European Journal of Information Systems (2013) 22, 45–55

www.palgrave-journals.com/ejis/

RESEARCH ARTICLE

Using grounded theory as a method for rigorously reviewing literature

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Abstract
This paper offers guidance to conducting a rigorous literature review. We present this in the form of a five-stage process in which we use Grounded Theory as a method. We first probe the guidelines explicated by Webster and Watson, and then we show the added value of Grounded Theory for rigorously analyzing a carefully chosen set of studies; it assures solidly legitimized, in-depth analyses of empirical facts and related insights. This includes, the emergence of new themes, issues and opportunities; interrelationships and dependencies in or beyond a particular area; as well as inconsistencies. If carried out meticulously, reviewing a well-carved out piece of literature by following this guide is likely to lead to more integrated and fruitful theory emergence, something that would enrich many fields in the social sciences.
European Journal of Information Systems (2013) **22,** 45–55. doi:10.1057/ejis.2011.51; published online 29 November 2011

Keywords: grounded theory; systematic state-of-the-art literature reviews; theory development; theory emergence

'Though this be madness, yet there is method in't' William Shakespeare

Introduction

The task of competently reviewing a chunk of academic literature is important in every academic community yet seldom addressed. Alone the actual selection of relevant literature for a review's purpose is a non-trivial task; many literature reviews do not offer clarity about how and why they obtained their specific samples of literature. Moreover, reviews only rarely adequately explicitly express the methods of analysis that were used. Better legitimization of every choice made during the review process enhances the value of a review; it becomes not only more useful to the field but also more replicable. Well-explicated and rigorous literature reviews also have a higher chance of getting published (e.g., Webster & Watson, 2002). In this paper, we address how one may produce a rigorous literature review with the aim of enhancing the sophistication of reviewers' efforts in pursuit of theoretical progress and more original empirical study. Compared with the vast and deep breadth of literature on empirical research methods and philosophical approaches to science, there are in contrast very few instructional texts for conducting a solid literature review (Buchanan & Bryman, 2011; Cooper, 1998). Typically, in performing a literature review many single studies are involved, and it can feel like madness; in this paper we offer a systematic and rigorous approach to carrying out a literature review; it is rooted in the use of Grounded Theory (Glaser and Strauss, 1967), which we recommend.

Received: 31 August 2009
Revised: 25 September 2011
Accepted: 16 October 2011

The aim of using a Grounded Theory approach to literature reviewing is to reach a thorough and theoretically relevant analysis of a topic. Many good reviews have used a similar approach, largely in tacit ways (e.g., Alavi & Leidner, 2001; Glynn & Raffaelli, 2010). To the best of our knowledge, however, no one has articulated a Grounded Theory approach or method to literature reviewing so that the 'technique' can be mastered, taught and further refined by both novice and established researchers. In this article we encourage (aspiring) researchers who start a literature review to apply our guide; we offer various do's and don'ts for conducting a potentially publishable state-of-the-art review. This guide is supposed to aid in the review-coverage of a clearly specified academic niche; applying Grounded Theory aims to point to well-rooted and fruitful new links between variables. Moreover, we argue in this guide in favor of transparency about the choices made during the entire reviewing process. In a step-by-step fashion, we set forth how researchers may apply the method; we include a few examples from the Information Systems (IS) literature. Our ambition here is to show the benefit of meticulously applying Grounded Theory for extracting the full theoretical value out of a well-chosen set of published studies. Applying Grounded Theory within the IS field is on the rise and discussed more and more (Fernandez & Lehmann, 2011).

What we have labeled as the Grounded Theory Literature Review Method consists of five stages and is iterative in nature. In the first 'Define' stage four steps are worked through so that – on the drawing board – the most suitable data set is identified. Only in the second 'Search' stage is the actual search for the studies performed. The third stage 'Select' refines the sample of studies to be reviewed. The fourth stage 'Analyze' shows how qualitative research methods, rooted in Grounded Theory, extract genuine value from the selected studies. The fifth stage 'Present' contains the two key steps in the writing of a coherent overview paper, which should show not only the findings and insights obtained but also the key decisions made during the review process.

The intention of this article is not to describe the characteristics of Grounded Theory; readers are referred to other articles in this Special Issue and beyond for such information. Rather, the goal of this Research paper is to show how to use Grounded Theory to rigorously do a literature review that produces new insights and conceptualizations. First, we point to various other authors' guidelines for conducting literature reviews, aligning their insights with the framework of Webster & Watson (2002). We then utilize this background and outline a five-step process we call 'Grounded Theory Literature-Review Method'. We end the paper by stressing the increasing societal need for the advancement of theory and how a thorough, solidly documented and well-argued literature review is pivotal for scientific innovation.

