

Seminar on Enterprise Software

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How to do a **systematic literature review**?

- Kitchenham B., Charters S. (2007) Guidelines for performing Systematic Literature Reviews in Software Engineering EBSE 2007-001. Keele University and Durham University Joint Report, (2007)

How to do **systematic mapping studies**?

- Petersen K., Feldt R., Mujtaba S., Mattsson M. (2008): Systematic Mapping Studies in Software Engineering, Proceedings of the 12th international conference on Evaluation and Assessment in Software Engineering, EASE'08

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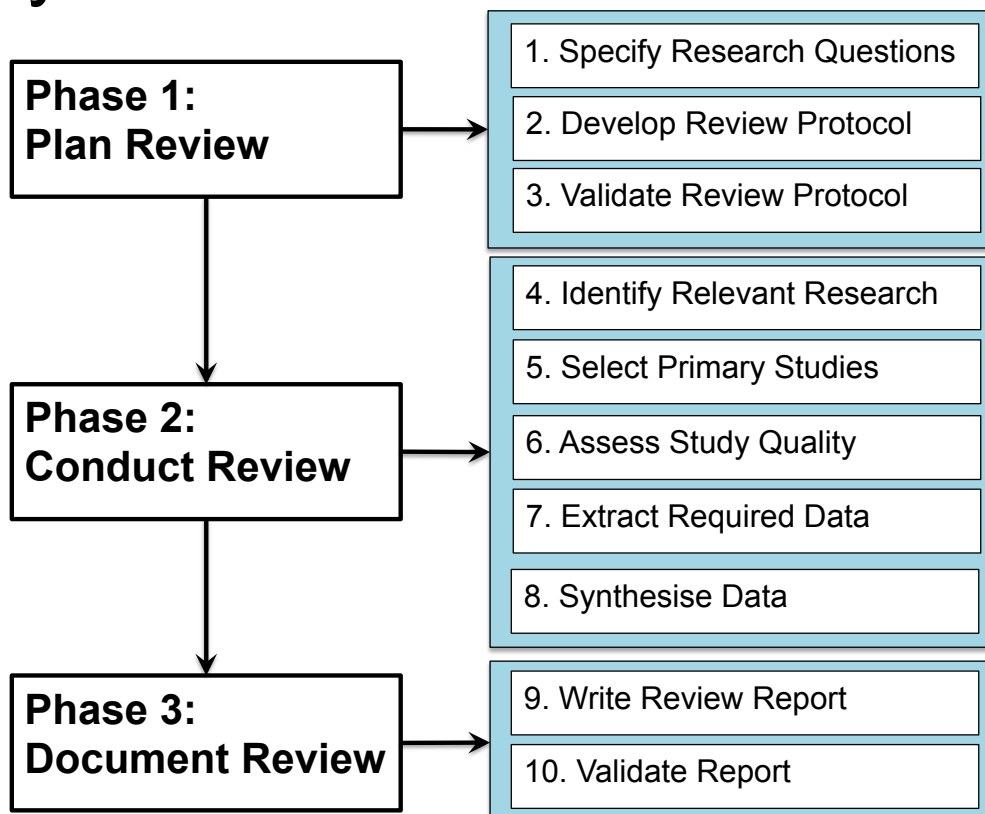
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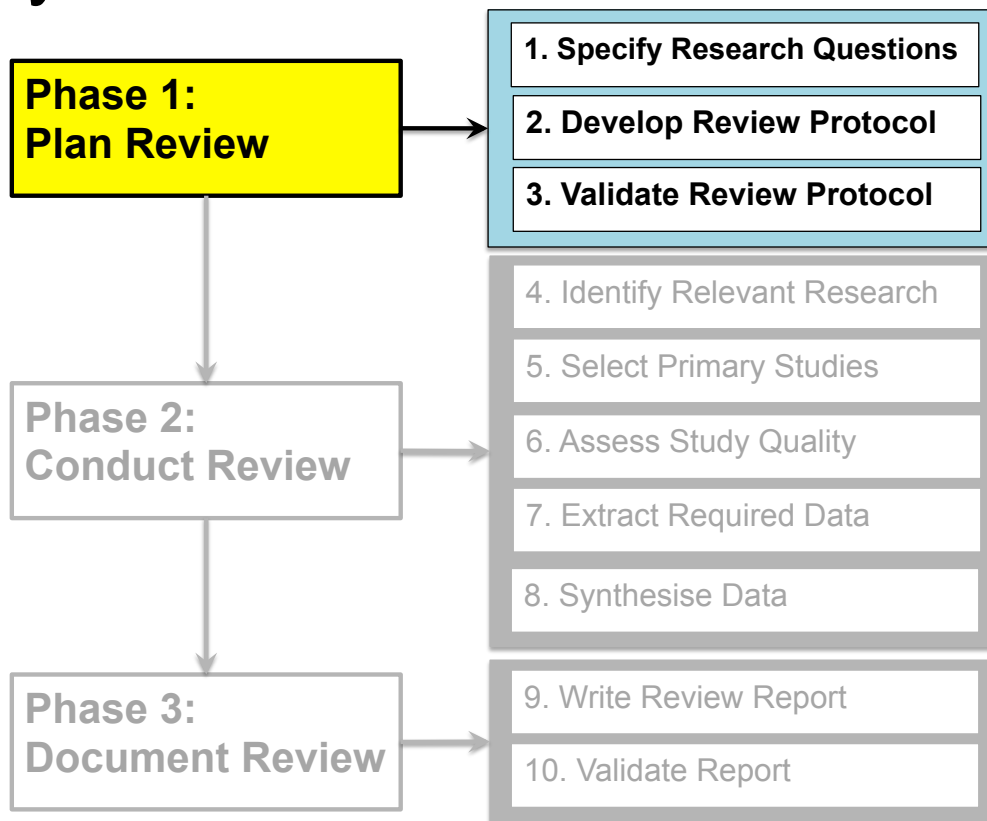
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Systematic Literature Review



