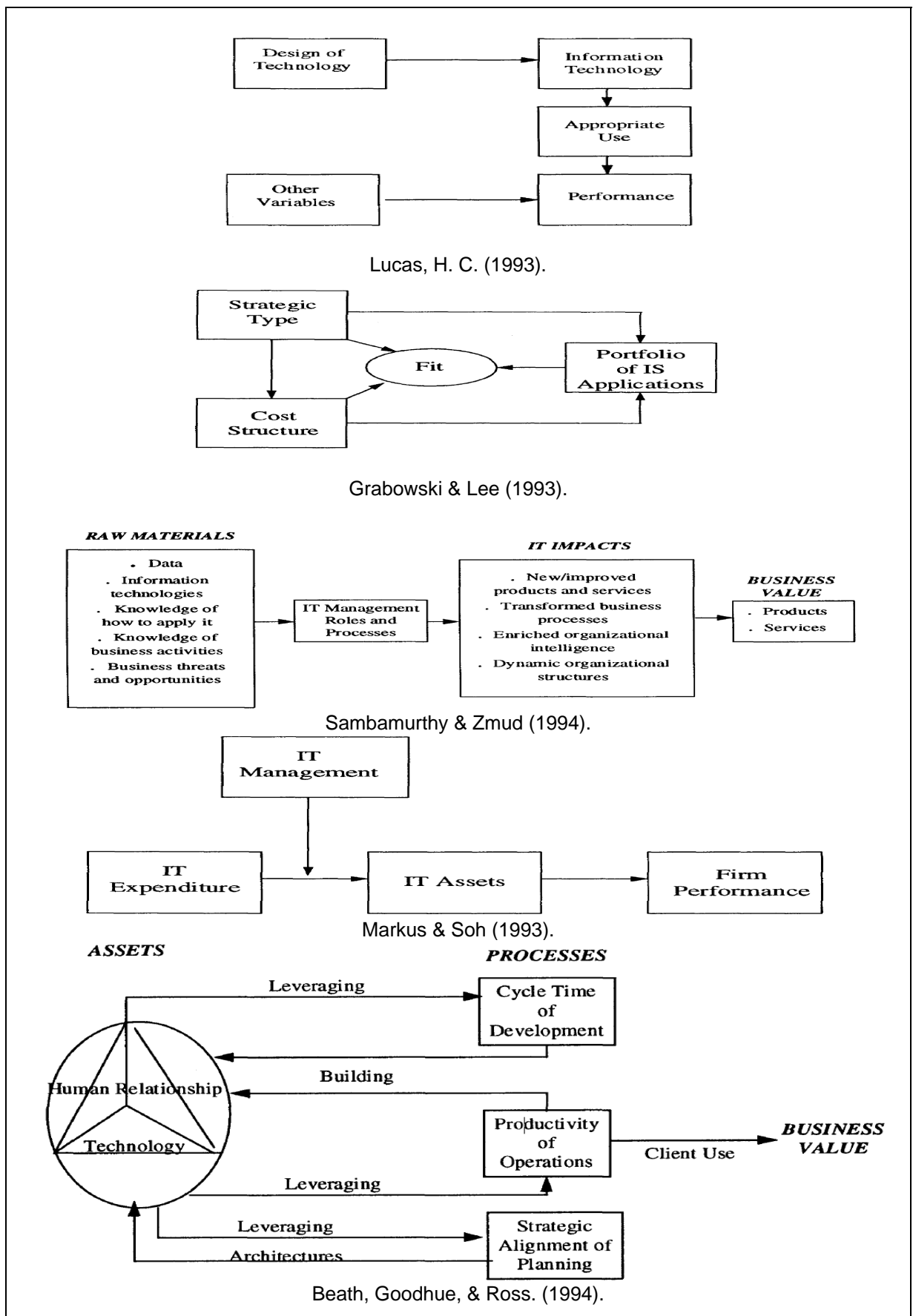


Figure 11. Models of IT Business Value (Soh & Markus, 2005, pp. 31, 33f)

