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Question Answering Systems: Survey and Trends

Abdelghani BOUZIANE[a], Djelloul BOUCHIHA[a], Noureddine DOUMI[b] and Mimoun MALKI[c]

[a]Ctr Univ Naama, Inst. Sciences and Technologies, Dept. Mathematics and Computer Science, Algeria
{Ghani.ab1; bouchiha.dj}@gmail.com

[b]University Dr. Tahar Moulay of Saida
noureddine.doumi@univ-saida.dz

[c]EEDIS Laboratory, Djillali Liabes University of Sidi Bel Abbes, Algeria
Malki.Mimoun@univ-sba.dz

Abstract

The need to query information content available in various formats including structured and unstructured data (text in natural language, semi-structured Web documents, structured RDF data in the semantic Web, etc.) has become increasingly important. Thus, Question Answering Systems (QAS) are essential to satisfy this need. QAS aim at satisfying users who are looking to answer a specific question in natural language. In this paper we survey various QAS. We give also statistics and analysis. This can clear the way and help researchers to choose the appropriate solution to their issue. They can see the insufficiency, so that they can propose new systems for complex queries. They can also adapt or reuse QAS techniques for specific research issues.

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1. Introduction

The rapid increase in massive information storage and the popularity of using the Web allow researchers to store data and make them available to the public. However, the exploration of this large amount of data makes finding information a complex and expensive task in terms of time. This difficulty has motivated the development of new adapted research tools, such as Question Answering Systems.

In fact, this kind of system allows the user to ask a question in natural language (NL) and return the right answer to his question instead of a set of documents deemed relevant, as is the case for engines research.

However, for Question Answering Systems dedicated to manipulate text and Web documents, the structure of the required information affects the accuracy of these systems. QAS are most effective to interact with structured knowledge bases.

Due to the importance QAS, Other surveys are available in the literature, like [1] and [2]. In our survey paper:

- We count Question Answering Systems and analyze the propositions according to different points of view,
- We refresh existing surveys by adding recent works,
- Motivated by our ongoing project, titled QAS for Arabic Linked Data, we give a classification based, in particularly, on language and data-structure dimensions.
- Statistics presented through graphical histograms give clear view to researchers working in this field.

The rest of the paper is organized as follows: Section 2 describes some notions related to the discussed issue in the paper. Section 3 cites and classifies Question Answering Systems, Section 4 provides statistics on the QAS. In Section 5, we describe the project that we are working on. Finally, Section 5 concludes our work.

2. Background

Many notions have to be learned before counting works on Question Answering Systems.

2.1. What is Question Answering System?

Many definitions are available in the literature:

“For human-computer interaction, natural language is the best information access mechanism for humans. Hence, Question Answering Systems (QAS) have special significance and advantages over search engines and are considered to be the ultimate goal of semantic Web research for user’s information needs” [3].

“Question Answering on the Web is moving beyond the stage where users simply type a query and retrieve a