Rapid Reviews in Software Engineering

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Abstract Integrating research evidence into practice is one of the main goals of evidence-based software engineering (EBSE). Secondary studies, one of the main EBSE products, are intended to summarize the "best" research evidence and make them easily consumable by practitioners. However, recent studies show that some secondary studies lack connections with software engineering practice. In this chapter, we present the concept of Rapid Reviews, which are lightweight secondary studies focused on delivering evidence to practitioners in a timely manner. Rapid reviews support practitioners in their decision-making, and should be conducted bounded to a practical problem, inserted into a practical context. Thus, Rapid Reviews can be easily integrated in a knowledge/technology transfer initiative. After describing the basic concepts, we present the results and experiences of conducting two Rapid Reviews. We also provide guidelines to help researchers and practitioners who want to conduct Rapid Reviews, and we finally discuss topics that may concern the research community about the feasibility of Rapid Reviews as an evidence-based method. In conclusion, we believe Rapid Reviews might be of interest to researchers and practitioners working on the intersection of software engineering research and practice.

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1 Introduction

Evidence-based practice aims to curate the best research evidence in a given domain of expertise and integrate the findings into practice (McKibbon 1998). The medical research field was one of the pioneers embracing such a paradigm. More recently, following the promising results in medicine, many other research fields have been adopting evidence-based practice, such as psychology (Anderson 2006), nursing (DiCenso et al. 1998), crime prevention (Farrington et al. 2003), social work (Webb 2001), and education (Davies 1999). The seminal paper of Kitchenham et al. (2004) introduced the evidence-based practice in the software engineering community. According to the authors, the goal of evidence-based software engineering (EBSE) is to provide the means by which current best evidence from research can be integrated with practical experience and human values in the decision-making process regarding the development and maintenance of software. (Kitchenham et al. 2004) (bold emphasis added)

Considering this goal, it is no coincidence that secondary studies are the main products of EBSE. Some authors argue that the knowledge aggregated in secondary studies is the most appropriate to be transferred to practice (Lavis et al. 2003). This belief is rooted in years of evidence-based practice, showing that individual studies often lead to different conclusions compared to more mature and comprehensive secondary studies (Lavis et al. 2003). As an example, a study comparing the mortality rates of for-profit and nonprofit hospitals found a lower risk of death in for-profit hospitals. On the opposite direction, a secondary study, considering data from studies that summed up 26,000 hospitals and 38 millions patients, found a higher risk of death in for-profit hospitals (Devereaux et al. 2002).

Fast forwarding 15 years, EBSE is now a mature field with new studies being conducted on a regular basis (da Silva et al. 2011; Borges et al. 2014, 2015). However, despite its evolution, several researchers claim that EBSE still lacks connection with software engineering practice (Hassler et al. 2014; Santos and da Silva 2013; da Silva et al. 2011). An investigation with researchers specialized in EBSE revealed that the "lack of connection with industry" is the sixth top barrier to conduct secondary studies, from a total of 37 barriers (Hassler et al. 2014). In the same direction, the study of Santos and da Silva (2013) deployed a survey to 44 authors of 120 secondary studies; only six of them affirmed their studies had direct impact on industrial practice. In addition, a tertiary study identified that only 32 out of 120 secondary studies provide guidelines to practitioners. These findings may indicate that EBSE has not been accomplishing its main goal.

The evidence-based medicine community also faced similar problems in its early days and it is still facing them to some extent nowadays (Best et al. 1997; Tricco et al. 2015, 2017). To mitigate this lack of connection with practice, one of the most successful initiatives of the medical field is what has been called Rapid Reviews (RRs) (Tricco et al. 2015). Rapid Reviews are secondary studies aiming to provide research evidence to support decision-making in practice. RRs must be conducted taking into account the constraints inherent to practical environments, such as time

and effort. RRs usually deliver evidence in a more timely manner, with lower costs, and reporting results through more appealing mediums (Cartaxo et al. 2018a). As a consequence, RRs tend to be more connected to practice when compared to Systematic Reviews (SRs).[1] To achieve these goals, RRs omit or simplify some steps of SRs. For instance, RRs can limit the search sources or use just one person to screen primary studies (Tricco et al. 2015).

Inspired by our peers from the medical field, we recently introduced the concept of RRs in software engineering contexts (Cartaxo et al. 2018a,b, 2019). The kick start of an RR is a practical problem that exists in a software project. This particular problem must motivate researchers to screen the literature looking for potential answers. As a consequence, researchers must work closely to practitioners to guarantee that the RR is close tied to a practical context. Instead of using a traditional paper-based format, the results of an RR should be incorporated in more attractive mediums, such as Evidence Briefings, which are one-page documents reporting the main findings of an RR (Cartaxo et al. 2016).

At first sight, one may argue that while RRs speed up the process by simplifying some predefined steps of SRs, they may also introduce methodological threats. To better understand this concern, several studies were conducted in medicine to evaluate the impact of RRs methodological adaptations, in comparison to SRs (Abou-Setta et al. 2016; Corabian and Harstall 2002; Best et al. 1997; Taylor-Phillips et al. 2017; Van de Velde et al. 2011). Although there is evidence reporting divergences between RRs and SRs (Van de Velde et al. 2011), there is more evidence reporting the similarity of results obtained with those two approaches (Abou-Setta et al. 2016; Corabian and Harstall 2002; Best et al. 1997; Taylor-Phillips et al. 2017). While further investigations are still needed to draw more conclusive results, RRs should not be understood as a replacement for SRs. Instead, we believe that both can (and should) co-exist: while SRs are important to provide in-depth evidence, RRs are useful to easily and quickly transfer scientific knowledge to practice.

In this chapter, we present the background concepts related to RRs (Sect. 2); show results and experiences on conducting this type of studies in software engineering (Sect. 3); introduce guidelines on how to plan, perform, and report RRs (Sect. 4); further discuss topics about the feasibility of RRs that may concern the software engineering research community (Sect. 5); list recommended further reading (Sect. 6); and close with the conclusions (Sect. 7).

[1] By SRs we mean the more methodologically rigorous secondary studies like meta-analyses, the traditional systematic literature reviews, or systematic mapping studies (Kitchenham and Charters 2007).

2 Background

In this section we provide some background information about what an RR is; why using RRs, based on evidence of their benefits; who is using RRs; and how RRs compare to SRs in terms of their results and methodological characteristics.

2.1 What Is a Rapid Review?

Rapid Reviews are practice-oriented secondary studies (Watt et al. 2008; Haby et al. 2016; Polisena et al. 2015; Tricco et al. 2017). The main goal of an RR is to provide evidence to support decision-making towards the solution, or at least attenuation, of issues practitioners face in practice. To support this goal and to meet time constraints of practitioners, RRs have to deliver evidence in shorter time frames when compared to SRs, which often take months to years (Tricco et al. 2015). To make RRs compliant with such characteristics, some steps of SRs are deliberately omitted or simplified.

Since RRs are a recent phenomenon in evidence-based medicine, many methodological variations have been identified. This can be observed in the study of Featherstone et al. (2015), which analyzed the methods employed in many published RRs. Additionally, Tricco et al. (2016) interviewed 40 RRs producers and also observed the presence of method variability. These two studies identified high heterogeneity among RRs, from varying time frames to ambiguous definitions of what an RR is. Despite RRs high methodological variability, the majority of RRs share at least the following core aspects:

Rapid Reviews Should Be Performed in Close Collaboration with Practitioners, Bounded to Practical Problems, and Conducted Within Practitioners Context The argument to conduct lightweight secondary studies like RRs holds only in scenarios where time and costs are hard constraints. This kind of scenario is typically observed in the practice of many fields. Therefore, RRs are only conceived bounded to practical problems and conducted within their practical contexts. Thus, practitioners should be willing to devote part of their busy schedule in order to participate on RRs, although the level of participation can vary. RRs that are neither conducted with practitioners' collaboration nor related to a problem that emerged from a practical context are considered deviations, and then, should be avoided by the software engineering community.

