

Levels of Exploration in Exploratory Testing: From Freestyle to Fully Scripted

The aim of the research study is to provide a structured framework for understanding and implementing exploratory testing (ET) by delineating levels of exploration, ranging from freestyle testing to fully scripted approaches. By examining existing test charters and incorporating insights from industry practitioners, the research seeks to establish a clear classification of these exploration levels and their corresponding characteristics. Through validation via focus groups at prominent companies in the field, including Sony Mobile Communications, Axis Communications, Ericsson, and Softhouse Consulting, the study aims to not only verify the proposed classification but also gain insights into the factors influencing the selection of exploration levels in real-world testing scenarios. Ultimately, the research attempts to enhance the effectiveness and applicability of ET by providing guidance on tailoring test charters to different levels of exploration, thereby facilitating more informed decision-making in testing practices.

The study's methodology involved a multi-faceted approach to address the research questions regarding the characterization of different degrees of exploration in ET and the factors influencing these levels. Initially, the researchers identified 35 potential information items for test charters and focused on utilizing them to define the levels of exploration. By analyzing 15 test charter examples obtained from literature searches, ranging from high to low degrees of exploration, the researchers developed a classification of exploration levels. Examples by Suranto and Claesson provided insights into the extent of guidance given to testers and the level of exploration permitted. Additionally, focus groups at prominent companies provided validation and insights from industry practitioners. This comprehensive methodology integrated literature review, test charter analysis, and industry validation to effectively address the research questions and enhance understanding of exploration levels in ET.

The results of the study on levels of exploration in exploratory testing (ET) revealed a comprehensive classification ranging from freestyle testing to fully scripted testing, with intermediate levels of high, medium, and low exploration. Test charters were identified as crucial guiding elements, with each level of exploration defined by the extent of information and instructions provided to testers. Factors influencing the choice of exploration levels were analyzed through focus groups, highlighting six main areas including defect detection, time and effort, people-related factors, evolution and change, traceability, and quality requirements. Practitioners generally favored higher exploration levels for defect detection, time efficiency, critical thinking, and learning, while lower exploration levels were deemed more suitable for traceability and verifying quality requirements. However, challenges such as reproducibility of defects and difficulty in tracing requirements coverage were noted at higher exploration levels. These findings underscore the nuanced considerations involved in selecting exploration levels in ET, balancing factors like defect detection and efficiency with traceability and quality verification.

The implications of these findings for research and practice are significant. Firstly, the classification of exploration levels provides a structured framework for understanding and implementing ET, enabling practitioners to make informed decisions about the preferred level of exploration based on specific testing objectives and constraints. Additionally, the identified factors

influencing exploration level selection offer valuable insights for both researchers and practitioners in designing testing strategies and methodologies. Future research could focus on further validating the proposed classification across different contexts and industries, as well as exploring strategies to mitigate challenges associated with higher exploration levels such as reproducibility of defects and traceability. Practitioners can leverage these insights to tailor their testing approaches, striking a balance between exploration and control to optimize defect detection while ensuring traceability and quality verification in software testing processes.

DOI: doi={10.1109/ACCESS.2018.2834957}

Team members: Iancu Aurelian, Iliescu Andrei, Gligor Ovidiu