Methodology for Assessing the State of the Practice for Domain X

Spencer Smith
McMaster University, Canada
smiths@mcmaster.ca

Jacques Carette
McMaster University, Canada
carette@mcmaster.ca

Olu Owojaiye
McMaster University, Canada
owojaiyo@mcmaster.ca

Peter Michalski
McMaster University, Canada
michap@mcmaster.ca

Ao Dong
McMaster University, Canada
donga9@mcmaster.ca

Abstract

...

2012 ACM Subject Classification Author: Please fill in 1 or more \ccsdesc macro

Keywords and phrases Author: Please fill in \keywords macro

Contents

1 Introduction

Purpose and scope of the document. [Needs to be filled in. Should reference the overall research proposal, and the "state of the practice" exercise in particular. —SS]

2 Overview of Steps in Assessing Quality of the Domain Software

1. Identify domain. (Provide criteria on a candidate domain.)
2.

3 Identify Candidate Software

4 Domain Analysis

Commonality analysis. Follow as for mesh generator (likely with less detail).

5 Empirical Measures

5.1 Raw Data

Measures that can be extracted from on-line repos.

[Still at brainstorm stage. —AD]

- number of contributors
- number of watches
- number of stars
- number of forks
- number of clones
- number of commits

- number of total/code/document files
- lines of total/logical/comment code
- lines/pages of documents (can pdf be extracted?)
- number of total/open/closed/merged pull requests
- number of total/open/closed issues
- number of total/open/closed issues with assignees

5.2 Processed Data

Metrics that can be calculated from the raw data.

[Still at brainstorm stage. —AD]

- percentage of total/open/closed issues with assignees - Visibility/Transparency
- lines of new code produced per person-day - Productivity
- lines/pages of new documents produced per person-day - Productivity
- number of issues closed per person-day - Productivity
- percentage of comment lines in the code - maintainability [Not Ao's qualities —AD]

5.3 Tool Test - HubListener

[This section is currently a note of unorganized contents. Most parts will be removed or relocated. —AD]

GitHub repo

The data that HubListener can extract.

Raw:

- Number of Files
- Number of Lines
- Number of Logical Lines
- Number of Comments

Cyclomatic: Intro

- Cyclomatic Complexity

Halstead: Intro

- Halstead Effort
- Halstead Bugs
- Halstead Length
- Halstead Difficulty
- Halstead Time
- Halstead Vocabulary
- Halstead Volume

Test results: HubListener works well on the repo of itself, but it did not work well on some other repos.

[This citation needs to be deleted later. It's here because my compiler doesn't work with 0 citations —AD] Emms [2019]

6 User Experiments

Describe experiments with users to assess usability, performance etc.

7 Analytic Hierarchy Process

Describe process. Domain expert review.

8 Quality Specific Measures

8.1 Installability [owner —OO]

8.2 Correctness [owner —OO]

8.3 Verifiability/Testability [owner —OO]

8.4 Validatability [owner —OO]

8.5 Reliability [owner —OO]

8.6 Robustness [owner —PM]

8.7 Performance [owner —PM]

8.8 Usability [owner —JC]

8.9 Maintainability [owner —PM]

8.10 Reusability [owner —PM]

8.11 Portability [owner —PM]

8.12 Understandability [owner —JC]

8.13 Interoperability [owner —AD]

8.14 Visibility/Transparency [owner —AD]

8.15 Reproducibility [owner —SS]

8.16 Productivity [owner —AD]

8.17 Sustainability [owner —SS]

8.18 Completeness [owner —AD]

8.19 Consistency [owner —AD]

8.20 Modifiability [owner —JC]

8.21 Traceability [owner —JC]

8.22 Unambiguity [owner —SS]

8.23 Verifiability [owner —SS]

8.24 Abstract [owner —SS]

9 Using Data to Rank Family Members

Describe AHP process (or similar).

References

Steve Emms. 16 best free linux medical imaging software. https://www.linuxlinks.com/medicalimaging/, 2019. [Online; accessed 02-February-2020].