

Quality Guidelines for Research Artifacts in Model-Driven Engineering (Artifact Paper)

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Abstract—Sharing research artifacts is known to help people to build upon existing knowledge, adopt novel contributions in practice, and increase the chances of papers receiving attention. In Model-Driven Engineering (MDE), openly providing research artifacts plays a key role, even more so as the community targets a broader use of AI techniques, which can only become feasible if large open datasets and confidence measures for their quality are available. However, the current lack of common discipline-specific guidelines for research data sharing opens the opportunity for misunderstandings about the true potential of research artifacts and subjective expectations regarding artifact quality. In this artifact paper, we describe the research artifacts created from the homonym paper [1] accepted in the Foundation Track of the MoDELS’21. To foster the reproducibility and reusability of our results, we make the artifact of this study available on the website: <https://mdeartifacts.github.io/>.

Index Terms—Software artifacts, Open Science, Model-Driven Engineering, Quality Management

I. WHAT THIS ARTIFACT DOES/INCLUDES?

In this artifact paper, we describe the artifacts created from the paper **Quality Guidelines for Research Artifacts in Model-Driven Engineering** [1] accepted in the MoDELS’21. In this artifact, you will find: (1) Text documents (in *.docx* format) with the full set of research practices extracted; (2) Various mind maps (in *.mm* format) that we created to categorize research practices according to the 5W2H framework; (3) Our guidelines, which include the 19 factual questions and 84 best practices specifically tailored to MDE research projects; (4) Our Survey questionnaire and responses (between April-May 2021) and R scripts for analyzing the responses and drawing the plots shown in the paper.

II. WHERE IT CAN BE FOUND?

This artifact is hosted on GitHub as an open-source project, under the MIT license [2]. For long-term availability, we also archived our project on Zenodo [3] Finally, we also plan to maintain a website for this project [4].

III. HOW TO REPRODUCE THIS WORK?

A successful replication/reproduction of our work entails the following: (1) Curation of research practices common to a given research community; (2) Classification of practices according to the 5w2h method; (3) Refinement of practices (e.g., remove redundancy, addition of missing practices); (4) Repeating the survey among experts in the research community and the analysis of responses. To design your own replication/reproduction, we recommend the interested reader to look at the files available in the directory `artifacts/202107_models/` of this artifact [2].

In the directory `202107_models/data/`, you will find the *.docx* files and mind maps in *.mm* format with the practices and see how those could be organized. To open the mind maps in *.mm* format, we recommend the user to use the FreePlane Mind Mapping tool [5], which is multiplatform.

In the directory `202107_models/analysis/`, we also provide a set of RScripts [6] and an RStudio project [7] for reproducing the plots shown in the paper, e.g., participants’ role, challenges faced by MDE experts, overall satisfaction of participants, top-priority practices. To reproduce these steps, please check the R scripts `analysis/analysis_0[1-4]*.Rmd`. These files shall reproduce the analysis of the survey responses and figures we used to answer the Research Questions 1 to 4.

IV. ACM REVIEWING AND BADGING

We believe this artifact fulfills the criteria specified in the document *ACM Review and Badging v1.1* [8], particularly for the badges **Artifacts Available** and **Artifacts Evaluated – Reusable**. For the Artifacts Available, we have given the location of the artifact on GitHub [2] and a DOI issued by Zenodo [3]. For the Artifacts Evaluated – Reusable, we have made an effort to provide documentation explaining how to obtain the artifact, what are the main parts of the artifact, how to get started, and how to use the artifact in more detail.

V. FINAL REMARKS

As an open-source initiative, we are happy to have your collaboration and contributions towards better MDE artifacts. Feel free to contact us via GitHub or email!

REFERENCES

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