Earlier advice on literature reviewing

A decade ago, Webster & Watson (2002) published a paper on writing literature reviews in the IS field which has become a standard. Their aims were: (1) to show researchers how to design, do and present literature reviews, and (2) to motivate researchers to do more systematic reviews, so that it would speed up theoretical progress in the IS field. Their paper is valuable reading for anyone doing a literature review, especially in the IS field. Today, even more precision and analytic rigor is needed when aiming to publish theory-building reviews. Hence, we extend their advice by stressing even more explicitness and care in the various stages of creating a thorough review.

Before commencing with a literature review, one must be aware of the variety of sources it may eventually evolve from, and how to search for them. Hart (1998), gives an insightful overview of this in his book 'Doing a Literature Review: Releasing the Social Science Research Imagination'. Typically, sources other than peer-reviewed journal and conference articles and book chapters are not seen as acceptable data for a scholarly review. Webster & Watson (2002) explain that researchers engaged in reviewing must be clear about their focus and aggregation level(s). The use of various systematic search and select methods in transparent ways is recommended; it must be geared to acquiring a well-legitimized corpus of articles that are 'integrate-able' for purposes of delineating new paths of future research that fuels the theory involved.

Webster & Watson (2002, p. 13) state that an effective review creates '… a firm foundation for advancing knowledge', facilitating theory development. By using Grounded Theory for the purpose of literature reviewing, this goal is shared: we review in order to advance the depth and breadth of an academic niche. Grounded Theory's hallmark is its inductive nature, that is, it lets the salient concepts arise from the literature. Grounded Theory enables the key concepts to surface, instead of being deductively derived beforehand; they emerge during the analytical process of substantive inquiry. In the Analyze section, we will show how this approach to the concepts buried in part in the texts works. In Webster & Watson's (2002, p. 18) advice about how to synthesize findings they speak of 'categorizing articles' instead of categorizing sets of ideas across articles. In polar contrast, in order to reclaim a narrative in which theoretical progress is crucial, Grounded Theory forces the reviewers to focus on the researched concepts. This is to be done through the fairly random yet methodical ways of reading the content of all the review's single studies, so that eventually new ideas emerge. For example, through axial coding procedures reviewing may become more of a skill than a subjective art. Webster & Watson (2002, p. 19) do admit that 'extending or developing theories … is often the weakest part of a review'. The clear advantage of using Grounded Theory for analytical review purposes lies in its depth and breadth of the analyses and progress achieved; the ways of thinking through the ideas that one has at one's disposal grounds more original the newly

integrated ideas that can be taken to the next level of follow-up research.

Webster & Watson (2002, p. 15) state that 'a high-quality review is complete and focuses on concepts'. 'Complete' in this sense must be understood as 'saturated'; a literature review is indeed never complete: new articles will always appear. That being said, a good review must be a richly competent coverage of a well-carved out niche in the literature. Researchers writing a review may even choose to analyze from a particular angle. As long as they explicate this point of view clearly and argue logically, their deliberate incompleteness is not necessarily a problem. There is no doubt whatsoever that Hart (1998) is correct in saying 'There is no such thing as a perfect review', but we would rather in our narrative strive for the ideal of a convincing and potentially testable or 'researchable' new integration. We do concur with Webster & Watson (2002) that a high-quality review focuses on concepts, making the use of Grounded Theory – with its analytical focus on concepts – particularly useful. Their (2002) idea of a 'concept' can be seen as a broad term covering both 'concepts' and 'categories' in the instantiated form of Grounded Theory. One should, they argue, take the time to '… develop a logical approach to grouping and presenting the key concepts …' (p. 17). Webster and Watson have subsequently not followed through on this exhortation, and we hope to fill this void and show in the Analyze section below how to handle this key-reviewing task, using Grounded Theory. In its disciplined ways of analyzing and integrating findings and insights, Grounded Theory adds its solid methodical value.

In a similar vein, Webster & Watson (2002) do note the challenge of structuring and presenting a literature-review's findings. We explicitly address in stage five of our method the organization and communication of the outcomes of the process of literature reviewing, arguing the structure of a literature review arises ideally from the content of the analyses. The rigorously executed analysis of the literature should direct the ways of integrating and consequently presenting the findings. A highly transparent 'letting-the-data-speak-for-itself' type of approach is likely to lead to theory emergence or to a grounded theoretical sensitivity that provides guidance without jeopardizing emergence.

Grounded theory as a review method

Let us now explain the five-stage approach for conducting a rigorous literature review (outlined in Table 1) that invokes Grounded Theory as a method during the analysis stage. We would like to emphasize that this method is intended as a guide, to help systematize the reviewing process for a more optimal outcome that contributes to theoretical progress. Obviously here as elsewhere one size does not fit all, and there should be no hesitation whatsoever to deviate from our proposed steps, as long as such variation is well motivated. We encourage researchers to use this flexibility in ways that do not interfere with the aspirations of their review. Note that our approach can be used for many different types of literature reviews. Moreover, Grounded Theory is not about presenting raw data, theory testing, or word counts (Suddaby, 2006); rather, it enables the researcher to come up with a theory-based or concept-centric yet accurate review. We will use the Grounded Theory approach advanced by Strauss & Corbin (1990, 1998).

