Toward an Ontology-Based Chatbot Endowed with Natural Language Processing and Generation

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Context
With the last evolution of the web, several new means of communication have showed up. In the commercial domain, chatbot technologies are now considered as essential for providing a wide range of services (e.g. search, FAQ, assistance) to the end-user, and to make a client a faithful customer. We propose an on-going work on the definition and implementation of SynchroBot, an ontology-based chatbot that relies on Semantic Web and NLP models and technologies to support user-machine dialogical interaction in the e-commerce domain.

SynchroBot: A preliminary approach

Question
Give me the address of a Nexus 5 seller?

Answer
The address of a Nexus 5 seller is 44-46 avenue Jean Medecin Nice!

Question Interpretation
EAT Recognition: [ADDRESS]
Property Detection: [sbo:address] [sbo:seller]
Named Entity Recognition: [sbr:Nexus_5]

Query Generation

<seller>
 Domain: Product
 Range: Seller

Nexus_5

<saddress>
 Domain: Address
 Range: Seller

Relational Graph

SPARQL Query

SELECT ?address
WHERE {
  ?phone sbo:name "Nexus_5"
  ?phone sbo:seller ?Seller
  ?Seller sbo:address ?address
}

Answer Generation

Repository of answer patterns

The address of (subject) is (value)

The address of (subject) seller is (value)

(subject) is located in (value)

Knowledge Base

E-commerce Ontology

We transform raw data, extracted through the web sites API and relying on an e-commerce Ontology, into RDF Triples.

Web Sites API

ONLINE DEMO: http://synchrobot.synchronext.com/SynchroBot-Gui/

Repository of answer patterns

The address of (subject) is (value)

The address of (subject) seller is (value)

(subject) is located in (value)

Triple Store

Subject
Nexus_5
LaFnac

Predicate
seller
address

Value
LaFnac
44-46 avenue Jean Medecin Nice

Nexus_5 hasPrice 400$