Rapid Reviews Are Intend to Reduce Costs and Time of Heavyweight Methods To better fit in the practitioners' agenda, RRs should be conducted and reported in a timely manner. Many strategies have been applied to RRs in health-care related fields to reduce cost and time, such as limiting search strategy by date of publication and/or search source; using just one person to screen studies; not conducting quality appraisal of primary studies; presenting results with no formal synthesis, among others (Tricco et al. 2015, 2016).

Rapid Reviews Results Should Be Reported Through Mediums Appealing to Practitioners One important aspect of RRs is the way they are reported. Many authors argue that alternative mediums should be used—when practitioners are the target audience—instead of the traditional research paper format (Beecham et al. 2014; Grigoleit et al. 2015; Cartaxo et al. 2016). To substantiate this claim, Tricco et al. (2015) observed that, although RRs present several variations on their methods and terminologies, 78% present results as a narrative summary reported in mediums that better fit practitioners' needs. Examples of alternative mediums include: the Contextual Summaries of Young et al. (2014), which limit the report to a one-page document; the Briefings presented by Chambers and Wilson (2012), which summarize the main findings of a secondary study in one section; or even the Evidence Summaries by Khangura et al. (2012), which use an informative box separated from the main text to highlight the audience and nature of the report. In the context of software engineering, there are only a few approaches that can be used in this regard. We particularly recommend Evidence Briefings (Sect. 4.3.1) as a potential way to report the results of an RR.

It is important to note that RRs are neither (1) ad-hoc literature reviews nor (2) an excuse for absence of scientific rigor. RRs must be systematic, by means of following a well-defined protocol. In addition, all the methodological concessions made to an RR must be documented in its protocol. In the RR's report, there must also be a disclaimer about potential methodological limitations (although the details can go on the protocol only, aiming to make the report as concise as possible).

2.2 Why Should One Use Rapid Reviews?

The emerging character of RRs can be explained in terms of their benefits. For instance, a study observed that RRs saved approximately $3 million when implemented in a hospital (McGregor and Brophy 2005). Moreover, a survey

exploring the use of 15 RRs revealed that 67% were used as reference material and 53% were used to, in fact, support decision-making in practice (Hailey 2009). Additionally, Lawani et al. (2017) reported that RRs enabled the development of clinical tools more rapidly than with SRs. Other studies have also demonstrated positive impact of RRs in practice (Taylor-Phillips et al. 2017; Hailey et al. 2000; Batten 2012; Zechmeister and Schumacher 2012; Tricco et al. 2015). Although the main targets of RRs are practitioners, some benefits to researchers and the research community as a whole can be identified. For example, RRs can support and facilitate applied research or serve as a platform to make software engineering research more relevant (Beecham et al. 2014).

2.3 Who Is Using Rapid Reviews?

Although RRs are not well-known in software engineering, there is a growing interest in RRs in health-related fields. For instance, Tricco et al. (2015) mapped 100 RRs published between 1997 and 2013 in medicine. Additionally, major medicine venues, such as the prestigious Systematic Reviews journal[2] officially recognized RRs as one of the evidence-based practice methods (Moher et al. 2015). Moreover, Cochrane—a global renowned group of researchers and practitioners specialized in evidence diffusion in health-care—announced in 2016 a group to play a leading role in guiding the production of RRs (Garritty et al. 2016; Cochrane Rapid Reviews Methods Group n.d.). Due to the increasing importance of RRs, the Canadian Agency for Drugs and Technologies in Health (CADTH) promoted the Rapid Review Summit in 2015, which focused on the evolving role and practices of RRs to support informed health care policy and clinical decision-making (Polisena et al. 2015). Even the World Health Organization (WHO) has recently published a guide presenting the importance of RRs (Tricco et al. 2017).

2.4 How Rapid Reviews Are Compared to Systematic Reviews?

Some studies were conducted to evaluate the impact of RRs methodological adaptations by comparing them with SRs. A scoping review found nine studies comparing the results of RRs and SRs. The comparision found that the results of RRs and SRs were similar (Abou-Setta et al. 2016). To illustrate, Corabian and Harstall (2002) compared six RRs with their SRs peer reviewed publications. The conclusions differed only in one case. Another example is the study of Best et al. (1997), where two of the RRs conducted by the authors were in agreement with SRs published later on the same topic. Still, Taylor-Phillips et al. (2017) conducted an RR

[2] https://systematicreviewsjournal.biomedcentral.com.

and an SR about the same topic in order to compare their results. The comparison shows that RRs can provide similar results compared to SRs. In that case, both RR and SR identified the same set of papers.

Although there is evidence reporting the similarity of results obtained by RRs and SRs, there is also evidence on the opposite side. For instance, the work of Van de Velde et al. (2011) compared results from their RR to an SR that was conducted by another group, on the same topic, and conflicting results were observed. Therefore, further investigations are still needed to draw more conclusive results.

Rapid Reviews Should Not Be Considered as Replacements for Systematic Reviews We believe RRs should be understood as a complementary scientific product. More concretely, while SRs are important to curate in-depth knowledge, RRs are important to easily and quickly transfer established knowledge to practice.

Table 1 compares the main methodological characteristics of RRs and SRs. The RRs characteristics are based on many medicine studies and guidelines (Tricco et al. 2017; Khangura et al. 2012; Abou-Setta et al. 2016; Taylor-Phillips et al. 2017), while the SRs characteristics are based on Kitchenham's software engineering guidelines (Kitchenham and Charters 2007; Cruzes and Dybå 2011a; Santos and da Silva 2013).

3 Examples of Rapid Reviews

In this section, we describe two RRs that we conducted. The goal is to make people who want to perform an RR familiar with the approach. The real problems that the two conducted RRs were intended to provide solutions to are (1) the improvement of customer collaboration and (2) the improvment of team motivation, respectively. We will use these two RRs as example throughout this chapter.

3.1 Improving Customer Collaboration

This RR was conducted in collaboration with an innovation institute. At first, we performed an interview with the institute's representatives to identify the problems they were facing. Among various software projects, we focused on the one that was having difficulties related to low customer collaboration. The complete and detailed results of this experience are reported in Cartaxo et al. (2018a).