Table 16. Analysis of IT business value models (Soh & Markus, 2005, pp. 35)

Criteria	Lucas	Grabowski & Lee	Markus & Soh	Beath, Goodhue & Ross	Sambamurthy & Zmud
Outcome	Organizational performance (variable)	Organizational performance (variable)	Quality IT assets (discrete intermediate outcome) Improved organizational performance (discrete outcome)	Improved business processes (discrete intermediate outcome) Business value (variable)	IT impacts (intermediate variable outcome) Business value (variable)
Logical Form	If IT is not well designed, then appropriate use will not result (P) If appropriate IT use, then increased organizational performance (V)	If there is a poor fit among strategic type, cost structure and portfolio, then decreased organizational performance (P)	Without IT spending, there will be no IT assets (P) Without quality assets, no improvement in organizational performance (P)	Without high quality assets, no improved business process (P) Without improved business processes, no increase in business value (P)	Without raw materials, no IT impacts (P) Greater IT management competencies, greater IT impacts (V) Greater IT impacts lead to greater business value (V)
Assumptions	Good IT design may not lead to increased performance because it may be inappropriately used (P) Organizational performance will increase with more appropriate use of well designed IT (V)	Increased organizational performance may not occur even if there is a fit because of competitor actions (P)	Quality IT assets may not occur even with IT spending; effective conversion is dependent on management processes (P) Quality assets may not lead to improved performance, due to competitor actions (P)	Increase in business value may not occur even with quality IT assets and improved business processes because of process losses, and lack of use (P)	IT impacts may not occur with availability of raw materials, dependent on IT management processes (P) IT impacts occur when there are effective management processes (V) Business value results when there are favorable IT impacts (V)
Role of Time	Sequential ordering of IT design and implementation then use (P)	Not considered	Sequential ordering of IT spending, management processes, and IT assets (P)	Sequential ordering of IT assets, process improvement, and use (P)	Sequential ordering of raw materials, management processes, and IT impacts (P)

Note: (P) and (V) refer to process and variance characteristics respectively.

The aforementioned literature reviews all commonly achieve logical coherence by using their literature synthesis to identify research needs and to subsequently suggest recommendations on how to address these needs. I recommend that researchers adopt the logic of this flow when they suggest a research agenda in their literature reviews.

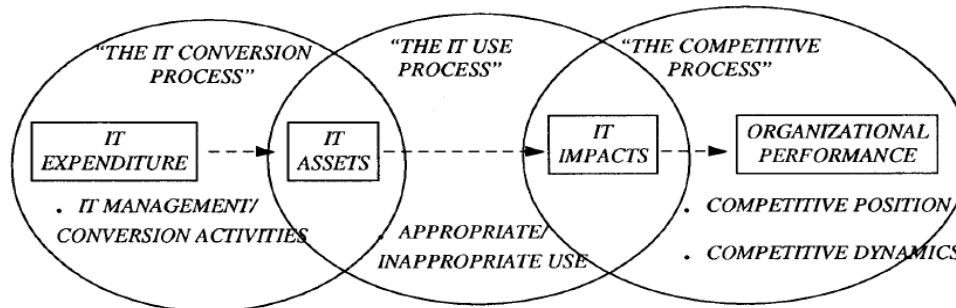


Figure 12. Process Theory on IT Business Value (Soh & Markus, 2005, p. 37)

