

Proposal to fund interoperability across 3 open source health projects under LibreHealth to improve user experience, support training and scale digital health solutions.

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Executive summary

LibreHealth is an umbrella organization of open source health information systems projects under the fiscal sponsorship of the Software Freedom Conservancy (SFC). LibreHealth was formed in 2016 so that individual digital projects may get equal visibility to the community members as well as to evolve as a single destination that showcases best open source practices for health IT needs of low-resource settings. LibreHealth currently has 3 projects – LibreHealth Toolkit (which is adopted from OpenMRS) to provide a base platform for digital innovations, LibreHealth Electronic Health Record (LibreHealth EHR) and LibreHealth Radiology Information System (LibreHealth RIS). Core to LibreHealth is a shared infrastructure for all projects, education and training support and diversity for community support.

Equal project visibility is important to be responsive to end user needs. For example, in EHR projects like OpenMRS or OpenEHR, radiology is considered a small module and end users that need features and enhancements related to radiology must convince the whole community to prioritize this need, resulting in slow or no decision making and lack of responsiveness to end user needs. Since each project under LibreHealth has its own project maintainer and roadmap, end users have an amplified voice in building products that meet their goals in a timely fashion. Our mission to serve as a common home for open source digital health products eliminates waste and redundancy that occurs when end users are forced to adopt multiple end products. Particularly in low-resource settings, this silo approach has caused severe hardships - dependence on foreign actors, lack of actionable information and poor health outcomes due to lack of continuity of care. LibreHealth is solving this problem for low-resource settings, in high-income, middle-income or low-income countries, because we know from experience that even in high-income countries, there are innumerable low-resource settings. Our shared core resources of infrastructure, community, training and support help reduce resource wastage.

Despite the benefits reaped from LibreHealth, we have firsthand experience that distributing multiple digital health products is not enough. We need to seamlessly transition or integrate between our projects by providing a single user experience. This would shield the user from the burden of maintaining complex health systems and frees their time to focus on improving patient care. For example, we currently have 4 universities in our education program piloting the use of the EHR system for graduate informatics training. We have developed treasure hunts to help students discover the EHR and when errors and bugs are identified, they are escalated via support to the core EHR team to be fixed. We anticipate that the student needs will expand to include imaging informatics (thus required to use LibreHealth RIS) and use of standards and terminologies (hosted in Toolkit). With our current code structure, the shift to expand such support would be enormous and put a strain on our infrastructure, essentially making it

unsustainable. This same case is easily extended to an end user who uses one product and has a need addressed by a different product.

To overcome this barrier, we have a plan to

1. Adopt FHIR, an open standard for health data exchange, across all our current projects
2. Implement FHIR's RESTful services and use its information model across projects
3. Build web components against FHIR endpoints that are shareable between all projects.

This is our specific aim for the DIAL grant. Once successful, we would then embark on phase II of the project to build a single marketplace where we can package and distribute products to meet end user needs. By improving the pipeline of distribution we hope we can reduce the burden of bringing on new projects to LibreHealth as well as impact the end user by improving software delivery, packaging and maintenance. In the past we have worked on such projects using Google Summer of Code students and also graduate students conducting independent study. We hope that we can meet our first two objectives before the next Google Summer of Code for 2018, and hence provide a base for new students to work on for phase II of the project.

Proposed Budget and high level plan

We already have a volunteer team of core developers across all 3 projects. By using the funding, we will do a code spike for Interoperability that implements FHIR and provides basic developer toolkit that allows for development of web components using JavaScript languages. We plan to extend the developer toolkit to include training modules for new developers

Success

Our primary output measures include

1. Major FHIR based release of LibreHealth Toolkit, LibreHealth RIS and LibreHealth EHR
2. Software Development Kit for building web components against FHIR
3. Number of web components developed

A later goal is to assess successful integration of the phase I component with Google Summer of Code student projects to provide a single marketplace of LibreHealth digital tools for end users.