Table 1 Five-stage grounded-theory method for reviewing the literature in an area: to be used in an iterative fashion

Number	*Task*
1. DEFINE	
1.1	Define the criteria for inclusion/exclusion
1.2	Identify the fields of research
1.3	Determine the appropriate sources
1.4	Decide on the specific search terms
2. SEARCH	
2.1	Search
3. SELECT	
3.1	Refine the sample
4. ANALYZE	
4.1	Open coding
4.2	Axial coding
4.3	Selective coding
5. PRESENT	
5.1	Represent and structure the content
5.2	Structure the article

It is crucial that researchers before commencing with their review project explicate, however vaguely, the topic and scope of the review. At the outset some reviewers may have already formulated precise research questions; not all do. The very specific questions may emerge or be adjusted during any stage of the review process. Having a well-marked scope of the topic and having a set of research questions will greatly benefit the reviewer in each of the stages and steps to follow. The earlier one has a precisely defined and legitimized set of research questions the better. Yet, it is seldom that the starting questions of a review paper are unchanged during a review process. The true value of a precise formulation of a review's topic, scope and research questions is that it serves as a superbly clear reference point, one that penetrates and shapes a great many of the decisions made during the unfolding of the literature-review process. To be sure, the specific research questions of a review are likely to only become genuinely clear and precise in successive stages of the review process. In other words, starting a review with a well-defined research problem allows a researcher to progressively refine its scope into intriguing yet 'answerable' research questions for the review.

Owing to the in essence iterative nature of a reviewer's task, we recommend the practice of writing process reports or logbooks at each stage. Such concise diaries will serve as a kind of memo during each of the five stages of the review study. Each write-up of reasons behind each of the choices made per step and stage forces the researcher to document the motivation or logic for each decision made. Keeping such process diaries will greatly enable the reviewer in the final Present stage to achieve the major goal of transparency, to accurately recall the logic for certain earlier review decisions. This is particularly handy if, at any point, steps or tasks need to be redone or replicated. This chronological logbook of course is separate from the ultimate write-up of the literature review for submission purposes. What is crucial is that at the presenting stage these logbooks will allow for the authentic disclosing of key choices made while reviewing. This simple means for enhanced transparency purposes will dramatically help meet the need to '… situate your paper in the research context …' (Humphrey, 2011).

Define

In order to efficiently perform a systematic literature search one needs to define the criteria for inclusion and/or exclusion of an article in the data set. This first task involves marking out the scope of the review as well as inclusion and exclusion criteria (Step 1.1 of Table 1). This also includes additional sampling criteria at work that are not related to the substantive content of the research. For example, one may restrict the kinds of publication outlets, setting a certain threshold such as the impact factor of an outlet; or one may determine a certain time frame of the publication (e.g., within the last decade) to be sorted through and so on. A clear example of the crucial role of carefully explicated selection criteria for identifying a corpus of literature can be found in a recent review by Baarspul & Wilderom (2011).

Later on the initial inclusion criteria of the review may need to be relaxed or further limited (i.e., revisited). This very realistic possibility is in itself a sufficient reason for keeping a logbook. If at any point in the review process a revision is called for, a string of subsequent results and decisions is implicated. One consequence of any revision (at any step or stage) is that every taken earlier decision from a particular point onwards will need to be reconsidered.

In the second step (1.2 of Table 1), appropriate 'fields' of research should be identified. These 'fields' may span different disciplines like IS and Psychology, which are quite broad. A narrow field would be an area nested within one discipline. Clearly, depending on the nature of the topic and/or specific research question(s), the degree to which the frame of reference is manifestly interdisciplinary will vary. The topic of e-Tourism, for instance, spans different subfields within different disciplines; apart from younger research fields such as IS, the Tourism and Hospitality field has generated an abundant set of publications on the topic. Also, disciplines such as Marketing and Communication studies have engaged with e-Tourism. In order to find out which research fields are appropriate to include in such an interdisciplinary review, researchers on a review team would ideally be familiar with the constituting fields. Apart from a well-argued field delineation, it is good practice to explain any other choice made in this step, that is, considerations for the ultimate field selections need to be documented. For instance, one may limit the review in time or type of outlets. Ideally, the chosen fields must contain the most relevant texts on the topic, and if one were to redo the same sampling task again, the same results should surface.

In order to optimize the actual finding of the desired texts in the field(s) one has provisionally selected in Step 1.2, in Step 1.3 (of Table 1) the outlets and databases are selected. Based on the filtering power of the inclusion and exclusion criteria and the research field(s) involved, a list needs to be compiled of all probable corresponding outlets. In order to guide researchers to the available academic sources in the IS field, Schwartz & Russo (2004) published an article for quickly finding relevant articles in top IS journals. Their advice can function only as a bare starting point, given that technologies for effective academic searches continuously change.

