SideBox 1

Example of a Systematic Review

To illustrate what is involved in a 'typical' systematic review in software engineering, we have taken a recent review as our example. Systematic reviews are quite complex procedures, so the aim is just to provide a very simple outline of what is involved, to give some idea about the nature of the process.

The example study is that reported in (Shahin et al., 2014). The focus of this was to examine the ways in which software architecture visualisation techniques were employed, and the purposes for which they were used. Like many systematic reviews in software engineering, this is partly a *mapping study* (identifying the scope of the primary studies, with only limited synthesis), although it does provide some analysis of the outcomes. In the rest of this box, we simply describe the first steps of the study process (the outcomes are too detailed to be easily summarised).

Research Questions: Five (some were subdivided). A good example is RQ5: "Which are the architecture visualisation techniques mostly used in industry?" (this is a typical 'mapping study' question, giving limited scope for synthesis).
Period Covered: February 1999—July 2011.
Searching: Manual + Electronic.
Electronic Search String: (architecture OR architectural OR architecting OR structure) AND (visual OR visualize OR visualization OR visualizing OR diagram OR picture OR graphic OR graphical).
No of studies used for analysis: 53

Manual searching involved a search of over 30 journals and conferences containing 20,169 publications, while the electronic search returned 2,887 publications. So the initial inclusion/exclusion step (based on title and keywords) covered 23,056 titles, from which they retained 300. In the next step, looking at the abstracts of these reduced the number to 89, but checking the references used in this set (termed 'snowballing') identified another 14 papers not found by the searches. After reading the 103 papers in full, they selected the final set of 53 that were used for the analysis.

This is fairly typical of the scale of effort involved in the initial steps of a systematic review, although we should note that many studies only employ electronic searching, or use a modest amount of manual searching to check the reliability of the search strings.

Reference

Shahin, M., Liang, P. & Babar, M. A. (2014), 'A systematic review of software architecture visualization techniques', Journal of Systems & Software 94, 161–185.