A simplified model of electronic health records for facilitating import into the Informatics for Integrating Biology and the Bedside platform

Kavishwar B. Wagholikar MBBS PhD1,2, Vishal P. Vernekar BE1, Akshay Zagade BE1, Yuri Ostrovsky PhD1, Nikhil Bapat BE1, Rupendra Chulyadyo 3, Jeffery G. Klann PhD2,3, Michael E. Mendis MS4, Vivian Gainer MS4, Christopher Herrick MBA4, Rahul Patel MS1, Shawn N. Murphy MD PhD2,3,4

1 Persistent Systems, Pune, India and Santa Clara, CA; 2 Harvard Medical School, Boston, MA; 3 Massachusetts General Hospital, Boston, MA; 4 Partners Healthcare Boston, MA; 5 Brigham and Women’s Hospital, Boston, MA;

Introduction

There exist substantial challenges for importing EHR data into i2b2, despite the widespread deployment of the i2b2 platform. In the absence of community best practice guidelines or official tooling, HIT teams resort to ad-hoc approaches to import EHR data. Consequently, HIT team members face a steep learning curve of understanding the i2b2 schemas, and documentation of webservices to populate the i2b2 CRC tables, as any non-compliance with the schema risks loss of functionality of the i2b2 web-services. We present the difficulties associated with importing data into the i2b2 data model and a simplified schema of the EHR for facilitating data import. Furthermore, we describe and implement a tool to simplify the import process. Our motivation is that simplifying the import of data into i2b2 will be useful for the i2b2 community and will facilitate interchange of data between other models.

Methodology and Results

We investigated the process of importing data into the i2b2 data model and identified challenges. We developed a simplified schema of the EHR data, that is sufficient to populate the i2b2 data model, and developed tooling that can ingest data from the simplified schema to successfully populate an i2b2 instance. The import-tool is called ‘Clinical Data Infrastructure’ (CDI) plugin and is available as open source.

Results and Discussion

Figure 1. demonstrates that the simplified observation fact table has only three mandatory elements, and a very simple mechanism for representing numerical or textual values. While radically simplifying the import of commonly occurring data, the model allows for use of columns from the detailed i2b2 schema, to represent the rare data instances if needed for ensuring reverse compatibility.

Acknowledgements

This work was supported by R00-LM011575,R01-HG009174, Partners healthcare and Persistent Systems.

References