Step 1.4 (of Table 1) leads to a precise formulation of the variously possible search terms. This task holds the key to the outlets and databases. Ideally, the set of search terms should be reflective of the entire scope of the chosen research area. Different outlets and databases support different search functionalities. Some outlets allow one to search with keywords merely in the title and/or abstract, while others enable a search through everything or any specific subset of text. Some provide support for operators like 'AND' and 'OR', which can be used to provide two or more keywords. Further, the possibility of using so-called wildcard tokens is available only sometimes. For example, when searching for the e-Recruiting literature (in a field wider than the IS literature alone) there are numerous synonyms like recruitment, recruiting and so on. With a wildcard token, every word that starts with 'recruit' can be searched if using the search term 'recruit*'. To effectively and honestly show the reader how the search was conducted, all the used search terms need to be listed in the review article.

Search

Step 2.1. (Stage 2 in Table 1) is the actual search through all the identified sources (e.g., databases). When actually navigating the databases (for instance Web of Science or Scopus) the researcher is likely to 'hit' not only duplicates but also surprises, that is, seemingly suitable texts that will force the reviewer to revisit earlier set sampling and related criteria. The search can be time-consuming, often episodic, and result in either a feast or famine of outcomes. For instance, it may become apparent that some essential synonyms of search terms were originally missing or that the scope was not sufficiently comprehensively set during the first stage. This means some

steps of the Define stage need to be revisited before moving to the next stage. Thus, this situation routinely involves iteration, that is, refinements or adjustments in one of the steps of Stage 1. When searching, it is important to document the searches and search terms, what the sources were, and their results. When later writing the review, for the sake of transparency one must make use of all this (process type of) material. For more information on searching literature, we refer to Hart's book (2000) on this very topic.

Select

It is only in the third stage (Table 1, Step 3.1) that the sample of texts is actually selected. First, one should filter out doubles. Then, other papers are set aside by virtue of not fitting the criteria. This is done by reading the titles, abstracts or more of the texts. Forward and backward citations should be checked in order to further enrich the quality of the sample. For every newly selected article, Stage 3 needs to be carried out. One continues going back and forth until no new relevant articles appear or, in other words, until the data is exhausted. Webster & Watson (2002) suggest starting out by searching leading journals and selected conference proceedings, and then using this corpus for doing forward and backward citation tracking. In our view, carrying this procedure out prematurely in the search process may result in unnecessary forward and backward citation tracking of articles that eventually will not be selected. A graphical representation of the entire sampling stage is presented in Figure 1. When working with multiple researchers, they should discuss the criteria and reasons for the final selection and settle upon the subset of the articles they will review. At this stage, inter-coder reliability checks can be conducted. When doing so, we propose a minimum of 90% overlap as a standard of article selection among at least two coders. An example of how this might be done is shown in Table 2 (see also Furtmueller *et al*, 2011, for an example of inter-coder reliability procedures). Note that the columns in Table 2 are extendable, given a set of criteria. In this specific example the articles are ordered by year. Every researcher needs to construct this type of table from the data set after filtering out the doubles. Then, researchers should agree upon a final data set of articles, based on a comparison of their tables. When working alone, such tables remain very useful for structuring, but also for clearly explicating reason(s) for choosing a certain article at a particular moment in the selection process.

All the literature found and selected up to this point relates to the precise boundaries setting of the desired topic of study: the niche shaping. Next begin the actual analytical work of applying Grounded Theory, the Analyze stage, which is the heart of the literature-reviewing effort. The other four stages are either deliberate foreplay (Stages 1, 2 and 3) or crucial learned reflection (Stage 5), respectively.

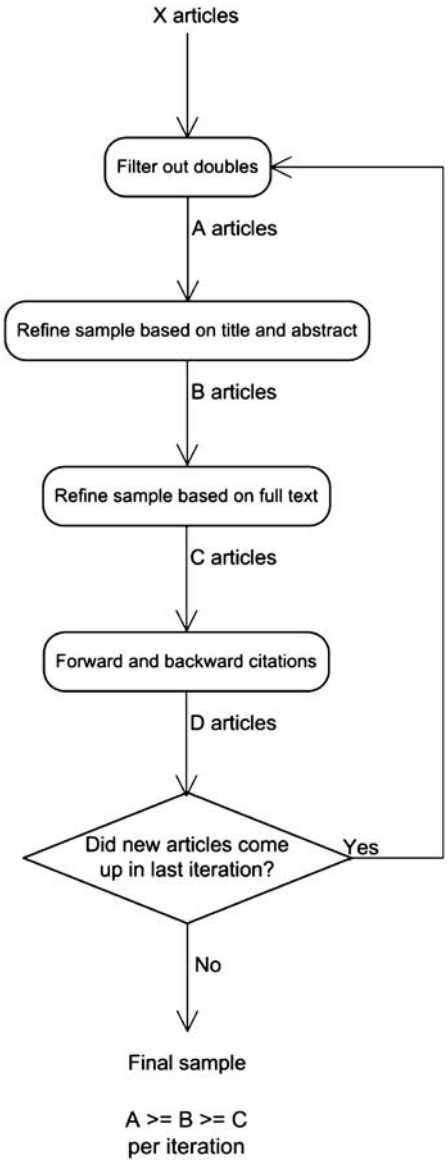

Figure 1 Select stage in reviewing the literature in an area.

