Data Extraction Sheet

# Extraction Data

Where something is not clear, please explicitly state “unclear” in the respective cell and add a manual comment in the column “Manual Comment”.

# **Contact mailing list is: ecsa-eval@list.uni-koblenz.de**

Please use that for your questions.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Extracted Data** | | **Characteristic** | |
| **Meta Data** | | | | |
| 0 | ID | | BibTeX-Key | |
| 1 | Year | | 2016 – 2020 | |
| 2 | Author | | Author Names, collected separately to identify them separately | |
| 3 | Organisation | | Set of organizations – if >1 organizations, make another line for the same author | |
| 4 | Country | | Set of countries – >1 countries, make another line for the same author | |
| 5 | Industry Paper | | industry track,  yes, >= 1 industry affiliated author,  no | |
| 6 | Secondary Study | | yes, no (yes: no need to investigate further) | |
| **Paper content** | | | | |
| 7 | Research Object | | \* Architectural Aspects  \* Architectural Assumptions  \* Architecture Analysis Method  \* Architecture Decision Making  \* Architecture Description  \* Architecture Description Language  \* Architecture Design Method  \* Architecture Evolution  \* Architecture Extraction  \* Architecture Optimization Method  \* Architecture Pattern  \* Quality Evolution  \* Reference Architecture  \* Teaching  \* Technical Dept   * When a new research objective has been found:   + Contact Mailing-List ecsa-eval@list.uni-koblenz.de and propose:     - Reference to the original paper     - Name of the objective     - Short description of the objective (1-2 sentences) | |
| 8 | Evaluation method | | \* None  \* Argumentation  \* Benchmark  \* By Construction  \* Case Study  \* Experiment  \* Field Experiment  \* Focus Group  \* Grounded Theory  \* Interview  \* Literature Review  \* Mining Repositories  \* Motivating Example (demonstration purpose)  \* Questionnaire  \* User Study  \* Verification   * When a new Evaluation type has been found:   + Contact Mailing-List ecsa-eval@list.uni-koblenz.de and propose:     - Reference to the original paper     - Name of the type     - Short description of the type (1-2 sentences) | |
| a | Guideline to Evaluation type | | none referenced,  or: Which guidelines are referenced and used? (BibTeX key) | |
| b | Property | | Properties of the research object that were evaluated, as “property-as-such” or possibly in relation to other properties or context factors. | |
| c | Property Instance | | * none * Accuracy * Adaptability * Applicability * Availability * Completeness * Complexity * Cost Savings * Effectiveness * Extensibility * Feasibility * Modularization * Performance (An example for a relation to other properties would be that the performance was evaluated for different sizes of a problem to be solved) * Precision * Productivity * Scalability * Security * Technical Debt * Trustworthiness * Uncertainty * Usability * Usefulness * When a new property has been found:   + Contact Mailing-List ecsa-eval@list.uni-koblenz.de and propose:     - Reference to the original paper     - Name of the property     - Short description of the property (1-2 sentences) | |
| d | Metrics | | examples are:   * LoC * Response Time * Number of Components * Number of elements * Person-months per 1000 LOC * Precision * recall * F-score/F1 (and others) * similarity metrics * ...   To measure the answer to the research question (or the property, if no research question exists) | |
| e | Research Question | Research Question or Evaluation Question. Please just copy-and-paste it into the data extraction sheet. Without parentheses | |  |
| 9 | Evaluation Artifacts | |  | |
| a | Tool prototype | | None, used, available.  Available means: Mentioned and linked from the paper, website exists and contains some artifacts. Outdated links means \*used\*, not \*available\*. | |
| b | Input Data | | None, used, available  Description: see 9a | |
| 10 | Artifact Evaluation Package available for replication? | | Yes (mentioned and linked from the paper, website exists and contains some artifacts), No, outdated link | |
| 11 | Threats to validity | | \* None  If an explicit section exists: list keywords in that section:   * subject bias, * evaluator bias, * implicit assumptions, * samples not representative * ...   Only the threats to validity to the evluation, not the limitation to, e.g., the implementation of a tool. Please also have a look at sections called “Limitations” or alike. | |
| 12 | Guidelines to Threats to Validity | | none referenced  or: Which guidelines are referenced and used? (BibTeX key) | |

# Glossary

## Research Objects

### Architectural Aspects

Methods for identifying specific architectural aspects in existing implemented architectures. E.g., when you automatically identify transactional contexts in an architecture.

### Architecture **Assumptions**

Describes assumptions for architectures, of architectures or architectural decisions.

### Architecture Analysis Method

A method for analyzing existing software architectures, e.g., to measure or evaluate specific qualities or functions.

### Architecture **Decision Making**

A method for making decisions or improving architectural decision making.

### Architecture Description

A paper describes a type of architecture, e.g., for specific domains.

### Architecture Description Language

A language for decripbing architectures.

### Architecture Design Method

A method for designing software architectures, e.g., to obtain specific qualities or functions.

### Architecture **Evolution**

The change of architecture over time.

### Architecture **Extraction**

Extracting the architecture, e.g. from code, binaries or log files.

### Architecture **O**ptimization Method

A method to optimize existing architectures (implemented or designed) to achieve specific qualities or functions.

### Architecture Pattern

Patterns how parts of an architecture should be designed to achieve certain advantages. Sometimes also called architecture style (e.g. Mayrhofer2019)

### Quality Evolution

Investigates the evolution of qualities in architectures.

### Reference Architecture

A description of an architecture (e.g. domain-specific or to solve recurring problems) that can be tailored to specific use cases.

### Teaching

Experiences in or proposals for teaching software architecting and related activities.

### **Technical Dept**

Investigates technical dept in architectures and how and why that changes.

## Evaluation type

### Argumentation

The authors only argue why a research object has a property.

### Benchmark

Comparing the property whilst using the presented approach with the properties when using other approaches, using a benchmark defined by a third party.

### By Construction

Argumentation specifically, that the approach has an effect on a property due to the construction of the approach.

### Case Study

Application of the approach to in a case study. I.e., it has a real-life context.

### Experiment

A controlled experiment which compares the application with the application of something else or the non-application.

### Field Experiment

An experiment in a real life context

### Focus Group

Interview of a small group of people, whose reactions are considered in the study.

### Grounded Theory

A specific methodology for qualitative research (will be explicitly stated)

### Interview

An inverview of people, e.g. practitioners

### Literature Review

A literature review used to evaluate, e.g., whether specific aspects have been subject of research before.

### Mining Repositories

The automated processing of public or private repositories with software-related artifacts.

### Motivating Example

The evaluation happens by demonstrating it on a motivational example.

### Questionnaire

A questionnaire is sent to multiple people.

### User Study

Observing the behavior of users during the application of an approach.

### Verification

Formal verification of an approach.