Protocol for Updating and Extending an Existing Tertiary Study of Systematic Literature Reviews in Software Engineering

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Original Questions

- *How many SLRs were published between 1st July 2008 and 31st December 2009?*

- *What research topics are being addressed?*

- *Which individuals and organizations are most active in SLR-based research?*

- *Are the limitations of SLRs, as observed in the original and extended studies, still an issue?*

- *Is the quality of SLRs improving?*

New Questions

- Is the level of compliance with the guidelines presented by Kitchenham (2007) improving?
- What are the types of research questions used according to the definition of (EASTERBROOK, et al., 2007)?
- What criteria were used for quality assessment?
- How the quality assessment was used?
- What type of data is extracted from the primary studies: quantitative or qualitative?
- What methods/procedures were used for data extraction?
- What methods/procedures were used for data analysis/synthesis?
- What are the conclusions of the reviews?

Fontes Automáticas

- *ACM*
- *IEEE*
- *SCOPUS*
- *Citeseer (the EPIC Protocol specified Google Scholar, but Citeseer was used)*
- *Web of Science*
- *SpringerLink*

Fontes Manuais

- Information and Software Technology
- Journal of Systems and Software
- IEEE Transactions on Software Engineering
- IEEE Software
- Communications of the ACM
- ACM Computer Surveys
- ACM Transactions on Software Engineering Methodologies
- Software Practice and Experience
- Empirical Software Engineering Journal
- IEE Proceedings Software (now IET Software)

- Proceedings International Conference on Software Engineering
- Proceedings International Symposium on Empirical Software Engineering and Metrics, which since 2007 merged these two symposia:
  - International Symposium of Software Metrics
  - International Symposium on Empirical Software Engineering
- Proceedings Evaluation and Assessment of Software Engineerin

Strings

- *1. "Software engineering" AND "review of studies"*
- *2. "Software engineering" AND "structured review"*
- *3. "Software engineering" AND "systematic review"*
- *4. "Software engineering" AND "literature review"*
- *5. "Software engineering" AND "literature analysis"*
- *6. "Software engineering" AND "in-depth survey"*
- *7. "Software engineering" AND "literature survey"*
- *8. "Software engineering" AND "meta analysis"*

- *9. "Software engineering" AND "past studies"*
- *10. "Software engineering" AND "subject matter expert"*
- *11. "Software engineering" AND "analysis of research"*
- *12. "Software engineering" AND "empirical body of knowledge"*
- *13. "Evidence-based software engineering" OR "evidence based software engineering"*
- *14. "Software engineering" AND "overview of existing research"*
- *15. "Software engineering" AND "body of published research"*
- 16. "Software engineering" AND "study synthesis"
- 17. "Software engineering" AND "study aggregation

Critérios

Exclusão

- *Informal literature surveys (no defined research questions, no search process, no defined data extraction or data analysis process).*

- *Papers discussing process of EBSE, SLRs or Meta-analyses.*

- Documents that are not a full paper (e.g. a PowerPoint presentation or extended abstract)

- SLRS related to Information Systems, HCI or other Computer Science topics that are clearly not Software Engineering.

Inclusão

- *Systematic Literature Reviews (SLRs) i.e. Literature surveys with defined research questions, search process, data extraction and data presentation*

- *Meta-analyses (MA)*

- *SLRs relating to Software Engineering related topics (i.e. topics related to the development, maintenance, project & quality management of software intensive applications) rather than IS or computer science.*