Table 1 Comparison of rapid reviews with systematic reviews methodological characteristics

Characteristic	Rapid reviews	Systematic reviews
Problem	Bounded to a practical problem and conducted within a practical context	Can emerge from academic and practical contexts (Kitchenham and Charters 2007). However, SRs focusing on problems emerged from practice are the exception (Santos and da Silva 2013)
Research questions	Lead to answers that help solving or at least attenuating the practitioners' problem. Exploratory questions aiming to identify which are the strategies and their effectiveness to deal with practitioners problem are one of the gold standards	SRs admit questions aiming to support practitioners decision-making, but also studies that are primarily of interest to researchers, with no practice-oriented questions (Kitchenham and Charters 2007)
Protocol	Must have a document formalizing the protocol	Must have a document formalizing the protocol
Stakeholders roles	Conducted in close collaboration with practitioners, sometimes even having practitioners responsible for executing some of the steps	Despite practitioners participation is possible, researchers usually conduct the entire process
Time frame	Days or weeks	Months or years
Search strategy	– May use few or just one search source (e.g., Scopus) – May limit search by publication year, language, and study design	– Multiple sources to search for primary studies are recommended – May also limit search by publication year, language, and study design, although more comprehensive search is recommended
Selection procedure	– Can be conducted by a single person – The inclusions/exclusion criteria can be more restrictive aiming to focus on primary studies conducted in contexts similar to the one motivating the RR. (e.g., studies with small-/medium/large companies, with companies in countries under specific laws, with open source projects only, etc.) (Tricco et al. 2017)	– Must be conducted in pairs to avoid selection bias – Usually is less restrictive regarding specificities of primary studies context, especially when it is a mapping study, broader in scope
Quality appraisal	Conducted by a single person, or not conducted at all (Tricco et al. 2017)	Conducted in pairs to avoid threats to validity due to low primary studies' quality

(continued)

Table 1 (continued)

Characteristic	Rapid reviews	Systematic reviews
Extraction procedure	Usually conducted by a single person to reduce time and effort	Conducted in pairs to avoid extraction bias
Synthesis procedure	Narrative summaries are the most common way to synthesize evidence (Tricco et al. 2015)	More systematic methods should be applied (e.g., meta-analysis, meta-ethnography, thematic analysis, etc.), although it is not always the case (Cruzes and Dybå 2011a)
Report	Alternative mediums that better fit practitioners needs (e.g., Evidence Briefings)	Traditional research paper format

This particular software project was late, and the software team needed either the approval or information from its customers to conclude many of the pending tasks. However, the team was having a hard time to establish a proper communication with their client. To illustrate this, one of the participants affirmed that "emails requesting clarification about requirements take one or two weeks for customer to reply."

In this context, we decided to conduct an RR together with the practitioners to provide evidence about strategies that would help them to deal with low customer collaboration. More concretely, each aspect of the RR protocol was discussed with the practitioners (e.g., the research questions, the inclusion/exclusion criteria, etc.). Online channels such as Skype and email were frequently used during this step. After selecting 17 primary studies, we summarized the findings in an Evidence Briefing document (Cartaxo et al. 2016). We also ran a workshop to discuss the findings and to answer additional questions. A full-time researcher (experienced in conducting secondary studies) was assigned to conduct this RR, which lasted 6 days. That time frame comprehends the first interview with the institute representatives to identify their problem, up to the workshop in the end to present and discuss the RR results.

After the workshop, we interviewed practitioners to assess their perception regarding the RR we conducted together with them. Practitioners reported many benefits regarding the use of RRs, such as the novelty of the approach, the applicability to their problem, the reliability of the content, among others. They also reported that the RR fostered the learning of new concepts. As a shortcoming, however, they found that some findings were not clear in the printed version of the Evidence Briefing—although they became clearer after discussing with researchers during the workshop (Cartaxo et al. 2018a).

We also did a follow-up with the practitioners 2 months after the workshop to assess whether they applied some of the strategies and findings reported in the RR. Interestingly, we discovered that practitioners indeed adopted some of the strategies in their daily work habits to improve customer collaboration, such as *Story Owner*, *Change Priority*, and *Risk Assessment Up Front* (Cartaxo et al. 2018a).

3.2 Improving Team Motivation

This RR was performed in collaboration with a software company that develops educational software products in Recife, Brazil. We first contacted the IT director, who is responsible for all technological aspects of the company. After presenting the goal of this research, a project manager joined us and discussed problems regarding low team motivation he faced in one of their projects. Similar to the RR on low customer collaboration, this RR was conducted in close collaboration with the practitioners from the software company (e.g., defining the research questions and the protocol). The complete and detailed results of this experience are reported in Cartaxo (2018).

Thirty five studies were selected and their evidence summarized and reported in an Evidence Briefing document. The results were also presented in a workshop. This RR took 8 days of a researcher experienced in conducting secondary studies.

When interviewing the practitioners after the workshop, they reported many benefits regarding the use of RRs, such as improvements in team confidence and the reliability on RRs findings. They also demonstrated to be willing to embrace RRs in their own process. This particular finding revealed that practitioners are willing to take the risks of using less rigorous methods, such as RRs, in exchange for evidence delivered in short time frames.

4 The Rapid Review Process

Conducting an RR involves three main phases *planning*, *performing*, and *reporting*. We describe them in detail next.

These phases are similar to the ones of an SR, as described by Kitchenham and Charters (2007). Each phase comprises various specific steps and that is where the differences between RRs and SRs become evident. While the latter adopts strategies aiming to reduce any type of research bias and to guarantee evidence quality, the former aims to deliver scientific evidence in a timely manner to support practitioners' decision-making.

4.1 Planning a Rapid Review

The planning phase of an RR comprehends the creation of a protocol to define all the decisions and procedures demanded to conduct the RR. The protocol must also make the practical problem it intends to provide evidence for explicit, as well as the roles of each stakeholder aiming to guarantee practitioners' active participation.

4.1.1 Demand for a Rapid Review

The demand for an RR can emerge from different sources under different contexts. Some possible arrangements we envision are:

- **Practitioners ask for a Rapid Review:** A decision-maker (i.e., practitioner) contacts a researcher or research institution asking for an RR aiming to make decisions based on evidence.
- **Researcher aligns her/his research agenda based on a practical problem:** A researcher contacts a software company (or an open source team) facing problems related to her/his research agenda. A researcher then proposes an RR to both provide evidence that practitioners need and to bound her/his research on a practical problem.
- **Researcher prospects a research agenda based on a practical problem:** A researcher contacts a software company (or an open source team) aiming to prospect practical problems to focus her/his research on. In this case, the RR has initially no predetermined focus. To narrow it down, the researcher could leverage interviews with practitioners to grasp the problems they are facing and then decide which one to tackle. This is how we conducted the two RRs presented in Sect. 3.

4.1.2 Defining the Problem

Close collaboration with practitioners is crucial to define the problem that will drive an RR. Since sometimes the problem is not already well-defined (or perhaps not even the practitioner is fully aware of the main problem s/he is facing), researchers can use qualitative research methods such as interviews or focus groups to better understand the context and the (eventually hidden) problems (Cartaxo et al. 2018a). Depending on how clear a problem is to practitioners, interviews could be more exploratory (e.g., to understand the whole challenges and needs), more objective (e.g., to understand missing details), or even skipped (e.g., if the problem is very well-defined). One important point to bear in mind when interviewing practitioners to define problems for RRs is that this may be an interactive process. Sometimes you identify a practical problem but there are no studies approaching such problem, so an RR will not be viable, and you may need to find another problem.

4.1.3 Defining the Research Questions

Research questions in RRs are as important as in SRs (Kitchenham and Charters 2007). Once they are defined, all effort is towards answering them. However, to provide useful answers, one has to ask meaningful questions. In RRs, answers are considered useful when they help practitioners to solve or at least attenuate their

practical problem. Consequently, questions are considered meaningful only when they lead to such answers.

Research Questions in Rapid Reviews Should Be Defined in Close Collaboration with Practitioners Questions aiming to identify research gaps or to provide more general insights into the research community should be avoided, and left to SRs. RRs should provide answers bounded to the practical context they are inserted into. In other words, RRs naturally have a narrower character than SRs.

Each problem will certainly demand different kinds of questions and approaches to investigate them. However, in our experience, exploratory questions aiming to identify strategies to deal with a particular problem are the cornerstone of RRs (Cartaxo et al. 2018a) since the most important thing to practitioners under time constraints is to discover strategies, supported by evidence, to solve their problems (Yourdon 1995). Examples of such questions are found in the RRs presented in Sect. 3. In the RR about customer collaboration we asked:

- What are the strategies to improve customer collaboration in software development practice?
- What are their effectiveness?