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Systematic Literature Review



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1. Specify Research Question

- **Effect** of a software engineering technology
- **Frequency or rate** of a project development factor
 - (adoption of a technology, frequency or rate of project success or failure)
- **Cost and risk factors** associated with a technology
- Impact of technologies
 - reliability, performance and cost models
- **Cost / benefit** analysis of employing specific software development technologies or software applications

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1. Specify Research Question

- Effect of a software engineering technology
 - Fr
 - • What evidence is there that cross-company estimation models are not significantly different from within-company estimation models for predicting effort for software/Web projects?
 - Co
 - Im
 - • Which experimental procedure is most appropriate for studies comparing within- and cross-company estimation models?
 - Co
- development technologies or software applications

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2. Developing Review Protocol

- Background
- The research questions
- The strategy that will be used to search for primary studies including search terms and resources to be searched
- Study selection criteria
- Study selection procedures
- Study quality assessment checklists and procedures
- Data extraction strategy
- Synthesis of the extracted data
- Dissemination strategy
- Project timetable

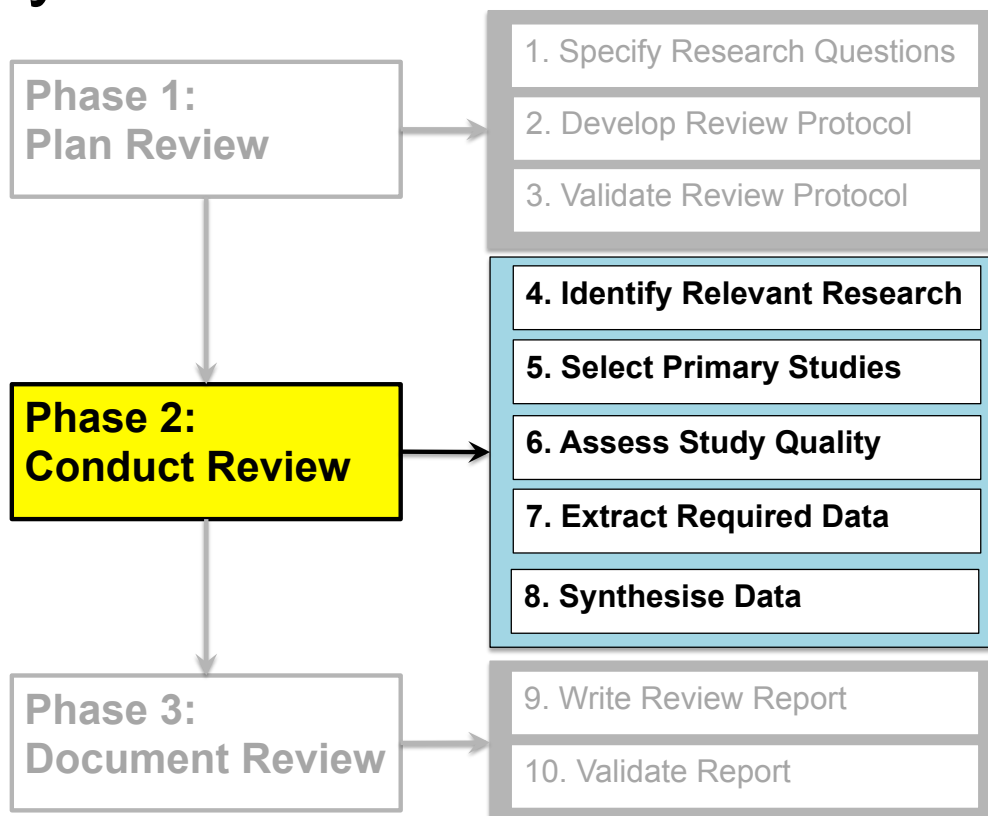
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3. Evaluating a Review Protocol

- If appropriate funding is available
 - a group of independent experts should be asked to review the protocol
 - same experts can later be asked to review the final report.
- **Students should present their protocol to their supervisors for review and criticism**

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Systematic Literature Review



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4. Identify Relevant Research

- Find as many primary studies relating to the research question as possible using an unbiased search strategy

Data Source	Documentation
Digital Library	Name of database Search strategy for the database Date of search Years covered by search
Journal Hand Searches	Name of journal Years searched Any issues not searched
Conference proceedings	Title of proceedings Name of conference (if different) Title translation (if necessary) Journal name (if published as part of a journal)
Efforts to identify unpublished studies	Research groups and researchers contacted (Names and contact details) Research web sites searched (Date and URL)
Other sources	Date Searched/Contacted URL Any specific conditions pertaining to the search

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4. Identify Relevant Research

- Find as many primary studies relating to the research question as possible using an unbiased search strategy

Software Engineering Digital Libraries

- **IEEEExplore**
- **ACM Digital library**
- **SpringerLink**
- **Google scholar** (scholar.google.com)
- **Citeseer library** (citeseer.ist.psu.edu)
- **Inspec** (www.iee.org/Publish/INSPEC/)
- **ScienceDirect** (www.sciencedirect.com)
- **El Compendex** (www.engineeringvillage2.org/Controller/Servlet/AthensService)

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5. Select Primary Studies

- **Study selection criteria** are intended to identify those primary studies that provide direct evidence about the research question
 - selection criteria should be decided during the protocol definition, although they may be refined during the search process

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6. Assess study quality

- Still more detailed inclusion/exclusion criteria
- Investigate whether quality differences provide an explanation for differences in study results
- As a means of weighting the importance of individual studies when results are being synthesised
- To guide the interpretation of findings and determine the strength of inferences
- To guide recommendations for further research

