

# CISQ



CONSORTIUM FOR IT SOFTWARE QUALITY

## Automation of Functional Size Measurement (FSM)

State of the Art and Research Agenda



Software Engineering Institute | Carnegie Mellon





- 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)**



- **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+**



- **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



**Philippe-E. DOUZIECH**  
Head of European Science Directorate  
e: [Philippe-Emmanuel@it-cisq.org](mailto:Philippe-Emmanuel@it-cisq.org)



<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>