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A Synthesis of Literature Review Guidelines from Information Systems Journals

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Abstract

There has recently been a plethora of guidelines published in Information Systems (IS) journals on how to conduct literature reviews for publication, often referred to as "systematic" literature reviews. The purpose of this paper is to make sense of these guidelines by synthesising them into a coherent whole. The synthesis results in the identification of five major stages for conducting literature reviews for publication, i.e. (1) Define the protocol, (2) Search the literature, (3) Select the papers, (4) Analyse, synthesise and interpret the data, (5) Write the review. The synthesis reveals that there are different types of literature review, but that the five broad stages are generally valid for all types. Differences in conducting literature review across type arise at a lower level of detail, when considering the specific activities to be performed at each stage. The greatest variation between types occurs at Stage 4, when analysing, synthesising and interpreting data.

1 Introduction

With the explosion of published literature, made all the more accessible due to increased availability of online access, the need to systematically and regularly synthesise and integrate this knowledge through literature reviews has become a necessity across all disciplines. In the Information Systems (IS) discipline there has been an increased interest in the publications of such literature reviews. There has also been a plethora of guidelines in IS journals about how to conduct such literature reviews (Webster & Watson 2002; Templier & Paré 2015; Paré et al., 2016; Bandara et al., 2015). This can create a dilemma amongst IS researchers as to which guideline to choose, given the differences between them, the different terminologies sometimes applied, and the different types of literature reviews (Paré et al., 2016; Templier & Paré, 2015). This paper aims to analyse, synthesise and interpret a set of guidelines to come up with an overarching and comprehensive set of stages and activities. In the next section we provide a brief description of the methodology employed after which

the different types of literature reviews identified are briefly summarised. We follow that with the outcomes of the synthesis before the paper is concluded.

2 Methodology for the paper

In order to develop a synthesis of guidelines for conducting literature reviews in IS, the initial step was to identify a set of guidelines drawing from IS journals. A search was conducted in Web of Science, and those guidelines that provided specific stages and activities to be performed were chosen for synthesis. Firstly, a basket of IS journals were identified by reference to the AIS Top 8, plus other IS journals on Web of Science, and with reference to Lowry et al. (2013). Journals were searched on Title and Topic with the keyword "literature review". The timespan was 2009 to 2019. 342 papers were identified. Thereafter, the titles were reviewed, and papers excluded if not about how to conduct literature reviews (e.g. papers that applied literature review methods to some phenomenon were excluded). 26 articles remained that focused specifically on the conducting of literature reviews. Lastly, the remaining articles were examined based on their abstracts and main objectives in relation to whether they offered substantive guidelines. From the 26 papers, 16 were omitted, leaving 10 papers to be further analyzed (See Figure 1). The papers were deemed sufficiently representative for the purpose of identifying a set of high-level stages and key activities recommended when preparing an IS literature review for publication.