Table 2 Example of one individual reviewer's selection

Year	*Author(s)*	*Title*	*Journal*	*Reason(s) for its selection*
1999	X	K	A	…
2000	Y	L	B	…
2001	Z	M	C	…

Analyze

It is in Stage 4 of conducting a literature review that the key principles of Grounded Theory are most expressly applied. These principles are used for analyzing the texts of the carefully chosen set of separate studies. Anyone hoping to use Grounded Theory for their literature review should of course explore the original references cited in

this paper. In this section, we assume basic familiarity with Grounded Theory and its different streams.

When use is made of Grounded Theory for literature-review purposes, the data has the form of published papers rather than the documentary evidence coming from the customary open-ended interview; ethnographic observational notes or conversational analysis coded transcripts. The corpus of papers (which are carefully searched and selected for) are rather uniquely archival, and aimed at representing the best available knowledge of a niche or area in which the literature review is performed. As a result of the article-selection in Stage 3, researchers are then confronted with one or more unstructured stacks of published studies (each), consisting mostly of single empirical ones. Note that one may thus demarcate various sub areas before one begins analyzing, but only if there are good reasons to do so, for example as in the case where two or more distinct disciplinary or stakeholder approaches are involved. Pre-arranging stacks of papers certainly seems to make the task of analyzing them more doable. But subject-matter type rationales is required for sub-grouping studies that one then analyses more or less separately; moreover, there needs to be an explicit write-up of what is going on when the analytical results of the subsets of papers are eventually being linked.

We propose to start analyzing each set of papers as follows: pick a random paper and read and highlight any findings and insights in the text that seem relevant to the review's scope and research question(s). All of the selected studies will eventually undergo this highlighting procedure at least once. Every word, sentence or paragraph that is highlighted in each paper represents a relevant 'excerpt'.

When reading the single studies for purposes of excerpting, the reviewer engages in 'open coding', 'axial coding' and 'selective coding'. These ongoing analytical (i.e., differentiating, integrating, partitioning and imagining types of) coding processes are applied systematically and are intertwined, so let's try to get a handle on them by zooming-in on their essential distinction.

Based on a stack of excerpts (and their associated study contexts), open coding (Step 4.1 of Table 1) takes place as follows. The researcher re-reads excerpt after excerpt. While reading them again a number of 'concepts' start to appear in one's mind that captures parts of the excerpted data set and their underlying studies. Ideally, this set of concepts is mutually exclusive and/or well-defined from earlier literature or can be well defined. Usually, there are additional comments or meta-insights about the findings or studies to make as well. Such insights tend to pertain mostly to the methodological and theoretical parts of the studies.

Together, the concepts and associated insights come to seem representative of the data in a niche, seen in the light of the specific review question(s) posed. In other words, open coding means that researchers engage in conceptualizing and articulating the often hidden aspects of a set of excerpts that they noted earlier as relevant during their close reading of a set of single studies. This way each set of excerpts is incorporated into a set of concepts and insights. This open coding step constitutes the first abstraction step that is taken by the researcher. This analytical step of open coding is essential; it is done in order to identify, (re-)label and/or build a set of concepts and insights based on the excerpts supported by the papers. Thus, distilling concepts and meta-insights about an area can be seen as a largely differentiating abstraction step, requiring a reviewer's analytical and creative skills when reading, understanding and analyzing in order to capture the knowledge to date. The ultimate goal of open coding is to identify a set of categories or a bird's eye image of the study's findings, with a set of theoretical and methodological insights attached. This distilling of a set of constructs from a set of excerpts (and their associated studies) pertains to the empirical findings (in their contexts) themselves.

To get a handle on the notion of open coding, imagine that a reviewer confronts multiple objects in a set of excerpts from three studies, and may classify them as the concepts 'car' and 'truck'. These 'cars' and 'trucks' that the papers deal with represent information on transportation vehicles with at least four wheels. Based on this, the concept 'means of transportation' is identified. The concept 'means of transportation' is a so-called 'category' (higher-order conceptualization). Categories capture groups of concepts like 'cars' and 'trucks' and could either be earlier studied concepts themselves or new ones that seem logical while thinking through the grouping of the found concepts. Concepts or categories can have 'properties'. In this case, 'means of transportation' has the property of having at least four wheels. These properties determine the differences between concepts or categories.

