Federal Health Information Model (FHIM)
And
It's Relation to the S & I Framework

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Purpose of the White Paper

The NHIN ARM team was tasked to review the Federal Health Information Model and assess whether it can or should be used within the S & I Framework. This white paper gives a high level overview of FHIM and then outlines how it may be used within the S & I Framework.

Overview of FHIM

The Federal Health Information Model working group has one main goal, whole health interoperability. This goal includes information modeling, terminology modeling, security and privacy framework, information exchange framework, and a process for the integration of these standards going forward. Since information modeling was the basis of them all, and since terminology modeling goes hand-in-hand with information modeling, they determined to put their initial focus on those two issues first. However the work done here also plays a role in the others. For example, information models need to be created for security and privacy. The framework can be generated as an artifact of the model using MDHT.

The information and terminology modeling is being done in two phases. Under phase 1, the federal agencies have come together and organized a working group to harmonize an initial set of models. Under phase 2, they will include organizations outside of the federal agencies and harmonize with those organizations.

Although the work within this group for phase 1 includes any federal agency that would like to be involved, the primary modeling work is being done by representatives from a number of federal agencies including VA, DoD, SSA, CDC, FDA, NCI, IHS, FHA, and CMS.

The information models are being created using a model-driven architecture approach using UML. The work is being done using IBM Rational. Since the work is being done using standard UML, the resultant work is relatively portable. The FHIM team has done work to explore the possibility of using MDHT to produce documentation from the UML that has been created. They are not using MDHT for modeling, but rather looking at using it as a tool to help generate artifacts from the models they are creating using Rational. They have also explored the possibility of using NIEM models as in input into FHIM.

To create an initial set of models, the group requested that the participating agencies provide any UML models that they were currently using. One of the base models for the FHIM was the VA Health Information Model (VHIM). They have further harmonized these models across participating agencies. The group has also chosen to use the HL7 version 3 Reference Information Model as one of the reference models. Note that it is one of the referenced models, but the RIM was not the basis of FHIM. Therefore the resultant FHIM may or may not

incorporate elements of RIM. It is mainly based on the current needs of the federal agencies involved.

In order to achieve interoperability, fields within a model are often associated and constrained by terminologies and value sets. In addition to harmonizing the structure of the information models, the FHIM group is working to harmonize the terminologies and value sets that are associated with the fields within the model.

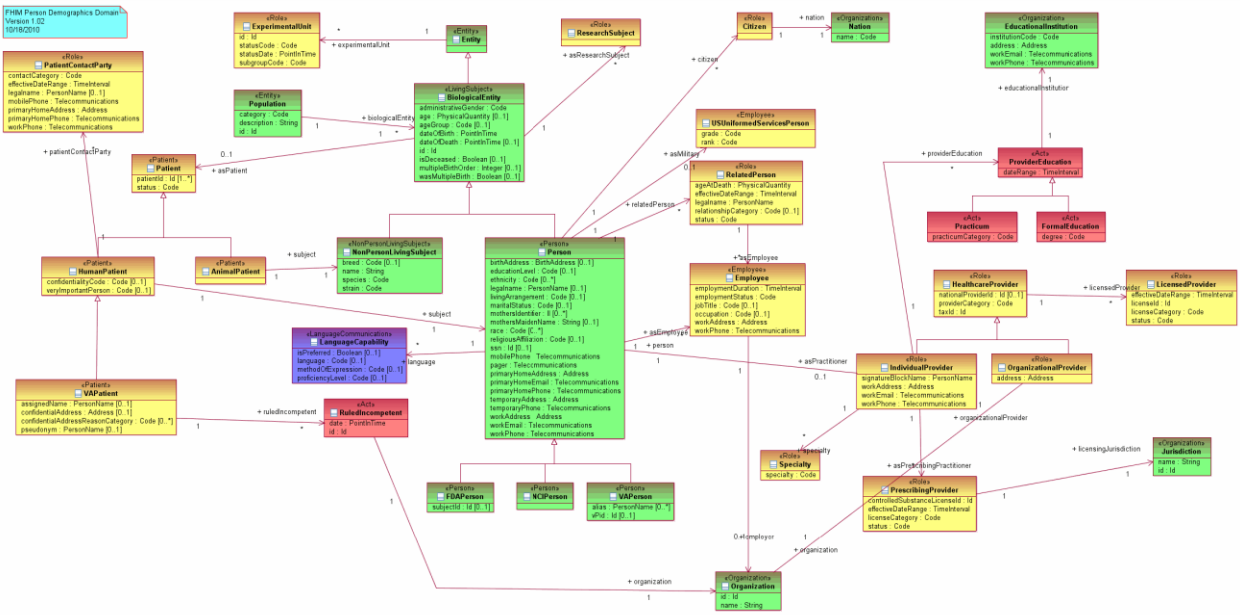
The FHIM working group has completed a first draft of the following information models:

- Person
- Eligibility and Enrollment
- Security and Privacy
- Behavioral Health

They are currently working and plan to finish a first draft of the following information models by April 2011:

- Lab
- Pharmacy
- Problems

The following diagram shows an example of one of the models created by the FHIM working group.