Similarly, in the RR about team motivation we asked:

- What are the strategies to improve software development teams motivation?
- What are their effectiveness?

Other research questions are possible, if answering them helps practitioners towards the solution of their problem. For instance, in the RR about customer collaboration, we also added the following two research questions:

- What are the benefits of customer collaboration in software development practice?
- What are the problems caused by low customer collaboration in software development practice?

Answers to those questions are useful because the findings were used by the development team to convince their customers about the importance of a better collaboration. On the other hand, these research questions were not necessary in the RR about team motivation, since the problem was internal to the company, and the stakeholders already agreed with the importance to improve team motivation. They just did not know how they can do it effectively.

4.1.4 Defining the Stakeholders Roles

An RR is a joint initiative between researchers and practitioners. Thus, active participation of both sides is not only important, but (as we see it) mandatory. The **researchers' role** is to guarantee the methodological consistency and transparency, while the **practitioners' role** is to make sure that the research is bounded to an actual practical problem, so the evidence will be useful.

In that context, different levels of participation are possible. Considering the extremes, it is possible for researchers to perform all activities related to an RR (e.g., defining the protocol, selecting primary studies, extracting data, synthesizing evidence, and reporting the results) as long as practitioners are involved in the entire process, validating each decision and ensuring the RR is bounded to their practical problem. We could also perceive, nevertheless, that practitioners could perform all activities of an RR, as long as researchers are involved, in particular, to validate each methodological decision. Any level of participation between these two extremes is also possible and encouraged. However, the effort of each stakeholder will be defined taking into account the time constraints and resource limitations in each specific situation.

Both, the RR about customer collaboration and team motivation were conducted near the extreme where researchers defined and executed the reviews. However, the practitioners were aware of every single step made, validating and making suggestions to it. This alignment between researchers and practitioners is crucial in order to avoid researchers losing focus, which in turn may lead to research questions that, although interesting from a pure academic perspective, are not related to a practical problem.

Since RRs and even SRs are not well-known in practice (Cartaxo et al. 2017), we believe this kind of arrangement (where researchers perform most of an RR's tasks) will happen more frequently, at least at the beginning. However, if the collective effort to link software engineering research and practice more closer unfolds, then we believe practitioners will recognize the relevance of initiatives like RRs and will be more willing to actively participate.

4.1.5 Creating the Protocol

The protocol of an RR has the same goal as the protocol of an SR: to specify all the methodological steps that undertake the review. The protocol itself is one of the most important elements that makes both RRs and SRs systematic. In this sense, it is important to highlight that RRs are not synonymous to ad-hoc literature reviews, but rather systematic. As a consequence, an RR demands a well-documented protocol.

A major difference between RRs and SRs protocols, nevertheless, is the natural inclination of the former to suffer changes throughout the review process. These changes might happen due to the flexible process that RRs allow. However, changes made after the protocol definition must be documented and justified transparently (Tricco et al. 2017).

The components of an RR protocol are similar to the ones of SRs as described by Kitchenham and Charters (2007), such as: research questions, search strategy, inclusion/exclusion criteria, selection procedure, extraction procedure, synthesis procedure, reporting, among others.

Again, we want to highlight the importance of establishing a close collaboration with practitioners when defining and conducting an RR protocol. This is crucial to make sure practitioners' needs are well-covered and the RR will be performed aiming to provide useful answers. An example of an RR protocol can be found in Cartaxo et al. (2018a).

4.2 Performing a Rapid Review

In this section we present some strategies that may be used to reduce time and cost of performing an RR. For each step, we present some suggestions on how to perform the step. However, one does not have to embrace all strategies, on the contrary, the researcher has to analyze the context and limitations where an RR is being conducted and define which strategies better conciliate given trade-offs. For instance, an RR may use more than one search source to identify primary studies if ensuring broad coverage is critical, but skip the quality appraisal. While other RRs may use just one search source and conduct a rigorous quality appraisal if the reliability on the evidence is critical.

Transparency Is the Golden Standard in Rapid Reviews Regardless of the strategies employed to reduce cost and/or time to conduct an RR, limitations and threats to validity must be reported in the protocol. Practitioners may and are willing to consume evidence based on less rigorous methods like RRs, as long as they are aware of the limitations and threats to validity (Cartaxo et al. 2018a).

4.2.1 Search Strategy

SRs usually employ multiple search strategies to guarantee exhaustive coverage such as using multiple search engines, manual search in conference proceedings and journal issues, as well as forward and backward snowballing approaches.

Adopting all these strategies simultaneously can be extremely resource consuming. An RR, on the other hand, may choose to focus on a single search strategy. For instance, instead of using several search engines, RRs may focus on a single one, more likely Scopus or Google Scholar. These search engines cover a wide spectrum of research papers and usually index papers from the major digital libraries. Complementing the results of the search engine with a snowballing approach has also shown to be a viable option (Badampudi et al. 2015). There are other approaches that, if employed, could reduce the effort placed on conducting RRs, such as:

1. Limiting the search by date;
2. Restricting the language in which the paper is written;
3. Focusing on a given geographical area, or;
4. Limiting the primary studies according to their research method (e.g., controlled experiments only, or case studies only) (Tricco et al. 2017).

It is important to note that those approaches may lead to relevant studies being not included and, as a consequence, reducing the coverage of an RR. If one of these strategies is adopted, threats to validity must be transparently reported. In both RRs, the one about customer collaboration and the one about team motivation, we used one search source only: the Scopus search engine.

4.2.2 Selection Procedure

Since RRs are bound to a practical context, one may define restrictive inclusion/exclusion criteria. The goal here is twofold: to reduce the amount of studies to screen and to provide evidence that better fit practitioners' needs.

For instance, the RR about team motivation was conducted in a small private company with collocated teams. Therefore, some of the inclusion/exclusion criteria were as follows:

- The study must not be related to large companies;
- The study must not be related to distributed teams;
- The study must not be related to crowd source software development;
- The study must not be related to open source software development;

Defining restrictive inclusion/exclusion criteria may reduce the time and effort to conduct an RR. However, this procedure does not necessarily incur in threats to validity. In fact, it may be considered good practice to consider evidence only from primary studies conducted in similar contexts to that of the performed RR. Highly contextualized studies are considered one of the best ways to have impact in practice (Dybå et al. 2012; Cartaxo et al. 2015).

Moreover, SRs usually require independent screening of studies by at least two reviewers (Kitchenham and Charters 2007; Tricco et al. 2017), which is very resource intensive. RRs, on the other hand, may have a selection procedure conducted by a single reviewer. Another option is to have a second reviewer just to

pass through a reduced sample of studies. Such strategies may obviously introduce selection bias and must be reported accordingly.

Usually, SRs split the selection procedure into several substeps. In the first substep, reviewers screen primary studies' titles and abstracts, and in the second, the entire papers content. To abbreviate this process, one may split the selection procedure into three substeps, instead of two. The first substep can be dedicated to screening primary studies' titles only. This might accelerate the exclusion of papers that are clearly out of scope since it prevent one to read papers abstracts. On the other side, it may provoke false negatives. The second substep would select primary studies based on abstract only, and the third substep based on the entire content. Regarding this particular strategy, one of the practitioners that participated on the RR about customer collaboration give us the following feedback:

> Sometimes we search for solutions in just one source [...] Then we do it exactly as recommended by that source but it may not work for us. When we do it like this [the RR], we can have more possibilities [the strategies identified by the RR], even considering it was conducted faster [the RR compared to SRs], and maybe many things [papers] could be lost just because of the title [the first round of selection procedure, which we analyzed only the titles of the papers], because someone put a bad title. That is ok, who cares?