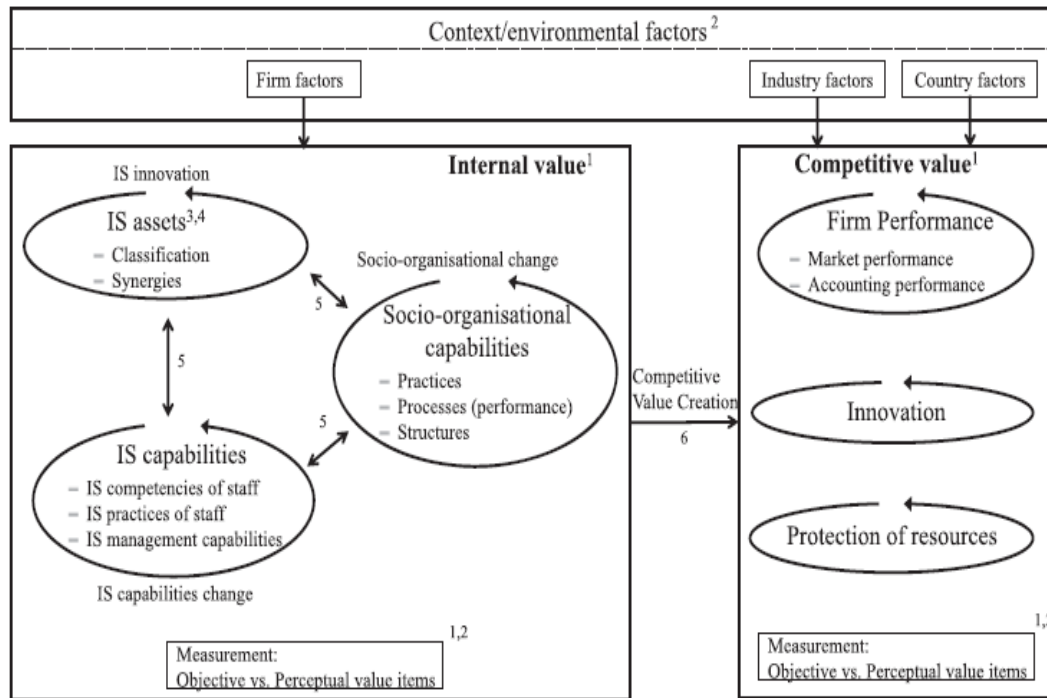


Figure 13. Research Agenda Suggested in Schryen (2013, p. 151)

Developing a research agenda, including research thrusts, research propositions, research paths, and, most desirable, theories and methodologies for future research, is a challenging and innovative task that can hardly—and should not—be standardized for the purpose of flexible and innovative pointers to relevant research. Readers can find more examples of how research agendas can be developed in the literature reviews of Joseph, Ng, Koh, and Ang (2007), who propose a research agenda with a contextual model of turnover of IT professionals, Tyran and Shepherd (2001), who suggest a research framework for research on group support system technology to the classroom, Wade and Hulland (2004), who use the well-established resource-based view to develop IS research paths, and Belanger and Crossler (2011), who develop an information privacy concern multilevel framework and use this framework to make a chart for future research.

Table 17. Research Thrusts and Research Paths (Schryen, 2013, p. 159)

Research gaps	Research thrusts	Research paths
Ambiguity and fuzziness of the “IS business value” construct	How can we yield a comprehensive, consistent and precise understanding of the multifaceted construct “IS business value”?	Disaggregation and operationalisation of four types of IS business value (based on suggested value taxonomy) Identification of value items with which the respective value can be measured Use of objective and perceptual measures Identification and development of methodologies that allow the measurement of value items
	How can the assessment of (internal and competitive) business value account for the context of evaluation, and in particular the firm, industry and country environment and the preferences of evaluators?	Identification of (value item specific) environmental factors and their impact on the ultimate economic meaning of value items Use of “states” as conceptual constructs of economic conditions, which are instantiations of environmental factors Consideration of subjective preferences of stakeholders Identification of preference functions of stakeholder (utility theory)
Neglected disaggregation of IS investments	How can total IS investments be disaggregated conceptually and empirically such that the impact of different types of investments on the economic performance of a firm can be determined?	Conceptual development of IS asset classification according to the objectives of the firm Suggestion of methodologies that account for potential ambiguities in classification Case studies in firms in order to trace and evaluate investments in particular IS assets
	How can the disaggregation of total IS investments	Identification of synergy opportunities of IS assets by means of business objectives, critical success factors and key performance indicators

Table 17. Research Thrusts and Research Paths (Schryen, 2013, p. 159)