Avaliação de Qualidade

Are the review's inclusion and exclusion criteria described and appropriate?	Is the literature search likely to have covered all relevant studies?	Did the reviewers assess the quality/validity of the included studies?	Were the basic data/studies adequately described?
Y (yes), the inclusion criteria are explicitly defined in the paper,	Y, the authors have either searched 4 or more digital libraries **and included additional search strategies** or identified and referenced all journals addressing the topic of interest;	Y, the authors have explicitly defined quality criteria and extracted them from each primary study;	Y, Information is presented about each paper so that the data summaries can clearly be traced to relevant papers;
P (Partly), the inclusion criteria are implicit;		P, the research question involves quality issues that are addressed by the study;	P, only summary information is presented about individual papers e.g. papers are grouped into categories but it is not possible to link individual studies to each category;
N (no), the inclusion criteria are not defined and cannot be readily inferred.	P, the authors have searched 3 **or (4 digital libraries with no extra search strategies)** , or searched a defined but restricted set of journals and conference proceedings;	N, no explicit quality assessment of individual papers has been attempted or quality data has been extracted but not used.	N, the results of the individual studies are not specified i.e. the individual primary studies are not cited.
	N, the authors have searched up to 2 digital libraries or an extremely restricted set of journals.		
	Note that scoring question 2 also requires the evaluator to consider whether the digital libraries were appropriate for the specific SLR.		

Folha de Avaliação da Qualidade

Reviewer	Oringal Study Ref	Study Ref	Question 1 Are the review's inclusion and exclusion criteria described and appropriate?	Question 2 Is the literature search likely to have covered all relevant studies?	Question 3 Did the reviewers assess the quality/validity of the included studies?	Question 4 Were the basic data/studies adequately described?	Final Score	Agreement
R3	[22]	FS19	1	1	0	1	3	3
OR	[22]	FS19	0,5	1	0	1	2,5	
R3	[31]	FS28	1	1	0	1	3	3
OR	[31]	FS28	1	1	0,5	1	3,5	
R3	[49]	FS32	1	1	1	0,5	3,5	4
OR	[49]	FS32	1	1	1	0,5	3,5	
R3	S18	OS18	0	0	0	0	0	3

Extração de Dados

- The source (i.e. the conference or journal that published the study).
- The year when the study was published. Note if the study was published in several difference sources all dates will be recorded and the first date will be used in any time-based analysis used to track the EBSE activity over time.
- Classification of study:
  - Type (Systematic Literature Review SLR, Meta-Analysis MA)
  - Scope (Research trends or specific research question).

Extração de Dados

- Main software engineering topic area.
- The author(s) and affiliation (organisation and country).
- Research question/issue.
- Whether the study made reference to an EBSE paper or the original SLR Guidelines (Kitchenham, 2004).
- How many primary studies were analysed.
- Whether the study proposed practitioner-oriented guidelines.
- Summary of study.
- Quality score for the study.

Folha de Extração

Study Ref	Source	Year	Review Type	Review Scope	Type of Research Question	Quality Score	Topic Area	Cites EBSE?	Cites guidelines?	Num. Primary Studies	Include Practitioners Guidelines	Source Type	Impact Gscholar	Impact Scopus
SE01	IST	2008	MS	SERT	DCL	4	Human Aspects	N	PU2004	92	No	J	24	7
SE02	IST	2008	MS	RT	DCL	4	Knowledge Management	EBSE2004, EBSE2005	PU2004	68	Yes	J	22	7
SE03	JSS	2008	MS	RT	FD	1,5	Research Topics in Software Engineering	N	N	691	No	J	6	3
SE04	ICSP	2008	MS	SERT	DCL	1	Software Project Management	N	N	48	No	C	3	1
SE05	IST	2008	MS	SERT	DCL	4	Agile Software Development	N	G2007	36	Yes	J	133	45
SE08	IEEE AC	2008	MS	SERT	DCL	2	Software Testing	N	IR2005	14	Yes	C	6	1
SE09	IREC	2008	MS	SERT	DCL	2	Requirements Engineering	N	G2002	240	No	C	9	2