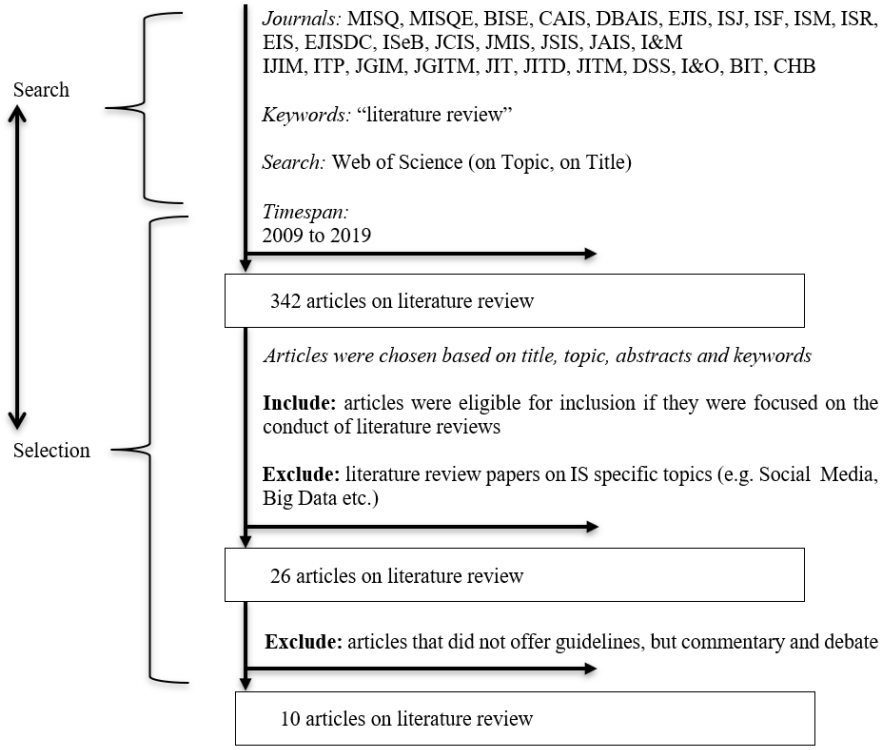

Figure 1: Search and selection process. (after the fashion of Günther et al., 2017)

These IS publications furthermore derived their guidelines by casting a wider net across domains and disciplines, so in this paper we felt no need to reinvent the wheel in going back to the sources already examined by the IS authors. Whilst all papers offered general guidelines, there were different emphases, e.g. some focused on being systematic (Okoli, 2015), whilst others proffered a hermeneutic approach (Boell & Cecez-Kecmanovic, 2014). Some papers advocated for use of a specific analytical method, such as grounded theory (Wolfswinkel et al., 2013) or critical discourse analysis (Wall et al., 2015), whilst others addressed a specific stage, such as literature search (vom Brocke et al., 2015).

Author(s)	Key Focus	Published In
Sylvester et al. (2013)	Historical Discourse and SSM as method	Behaviour & Information Technology
Wolfswinkel et al. (2013)	Grounded Theory as method	European Journal of Information Systems
Boell & Cecez-Kecmanovic (2014)	Hermeneutic Approach	Communications of the Association for Information Systems
Bandara et al. (2015)	Qualitative Rigour through Tool Support	Communications of the Association for Information Systems
Okoli (2015)	Overarching Systematic Guidelines	Communications of the Association for Information Systems
Schryen (2015)	Overarching Qualitative Guidelines	Communications of the Association for Information Systems
vom Brocke et al. (2015)	Literature Search	Communications of the Association for Information Systems
Templier & Paré (2015)	Overarching Guidelines	Communications of the Association for Information Systems
Wall et al. (2015)	Critical Discourse Analysis as Method	Communications of the Association for Information Systems
Paré et al. (2016)	Systematicity and Transparency as twin concepts	European Journal of Information Systems

Table 1: Identification of IS Guidelines.

3 Types of Literature Reviews in IS Research

There are several types of literature review that can be published, differentiated primarily by the aim of the literature review, but also at times by the methodology used for collecting and analysing literature. Table 2 below provides a synthesis of types identified in IS publications, with some overlap across types.

Type	Description	Reference in IS Journal(s)
Narrative	Employs a flexible approach to mapping the current state of knowledge and identifying potential gaps in previous studies.	Templier, & Paré (2015); Boell & Cecez-Kecmanovic (2014)
Developmental/ Theory building	Develops theory from collected literature. The goal is to provide new conceptualisations, models, theories etc.	Templier & Paré (2015); Schryen (2015); Paré. et al. (2015); Wolfswinkel et al. (2013)
Aggregative/ Theory testing	Delineates and analyses concepts and relationships based on past empirical research. Indicates whether a theoretical explanation of the phenomenon is supported or not from literature.	Okoli (2015); Schryen (2015); Templier & Paré (2015); Paré. et al. (2015)
Meta-Analysis	Focuses on quantitative studies by merging and analysing results from prior research. The goal is to provide a holistic quantitative representation of research results. Considered a sub-category of Aggregative	Bandara et al. (2015); Templier & Paré (2015)
Cumulative	Analysis is based on year of publication, methodology, sampling techniques etc. The goal is to build a cumulative body of knowledge.	Templier & Paré (2015)
Synthesis	Entails collecting, mixing, altering, reshuffling, designing and generalising. The goal is to collect and synthesise specific literature around a given topic.	Schryen (2015); Paré. et al. (2015)
Research gap identification	Points out future research directions by identifying aspects of a phenomenon overlooked or where not enough evidence has been found related to the problem.	Bandara et al., (2015); Schryen (2015); Okoli (2015); Paré et al. (2015)
New perspective	Researchers develop new insights and angles to existing domain knowledge that was not previously uncovered.	Schryen (2015); Paré et al. (2015)
Research Agenda	An analysis of previous and upcoming trends that assists scholars in forecasting and to present future agendas. This review has the ability to provide clear and concise arguments based on research gaps that should still be addressed in future research.	Schryen (2015); Bandara et al. (2015); Paré et al. (2015)

Table 2: Types of Literature Reviews in Information Systems Research.