Research gaps	Research thrusts	Research paths
	account for synergies and complementarities of IS assets?	Distinction between “super-additive IS value synergy” and “sub-additive IS cost synergy”
IS business value creation process as grey box	How, why and when do IS assets, IS capabilities and socio-organisational capabilities affect each other and jointly create internal value?	Interdependencies between particular IS capabilities, competencies and practices; development of IS capabilities over time (change in IS capabilities) Impact of socio-organizational change on changes in IS capabilities; consideration of three types of socio-organizational capabilities: customer management capability, process management capability and performance management capability Future work needs to resolve contradictory results in the literature regarding the relationship between IS innovation and socio-organizational change. Relationship between IS innovation and change in IS capabilities needs to be investigated in order to understand how IS assets and innovation contribute to building and sustaining valuable, scarce, and difficult-to-imitate resources.
	How, why and when do IS assets, IS capabilities and socio-organisational capabilities jointly create competitive value, thus performing a value creation process?	Identification of complementarities of IS assets, IS capabilities and socio-organisational capabilities by means of business objectives, critical success factors and key performance indicators Protection of access to resources, decrease in dependence of own firm on other firms, and increase in dependence of other firms on own firm through inter-organisational IS (resource dependence theory) Competitive value of IS and capabilities manifests in performance differences along dimensions consistent with their strategic purpose (resource-based view, IS governance). IS use can have unanticipated consequences. The development of an integrated explanatory theory can draw on the multidisciplinary theoretical input of Markus and Robey (2004). Erosion of competitive value over time depends on ability and speed with which IS assets and capabilities are imitated by competitors.

Table 18. Limitations of Past Research (Roberts et al., 2012, p. 640)

Limitation	Description	Guidelines
Conceptualization	A substantial number of IS articles conceptualize absorptive capacity as an asset. Conceptualizing absorptive capacity as an asset raises construct validity issues and fails to capture knowledge absorption processes. Possessing relevant prior knowledge is a necessary but insufficient condition for a firm to have an effective absorptive capacity capability. This also underestimates the role IT can play in knowledge absorption.	Conceptualize absorptive capacity as a capability Employ a holistic approach to the relationship between IT and absorptive capacity
Level of Analysis	IS scholars have investigated absorptive capacity at the individual level. Failure to take into account the differences between individual absorptive capacity and collective absorptive capacity undermines construct validity and inhibits theoretical development.	Conceptualize and measure absorptive capacity as a collective construct Build on appropriate learning research
Measurement	IS researchers often define absorptive capacity as a capability and yet measure it as an asset, thereby undermining construct validity. Adapting measures of organizational absorptive capacity at the individual level also complicates construct validity. Scholars eschew established measures of absorptive capacity, inhibiting the building of a cumulative research tradition. Finally, researchers often miss capturing the domain-specific nature of absorptive capacity.	Conceptualize and measure absorptive capacity as a multidimensional capability Develop metrics that capture each of absorptive capacity’s dimensions Measure absorptive capacity with respect to specific knowledge domains
IT Artifact	A substantial amount of IS research employs a nominal view of the IT artifact in relation to absorptive capacity. Conceptualization of IT is absent from these studies. Furthermore, absorptive capacity is often conceptualized as an asset or at a “macro” or abstract level, thereby making it difficult to provide relevant implications for managers.	Describe the relationship between IT and absorptive capacity Develop theoretical contexts with well-defined boundaries

