Automation of Functional Size Measurement (FSM)

State of the Art and Research Agenda
- Existing automated measurement standards for FSM

- Related constraints and achievements

- Proposals for elements of a research agenda on automation of FSM
• Existing automated measurement standards for FSM
  – Positioning within FSM landscape & Overview
  – Status & Roadmap
• Related constraints and achievements

• Proposals for elements of a research agenda on automation of FSM
• Focus on ex-post control
  – N/A for ex-ante estimation
• Focus on implemented software
  – N/A for requirements, documentation, and other artifacts

• Aim at delivering automatable repeatable and objective source-code-based measurements of
  – software size
  – software development activity
• Aim at supporting FSM methodologies dealing with non functional requirements (NFR)
Overview

- **Automated Function Points**
  - Software functional sizing based on its source code
  - As consistent with IFPUG CPC as allowed by automation and source-code information
• **Automated Enhancement Points**
  - Development activity sizing based on source code evolution
  - Enriches AFP with
    - Coverage of all development activities with impact on the source code (i.e., including NFR impacts)
    - Account for AFP addition, update, and deletion individually
    - Account for implementation complexity when dealing with AFP updates
• OMG validated specifications
  – Automated Function Points (AFP, 01/2014)
  – Automated Enhancement Points (AEP, 06/2016)
  – Misc.:
    • Automated Source Code Security/Reliability/Performance Efficiency/Maintainability Measures (ASCSM/ASCRM/ASCPEM/ASCMM, 06&09/2015)
    • Automated Technical Debt Measure OMG validated specifications (ATDM, 06/2017)
• ISO/IEC JTC 1/ SC 7/ WG 6 to get AFP approved as ISO 19515

• AEP & ATDM leverage to build a “quality-adjusted productivity” measure

• Misc:
  – Extension of ASCxM to cover embedded software
• Existing automated measurement standards for FSM

• Related constraints and achievements
  – Adoption
  – “End-to-end” usage

• Proposals for elements of a research agenda on automation of FSM
• Tooling
  – AFP supported by CAST AIP 7.1+
  – AEP supported by CAST AIP 8.2+
“End-to-end” usage

• Similar unit but different content...

• Reconciliation:
  – Calibrate AFP/AEP to align on manual FP
  – Account for undocumented FP identified by AFP/AEP

• Cohabitation:
  – Build multi-measure practice
  – Build correlation models, ...

• Still a work in progress
  – (cf. proposals for elements of a research agenda)
• Existing automated measurement standards for FSM

• Related constraints and achievements

• Proposals for elements of a research agenda on automation of FSM
  – ST: standards adjustments
  – MT: develop usage guidelines and specifications
• EC formula adjustment
  – Specify a better Effort Complexity measure
• ER management
  – Guidelines to manage Equivalence Ratio within and across organizations
• IF formula adjustment
  – Specify better Impact Factors
• Abacus
  – Review thresholds and levels
• **Solidify best practices around joint use of manual and automated counting**
  – Feedback loop between ex-ante estimation and ex-post control
  – Both for functional and non-functional requirements
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http://www.omg.org/spec/AFP
http://www.omg.org/spec/AEP
http://www.omg.org/spec/ASCSM
http://www.omg.org/spec/ASCRM
http://www.omg.org/spec/ASCPEM
http://www.omg.org/spec/ASCMM
http://www.omg.org/spec/ATDM