Semantic eXchange Protocol (SXP)

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Abstract

Knowing what the schema of a database or document is does not convey the meaning of the data. A language to allow two or more systems to understand their data based on their own knowledge and that of humans via training it what this paper proposes. This language takes the form of a protocol in computer systems in which syntax is exchanged to generate dynamic understanding.

Status

This whitepaper is an initial draft release and is provided for review and evaluation only. The Companies hope to solicit your contributions and suggestions in the near future. This document serves as a placeholder for a specification that would be governed by a standards group, if accepted.

XML tagging vs Semantics

While tagging is good and simple, the largest limitation is the lack of agreement as to what the tags mean. In traditional computational languages, the meaning is agreed upon ahead of time in the form of a specification. While XML itself provides wonderful possibilities, the data is meaningless unless it conforms to a standard. If it conforms to a standard, then why use tagging in the first place?

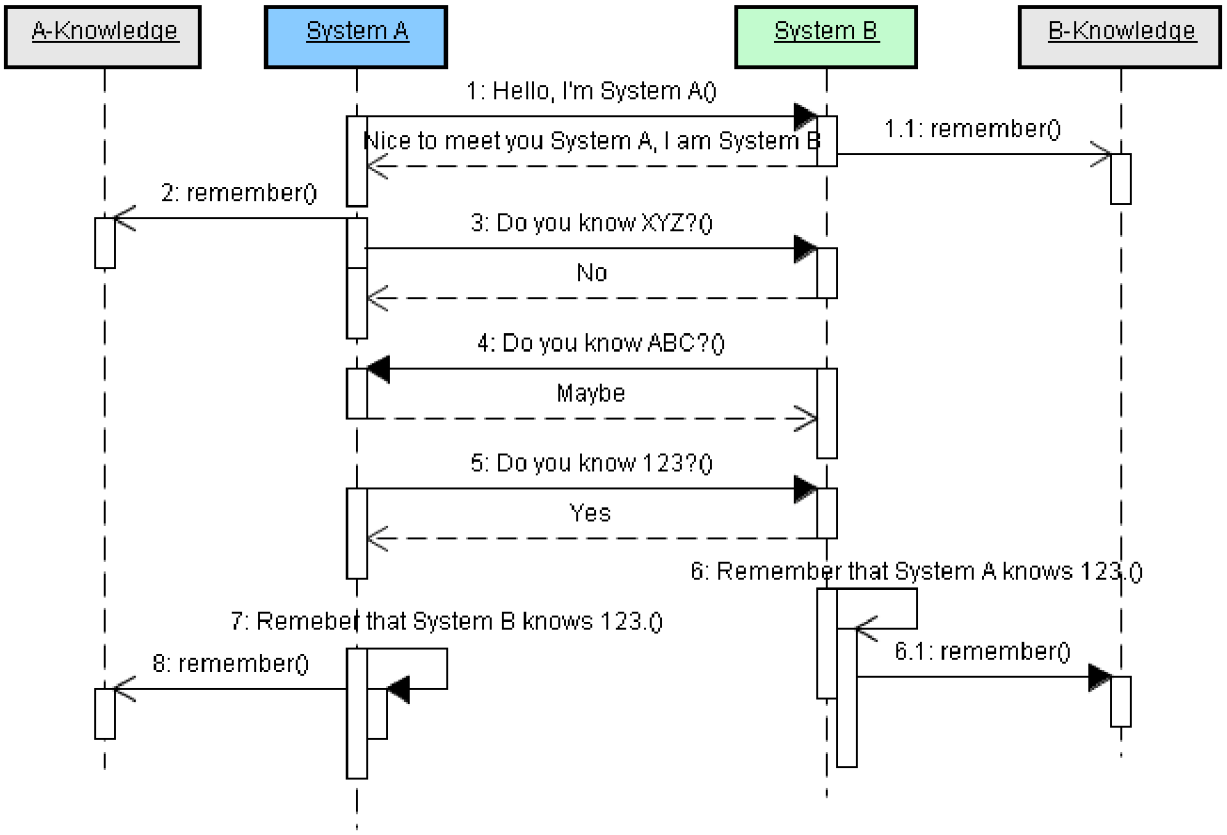
An alternative to standard tags are mediation tools which allow translation from one tag to another. This process allows different systems to exchange data as long as someone has "programmed" the mapping with the semantics.

XML Schema helps to constrain the content (values) of tags and structure only. As far as I can tell, it does not define the meaning of the tags.

Auto Mediation

The meaning of tags is always going to be initially in the mind of the creator and then in the minds of those that agree on its meaning. Manual efforts such as creating XSLT files or write code to translate and parse tags transfers the meaning of the tags into behavior. Doing so automatically might be called Auto-Mediation.

The following interaction diagram describes what the intent and function of the SXL is:



First, each system has a knowledge base from which a history of prior conversations can be found along with recognition patterns and signatures that have be “learned” and recorded. So, in a sense, SXL uses or incorporates a form of artificial intelligence.

Quick Compare
Computers are faster than humans with regard to the exchange rate of words. So SXP can also request for dictionaries. Dictionaries are complete listings of terms that the system understands. This enables a remote system to quickly understand what the other system knows and also to understand what it does not yet know.

Related Efforts

Using internet search engines for terms such as “Metadata exchange Language” or “Semantic exchange” provides a list of many efforts and specifications which pertain to the syntax of exchange rather than knowledge exchange which is learned via conversation. Some of these links are referenced at the end of this paper and they are worth reviewing.

Resource Description Framework (RDF) provides a way to relate terms via syntax. SXP provides a dynamic mechanism, of which the output could be RDF syntax.

OWL Web Ontology Language provides a way to define relationships between terms, generally in a static manner. OWL could also be a product of SXP, as a caching mechanism.

The terms exchanged by SXP would most likely be OWL and RDF compliant. Meaning that OWL content represents knowledge, SXP is the way in which to share and extend knowledge.

Common Reference

Columbus and his crew did not know how to communicate with the natives when they landed in the "West Indies" on October 12, 1492. They used language immersion techniques to train each other using common points of reference. By pointing to an object they both know and speaking their words for it, an exchange occurs. Applying this technique to separated systems, SXP can pass a reference to a common shared entity via a URI from translation dictionaries can be created based on each system understanding of the shared content.

Terminology and Concepts

The following definitions outline the terminology and usage in this paper.

Meta-Data:
Data about data.

Ontology:
A description of terms and their relationships.

Acknowledgements & References

[http://topicmaps.org/]
Topic Maps

[Semantic-Web]
www.semanticweb.org/knowmarkup.html

[XFML]
http://xfml.org/
eXchangeable Faceted Metadata Language (XFML) is an open XML format for publishing and sharing hierarchical faceted metadata and indexing efforts. XFML Core is lightweight and easy to implement, yet uniquely powerful.

[RDF]
http://logicerror.com/semanticWeb-long

[WS-MetadataExchange]
Web Services Metadata Exchange (WS-MetadataExchange) defines three request-response message pairs to retrieve three types of metadata: one retrieves the policy, WSDL, and schema.
http://www.service-architecture.com/web-services/articles/web_services_metadata_exchange_ws-metadataexchange.html

[Web Ontology]
http://www.w3.org/2001/sw/WebOnt/