

Systematic Literature Reviews

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[Systematic Literature Reviews]

- SLR are conducted to identify, analyze and interpret all available evidence related to a specific research question
- Their goal is to give a complete and comprehensive picture of the evidence
- SLR must be conducted in a scientifically and rigorous way

[Mapping Studies and SLR]

- Differences of mapping studies to SLR
 - Research questions are broader
 - Field of study is less explored
- A mapping study follows the same principles of SLR, but searches for a broader scope
 - Analysis tends to be more qualitative

[Mapping Studies vs. SLR]

	Mapping Study	SLR
Goal	Classification of a topic	Identify best practice (state of the art)
Research Question	Generic	Specific
Search Process	Defined by a topic	Defined by a research question
Scope	Broader	Focused

[The SLR Process]

- The SLR process for Software Engineering was adapted from other areas (mainly medicine)
 - Guidelines were proposed by Kitchenham and Charters (2007)
- It is structured in three steps
 1. Planning
 2. Conducting
 3. Reporting

[1 - Planning the Review]

- A SLR can be viewed as a research method for making a literature review
- Planning a SLR include several actions
 - Identification of the need for a review
 - Specifying the research question(s)
 - Developing a SLR protocol

[The Need for a Review]

- Motivation for a researcher
 - To understand the state-of-the-art in a research area
- Motivation for a practitioner
 - To use empirical evidence to support making a decision
- Key questions
 - Is there a pre-existing SLR in the area?
 - Are there sufficient data reported?

[Specifying Questions]

- Research questions must be well planned, discussed and phrased
- They set the focus for
 - The identification of primary studies
 - The extraction of data from the studies
 - The analysis of the data

[PICOC]

- Several aspects should be taken into account for creating research questions
- PICOC aspects
 - *Population*: people, programs or business
 - *Intervention*: technology or procedure used
 - *Comparison*: how is the treatment defined?
 - *Outcomes*: how practical are the results?
 - *Context*: academia or industry?

[Developing a Protocol]

- The SLR protocol defines the procedures to be followed
 - The protocol should be reviewed by peers to ensure its consistency
- The SLR protocol also acts as a log, as it is useful both during the review and afterwards to discuss its validity

[Items of a Protocol]

- Relevant items to be covered
 - Background and rationale
 - Research questions
 - Search strategy for primary studies
 - Study selection criteria
 - Study quality assessment (checklists and procedures)
 - Data extraction strategy
 - Synthesis and dissemination



[2 - Conducting the Review]

- Conducting a SLR means setting the review protocol into practice
- It includes
 1. Identification of research
 2. Selection of primary studies
 3. Study quality assessment
 4. Data extraction
 5. Data synthesis

[3 - Reporting the Review]

- Results should be reported targeting different audiences
 - Webpages
 - Short summary leaflets
 - Papers (researchers)
 - Magazines (practitioners)
 - (Extended) Technical report
- Lessons learned are important for the research audience point of view

[SLR Growth]

- There is a growth of SLR in recent years
 - Quality of SLR is also increasing
- Search tools (e.g., Google Scholar) make SLR easier
 - It is sometimes required to make SLR manually (e.g., local publications not available online)

[Bibliography]

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
 - Chapter 4. Systematic Literature Reviews