Sustainability challenges for the MerMEId

Software-Sustainability Challenge Submission

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ABSTRACT

The paper presents the web based editor MerMEId and the challenges concerning its sustainability and maintainability. MerMEId is an established—and the only—tool in digital musicology that has been developed explicitly for creating and managing musical catalog data in MEI. While there is a huge demand from projects world-wide, the MerMEId suffers from the lack of institutional support and technical debts.

KEYWORDS

musicology,software,sustainability,infrastructure

1 NATURE AND PURPOSE OF THE SUSTAINABLE TOOL OR RESOURCE

The software "MerMEId" (Metadata editor and Repository for MEI data) is an open-source metadata editor designed for creating and modifying MEI files, which are XML files adhering to the Music Encoding Initiative (MEI) guidelines. MEI is the de facto standard for open-access electronic representations of scholarly music editions and is widely used by a global community.

MerMEId serves as a critical tool for musicologists and researchers in the field of digital music editing, offering them a powerful platform for encoding, managing, and enhancing metadata related to musical works, performances, and sources in adherence to MEI standards. Its community-driven development approach ensures that it remains responsive to the evolving needs of the musicological community [2–4, 7].

The system architecture consists of an eXist database as a storage backend, a frontend written in XQuery and XForms, processed by an Orbeon XForms server. The eXist db backend provides various generic interfaces (e.g. REST, XMLRPC) for accessing the MEI data and the frontend provides collection listing and filtering, and the editing of individual files.

2 AUDIENCE AND USERS, DISCIPLINES AND SUBJECTS

MerMEId serves a diverse audience comprising musicologists, librarians, archivists, digital humanities scholars, and professionals in library and information science. It is particularly relevant to disciplines related to musicology, digital humanities, and cultural heritage management, offering specialized support for music-related metadata encoding and management.

Musicologists MerMEId primarily targets musicologists who are involved in the creation, management, and scholarly analysis of musical editions, performances, and related metadata. It provides them with a specialized tool for encoding and documenting musicological data in compliance with MEI standards.

Librarians and Archivists Librarians and archivists working in music libraries and archives use MerMEId to catalog and manage music-related resources, including musical works, scores, manuscripts, and performance histories. The tool assists in the creation of detailed bibliographic descriptions.

Digital Humanities Researchers Researchers in the field of digital humanities, particularly those focusing on music, may use MerMEId to support their data-intensive projects, facilitate the digitization of musical resources, and enhance metadata for analysis and research.

Music Researchers Scholars conducting research in various areas of musicology, including music history, music theory, and music performance, benefit from MerMEId's capabilities for documenting and organizing music-related data.

Catalogers and Curators Professionals responsible for cataloging and curating music collections in libraries, archives, and cultural institutions use MerMEId to create comprehensive records and improve the discoverability of musical resources

3 POSITION WITHIN THE RESEARCH LIFECYCLE

MerMEId is positioned at multiple stages of the research lifecycle, from data collection and encoding to data dissemination and preservation. Researchers use the tool to create structured metadata for musicological materials during initial stages of data collection and encoding, and they enhance and enrich this data in subsequent stages with the same editing tool.

The collection browser of the MerMEId allows for filtering and searching, thus facilitating basic analysis of the created corpora. Researchers can use the data created and managed in MerMEId for the publication of scholarly music editions, research papers, and online resources. The tool aids in disseminating research findings to a wider audience and bridges the gap between traditional musicology and digital humanities for creating FAIR research data [1, 6].

4 MEANS OF ACCESS AND ACCESSIBILITY

MerMEId is a web based editor, making it widely accessible to users with internet connectivity. It can be installed via Docker on a remote server but also on a local machine for testing or air gapped settings. The source code is available from GitHub under an Apache-2.0 open source license, so users and developers can view, modify, and contribute to the codebase.

5 CHALLENGES FOR SUSTAINABILITY

One of the primary challenges is securing ongoing funding and resources for the development, maintenance, and support of the software and its deployment. While MerMEId has just recently gained some short term funding from the German Research Foundation (DFG), this does not meet long-term needs [5]. The challenges for the MerMEId include also:

Community Engagement Sustaining an active and engaged user and developer community is vital for the continued improvement of MerMEId. Encouraging community participation and collaboration can be challenging, as it requires ongoing communication, outreach, and the provision of resources.

Technical Debt The codebase of MerMEId has accumulated technical debt over the years, making it less maintainable and adaptable to new technologies. Addressing technical debt and modernizing the software is resource-intensive but desperately needed to attract new developers. This is particularly true for the system architecture and its dependency on XForms and the Orbeon XForms processor.

Documentation Comprehensive documentation is essential for both users and developers. Creating and maintaining up-to-date documentation that covers installation, usage, and development is missing. Existing help pages need to be reviewed and eventually migrated to some dedicated documentation system.

Testing and Quality Assurance Ensuring the reliability and quality of the software through rigorous testing, including unit tests, integration tests, performance tests, and security audits, is essential. While a continuous integration/deployment pipeline has been set up via GitHub actions, only very basic tests are currently in place.

6 FUTURE DIRECTIONS

The Center for Music, Edition, Media at Paderborn University has recently received a DFG grant for "MerMEIding to the future – A community driven sustainability approach for high quality metadata within digital musicology". The objectives involve work on the backend, frontend, and the documentation. Quality assurance through automated tests and public dissemination are also deliverables, connecting the planned work packages to the wider MerMEId community for feedback.

All in all, we strive to make the MerMEId future-proof so that it can meet the requirements of the musicological community in the long term.

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