Evaluating Software Quality Practices in Industry in Europe

Preliminary Results

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Context

Portefeuille TIC

- ERDF project lead by CETIC (2007-2013)
  - CEIQS: Center of expertise in engineering and quality of systems
    - aimed at developing a portfolio of innovative techniques allowing local companies to master the diversity, complexity, quality and rapid evolution of information systems
  - workpackage QUALGEN
    - collaboration between FUNDP and UMONS since 2010

- Supported by Wallonia
Objectives

Explore quality-related software development practice in industry

- Target: Companies involved in software development or software maintenance in Europe
- Procedure: On-line questionnaire

Compare this across different countries

- Survey in 4 languages (English, French, Spanish, Dutch)
Online survey carried out in the Walloon region

- Carried out from 29/5 to 30/6 2012
- 44 full useful responses from 188 participants

Obtained initial results

- Popularity of processes, tools and techniques
- Some practices seem to vary with company size
Pilot Study: Popularity Results
quality improvement tools and techniques

Most popular
- Version control (97.6%) and bug tracking (92.7%) platforms
- Wide use of testing: 97.7%
- Design patterns: 72.7%
- Refactoring: 58.5%

Moderate popularity
- Design improvement (e.g. code smell reduction): 42.9%
- Bad quality detection tools: 36.8%
- Metrics and visualisation tools: 35.7%
- Dynamic analysis tools (profiling etc.): 36.6%

Unpopular
- Use of quality models: 19.4%
Pilot Study: Popularity Results
process related

Most popular
- Agile practices (63.6%)
- Change and configuration management processes (73.8%)

Moderate popularity
- Development processes (45.5%)
- Test processes (46.5%)
- Quality support/improvement process (32.4%)

All respondents believe that quality assurance and testing are very important for project success
Pilot Study: Effect of Company Size

- Agile practices popular regardless of company size
- No clear difference in development process across company sizes
- Quality process mostly used by big and medium companies
- Micro companies behave differently (Regarding processes and agile)
Survey Summary

Topics addressed
- Use of a particular development process
- Use of structural software quality measurement and improvement
- Use of testing
- Use of quality models and quality standards
- Development tool support for the above

Survey procedure
- Online questionnaire: October – November 2012
- 46 questions
- Convenience sampling – invitations sent to potential respondents
- 171 useful responses (until 15 November)
  - 155 from NL (51%), BE (18%), ES (16%), FR (15%)
Company Size Distribution

- Big – 60 (39%)
- Micro – 33 (21%)
- Small – 42 (27%)
- Medium – 18 (12%)
- NA’s – 2 (1%)
Processes

Usage of development processes

- No difference between countries (more imposed in France)
- Difference by company size, processes increasingly used and followed by company size:

![Bar chart showing usage of development processes by company size.](chart.png)

- **Used**
- **Always or frequently strictly followed**
Agile Methodologies

Usage of agile methodologies

- Generalized in all countries
- Balance between self-choice and imposed for small and big companies
Design artefacts and documentation

- Documented design? No difference by country (48% - 65%)
- Increased use and imposition by size, self-chosen in small companies
Design

Updating design artefacts and documentation

- Bigger companies update more frequently
- Small companies update less frequently than micro
Use of Design Patterns

- No significant difference between countries (popularity between 69% and 77%)
- More imposed in big companies
- Less used in micro companies
Change Management Processes

- Increased usage by company size

![Bar chart showing the increased usage of change management processes by company size, with categories for Big, Medium, Small, and Micro companies. The chart compares imposed processes, self-chose processes, and no processes.]
Test Processes

By company size

- Increased usage and imposition by company size

![Bar chart showing the distribution of test processes by company size. The chart indicates the percentage of companies using imposed, self-choice, and not using test processes for different company sizes: Big, Medium, Small, and Micro.](chart.png)
Testing time

By company size

- Similar distribution for big and micro
- Medium 15% - 25%
- Small 5% - 15%
Quality Processes

By company size

- Increasedly more used and imposed by company size

![Bar graph showing the usage of software quality processes by company size, with categories for imposed, self-choice, no, and I don't know.](image-url)
Quality Models

By company size

- Increased usage by company size
- More “I don’t knows” in medium companies

![Bar chart showing the percentage of companies in different size categories and their responses to a question with options: Yes, No, I don't know.](chart.png)
Country & Size Distribution

Not evenly distributed

- Results might be biased
- Get more responses or adjust the results

<table>
<thead>
<tr>
<th>Country</th>
<th>Micro</th>
<th>Small</th>
<th>Medium</th>
<th>Big</th>
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<tr>
<td>Belgium</td>
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<tr>
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<tr>
<td>Spain</td>
<td>2</td>
<td>12</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>
Conclusions

Not clear differences between countries

- Small differences for some particular cases

Differences company size

- No difference for agile methodologies
- Usage increases by size for the rest: processes, usage and updates of design documents, testing processes and dedicated time, quality processes and models
- Imposition of processes or practices increases with company size
- Help for gathering more contacts and improving the sample distribution