Toward an Effective Automated Tracing Process

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The research on automated software traceability has noticeably advanced in the past few years. Various methodologies and tools have been proposed in the literature to provide automatic support for establishing and maintaining traceability information in software systems. This movement is motivated by the increasing attention traceability has been receiving as a critical element of any rigorous software development process. However, despite these major advances, traceability implementation and use is still not pervasive in industry. In particular, traceability tools are still far from achieving performance levels that are sufficient for practical applications. Such low levels of accuracy require software engineers working with such tools to spend a considerable amount of their time verifying the generated traceability information, a process that is often described as tedious, exhaustive, and error-prone. Motivated by these observations, in our research we explore several research directions related to enhancing the performance of automated tracing tools and techniques. In particular, our work addresses several issues related to the various aspects of the IR-based automated tracing process, including trace link retrieval, performance enhancement, and the role of the human in the process. Our main objective is to achieve performance levels, in terms of accuracy, efficiency, and usability, that are adequate for practical applications, and ultimately, to accomplish a successful technology transfer from research to industry.

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