HL7 FHIR and Schema.org

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Abstract. *Schema.org* was developed by a number of major search engine companies such as Bing, Google and Yahoo! as a common vocabulary for marking up web pages. The combination of HTML and Microdata, RDFa 1.1 Lite or JSON-LD enables a well-known set of semantic tags to be added to existing human-readable web pages. *Schema.org* has been widely adopted by public web sites and multiple extensions have been created for domains such as automobiles, bibliographic resources, product classifications, healthcare and life sciences.

The HL7 Fast Healthcare Interoperability Resources (FHIR) standard defines a standard set of "resources" that are used to exchange clinical and healthcare related information. FHIR is slated to become the de-facto interchange mechanism for healthcare and related information. We have developed a *schema.org* representation for the FHIR information models known as *fhir.schema.org*. The purpose of this representation was to promote discussion of the value of *fhir.schema.org* to annotate web based clinical information with their clinical model equivalent.

Keywords. HL7 Fast Healthcare Interoperability Resources (FHIR); schema.org; RDFa; JSON-LD; Semantic Web Technologies

Schema.org[1] was launched by the search engine giants, Google, Bing and Yahoo! to "create and support a common set of schemas for structured data markup on web pages." HTML, when combined with Microdata[2], RDFa 1.1 Lite[3] or JSON-LD[4] allowed human readable pages to be annotated with semantic tags that identify the creators, purpose and content of the annotated pages. Since its inception in June 2011, *schema.org* has been widely adopted and its tags can be found on a wide variety of public and commercial web pages. The major search engines now include "info boxes" that summarize and compare the semantic aspects of the linked web pages.

Schema.org supports two extension mechanisms[4]: 1) refinements and extensions to the existing *schema.org* classification systems and 2) completely separate classification systems that utilize *schema.org* technology but are maintained as separate resources. Several extensions have emerged and have been or are in the process of being adopted, including classifications for automobiles and engines, bibliographic resources, standard product codes[6], healthcare[7], life sciences[8],, etc.

HL7 Fast Healthcare Interoperability Resources (FHIR)[9] is an emerging standard for exchanging healthcare information electronically. FHIR defines a collection of "re-

sources" that "can easily be assembled into working systems." FHIR is rapidly becoming *the* interchange standard for clinical and healthcare data. We have proposed a *schema.org* extension known as *fhir.schema.org* that allows clinical information to be categorized by its relationship with the data elements defined in the FHIR information model. The purpose of this proposal is to investigate potential uses of *fhir.schema.org* annotations for categorizing and mapping clinical information from sources such as blogs, personal devices and other sources to the FHIR format.

The purpose of this poster is to ask questions -- to explain *schema.org*, FHIR and its representation in the schema.org idiom[10], to call attention to the Health and Lifesciences[7] and Bioschema[8] schema.org extensions, to provide a couple of proposed use cases and to ask people to examine the relationships between these resources and healthcare data models.

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