Dados Objetivos

Study Ref	Source	Year	Review Type	Review Scope	Type of Research Question	Quality Score	Topic Area	Cites E...
SE01	IST	2008	MS	SERT	DCL	4	Human Aspects	N
SE02	IST	2008	MS	RT	DCL	4	Knowledge Management	EBSE2004,
SE03	JSS	2008	MS	RT	FD	1,5	Research Topics in Software Engineering	N
SE04	ICSP	2008	MS	SERT	DCL	1	Software Project Management	N
SE05	IST	2008	MS	SERT	DCL	4	Agile Software Development	N
SE08	IEEE AC	2008	MS	SERT	DCL	2	Software Testing	N
SE09	IREC	2008	MS	SERT	DCL	2	Requirements Engineering	N

Topic Area	Cites EBSE?	Cites guidelines?	Num. Primary Studies	Include Practitioners Guidelines	Source Type	Impact Gscholar	Impact Scopus
...opic Area	N	PU2004	92	No	J	24	7
...ement	EBSE2004, EBSE2005	PU2004	68	Yes	J	22	7
...n Software Engineering	N	N	691	No	J	6	3
...lanagement	N	N	48	No	C	3	1
...velopment	N	G2007	36	Yes	J	133	45
	N	IR2005	14	Yes	C	6	1
...ineering	N	G2002	240	No	C	9	2

Dados Subjetivos

Study Ref	Source	Year	Review Type	Review Scope	Type of Research Question	Quality Score	Topic Area	Cites E
SE01	IST	2008	MS	SERT	DCL	4	Human Aspects	N
SE02	IST	2008	MS	RT	DCL	4	Knowledge Management	EBSE2004,
SE03	JSS	2008	MS	RT	FD	1,5	Research Topics in Software Engineering	N
SE04	ICSP	2008	MS	SERT	DCL	1	Software Project Management	N
SE05	IST	2008	MS	SERT	DCL	4	Agile Software Development	N
SE08	IEEE AC	2008	MS	SERT	DCL	2	Software Testing	N
SE09	IREC	2008	MS	SERT	DCL	2	Requirements Engineering	N

opic Area	Cites EBSE?	Cites guidelines?	Num. Primary Studies	Include Practitioners Guidelines	Source Type	Impact Gscholar	Impact Scopus
	N	PU2004	92	No	J	24	7
ement	EBSE2004, EBSE2005	PU2004	68	Yes	J	22	7
n Software Engineering	N	N	691	No	J	6	3
lanagement	N	N	48	No	C	3	1
velopment	N	G2007	36	Yes	J	133	45
	N	IR2005	14	Yes	C	6	1
ineering	N	G2002	240	No	C	9	2

Cuidado!

Study Ref	Source	Year	Review Type	Review Scope	Type of Research Question	Quality Score	Topic Area	Cites E
SE01	IST	2008	MS	SERT	DCL	4	Human Aspects	N
SE02	IST	2008	MS	RT	DCL	4	Knowledge Management	EBSE2004,
SE03	JSS	2008	MS	RT	FD	1,5	Research Topics in Software Engineering	N
SE04	ICSP	2008	MS	SERT	DCL	1	Software Project Management	N
SE05	IST	2008	MS	SERT	DCL	4	Agile Software Development	N
SE08	IEEE AC	2008	MS	SERT	DCL	2	Software Testing	N
SE09	IREC	2008	MS	SERT	DCL	2	Requirements Engineering	N

opic Area	Cites EBSE?	Cites guidelines?	Num. Primary Studies	Include Practitioners Guidelines	Source Type	Impact Gscholar	Impact Scopus
	N	PU2004	92	No	J	24	7
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velopment	N	G2007	36	Yes	J	133	45
	N	IR2005	14	Yes	C	6	1
ineering	N	G2002	240	No	C	9	2

Dicas

- Construir um dicionário de dados:
  - Elemento que deve ser parte das folhas de extração
  - Define cada campo de extração
- Estudar em grupo o dicionário
- Fazer em grupo pelos menos 5 extrações para que todos tenham o mesmo entendimento do dicionário