Assume now the researcher reads the fourth paper in which objects are a focus that they classify as 'motorbikes'. Since the 'motorbikes' of the fourth paper have less than four wheels, the researcher needs to change the properties of the category 'means of transportation'. This is why easily revisiting formerly read papers is an important part of open coding. For this purpose the researcher should continuously go back to the earlier read papers and/or excerpts; concepts (and/or categories with their belonging properties) might need to be changed due to potentially new insights gained in a later reading. This is also why a log or codebook is of such great value at this stage.

Imagine the researcher sees that both cars and motorbikes are intended to transport people. Consequently, the category 'person transportation' might be identified by the researcher. Based on information in these four papers, 'person transportation' could become a 'sub-category' of 'means of transportation' by having 'cars' and 'motorbikes'. Through this so-called axial coding (Step 4.2 of Table 1), the interrelations between categories and their sub-categories (including their properties) are identified. These higher-order categories (which qualitative researchers sometimes describe as core or key

categories, encompassing sub-categories) will eventually represent the main themes or patterns of the studies' findings in the data. Concepts can be part of categories or become (sub-)categories themselves.

Selective coding (Step 4.3 of Table 1) is used to integrate and refine the categories that were identified. A 'main category' in our literature-review method is either the subject of the review or concerns directly one or more of the specific research questions. Although axial coding is about finding the relations between categories and their sub-categories, selective coding is the process of identifying and developing relations between the main categories. It is mainly during selective coding that the researcher theorizes and/or re-conceptualizes in ways he or she sees fit the puzzle at hand. The essential task at this point is to develop a single reasoning with which one or a set of phenomena are potentially explained. It is thus this mental effort, rooted in as many relevant empirical facts as possible, that is geared at finding the driver(s) that triggers a story to be told.

When concepts and (sub-)categories begin to emerge, researchers need to be already engaged in so-called 'comparative analysis' – continuously comparing, relating and linking the identified categorizations with each other and the studied papers and excerpts. Based on similarities and differences that appear in this constant comparative analysis, the coding procedures (as described above) can be used to continuously refine the concepts and categories. The analytical coding steps (open, axial and selective coding) are performed in an intertwined fashion, going back and forth between papers, excerpts, concepts, categories and sub-categories. Preliminary results of analyzing the randomly selected texts/studies actually guide the consecutive reading and further analyzing of the remaining texts. This is called 'theoretical sampling'. Such an unbiased approach optimizes the chances for noting and pointing out aspects of the phenomenon under study in need of more data. This kind of analysis is performed until all papers and excerpts are carefully read, linked and analyzed, and 'theoretical saturation' has occurred. Theoretical saturation is only achieved when while developing the categories no new concepts, properties or interesting links arise (Strauss & Corbin, 1990; Strauss & Corbin, 1998). Data saturation is subject to debate and typically will be constrained by the time frame and other resources a researcher has at their disposal. Saturation is of course required for a convincing, representative, theory-based and forward-looking review.

In sum, open coding is the analytical process of generating higher-abstraction level type categories from sets of concepts/variables. Axial coding is the further developing of categories and relating them to their possible sub-categories. With selective coding the categories are integrated and refined. Whether categories and sub-categories come from the textual data itself, previously recognized categorization schemes or the mind of the researcher depends on the goal of the review and how it is linked to the findings of an area. Without a doubt the process of relating categories to each other may require a combination of inductive and deductive thinking. The individual codes thus provide both inspiration and verification. Note that the key concepts, categories, properties and insights derived through the analytical approach of Grounded Theory are of course naturally linked to the variables examined by the single empirical studies selected for the review. But given that these variables are being linked to each other, and in that process critically assessed, not all the original variables may resurface in the ways the area is seen to progress. In other words, a review does not only lead to new insights, some of them may imply that old variables may need (theoretical or operational) enrichment or simply less attention.

Again, it is essential to remain aware, especially when reading and analyzing articles/excerpts, that the researcher has to document the coding process. Memo writing and storing information in a dated codebook is fundamental, this documentation of emerging and changing ideas is enabling later tracing and retrospective comprehension. Moreover, it is of course important to document which excerpt(s) belong to which paper. Another codebook may help to map out evolving theory, and yet another may remind you later, in the presenting stage, of methodological or other research-area issues, large and small, that you noted during your analyzing. A basic documentation example is shown in the form of the concept matrix in Table 3, see also Webster & Watson (2002) and earlier advice by Salipante *et al* (1982). Using this type of concept matrix must become more dynamic than how Webster & Watson (2002) articulated it. When analyzing from a Grounded Theory perspective, the suggested matrix changes over time during the coding process. Thus, Table 4 presents the same concept matrix at an advanced stage of the analysis, whereby article C contributed a new concept (W), leading to a revisit to