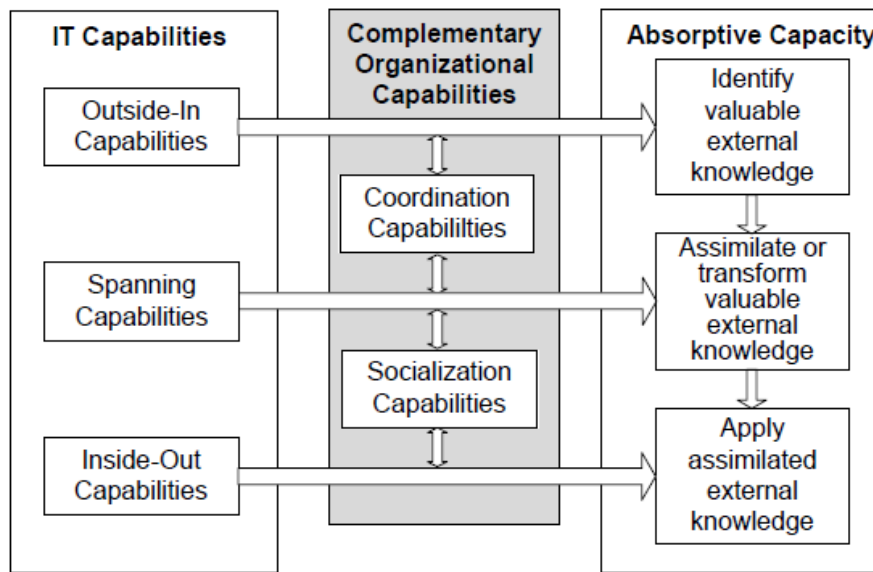


Figure 14. Research Agenda Suggested in Roberts et al. (2012, p. 641)

Table 19. Research Propositions (Roberts et al., 2012, pp. 642ff)

Proposition 1	Synergies arising from complementarities between outside-in IT capabilities and knowledge-exchange coordination capabilities will have a positive effect on a firm's ability to identify and recognize the value of external knowledge.
Proposition 2	Synergies arising from complementarities between spanning IT capabilities and knowledge-exchange coordination capabilities will have a positive effect on a firm's ability to assimilate and transform external knowledge.
Proposition 3	Synergies arising from complementarities between spanning IT capabilities and knowledge-exchange socialization capabilities will have a positive effect on a firm's ability to assimilate and transform external knowledge.
Proposition 4	Synergies arising from complementarities between inside-out IT capabilities and knowledge-exchange socialization capabilities will have a positive effect on a firm's ability to apply external knowledge.

10 Conclusion Phase

As in research papers of genres other than literature reviews, researchers should conclude their literature review. I recommend that researchers provide a summary of what their literature review has found, of what the implications for research and practice are, and what the limitations are. The summary should briefly synthesize each of the contributions of the literature review. In particular, it should state which concept(s) were adopted to review and interpret the literature and, potentially, to develop a research agenda. Of course, one should also summarize what they found in terms of literature findings, research gaps, extension of knowledge, and future research paths.

A literature review's implications can refer to research and practice and should be presented (Webster & Watson, 2002, p. xxi). Providing a research agenda means that one has already shown the essential implications for research. However, this does not necessarily mean having nothing more to say on future research. For example, Schryen (2013) provides a separate section entitled "Potential for further research" in which he briefly sketches future research areas that are not covered in the research agenda.

Finally, one should state the limitations. Note that each literature review has limitations and no "perfect" literature review exists. One does not reduce the quality of their review when making its limitations explicit. In contrast, a good literature review does not only state what it has done but also what future literature reviews still need to do. The limitations can be rooted, for example, in the selection of publication outlets, the choice of search strings and key words, the use of a specific time period, the adoption of specific concepts, and the scope and boundaries of the review as stated during the framing process.

11 Concluding Remarks

I conclude this tutorial by briefly summarizing what the paper includes, suggesting some further recommendations, and listing our tutorial's limitations.

This tutorial introduces the role of literature reviews in the IS discipline. It includes benefits of literature reviews for different groups of authors and provides definitions and understandings of literature reviews. I suggest both methodological foundations and practical guidelines for conducting qualitative literature reviews in the IS discipline. I propose a methodological framework for conducting a literature review that consists of a framing process and phases of search and assessment, synthesis, interpretation, guidance, and conclusion. Thereby, my recommendations go beyond the question of how to search and synthesize the literature by also covering the even more challenging tasks of framing a literature review, interpreting research findings, and proposing research paths. This tutorial includes many examples, including one example that I use to illustrate all phases to guide the reader through the overall process of doing a literature review.

While the previous sections mainly contain recommendations for conducting specific tasks in a literature review, I add some further comments that researchers should generally consider when doing a literature review.