4 Synthesis of Stages

The five stages identified through synthesis, and the main activities associated with each stage are shown in Table 3. These stages are: (1) define the protocol; (2) search the literature; (3) select the papers; (4) analyse, synthesise and interpret the data and (5) write the review. Each will be discussed in turn.

Major Stages	Activities	References
Define the Protocol	• Agree on detailed procedure • Specify primary goal • Define key concepts • Establish boundaries • Draft the research question • Specify type of review • Specify disposition • Conduct reviewer training	Okoli (2015); Boell & Cecez-Kecmanovic (2014); Templier & Paré (2015); Paré et al. (2016), Wall et al. (2015)
Search the Literature	• Specify where to search • Identify the main sources • Specify terms to use • Specify dimensions to search • Specify timespan • Restrict search within bounds of research question • Minimize publication bias • Perform backward and forward search	Templier & Paré (2015); Okoli (2015); Schryen (2015); vom Brocke et al. (2015); Wolfswinkel et al. (2013); Bandara et al., (2015); Paré et al. (2016)
Select the Papers	• Specify inclusion/exclusion criteria • Review Title, Abstract, Keywords and apply screen (inclusion/exclusion criteria) • Review Introduction and Conclusion and apply screen • Review full papers for relevance, rigour and credibility	Schryen (2015); Templier & Paré (2015); Bandara et al. (2015); Wolfswinkel et al. (2013); Okoli (2015); Paré et al. 2016); Mikalef et al. (2018)
Analyse, Synthesise and Interpret	• Select and apply appropriate method	Templier & Paré (2015); Bandara et al. (2015); Wolfswinkel et al. (2013); Boell & Cecez-Kecmanovic (2014); Paré et al. (2016); Wall et al. (2015); Sylvester et al. (2013); vom Brocke et al. (2015)
Write the Review	• Specify structural elements • Consider presentation	Templier & Paré (2015); Wolfswinkel et al. (2013); Bandara et al. (2015); Schryen (2015)

Table 3: Synthesis of Literature Review Guidelines.

4.1 Define the Protocol

The development of a protocol is the initial step of a literature review (Okoli, 2015). It is crucial that there be a written and agreed upon protocol before proceeding, especially in cases where multiple researchers are involved (Okoli, 2015). The protocol should establish the disposition to be adopted (Paré et al., 2016), and the main research question. Okoli (2015) notes that the protocol is subject to change, however protocol changes must be documented, to affirm that the research work is comprehensive, clear, reproducible and is of high quality.

Agree on detailed procedure - Where there are several researchers involved there should be understanding and agreement upon the procedure that will be used, before starting (Okoli, 2015).

Specify Primary Goal - The need for a standalone review must be justified (Okoli, 2015). Clear objectives for the literature review are important as it suggests the structure and type of review required (Okoli, 2015).

Define Key Concepts - Defining the key concept(s) of relevance takes place at the start of the review, unless the review has a strong inductive, theory-building intent (Wolfswinkel et al., 2013).

Establish Boundaries - The scope and boundaries of the study should be made clear, as this will inform subsequent stages of search and selection (Templier & Paré, 2015, Okoli, 2015).

Draft the Research Question - The research question should be a one-to-two sentence statement that explains the aim and outcome (Okoli, 2015), and perhaps review's audience (e.g., scholars, practitioners, policy makers, etc.). For inductive studies the research question may be more open-ended (Bandara et al., 2015).

Specify type of review - The research question being studied, would be indicative of type of literature review to be conducted (Okoli, 2015). The specific type can be made explicit (see Table 2).

Specify Disposition - The disposition towards conducting a literature review can be either sequential or iterative (Paré et al., 2016). Certain types of literature review are more suited to a sequential flow, where stages are carried in a linear and ordered manner (Okoli, 2015; Templier & Paré, 2015). Other types, such as qualitative theory-building research (Bandara et al., 2015) or those adopting a hermeneutic approach will be iterative (Boell & Cecez-Kecmanovic, 2014).

Conduct reviewer training - All researchers collaborating on the literature review should be trained in note-taking and reviewing methods. This is essential in producing a review with a reliable standard (Bandara et al., 2015).