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6. Assess study quality

- Still more detailed inclusion/exclusion criteria
 - Investigate whether quality differences provide an explanation for differences in study results
 - As a means of identifying the strengths and weaknesses of individual studies
 - To guide the synthesis of the evidence and to determine the strength of the evidence
 - To guide recommendations for further research
- Checklists of factors that need to be evaluated for each study
 - Quantitative and qualitative studies

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7. Extract required data

- Design data extraction forms to accurately record the information researchers obtain from the primary studies
 - Linked to the research questions

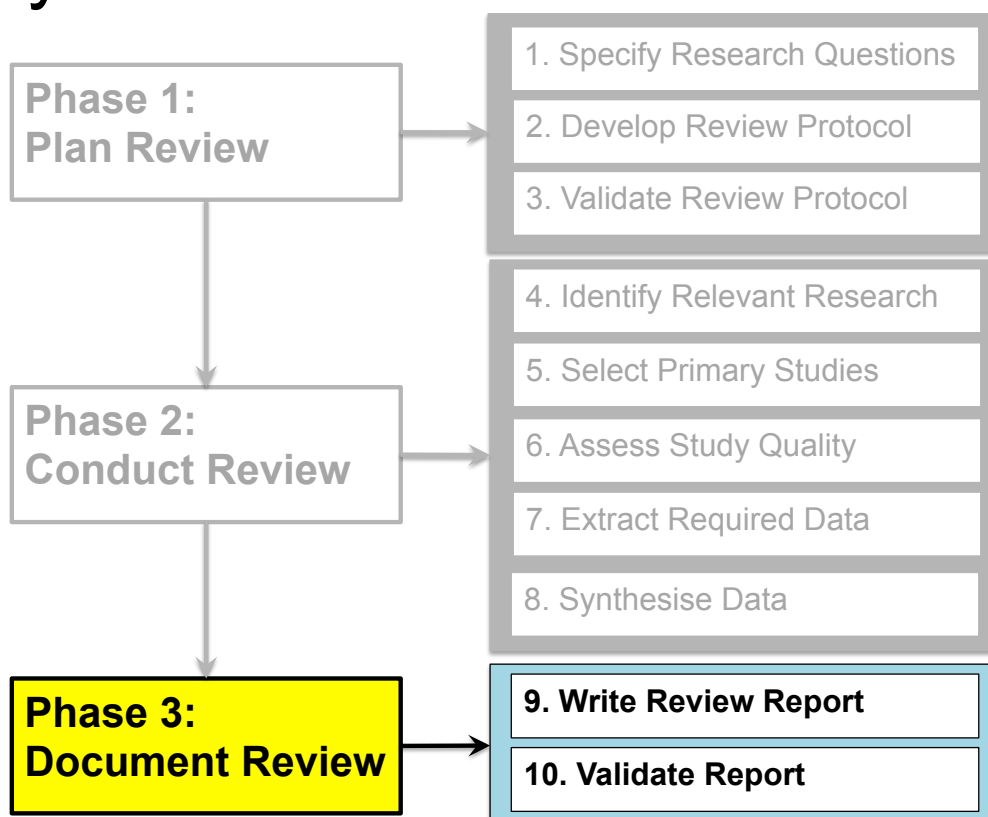
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8. Synthesise data

- Collating and summarising the results of the included primary studies
 - Descriptive (non-quantitative)
 - Quantitative
- The data synthesis activities should be specified in the review protocol
 - However, some issues cannot be resolved until the data is actually analysed

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Systematic Literature Review



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9. Write review report

- Specifying the dissemination strategy
 - Journal, conference paper, technical report,
- Formatting the main systematic review report
 - in a section of a thesis

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10. Validate report

- Journal articles will be peer reviewed as a matter of course
- Experts review theses as part of the examination process
- Technical reports are not usually subjected to any independent evaluation

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In your thesis work

At least 5-7 articles