RQ1: How do practitioners approach merge conflicts?RQ1 To understand the perspective of practitioners when encountering a merge conflict, we asked interview participants to reflect on situations when they initially face a merge conflict: what kind of information do they seek, how do they approach the resolution of the conflict, and what tools they use.

We identified nine factors (from card sorting) that practitioners consider when approaching a conflict and attempting to determine its difficulty (see Table survey$_m erge_c on flicts$).$We asked survey participants to rate how each of these ni$

We received 162 responses and present the aggregated results in Table survey$_m erge_c on flicts$; $ranked according to the mean$

table*[!htbp] 1.3 Practitioners' Needs for Merge Conflict Resolutions from Survey survey$_r es_d if f stabular x 0.87 > c| > l| * 5$

Need Description 1 2 3 4 5 Mean Median

Technical Aspectsartifact-based-factors Two of the top four factors refer to perceptions about the complexity of merge conflicts (F1, F3), with the third factor being number of conflicting lines (F4), which can be construed as a specific metric of complexity of the conflict. While practitioners mentioned complexity of the lines of code and the file, none mentioned using metrics, such as cyclomatic complexity fenton2000quantitativemccabe1976complexity or Function Point Analysis garmus2001fpasymons1988function. Instead, practitioners made educated guesses on the complexity of the code based on their own experience of either writing the code, or having worked with it. Some of the simple to compute metrics, such as number of conflicting lines of code (F4), number of files involved (F8), atomicity of changesets (F6), and the time they thought it would take to resolve the conflict (F5) were mentioned. The only factor where static analysis tools can help was in identifying the dependencies of the conflicting code (F7). This indicates that understanding the complexity of the conflicting code is important, but practitioners do not use the metrics that have been proposed by research. While some of the simple proxies for complexity are used, practitioners primarily rely on their own "judgement" of the complexity of the conflict.

This perception of the conflict complexity can affect whether a practitioner resolves the conflict immediately (when small), or whether they should wait to examine the conflict when further resources are available; P8 commented: quoting "Small is always easy. A 1-line merge conflict is always easier to resolve than a 400-line merge conflict, and can be done now."