Table 3 Basic concept matrix for literature-reviewing

Article	*Concepts*		
	X	*Y*	*Z*
A	√	√	√
B	√	√	

Table 4 Advanced concept matrix for literature-reviewing

Article	*Concepts*		
	W	*XY*	*Z*
A		√	√
B		√	
C	√	√	

articles A and B. This procedure results in the merging of concepts X and Y. Table 4 may be further enriched by subdividing the individual concepts, thus exposing possible relevant relations between concepts/categories or their properties. This could be the result of yet another article D that provided excerpts that give the researcher the notion that concept W in Table 4 actually consists of multiple concepts (U and V). The rearranging of concepts is a continuous process during the analysis, and it could very well be that merged concepts (like XY) or separated concepts (like W into U and V) are separated (into X and Y) and merged (into W) again later. During the analysis stage, as more articles are analyzed, concepts are refined by this merging and separating, and this may also require relabeling of concepts and categories.

When engaging in building theory, it is important to bear in mind that references, data, lists of variables or constructs, hypotheses, and diagrams are seldom theoretical in and of themselves (Sutton & Staw, 1995). Moreover, a good literature review must show key and particularly remarkable (context-related) aspects of the studied literature, even if they happen not to be particularly theoretical. Nevertheless, theory building is one of the increasingly important outcomes when using Grounded Theory to review a carved-out segment of literature. Using Grounded Theory when reviewing publications may even lead to challenging the underlying rationale of existing theory (Dubin, 1978; Whetten, 1989). Eisenhardt (1989), explains that theory development can take many forms, from analyzing available literature and extending existing theoretical models, to using common sense or experience. As Kaplan (1964), Merton (1967) and Sutton & Staw (1995) point out, theory is the answer, contra Comte, to the question why? A strong theory contains reasons for the manifestations of certain phenomena. Grounded Theory aids in building theory when performing a literature review: by focusing on phenomena through a rigorous concept-centric approach. The end result of the analytical processes is among other things also the discovery of gaps in knowledge that are important for research explorations with a theory-building focus. We do see a thorough literature review as a form of grounded sensitivity that provides theoretical and other guidance without jeopardizing emergence. Thus, when theory building is the aim, the Grounded Theory literature review is guided by the principle of reading for theoretical sensitivity in order to achieve emergence. Thus, the Analyze stage results not only in an account of what is empirically found; it also leads to explanations for the findings and it offers insights into what in the old and the prospective research might be seen as relevant to the wider world and/or relevant for the sake of theorizing.

Present

The knowledge gained from the analytical stage is to be used also for thinking through ways to represent and structure the content, that is, the findings and associated insights of an area. The new perspective on the 'what, how and why' of an area is thus likely to affect the presentational logic in the paper. Representing and structuring the knowledge of an area's content (Step 5.1 of Table 1) must first of all be based on set(s) of empirical findings and the associated insights captured in the log- and codebooks. It may well be that certain earlier noted insights or even empirical facts only become more relevant at the end of the analytical process when the accumulated knowledge, including theoretical points and progress, needs to be shown in a somewhat integrated fashion. Moreover, various forms of logical reasoning and cognitive pattern recognition may supplement the making sense of the core findings and insights. That is why at this stage some of the systematic and precise logbook-type decisions, rationales and associated insights jotted down during the entire review process (process notes) may unexpectedly rise to more prominence.

On the other hand, Grounded Theorists do typically prefer the creativity of the data over the creativity of the researcher who carries out the review. We realize that this can be a delicate balance and sometimes even involve a bold choice between the two. Moreover, we should not downplay the various additional insights that reviewers may obtain during the process about an area or regarding aspects of the past research as a whole. Some of these insights might have been unreflectively jotted down. Yet when synthesizing them, these insights may be of help in efforts to portray a forward-looking accumulation of knowledge of the area. A solid representation of the accumulated empirical facts is of course to be included, for those readers of the literature review who would simply want an overview of the topic, niche or area. Obviously, one does need to provide rationales for adding to this other representations and explanations in a final article. Let us looks at few examples of various knowledge representations.

Alavi & Leidner (2001) provide an excellent example in their well-known review paper about how to use (graphical) representations in a review. Compiling different research, they use multiple tables and flow charts to gradually synthesize the field. Webster & Watson (2002) show three different tables (concept-centric *vs* author-centric listings, concept matrices listing articles, and concept matrices augmented with underlying concepts) that can be used not only for coding, but also for representing findings. These illustrations can be used to show the reader more than just a passive summing up of concepts without any clear purpose or network of linkages. Figure 2 shows an example of graphically depicting conceptual overlap from various categories (K, L, M, N). Here in this specific case the size of the circle represents the quantity of concepts in the category. A similar representation can be used to show the quantity of published papers that a certain concept was based on. Presenting findings using visualizations such as diagrams can help reach a wider audience. In recent years, there has evolved an immense literature on this topic which space limitations here prevent drawing out. Wolfswinkel *et al* (2010) apply many of these representations in their research.

