Case Studies and Data Collection for “Leveraging the Power of the Crowd for Software Testing”

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Our article “Leveraging the Power of the Crowd for Software Testing” presents three case studies of companies employing crowdtesting, in which a diverse group of people test software in real environments. We conducted instrumental case studies because we had selected the companies to gain deeper knowledge about crowdtesting and its value determinants in organizations. Furthermore, these cases represent the circumstances and conditions of everyday business situations.

Our research employed the principles of consortium research, which aims to develop solutions for a problem class within a collaborative environment. It profits from the collaboration of researchers and partner companies who all share the same goal.

We’ve been working with six companies for more than two years and have conducted more than 20 crowdtests in various scenarios with different intermediaries (for example, Applause). In workshops with the companies’ testing executives and the intermediaries’ founders and managers, as well as through crowdtesting itself, we noticed three basic scenarios:

- crowdtesting with external crowdtesters,
- crowdtesting with a company’s own employees, or
- crowdtesting with a company’s customers.

Each case study in our article covers one of these scenarios, to illustrate the different settings and outline how to profit from crowdtesting in these scenarios. The case studies involved these companies (whose names we’ve changed to protect privacy):

- Case A. Alpha Corp. (industrial production),
- Case B. Beta Enterprises (insurance), and
- Case C. Gamma Bank.

Table A shows the data collection methods and data sources we used. We conducted the interviews between February 2015 and May 2016. They followed roughly structured guidelines with questions on topics such as crowdtesting requirements and goals, as well as the crowdtesting work’s quantity and quality. We conducted the interviews before and after the crowdtesting to elucidate the participants’ expectations and review the course of each crowdtesting project. Overall, we conducted 19 interviews, at least six for each case study, with each interview lasting approximately 30 to 60 minutes. We took detailed notes during the interviews, and we recorded and transcribed them.

In addition, we conducted workshops with the three companies’ test managers to validate bugs and define their severity and priority. The workshops lasted approximately 90 to 120 minutes.
For data analysis, we conducted content analysis using category-based coding.\(^5\) Besides the interviews, we measured objective criteria—the time schedule and test results. For cases A and C, the crowdtesters received a build version that was also tested in-house. Analyzing the platform data (the crowdtester submissions) and the intermediaries’ reports comparing that data to the test results provided by the in-house department let us draw meaningful conclusions regarding the reports’ quality.

**References**


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**TABLE A**

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<thead>
<tr>
<th>Data source</th>
<th>Interviewees</th>
<th>Content or subject</th>
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| Initial interviews       | All the study participants (in all three case studies) | • Determining the crowdtesting requirements and goals (time, cost, quality, crowd, and so on)  
  • Determining the testing specifications |
|                         | Project manager (1 in each case study)          | • Determining a concrete time schedule for crowdtesting  
  • Inquiring about the expectations of crowdtesting quality  
  • Inquiring about the perceived project progression |
|                         | Test managers (2 in case A, 1 in cases B & C)    | • Inquiring about the strategic direction for the use of crowdtesting  
  • Inquiring about the crowdtesting’s long-term goals |
|                         | Executives (The head of software development in case A, no one in case B, and the head of distribution channel e-banking in case C) | |
| Final interviews         | All the study participants (only in cases A & B) | • Inquiring about the perceived crowdtesting project success and satisfaction with the progress, quality, and results  
  • Comparing the results with in-house testing (for cases A and C)  
  • Evaluating the crowdtesters’ responses (especially for case B)  
  • Deducing the lessons learned and implications for the overall project and crowdtesting projects in general |
|                         | Project manager (1 in case A and none in cases B & C) | |
|                         | Test manager (1 in each case study)              | • Meeting minutes  
  • Reports provided by intermediaries |
| Project documentation    | —                                               | • Crowdsource participant reports and bug reports  
  • Observation of crowdtests |
| Platform data            | —                                               | |

* Case A was Alpha Corp. (industrial production), case B was Beta Enterprises (insurance), and case C was Gamma Bank (names changed to ensure privacy).*

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