4.2 Search the Literature

A systematic and rigorous search of literature is fundamental (Schryen, 2015). Wolfswinkel et al. (2013), Bandara et al. (2015), Okoli (2015), Schryen (2015), Templier & Paré (2015) and vom Brocke et al. (2015) highlight specific activities to be carried out in the literature search stage as follows.

Specify where to search - Textbooks and literature reviews from other scholars can be used as a base for searching literature (Schryen, 2015; vom Brocke et al., 2015). In standalone reviews, sources such as the AIS Electronic Library (AISeL), JSTOR, ABI/Inform, IEEE Xplore and ISI Web of Science are frequently used in IS (Bandara et al., 2015, Okoli 2015).

Identify the main peer refereed journal and conference outlets - Bandara et al., (2015) and Levy & Ellis (2006) recommend the use of top ranked peer-refereed journals and conference outlets. In IS, these would include the AIS "basket of eight" (MISQ, EJIS, ISJ, JMIS, ISR, JAIS, JIT, JSIS) and AIS top 4 conferences (ICIS, EICS, PACIS, AMCIS) (Schryen, 2015). Additional top IS journals can be identified through bibliometric studies such as that of Lowry et al., (2013). In addition sources such as the Clarivate Analytics journal citation report (https://jcr.incites.thomsonreuters.com) and Scimago (https://www.scimagojr.com) provide details of high impact journals in a domain of study. Conference ranking systems in IS are rare, but some exist, e.g. the Australian Computing Research and Education site (http://www.core.edu.au/conference-portal), and the IFIP TC8 rankings (http://ifiptc8.dsi.uminho.pt/index.php/events/ranking-of-is-conferences). Some studies limit the search to journals only, or even the AIS top 8 journals. Whatever the decision, it must be documented and justified.

Specify terms to use (Search strings) - Following the selection of relevant literature databases, defining the search strings is vital in order to recognize appropriate literature (Wolfswinkel et al., 2013). It is recommended to select keywords from identified papers. Taxonomies suitable for the literature review can be utilised. For example, many of the taxonomies of keywords can be found on the ACM website (http://www.acm.org/about/class/class/2012) provides taxonomies of keywords. These references are only keywords and hence, should be combined to create search strings. Keywords that are linked with logical operators are frequently used in literature databases as search strings (e.g., AND, OR, NOT) (Schryen, 2015). A typical search string such as *"('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')"* is an example (Schryen, 2015). Researchers are able to use their own discretion to create a list of search strings, as search strings are not subjected to being correct or incorrect.

Specify dimensions (topic, title, keywords, abstract, results etc.) to search - Dimensions are required for the search, for example whether to search using titles, abstracts, keywords or complete research papers (Schryen, 2015). In addition, searching for publications by highly cited authors on the relevant topic can be done.

Specify timespan - A time period has to be indicated for the search (Schryen, 2015; vom Brocke et al., 2015). A time period of the search is selected after search strings are defined. Mapping the literature based on a specific timeframe e.g. looking at past studies going back 10 years should be sufficient (Templier & Paré, 2015; vom Brocke et al., 2015).

Restrict search within bounds of research question - Templier & Paré (2015) and Okoli (2015) agree that the research question must be the focus of the investigation and that the search strategy must be aligned to the research question(s). On the other hand, Bandara et al., (2015) argue that the research questions should be allowed to emerge as data (literature) is collected and analysed. The later argument holds where a strongly inductive approach is being followed, often within an iterative hermeneutic stance (Boell & Cecez-Kecmanovic, 2014).

Minimize publication bias (grey and unpublished data) - Strategies such as scanning grey, unpublished literature and contacting authors of previous unpublished studies avoid the potential for publication bias (Schryen, 2015). Publication bias refers to the "problem that significant (and supporting) results are more likely to be published than non-significant (and non-supporting) results" (Templier & Paré, 2015). Topic-specific dissertations and unpublished research reports could be included as well, where the research protocol suggests inclusion of such sources.

Perform backward and forward search - The literature review process can become cyclic. This is made in reference to a continuous forward and backward search within literature databases

(Schryen, 2015; vom Brocke et al., 2015). A backward search refers to the process of identifying articles by searching the reference lists of important papers (Webster & Watson, 2002; vom Brocke et al., 2015). The forward search refers to identifying articles that have cited some important papers. Google Scholar and Web of Science provide the function to forward search (Schryen, 2015; Webster & Watson, 2002).