4.2.3 Quality Appraisal

In addition to inclusion/exclusion criteria, quality criteria are also usually defined in SRs in order to select high quality evidence only. In a more extreme view, RR researchers can entirely skip this step, but threats to validity associated with this decision must be transparently reported. Both RRs we presented in Sect. 3, adopted this strategy.

Another less radical strategy would be to focus only on studies published in conferences and/or journals that employ a rigorous review process. This may increase the chances of selecting high quality evidence with a low effort (e.g., no need to analyze the evidence quality of each and all papers). Although this approach can also have limitations (e.g., a potentially relevant study could have published on a less prestigious venue or on arXiv), at least we know that the primary studies being included already passed through a rigorous sieve.

If evidence quality is critical in the context where the RR is being conducted, a strategy that may reduce the time and effort is to have quality appraisal carried out by a single reviewer or using pairs to appraise just a sample of papers. This differs from SRs, where quality appraisal is recommended to be conducted fully in pairs.

4.2.4 Extraction Procedure

The data extraction procedure can be conducted by a single reviewer in RRs, as long as the inherent biases are transparently reported. Both RRs we presented in Sect. 3, adopted this strategy. Moreover, in SRs, when data is missing on the selected studies,

it is usually recommended to contact the authors. Researchers who conducted RRs in medicine very infrequently indeed contacted primary studies' authors (Tricco et al. 2017). That can be a viable strategy: studies with missing data should probably be excluded from the RR and their exclusion must be reported. RRs consumers (a.k.a. practitioners) can reach those studies later if they wish to.

4.2.5 Synthesis Procedure

Knowledge synthesis is probably one of the most important steps of any secondary study, but at the same time one of the most time-consuming activities. However, a tertiary study revealed that as many as half of the SRs analyzed in software engineering do not present any kind of formal knowledge synthesis procedure (Cruzes and Dybå 2011b). They also summarized various methods for knowledge synthesis (e.g., meta-analysis, meta-ethnography, grounded theory, qualitative metasummary, among others) to encourage researchers to apply them. Furthermore, the chapter "Research Synthesis in Software Engineering" of this book summarizes the most frequently used synthesis methods in software engineering.

A possible strategy to reduce time and effort synthesizing evidence in RRs is using lightweight methods like narrative synthesis (Cruzes and Dybå 2011b; Tricco et al. 2017) in contrast to the more rigorous and time/effort consuming ones like meta-analysis (Lipsey and Wilson 2001) or grounded theory (Stol et al. 2016) methods alike. This decision brings an obvious limitation and must be reported, so practitioners consuming RRs evidence can make informed decision.

Conclusions, recommendations, and implications are particularly important in RRs since they can guide practitioners to adopt the synthesized knowledge. In medicine, they encourage researchers to dedicate time to make her/his conclusions and recommendations to practitioners and avoid presenting a report with findings only (Tricco et al. 2017). We experienced such kind of demand from practitioners on the RR about team motivation when a practitioner gave us the following feedback:

> since it [the RR] was focused on our problem, maybe if there was something saying which one [strategy identified with the RR] you recommend [...] this is what is missing [...] maybe it is missing a conclusion, the researcher's comments.

In addition, one should keep in mind that those conclusions, recommendations, and implications should be strongly bounded to the RR's context, in opposition to the ones drawn from SRs that usually aim to reach a wider audience and scope (Tricco et al. 2017).

4.3 Reporting a Rapid Review

Reporting and disseminating knowledge produced with RRs are as important as conducting the RR itself. SRs are usually conducted in academic environment and thus the report is usually focused on that audience. That means SRs are commonly

reported in scientific paper format and diffused through academic journals and conferences.

RRs, however, target software practitioners. Therefore, one should consider that not all information that is crucial to researchers is also relevant to practitioners (e.g., research method, background, related work, etc.). As a consequence, RRs must be reported in a more straightforward way, focusing on results and recommendations, so practitioners can easily consume the information to support their decision-making.

There are several approaches that could be used in this regard, as presented in Sect. 2.1 (Chambers and Wilson 2012; Khangura et al. 2012; Young et al. 2014; Best et al. 1997). This section presents the concept of Evidence Briefings, which are alternative mediums to report RRs more focused on practitioners needs, and also discusses the importance of disseminating knowledge produced with RRs.

4.3.1 Evidence Briefings

Evidence Briefings are one-page documents reporting the main findings of RRs (Cartaxo et al. 2016). A template, as well as examples of such documents can be found online.[3] The Evidence Briefings template was defined based on the best practices observed in medicine as well as on Information Design (Tondreau 2011) and Gestalt Theory (Lupton and Phillips 2015) principles. Figure 1 shows an example of an Evidence Briefing. The numbers within squares denote each part of Evidence Briefing's structure, and following there are some guidelines on how to fill each of those parts:

1. The **title** of an Evidence Briefing should be as concise as possible, and comprise one or two lines only. Titles with more than two lines should be avoided since they might reduce document space to report RRs' findings.
2. To fill the Evidence Briefing's **summary**, we suggest researchers to adopt the following structure: *This briefing reports scientific evidence on* <RESEARCH GOAL>. The summary should span few lines. Following is an example of Evidence Briefing's summary: "This briefing reports scientific evidence on the challenges involved in using Scrum for global software development (GSD) projects, and strategies available to deal with them."
3. The **findings** section is the most important one. It should list the main findings of the RR. When writing the findings, we recommend to use one finding per paragraph. Bullets to highlight important points as well as charts, figures, and tables are welcome since they make the findings even easier to read. Findings should be short sentences, straight to the point. The findings section should not include information about the research method. The idea of the Evidence Briefing is to quickly communicate the main findings of an RR to practitioners. If they

[3] http://cin.ufpe.br/eseg/briefings.

Fig. 1 Evidence Briefing structure

have interest they can refer to the complementary material reference shown in item 5.
4. The **box at the right side** of the Evidence Briefing should be filled with information about the Evidence Briefing's target audience, clarifications about what information is included, and what is not included in the Evidence Briefing. The template has a complete set of suggestions to structure information in the right box.
5. The **reference** to complementary material should be placed at the bottom of the Evidence Briefing. It may be a link to a webpage containing at least the following documents/information: the RR protocol document and a list of references to the primary studies included in the RR.
6. **Logos** of universities, software companies, and any other institutions involved in the RR initiative should be placed at the very top of the Evidence Briefing document. This publicizes the institutions producing Evidence Briefings and might make practitioners search for more RRs on institutions' websites.

Although other mediums to transfer scientific evidence exist, we recommend the use of the Evidence Briefings because, as observed in an empirical evaluation, both researchers and practitioners are positive about using Evidence Briefings as a medium to transfer scientific knowledge to software engineering practice (Cartaxo et al. 2016).

4.3.2 Dissemination of Rapid Reviews Results

Not all RRs are disseminated beyond the practitioners' scope due to sensitive information belonging to the software company involved. However, if this is not the case, we recommend researchers conducting an RR to post the resulting report (e.g., Evidence Briefing) online on the research institution's or the company's website. Sharing the report on social networks such as Twitter or ResearchGate can also increase the impact of the reviews.

5 Further Discussions on the Feasibility of Rapid Reviews

In this section we present further discussions about topics that may concern software engineering research community about the feasibility of RRs as an evidence-based method.