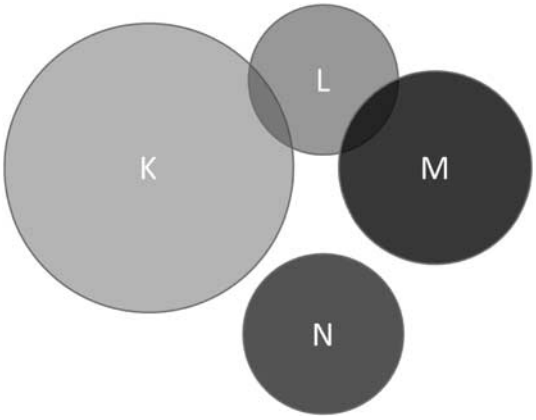

Figure 2 Representation of aspects of a set of studies that have been analyzed with the grounded theory method.

The structure of a review paper (Step 5.2 of Table 1) may be organized similarly to empirical accounts. An Introduction section should briefly state the scope, how and why the topic was approached by the reviewer, the problem addressed in the review and present one or more specific review questions (Creswell, 2008). The beginning of the paper needs to yield the substantive rationale for the review, including why this type of literature review is relevant to the world and particular groups of potential readers; it should also offer insights on the definitions of the key terms. There of course ought to be a methodological section. In each main section of a literature-review paper the specific findings are elaborately discussed, and future research directions could be suggested. The article ends with a discussion and/or conclusion, containing implications, not only for new research options but also possibly for new practices. The discussion section should bring surprising findings to the fore and show the benefits of the use of Grounded Theory for explicating interconnections of emerging concepts. A last section also includes the review's limitations and the unavoidable biases that may have occurred in one or more steps of the entire process. The paper would need to be explicit also about the development of theory in the chosen area and how other theory, ideas or other fields might be of substantive relevance to the reviewed area.

Conclusion

We have presented a step-by-step guide for engaging in rigorous reviewing of a carefully selected sample of academic literature, using Grounded Theory as a method. A high-quality review inspires valuable studies that extend the earlier theoretical and empirical repertoire. Although many reviewers have adopted a similar approach, none have articulated a guide before. Our aim with our five-stage flexible roadmap is to enable more thorough and transparent reviews. By undertaking the scenario herein recommended, academic researchers, especially those working within complex and dynamic fields like IS (see Webster & Watson, 2002) may grasp the (madness-reducing) value of Grounded Theory for review purposes.

The key advantage of using Grounded Theory is the recognition that the textual data can be analyzed in very different ways. The cardinal challenge in analyzing a body of published knowledge is to freshly observe and learn from the plurality of 'cases' contained therein. In terms of the myth of the researcher as a blank slate (Urquhart & Fernandez, 2006), we concur that it is impossible to not be influenced by the background knowledge that one has; it is vital to be aware of what one knows and inclined to believe while being aware of alternative biases other people may and do hold. Besides the random and iterative yet thorough analytical approach to the well-filtered set of texts – in order to reach a creative integration of an area – our guide deliberately promotes more transparency in published literature reviews. This advice inverts the standard suppression of the contextual factors in practical inquiry, and says instead that it is informative for a reader to learn about the key choices made during the review process, many but not all of which are necessitated by the explicit iterative nature of the Grounded-Theory type analyzing effort.

The disadvantage of using our method may seem that one needs to be (or get) familiar with the extensive literature of Grounded Theory, which goes back to 1967 at least. This investment is likely to pay off, though: not only in terms of the enhanced depth of the forward-looking review; learning about Grounded Theory may help novice researchers to work quite systematically toward making sense of a seemingly amorphous data set. The analytical processes that Grounded Theory invokes are sound pathways helpful for theorizing in general. It has been long recognized that when wanting to engage in theory building, Grounded Theory knowledge is something one cannot do without (see, e.g., Eisenhardt, 1989).

Various researchers may take away different lessons from learning how to conduct a solid Grounded-Theory type literature review. Ph.D. and other students may use the method to learn about how to select and analyze a heap of single studies, and understand which steps are required to reach robust results that extend theory. Novice researchers may find it especially helpful when trying to make sense of a seemingly endless set of papers. More experienced researchers may become more aware of the steps they usually take, yet rethink their approach to a literature review because they grasp the fertility of one or more of the five stages delineated in our guide. We have made use of Grounded Theory for the conduct of a literature review based on the Straussian stream (Strauss & Corbin, 1990, 1998), and it might even be possible to incorporate features of other data-compressing and theory-building models. We have only done the groundwork for rethinking how to appropriate archival wisdom, and welcome further analytical refinement or ease of analytical systematization for achieving better and more

transparent reviews. The more refined the techniques for solidly and critically summarizing the products of inherited research, the faster the progress in better understanding our (IS) world is likely to go.

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