Google Summer of Code 2013 Application

OpenMRS SDK Proposal

By Christopher Niesel

Proposal:
The creation of an OpenMRS SDK.

Objective: Make it easier for developers and module designers to develop for OpenMRS.

Steps of Action:
1. In order for OpenMRS to be able to run, it requires MySQL. MySQL important since it responsible for the storage of data and records. However if we want to make it easier for new developers to get started right out of the box, the dependencies involved should be very slim. Therefore it is in our best interest to make it possible for OpenMRS to run with an embedded database. I have looked at a few options, which are HyperSQL[1] and H2[2]. HyperSQL (Hyper) is a 100% java database, which offers both in-memory and disk-based. Hyper can also be integrated with Spring and Hibernate making it a prime candidate for OpenMRS.[3] Since Hyper has existed for over 10 years there is a great community around which can help with problems throughout development. In 2010 version 2.0 was released, officially removing old code based on the discontinued HypersonicSQL engine and allowing for Hyper to comply with Standard SQL and JDBC 4 specifications.[4] Its current size is around 7mb for implementation purposes. H2 is very similar in nature to HyperSQL; it shares a common linage since H2 is the new re-write of the HypersonicSQL engine of which Hyper was based on. H2 supports the use of Hibernate dialect so implementation would be almost as easy as using Hyper. When looking at a performance comparison, H2 wins. It is faster in both embedded and client/server mode than Hyper and also much smaller, around 1.5mb.[5] This allows for very fast and configuration free development setup. In conclusion, both database engines are java based, however it is for us to determine what we require the most. If it is speed H2 is the winner. However if we want more stability, Hyper is the best option for that scenario. In order to implement an embedded database, only a few minor changes in the core of OpenMRS need to take place which allow for faster compilation times due to the skipping of certain scripts that were needed for a server/client based MySQL deployment.
2. For the rapid development of modules, certain specifications of the maven archetype must be declared, especially the OpenMRS version dependency. This is a major problem when the plugin is to be used with multiple versions of OpenMRS. In order to absolve the developer from this problem, a version detection of some sort should be considered so that the developer has the

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[1] http://hsqldb.org
[2] http://www.h2database.com
[3] http://books.google.com/books?id=qRQ-ZWYY5ygC&lpg=PA87&dq=hsqldb&pg=PP1#v=onepage&q=hsqldb&f=false
[4] http://hsqldb.org/web/features200.html
[5] http://www.h2database.com/html/performance.html

ability to deploy the module on any version of OpenMRS in a test environment to see how it will function. The script which will need to be written for both Linux/mac and Windows should generate the either the module outline or if it is an existing module, download it, and modify the dependency requirement to that of the current version of OpenMRS installed by the developer.

3. In order to see changes made to modules in the web environment, usually a re-start of OpenMRS is needed, however with the existence of the module re-loader it will be much easier[6]. It will need some improvements in order to allow continues re-loading without having to restart the entire app, as well as a configuration page so that settings like refresh interval and module directories can be adjusted. The settings page may also include start/stop functionality for the module.

4. The last step to this SDK is the packaging of everything. There are a few options. For instance just the zip file option, however this may cause some issues regarding path settings, since it is not possible to set environment variables. Therefore this option would only really work in a Unix environment where script files can manually export environment variables. For windows environments, an installer would be the best option.[7][8] This is how Atlassian coped with symlinks and variables such as location for java. Most Linux distributions tend to have a package manager, therefore further down the road, we should consider creating a package containing the SDK for red hat derivatives such as Ubuntu (a very commonly used distro), fedora and rpm based environments such as CentOS. Included in the SDK package would be scripts needed for tasks such as the creation of the module (performs the previously mentioned task of adjusting dependency requirements) and walks one through the steps of creating the module. The second required one would be a run script. This script would compile the module, and deploy it into an OpenMRS instance. Further scripts can be developed to allow for GIT commands such as cloning repositories, getting the newest changes, the creation of branches with regards to solving tickets and even more features like updating the SDK. There are endless possibilities on expanding this project once the ground has been built.

5. The very final thing to complete after having created the SDK is to update the documentation and the creation of a walkthrough using screen casting software, so that junior developers will have an idea of how to properly use and install the SDK itself so that they can start development on modules.

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[6] https://github.com/openmrs/openmrs-module-omodreloader/

[7] http://www.jrsoftware.org/isinfo.php

[8] http://wixtoolset.org/

Timeline (tentative):

May 3 – May 24 (Before Selection of Proposals):

- Continue to work on Tickets
- Familiarize myself more with parts of OpenMRS I will be working on
- Continue discussion on aspects of proposal with Mentor

May 25 – June 16 (Community Bonding Period):

- Get to know my fellow peers and co-workers
- Throughout this period, I will as always be available on IRC to further discuss the proposal with members of the OpenMRS community so that I will be able to adjust or add things that I may have not thought of before.
- I will be actively engaged in discussions with my Mentor to further understand and agree on what exactly needs to be modified so that OpenMRS will be able to function with an embedded database, while also examining where improvements in the reload module need to be made.
- My Mentor and I will also be looking at the options presented previously, on how best to approach the deployment of the SDK on various operating systems. This will include the installation itself as well as the use of scripts.

