# Characteristics of High Performing Testers – A Case Study

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## ABSTRACT

**Objective:** We studied what are the characteristics of high performing software testers in the industry. **Method:** We conducted an exploratory case study, collecting data through recorded interviews of one development manager and three testers in each of the three companies, analysis of the defect database, and informal communication within our research partnership with the companies. **Results:** We found that experience, reflection, motivation and personal characteristics were the top level themes. Experience related to the domain, e.g. processes of the customer, and on the other hand, specialized technical skills, e.g. performance testing, were seen more important than skills of test case design and test planning.

## Categories and Subject Descriptors

D.2.9 [Software Engineering]: Management–Productivity

## Keywords

Software Testers, Performance, Traits, Competencies, Expertise

## 1. INTRODUCTION

For decades, there have been ideas on personality and skills affecting the efficiency and effectivity of software engineers [3]. Scientific studies on the topic, e.g. [2], have been conducted over the years that have focused to programmers and analysts. To our knowledge similar studies of software testers have not been performed. This paper is an industrial case study of understanding the characteristics of high performing software testers of three successful medium-sized software product companies.

## 2. METHODOLOGY

Our research question is as follows: *What are the characteristics of high performing testers?* We define high performing as effective in terms of the number of detected defects and, in addition, by the characteristics of testers seen important by managers and testers. This study was conducted as an exploratory case study in three Finnish software product organizations (A, B, C). First, an initial analysis of the defect tracking database data was conducted to identify high performing testers in terms of detected defects. Second, to understand the characteristics of high performing testers we performed interviews of the product development manager and three high performing testers of each company (interview guides are available online [1]). Finally, transcribed interviews were coded using the topics of the interview guides as preformed codes as well as codes emerging from the data. In the end, we had 1896 quotations with 182 codes that were grouped under 23 groups.

## 3. RESULTS AND CONCLUSION

The four themes found in the characteristics of high performing testers are in Table 1. Based on the results we present the following two conclusions.

*Domain knowledge and specialized technical skills are seen more important than skills in test case design and test planning.* The fact that we only had three companies creating similar products, i.e. products for end-user domain experts, limits the generalizability of this result and calls need for further studies. Although, skills of test case design and planning were seldom mentioned one could easily argue that domain knowledge is simply a prerequisite for effective test case design and that a true top tester possesses experience both in the domain and in test case design. Perhaps future works of software testers should look for ways for acquiring domain knowledge effectively.

*Ability to reflect is an important characteristic of high performing domain expert tester.* In the interviews it appeared that domain experience is most useful when it is utilized for understanding what the user is trying achieve with the product and then to understand what parts of the software and what defects would be most crucial in the production environment.

## 4. REFERENCES

[1] Iivonen,J., *Identifying and Characterizing Highly Performing Testers – A Case Study in Three Software Product Companies,* Thesis M. Sc., Helsinki University of Technology, 2009, http://www.soberit.hut.fi/espa/publications/MTI.pdf

[2] Turley,R.T. and Bieman,J.M., 1995."Competencies of exceptional and nonexceptional software engineers," *The Journal of Systems & Software,* vol. 28, no. 1, 19-38.

[3] Weinberg,G., M., 1998.*The Psychology of Computer Programing - Silver Aniversay Edition,* New York, USA: Dorset House Publishing

Table 1. Characteristics of high performing testers found in different cases

| Experience and Skills | Reflection | Motivation | Personal characteristics |
|---|---|---|---|
| Experience with the product (A, B C) | Maintaining the "big picture" (A, B, C) | Has a mission to test "likes to find bugs" (A, B, C) | Thoroughness, conscientiousness, patience or persistency (A, B, C) |
| Experience in the domain (A, B, C) | Understands the effects of defects in production environment (B, C) | Knows the importance of the testing (B, C) | |
| Experience in programming (A, B, C) | | | Accurateness (B, C) |
| Experience in specific technical testing techniques (A, B, C) | Independent and knows own skills and limits (B) | | Creativeness (C) |
| Writes good defect reports (A, B, C) | Criticizes the product and process (C) | | |