5.1 Research Community Viewpoints on Rapid Reviews

Although RRs are a rising research method in the medical domain, they are so far hardly recognized in the SE community. We believe our community could and should benefit from it. However, due to the lack of RR studies in software

engineering, little is known about how our research community perceives the adoption of RRs.

This is particularly important because, according to Rogers (2003), the perceptions of all individuals involved in an initiative is one of the main predictors of its adoption. The importance of exploring the perceptions of practitioners—as we have done in Cartaxo et al. (2018a)—is easy to understand since practitioners are the target audience of RRs. But the perceptions of researchers should certainly not be neglected. Moreover, if the software engineering research community discards RRs, such kind of initiative can easily end even before having shown its potential. In informal discussions with EBSE specialists during conferences, we observed that their opinions about RRs seem to be highly polarized, especially when methodological concessions are made.

This feeling is now backed up with evidence from a study we conducted with 37 software engineering researchers (Cartaxo et al. 2019). We applied a Q-Methodology approach, enabling us to identify that researchers in software engineering can be classified in four groups according to their viewpoint on RRs:

Unconvinced Researchers aligned with this viewpoint are the ones that agree the most that further research comparing the methods and results of RRs and SRs is required before they decide how they think about RRs. The indecision of this viewpoint towards RRs is even more explicit when we look at the contradictory affirmations these participants provided. They think a well-conducted RR may produce better evidence than poorly conducted SRs, but on the other hand, they have more confidence in evidence produced with an SR than in evidence produced with an RR.

Enthusiastic Researchers aligned with this viewpoint are generally positive about RRs and believe RRs can provide reasonable evidence to practitioners if minimum standards to conduct and report RRs are established. They also strongly agree that a well-conducted RR may produce better evidence than a poorly conducted SR.

Picky Researchers aligned with this viewpoint are very skeptical about RRs, as well as concerned about the quality of primary studies included in RRs and how the results are reported. This negative perception can be explained by a strong belief hold by researchers aligned with this viewpoint, that knowledge users (practitioners) do not fully understand the implications of RR methodological concessions. Researchers sharing this point of view also put little faith in RRs validity. They strongly disregard the possibility that RRs can be timely and valid, especially when methodological concessions are made.

Pragmatic Researchers aligned with this viewpoint pragmatically focus on a variety of contextual information to decide if RRs are the best fit to support decision-making. They also believe practitioners are able to understand the impacts of flexible research methods adopted by RRs. Still, they believe rigid standards in RRs could reduce their usefulness to practitioners.

Although the viewpoints are quite diverse, there is a consensus that both RRs and SRs can be conducted very well or very poorly, and that time needed to conduct an

evidence synthesis study is not related to its quality. The main concerns about RRs—not necessarily shared among the four viewpoints—are: the need for more evidence about the effectiveness of RRs, the importance to determine minimum standards, the relevance of quality assessment to include primary studies, and the emphasis on transparency in RRs.

With this typology in mind, one can better understand what the main concerns of researchers are and promote better understanding about RRs. As a consequence, our community can pave a road better connecting research with practice and make software engineering research more impactful and relevant.

5.2 Publishing Rapid Reviews in Scientific Peer Reviewed Venues

Since RRs are commonly reported in non-scientific paper format (i.e., Evidence Briefings), they are usually internally reviewed, but not peer reviewed (Tricco et al. 2017). This may be seem as an unpromising incentive for researchers to conduct RRs since publishing papers in peer reviewed venues is important for their career. Nevertheless, we encourage researchers who conduct RRs to also publish their results in traditional scientific venues by reporting their results in a scientific outlet too.

Rapid Reviews Can and Should Also Be Published in Academic Peer Reviewed Venues One may argue that an RR will probably not constitute enough contribution to deserve a rigorous scientific publication. However, one should note that RRs are usually inserted into broader knowledge/technology transfer initiatives (Cartaxo et al. 2018b), and such initiatives are usually very enriching and welcomed in scientific venues. The paper may report not only the RR protocol and results, but also the perceptions of practitioners participating in the entire RR initiative. One example of such a peer reviewed RR publication in software engineering is one of our works (Cartaxo et al. 2018a). Additionally, if the cooperation between researchers and practitioners goes beyond the RR itself—for instance, when researchers actively participate, together with practitioners, designing the solutions to practitioners' problems based on the evidence provided by the RR, and adopting a participatory method like action research—the paper may report how the knowledge produced with that RR was applied in practice, and to what degree it solved or at least attenuated practitioners' problems. In fact, this kind of research would probably close the entire knowledge/technology transfer cycle in a marvelous way. It puts the scientific knowledge in action with direct impact to practice.

5.3 *On the Use of Grey Literature*

The last point that is worth discussing is whether one could conduct an RR with grey literature. This is a positive argument along these lines, which is often related to how practitioners share and acquire knowledge (i.e., through blog posts, talks, videos, etc.). These mediums are often created by (and for) practitioners and do not necessarily pass through a rigorous revision process. Although some researchers are taking advantage of grey literature (Garousi et al. 2016, 2017) in academic studies, there are still some conservative researchers that favor the traditional peer reviewed literature. In this chapter, we do not intend to add more fire on this already heated debate. However, we also concur that eventually, a researcher conducting an RR would have to think about what kind of literature s/he will include in her/his review. To guide this researcher, our experience suggests that researchers should focus only on peer reviewed literature when conducting an RR. This is particularly due to the fact that RRs may have already several limitations and threats to validity. We believe that adding grey literature to this equation could weaken the quality of the review produced, at least in the eyes of an unconvinced researcher. Obviously, this is a hypothesis that could be tested in follow-up studies. For more detailed information about using grey literature as evidence, refer to the chapter "Benefitting from the Grey Literature in Software Engineering Research" in this book.

6 Recommended Further Reading

For a better comprehension of this chapter, we suppose the reader has experience conducting SRs, or at least has knowledge of what an SR is, as well as the steps and procedures it comprises. If that is not the case, we refer the reader to the Kitchenham and Charters (2007) guidelines as well as the Kitchenham et al. (2004) EBSE seminal paper.

Regarding RRs, one can read the first experience conducting such kind of study in software engineering in Cartaxo et al. (2018a). We also recommend reading the practical guide on RRs provided by the World Health Organization (Tricco et al. 2017). It distills most of the accumulated experience conducting RRs in medicine. For a comprehensive view on the state of practice and research about RRs in medicine, one can take a look on Tricco et al. (2015) scoping study. It analyzes 100 RRs conducted between 1997 and 2013 under various perspectives, such as RRs characteristics, terminology, citation, impact on practice, comparison with SRs, among others. For a better understanding on how RRs fit in a more comprehensive knowledge/technology transfer initiative, there is our study proposing such a model in Cartaxo et al. (2018b).

Regarding initiatives related to RR, there is a recent trend towards the use of grey literature in multivocal literature reviews (MLRs) (Garousi et al. 2016, 2017; Yasin and Hasnain 2012). Generally speaking, the use of MLRs shares the core goal of an RR, which is to make research more aligned with practice. However,

there is a fundamental difference between these two approaches. On the one hand, RRs aim to provide knowledge based on scientific evidence from peer-reviewed and rigorous primary studies only, as well as deliver evidence in a timely manner. On the other hand, MLRs apply systematic methods to synthesize not only primary studies, but also grey literature. Moreover, MLRs do not necessarily emerge from a practical problem nor are they necessarily concerned about delivering evidence in a timely manner to practitioners. While RRs flexibilize the method, MLRs flexibilize the source of evidence. However, flexibilizing both aspects at the same time may produce results of low validity. Thus, RRs and MLRs are different approaches, although both can potentially contribute to reduce the gap between software engineering research and practice.