June 17 – July 17:

- Consult with developers and mentor on the wants for the embedded Database
- Work on integrating the chosen database
- Make sure OpenMRS is able to function properly with the implementation

July 18 – Aug 11:

- Work on improving the reload-module for seamless integration
- Discuss the wants and needs, set up a list of things to accomplish
- Test and debug the improved version of the module

Aug 12 – Aug 31:

- Modify maven archetype settings for easy deployment of modules
- Create scripts for both Linux and Windows to allow for module creation and deployment to OpenMRS instance

Sept 1 – Sept 16:

- Determine the best way to package the SDK
    - Consult with Mentor and peers
- Work on packaging of the SDK
- Test to see if everything works

Sept 17 – Sept 23:

- Work on screen cast and updating documentation
- Check code for quality and make sure all works well
- Write tests, if there need to be any

Who are you? What are you studying?
Hi Everyone,
My name is Christopher Niesel, I am currently a second year computer-, and political science student at the University of Western Ontario. I hope to continue my education further after I am done my undergrad in the field of law focusing on technology and open source software. As my part-time job I run the servers and maintain the computers at an international private school called London Language Institute. When I do have spare time I try and help out in my community by tutoring kids who need help with computer programming as well as continue to educate myself in the field of computer science by doing programming tasks and learning new languages.

Please provide the URL to your wiki personal space.
https://wiki.openmrs.org/display/~h3llborn/Home

Why are you the right person for this task?
I started to learn computer programming in grade 10 and kept working hard to improve my code quality and understanding of how to solve problems quickly and efficiently. Having worked with java for almost 4 years I believe that I have a very good understanding of how the syntax/language works. Since I am still in university, and have not completed my degree, I am always looking for an opportunity to code more, so that I will be able to understand how fully fledged software development works. My work ethic and knowledge combined with my experience as system administrator, which required extensive knowledge when it came to servicing and maintaining Linux/Windows/OSX operating systems as well as requiring me to write scripts to simplify tasks that would take a lot of time to do manually, make me the right person to work on this task, since it requires changes to some specific parts of the OpenMRS core and additional scripts to help make the install, running of the SDK and updating as easy as possible. Another reason I chose this task, is that when I first got to know OpenMRS I found it rather difficult to get everything ready to start developing, therefore if we want to attract more developers, especially junior ones, I believe we should make it as easy as possible for them to get started.

Do you have any other commitments we should know about?

Aside from finishing off my 2nd year of my Undergrad in April, I only have a part time job as the system administrator for London Language Institute where my hours are extremely flexible, I usually only work once a week. I also like to work out at the gym, which is something I tend to do after a long day of work to relieve stress. On weekends I tend to umpire a baseball game, baseball was one of my favorite sports so I try and still enjoy it on a limited basis since I am usually busy with other things, such as hopefully participating in Google summer of code.

List your Java experience.

I first started to learn java in grade 11 at my high school. Our school was very academically oriented thus the teachers that were hired actually knew about the subject they were teaching. My teacher at the time held an M.Sc. In Mathematics and Computer Science, it allowed her to teach a very thorough course starting off first with simple introductory problems, but slowly progressed towards harder ones. In my grade 12 year, she thought us the more about software development, file handling, etc. Our final project was a group one, its objective was to create a program of our choice, and the only requirement was that would use a datafile for configuration purposes. I will include some of the source code written in my grade 12 year and 1st year in University below as a link to my older github repository.

List your web interface experience.

When I was in grade 6, living in Europe I had my first encounter with HTML. My school offered a course which introduced one to how html worked. After moving to Canada, I did some website design for a childcare as a community service hours project in my grade 9 year. In Ontario, students are required to complete 40hrs of community service to graduate. Having successfully completed my hours I moved onto starting my own blog, geek-desk.com which is now defunct because I just could not keep up with writing articles and maintaining my extra-curricular activities. In grade 10 I was introduced to JavaScript where we worked on a variety of projects, they were primarily focused on website development. Moving on to University, I helped tutor students who took CS1033, a course focused on website development.

List any previous experience working with open source projects.

I have not worked with any open source projects prior to starting with OpenMRS.

Please provide links to websites created by you and/or source code examples.

http://www.oakparkchildcare.ca/

https://github.com/ioyou (my old github repository)

Do you have experience with Spring/Hibernate/DWR/HL7/Tomcat/MySQL/AOP?

The only experience I have in regards to the aforementioned applications is MySQL.

What is your preferred method of contact and how should we reach you with it?

I am usually always on IRC, however Skype would work, as would Google hangout.

<u>Please include your IRC nickname used when visiting our channel previously.</u>
My handle used in IRC is: h3llborn

<u>Provide ticket numbers of any patches/code you have committed to the OpenMRS code base.</u>
Here are my currently done tickets:
tickets.openmrs.org/browse/TRUNK-2303
tickets.openmrs.org/browse/TRUNK-3936