The artifacts for the FHIM working group are currently located in a private WIKI on the Open Health Tools (OHT) site. The group is waiting for a location within ONC to place these artifacts. In the meantime, OHT provided a location for the group. The URL for this project is:

https://www.projects.openhealthtools.org/sf/projects/fhims/

Currently none of the federal agencies have created an implementation using these information models. However, discussions have started as to how to apply them to implementations within the agencies.

FHIM and the S & I Framework

One of the overarching goals of the S & I framework is to provide a process by which new healthcare interoperability initiatives can be rapidly designed, prototyped, piloted, and tested using a fail-fast model. The process is meant to be an open process that enables any interested party to participate while speeding the adoption of the ideas and implementations.

As part of this process there are 5 phases: Pre-Discovery, Discovery, Implementation, Pilot, and Evaluation. FHIM used in combination with MDHT could play a role in the same phases defined in the MDHT Review White Paper that has already been written. Since that paper has described the use of MDHT within the S & I Framework, this paper will focus on FHIM only. The MDHT Review White Paper can be found at the following location:

http://jira.niemhealth.org/wiki/display/ARM/MDHT+Review+White+Paper

When taking MDHT out of the equation which would be used for artifact creation from the model, then FHIM is primarily focused on the creation of harmonized information models along with harmonized terminologies that take both the federal agencies models and the current standards into account. The models that are created are new models that have elements from each of those organizations. But the end result may, but also might not, resemble the work from current standards organizations like HL7.

Since the work is primarily focused on the information models and terminologies, it would mainly be of use in the Discovery phase. (Using MDHT, you could generate artifacts for the other phases as defined in the MDHT white paper). When an initiative is brought to the S & I Framework, part of the Discovery phase work would be to define the information model that would be used in the initiative. In those cases where FHIM has already created a harmonized specification for that data domain, it could be immediately reused and increase the speed of moving an initiative through the S & I Framework process. If an information model has not yet been harmonized by the FHIM group, the FHIM group could take the responsibility for researching and creating the harmonized model. They have a team of people across agencies that have a depth of experience in information modeling skills.

If the FHIM team were to be used for the information modeling portion of the S & I Framework process, the issue of open participation and open communication would need to be addressed. Currently the FHIM group is in phase 1, which means that only federal agencies are involved in the FHIM modeling work. Since only federal agencies are allowed to participate, it means that the information models are based only on those items that are brought by the federal agencies and may not address the needs of the medical community at large. The FHIM group's plan was to harmonize the models with the agencies under phase 1 and then pull in other organizations after the first set of models have been harmonized. In order to participate in the S & I Framework, the FHIM group would need to transition to phase 2 and allow for a more open process. It would need to allow non-federal organizations and individuals that are interested in a specific health information exchange initiative to participate in the information model and terminology harmonization process. The value this would bring to FHIM is that it would create a harmonized model that includes harmonization from non-government agencies.

Conclusion

The FHIM group has been successful in bringing together representatives from many federal agencies to harmonize a set of information models with the intent to use these across information exchanges within the federal agencies and non-federal organizations. They have created an organization which enables the discussions and harmonization process to be done. They have utilized tools like MDHT to produce useful artifacts out of the information models.

FHIM has not been implemented in production as of yet and has to go through the adoption and maturation phases like all standard and specification development efforts require.

It may be possible to integrate the FHIM team as part of the specification and harmonization teams within the Discovery phase as one of the external participants. If they are participants, then they group could use the FHIM models as a base set to start from. The models would then go through the consensus process with non federal agencies and would therefore be further harmonized.

One thing to note is that since these models did not start from the standards as a base, there may be hurdles in getting them accepted by the standards organizations. It is helpful that the current participants in the FHIM modeling group are also active participants in the standards organizations and have been working to get their ideas approved by those standards organizations. This will help to minimize this issue.