7 Conclusion

A new era of software engineering has emerged and it is changing the way we think about empirical research. In a recent series of posts at Communications of ACM blog, Meyer (2018a,b,c) precisely framed this era throughout a vision where empirical evidence and practice orientation are pivotal elements:

> As long as empirical software engineering was a young, fledgling discipline, it made good sense to start with problems that naturally landed themselves to empirical investigation. But now that the field has matured, it may be time to reverse the perspective and start from the consumer's perspective: for practitioners of software engineering, what problems, not yet satisfactorily answered by software engineering theory, could benefit, in the search for answers, from empirical studies? (Meyer 2018a)

Meyer's voice certainly is not alone. Many other researchers are starting to recognize practice orientation as the next long way ahead (Beecham et al. 2014; Duarte 2015; Laird and Yang 2015; Santos and da Silva 2013). Unfortunately, there is evidence that secondary studies in software engineering lack connection with practice (Santos and da Silva 2013; da Silva et al. 2011; Hassler et al. 2014; Cartaxo et al. 2017).

In this chapter, we introduced the concept of Rapid Reviews (RRs) in the context of knowledge transfer in software engineering. They are a type of secondary studies aiming to provide research evidence to support decision-making in practice, and in consequence, must be conducted taking into account the constraints inherent to practical environments. RRs usually deliver evidence in a more timely manner, with lower costs, reporting results through more appealing mediums, and more connected to practice, when compared to Full Systematic Reviews.

We also presented examples of experiences conducting RRs together with software engineering practitioners. They affirmed to have learned new concepts about the problem they were facing, as well as declared to trust in the findings provided by RRs. We also presented guidelines covering the entire RRs process aiming to help researchers and/or practitioners interested in conducting their own RRs.

Even looking for all the good results, to be fair, one has to highlight that RRs are not always a bed of roses. RRs have their limitations, and this must be considered carefully. They are certainly neither a silver bullet nor can they replace Systematic Reviews. Moreover, we explored and provided solutions aiming to address some concerns that researchers may have about the feasibility of RRs as a viable evidence-based research method. Such concerns are researchers perceptions (skepticism) about RRs flexible strategies, how to publish RRs in scientific rigorous peer review venues, as well as how to disseminate the results obtained by RRs.

In conclusion, we believe RRs can play an important role in promoting knowledge transfer from scientific empirical evidence to practice and reduce the gap between academic research and software engineering practice.

References

Abou-Setta AM et al (2016) Methods for developing evidence reviews in short periods of time: a scoping review. PloS One 11(12)

Anderson NB (2006) Evidence-based practice in psychology. Am Psychol 61(4):271–285

Badampudi D, Wohlin C, Petersen K (2015) Experiences from using snowballing and database searches in systematic literature studies. In: Proceedings of the 19th international conference on evaluation and assessment in software engineering, EASE '15. ACM, New York, pp 17:1–17:10. http://doi.acm.org/10.1145/2745802.2745818

Batten J (2012) Comment on editorial literature reviews as a research strategy. J Sch Nurs 28(6):409–409

Beecham S, O'Leary P, Baker S, Richardson I, Noll J (2014) Making software engineering research relevant. Computer 47(4), 80–83. http://dx.doi.org/10.1109/MC.2014.92

Best L, Stevens A, Colin-Jones D (1997) Rapid and responsive health technology assessment: the development and evaluation process in the south and west region of England. J Clin Eff 2(2):51–56

Borges A, Ferreira W, Barreiros E, Almeida A, Fonseca L, Teixeira E, Silva D, Alencar A, Soares S (2014) Support mechanisms to conduct empirical studies in software engineering. In: Proceedings of the 8th ACM/IEEE international symposium on empirical software engineering and measurement, ESEM '14. ACM, New York, pp 50:1–50:4. http://doi.acm.org/10.1145/2652524.2652572

Borges A, Ferreira W, Barreiros E, Almeida A, Fonseca L, Teixeira E, Silva D, Alencar A, Soares S (2015) Support mechanisms to conduct empirical studies in software engineering: a systematic mapping study. In: Proceedings of the 19th international conference on evaluation and assessment in software engineering, EASE '15, pp 22:1–22:14

Cartaxo B (2018) A model to transfer knowledge from research to software engineering practice based on rapid reviews and evidence briefings. PhD thesis, Center of Informatics – Federal University of Pernambuco – CIn/UFPE

Cartaxo B, Almeida A, Barreiros E, Saraiva J, Ferreira W, Soares S (2015) Mechanisms to characterize context of empirical studies in software engineering. In: Experimental software engineering Latin American workshop (ESELAW 2015), pp 1–14

Cartaxo B, Pinto G, Vieira E, Soares S (2016) Evidence briefings: towards a medium to transfer knowledge from systematic reviews to practitioners. In: Proceedings of the 10th ACM/IEEE international symposium on empirical software engineering and measurement, ESEM '16. ACM, New York, pp 57:1–57:10. http://doi.acm.org/10.1145/2961111.2962603

Cartaxo B, Pinto G, Ribeiro D, Kamei F, Santos RES, da Silva FQB, Soares S (2017) Using q&a websites as a method for assessing systematic reviews. In: 2017 IEEE/ACM 14th international conference on mining software repositories (MSR), pp 238–242

Cartaxo B, Pinto G, Soares S (2018a), The role of rapid reviews supporting decision-making in software engineering practice. In: 22nd International conference on evaluation and assessment in software engineering (EASE).

Cartaxo B, Pinto G, Soares S (2018b) Towards a model to transfer knowledge from software engineering research to practice. Inf Softw Technol 97:80–82. http://www.sciencedirect.com/science/article/pii/S0950584918300028

Cartaxo B, Pinto G, Fonseca B, Ribeiro M, Pinheiro P, Soares S, Baldassarre MT (2019) Software engineering research community viewpoints on rapid reviews. In: Proceedings of the 13th ACM/IEEE international symposium on empirical software engineering and measurement (ESEM), ESEM '19

Chambers D, Wilson P (2012) A framework for production of systematic review based briefings to support evidence-informed decision-making. Syst Rev 1:32

Cochrane Rapid Reviews Methods Group (RRMG) (n.d.) http://methods.cochrane.org/rapidreviews/. Accessed 27 Mar 2018

Corabian P, Harstall C (2002) Rapid assessments provide acceptable quality advice. In: Annu Meet Int Soc Technol Assess Health Care

Cruzes DS, Dybå T (2011a) Research synthesis in software engineering: a tertiary study. Inf Softw Technol 53(5):440–455. Special Section on Best Papers from {XP2010}. http://www.sciencedirect.com/science/article/pii/S095058491100005X

Cruzes DS, Dybå T (2011b) Research synthesis in software engineering: a tertiary study. Inf Softw Technol 53(5):440–455

da Silva FQ, Santos AL, Soares S, França, ACC, Monteiro CV, Maciel FF (2011) Six years of systematic literature reviews in software engineering: an updated tertiary study. Inf Softw Technol 53(9):899–913. Studying work practices in Global Software Engineering. http://www.sciencedirect.com/science/article/pii/S0950584911001017

Davies P (1999) What is evidence-based education? Br J Educ Stud 47(2):108–121

Devereaux P, Schünemann HJ, Ravindran N, Bhandari M, Garg AX, Choi PT-L, Grant BJ, Haines T, Lacchetti C, Weaver B et al (2002) Comparison of mortality between private for-profit and private not-for-profit hemodialysis centers: a systematic review and meta-analysis. J Am Med Assoc 288(19):2449–2457