4.3 Select the Papers

The search phase yields a set of articles, that need now to be screened for selection (vom Brocke et al., 2015). The selection process includes screening according to defined inclusion/exclusion criteria, reviewing papers according to these criteria, and then selecting papers based on their relevance, rigour and credibility (Mikalef et al., 2018).

Specify inclusion criteria - Inclusion criteria refer to the criteria used to select papers, based on, for example the research question and scope of study etc. Should several researchers be working on the literature review paper, a standardized inclusion criterion needs to be discussed and agreed upon (Bandara et al., 2015).

Specify exclusion criteria - To increase validity of any paper, it is important to state the criteria used to exclude research. This increases the credibility of the paper and ensures other authors can reference the published work confidently (Bandara et al., 2015). An example of excluding research is to not use duplicate studies in different sources or forms such as a conference papers subsequently published as journal articles (Bandara et al., 2015; Schryen 2015).

Review Title, Abstract, Keywords and apply screen - Titles, Abstracts and Keywords are reviewed in the first instance, and the inclusion/exclusion criteria applied (Bandara et al., 2015; Schryen, 2015).

Review Introduction, Conclusion and apply screen - Thereafter the Introduction and Conclusion of the remaining set of papers that satisfy the initial screen can be reviewed (Bandara et al., 2015; Schryen, 2015).

Review full papers for relevance, rigour and credibility - The remaining selected papers can be read in full. Mikalef et al., (2018) suggest papers should be examined based on their rigour, credibility and relevance.

4.4 Analyse, Synthesise and Interpret

The means by which analysis, synthesis and interpretation of data is conducted may vary depending on the research question and objectives, type of literature review, and method to be employed.

Select and apply appropriate method - A variety of methods can be used to analyse, synthesise and interpret literature, including soft systems methodology for heterogeneous literature (Sylvester et al., 2013), grounded theory techniques for theory-building literature reviews (Wolfswinkel et al., 2013), critical discourse analysis (Wall et al., 2015), meta-analysis techniques (Templier & Paré, 2015; vom Brocke et al., 2015) and so on. Geeling et al., (2017) show that thematic analysis could be integrated with grounded theory techniques, while mixed studies combine qualitative and quantitative techniques (Bandara et al., 2015). A hermeneutic review emphasizes the importance of integrating literature searches with the analysis and interpretation of text (Boell and Cecez-Kecmanovic, 2014).

The choice of method is determined by its appropriateness to the research question, the type of literature review being conducted, and the corpus of literature. For example, where there is a predominance of quantitative studies in a domain, a meta-analysis might be appropriate.

4.5 Write the Review

In writing up the review, a systematic approach can be followed to ensure that a substantive and relevant conclusion can be reached. Rowe (2014) states that the review structure and methods depend on the type of review and its core objective.

Specify Structural Elements - The Introduction to the paper needs to state the rationale and relevance of the review, leading logically to the research question (Wolfswinkel et al., 2013). Definitions of the key terms can also be included. A methodological section should follow this, detailing all the stages and activities executed. Thereafter, the literature review analysis, synthesis and interpretation should follow. The number of sections and content would vary depending on the outcomes. In all cases, however there should be clear and specific details of findings and their interpretation. The major outcome could be a developed theory, research gaps, a new perspective, research agenda etc. depending on literature review type and purpose (Schryen, 2015). The conclusion section will highlight research contributions, future research and limitations (Schryen, 2015; Wolfswinkel et al., 2013).

Consider Presentation - Webster & Watson (2002) assert that presenting findings using diagrams and visuals can be beneficial to readers for improved understanding and flow. Günther et al., (2017) show how the methods section of a literature review can make use of illustrations to visualise the process followed in search and selection. Schryen (2015) too provides exemplars of illustrations and tables that enhance readability of different stages of the review.

5 Conclusion

With the recent interest on how to conduct literature reviews for publication, there is an increasing demand to identify coherent steps to assist IS scholars during the literature review process. In a similar line, the increased availability of IS guidelines to conduct literature reviews has brought about confusion in terminology and in criteria for assessing quality. In this paper, we synthesised various IS literature review guidelines to assist researchers in making sense of the diversity of guidelines available in IS journals. Five major stages for literature review were identified, with detailed level activities associated with each stage. Furthermore, the paper reveals the importance of using a comprehensive set of stages during the review process, in accordance with either a sequential or iterative disposition. For now, additional effort can be made particularly in building an improved knowledge base in order to better understand the process and outcomes of following different review types, and of combining methods.

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