- As other authors (e.g., Webster & Watson, 2002, p. xviii; Zorn & Campbell, 2006, p. 178) have already advised, the tone should be respectful of the studies reviewed and of the related authors. Note that it is easy to criticize previous work and to find limitations. If doing so, do not rate the perceived quality of work but describe these with facts.
- Use visualizations (usually tables, diagrams, and figures, but other media data may be appropriate as well) in literature reviews to synthesize and conceptualize its contributions (Webster & Watson, 2002, p. xvii; Wolfswinkel et al., 2013, p. 8). It allows readers and reviewers to more easily catch the ideas compared to first reading many pages of text. It also helps to meet the requirement that Baker (2000, p. 238) states: "It is your task to make the complex clear, not to confuse the reader with obscure and obtuse references in the mistaken belief that the more difficult it is to understand the more erudite it must be".
- As an author of literature reviews, one reviews different types of literature contributions, including empirical research, conceptual work, opinion pieces, and practitioners' experience. As a consequence, the basis and strength of conclusions and arguments differ. Although one's literature synthesis should be concept centric, it does and should not prevent stating how and to what extent specific references have contributed to domain knowledge. Try to be as specific as possible in this regard and avoid making statements such as "Smith said", "Smith concluded", or "According to Smith" (Zorn & Campbell, 2006, p. 175). Rather, one should use formulations such as "Based on the multiple case study conducted in companies X,Y, Z over the years 2000 to 2002, Smith analyzed the transcriptions of his interviews with the CIOs of X,Y,Z and found in all three cases that ...".
- In the presence of many literature databases, journals, conferences, and other literature pools, writing a literature review methodologically and comprehensively usually requires not only a substantial amount of work and time but also the involvement of an experienced scholar. In his EJIS editorial, Rowe (2012, p. 470) even discourages single authorships: "My editorial experience with literature reviews at Systèmes d'Information et Management and EJIS leads me to discourage single author submissions. The likelihood to meet the publication standards expectations greatly increases if at least two colleagues with experience on the problem (in the domain) are collaborating.". This recommendation is consistent with my own experience gained during the composition of a single authorship literature review (Schryen, 2013) on IS business value, which is a field with hundreds if not thousands of papers published.
- Try to find an expert of the topic and ask this scholar for a friendly review. In addition, "try it out on an intelligent layperson with no pretensions to expertise on the topic to see if it passes the acid test of being both understandable and interesting" (Baker, 2000, p. 238).

This tutorial has some limitations. First, the suggested phase-based framework is only partially based on the literature. It also reflects my own experience and subjective attitude for how IS literature reviews should be written. Authors of other literature reviews may adopt different perspectives, and "there is not a single, uniform approach to developing a...review article" (Schwarz et al., 2007, cited in Boell & Cecez-

Kecmanovic, 2014, p. 44). However, my analysis of many IS literature reviews and papers on literature review methodologies shows in most of the key regards a homogenous picture. Second, I analyzed literature reviews of selected IS journals only. I did not systematically search the proceedings of IS conferences and the table of contents of renowned journals of neighbor disciplines, such as management science and computer science. Third, the literature on review methodologies I use is from the IS and social sciences disciplines. It would be interesting to adopt methodologies used in other academic disciplines. Finally, this tutorial addresses only qualitative literature reviews. More precisely, I exclude scientometric and bibliometric studies and literature reviews that apply vote counting and meta-analysis from my consideration. I also do not cover literature reviews that apply “ad hoc” framing or incremental framing; instead, I address literature reviews that use conceptual framing.

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About the Authors

First Name Last Name. After the references and the appendices, if there are any, come short biographical sketches of each author. The bios should be in normal text format, with a separate bio for each author. Put the author's name in bold at the start of the bio. Do not include titles such as "Dr." or "Professor". Italicize all journal titles in the biography. If referencing the *Communications of the Association for Information Systems*, spell out the entire name of the journal, just as in this sentence, rather than using the acronym for AIS. The maximum length of each biography should be approximately 150 words. Do not include email addresses.

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