DiCenso A, Cullum N, Ciliska D (1998) Implementing evidence-based nursing: some misconceptions. Evid Based Nurs 1(2):38–39

Duarte CHC (2015) Patterns of cooperative technology development and transfer for software-engineering-in-the-large. In: 2015 IEEE/ACM 2nd international workshop on software engineering research and industrial practice, pp 32–38

Dybå T, Sjøberg DI, Cruzes DS (2012) What works for whom, where, when, and why?: on the role of context in empirical software engineering. In: Proceedings of the ACM-IEEE international symposium on empirical software engineering and measurement, ESEM '12. ACM, New York, pp 19–28. http://doi.acm.org/10.1145/2372251.2372256

Farrington DP, MacKenzie DL, Sherman LW, Welsh BC et al (2003) Evidence-based crime prevention. Routledge, London

Featherstone RM et al (2015) Advancing knowledge of rapid reviews: an analysis of results, conclusions and recommendations from published review articles examining rapid reviews. Syst Rev 4:50

Garousi V, Felderer M, Mäntylä MV (2016) The need for multivocal literature reviews in software engineering: complementing systematic literature reviews with grey literature. In: EASE

Garousi V, Felderer M, Mäntylä MV (2017) Guidelines for including the grey literature and conducting multivocal literature reviews in software engineering. Preprint. arXiv: 1707.02553

Garritty C et al (2016) Cochrane rapid reviews methods group to play a leading role in guiding the production of informed high-quality, timely research evidence syntheses. Syst Rev 5:184

Grigoleit F, Vetro A, Fernandez DM, Bohm W, Diebold P (2015) In quest for proper mediums for technology transfer in software engineering. In: ESEM

Haby MM, Chapman E, Clark R, Barreto J, Reveiz L, Lavis JN (2016) What are the best methodologies for rapid reviews of the research evidence for evidence-informed decision making in health policy and practice: a rapid review. Health Res Policy Syst 14(1):83. https://doi.org/10.1186/s12961-016-0155-7

Hailey D (2009) A preliminary survey on the influence of rapid health technology assessments. Int J Technol Assess Health Care 25:415–418

Hailey D et al (2000) The use and impact of rapid health technology assessments. Int J Technol Assess Health Care 16:651–656

Hassler E, Carver JC, Kraft NA, Hale D (2014) Outcomes of a community workshop to identify and rank barriers to the systematic literature review process. In: Proceedings of the 18th international conference on evaluation and assessment in software engineering, EASE '14. ACM, New York, pp 31:1–31:10. http://doi.acm.org/10.1145/2601248.2601274

Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D (2012) Evidence summaries: the evolution of a rapid review approach. Syst Rev 1:10

Kitchenham B, Charters S (2007) Guidelines for performing systematic literature reviews in software engineering

Kitchenham BA, Dybå T, Jorgensen M (2004) Evidence-based software engineering. In: Proceedings of the 26th international conference on software engineering, ICSE '04. IEEE Computer Society, Washington, pp 273–281. http://dl.acm.org/citation.cfm?id=998675.999432

Laird L, Yang Y (2015) Transferring software engineering research into industry: the Stevens way. In: 2015 IEEE/ACM 2nd international workshop on software engineering research and industrial practice, pp 46–49

Lavis JN, Robertson D, Woodside JM, McLeod CB, Abelson J (2003) How can research organizations more effectively transfer research knowledge to decision makers? Milbank Q 81(2):221–248

Lawani MA et al (2017) Five shared decision-making tools in 5 months: use of rapid reviews to develop decision boxes for seniors living with dementia and their caregivers. Syst Rev 6:56

Lipsey MW, Wilson DB (2001) Practical meta-analysis. SAGE Publications, Thousand Oaks

Lupton E, Phillips JC (2015) Graphic design: the new basics, 2nd edn. Princeton Architectural Press, New York

McGregor M, Brophy JM (2005) End-user involvement in health technology assessment (HTA) development: a way to increase impact. Int J Technol Assess Health Care 21:263–267

McKibbon K (1998) Evidence-based practice. Bull Med Libr Assoc 86(3):396

Meyer B (2018a) Empirical answers to important software engineering questions (part 1 of 2). https://cacm.acm.org/blogs/blog-cacm/224351-empirical-answers-to-important-software-engineering-questions-part-1-of-2/fulltext

Meyer B (2018b) Empirical answers to important software engineering questions (part 2 of 2). https://cacm.acm.org/blogs/blog-cacm/224677-empirical-answers-to-important-software-engineering-questions-part-2-of-2/fulltext

Meyer B (2018c) The end of software engineering and the last methodologist. https://cacm.acm.org/blogs/blog-cacm/224352-the-end-of-software-engineering-and-the-last-methodologist/fulltext

Moher D et al (2015) All in the family: systematic reviews, rapid reviews, scoping reviews, realist reviews, and more. Syst Rev 4:183

Polisena J et al (2015) Rapid review summit: an overview and initiation of a research agenda. Syst Rev 4:137

Rogers E (2003) Diffusion of innovations, 5th edn. Free Press, New York. https://books.google.com.br/books?id=9U1K5LjUOwEC

Santos RES, da Silva FQB (2013) Motivation to perform systematic reviews and their impact on software engineering practice. In: 2013 ACM/IEEE international symposium on empirical software engineering and measurement, pp 292–295

Stol K-J, Ralph P, Fitzgerald B (2016) Grounded theory in software engineering research: a critical review and guidelines. In: Proceedings of the 38th international conference on software engineering, ICSE '16. ACM, New York, pp 120–131. http://doi.acm.org/10.1145/2884781.2884833

Taylor-Phillips S et al (2017) Comparison of a full systematic review versus rapid review approaches to assess a newborn screening test for tyrosinemia type 1. Res Synth Methods 8:475–484

Tondreau B (2011) Layout essentials: 100 design principles for using grids. Design essentials. Rockport Publishers, Beverly

Tricco A, Antony J, Zarin W, Strifler L, Ghassemi M, Ivory J, Perrier L, Hutton B, Moher D, Straus SE (2015) A scoping review of rapid review methods. BMC Med 13:224

Tricco AC et al (2016) An international survey and modified Delphi approach revealed numerous rapid review methods. J Clin Epidemiol 70:61–67

Tricco AC, Langlois EV, Straus SE et al (2017) Rapid reviews to strengthen health policy and systems: a practical guide. World Health Organization, Geneva

Van de Velde S et al (2011) Medicinal use of potato-derived products: conclusions of a rapid versus full systematic review. Phytother Res 25:787–788

Watt A, Cameron A, Sturm L, Lathlean T, Babidge W, Blamey S, Facey K, Hailey D, Norderhaug I, Maddern G et al (2008) Rapid reviews versus full systematic reviews: an inventory of current methods and practice in health technology assessment. Int J Technol Assess Health Care 24(2):133–139

Webb SA (2001) Some considerations on the validity of evidence-based practice in social work. Br J Soc Work 31(1):57–79

Yasin A, Hasnain MI (2012) On the quality of grey literature and its use in information synthesis during systematic literature reviews

Young I et al (2014) A guide for developing plain-language and contextual summaries of systematic reviews in agri-food public health. Foodborne Pathog Dis 11(12):930–937

Yourdon E (1995) When good enough software is best. IEEE Softw 12:79–81

Zechmeister I, Schumacher I (2012) The impact of health technology assessment reports on decision making in Austria. Int J Technol Assess Health Care 28:77–84