ISSN: 2454-4248
482 – 485

Importance of Sense and Reference in the Field of Web

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***Abstract*:** With the technology revolution, the demand of computers, laptops, mobiles has been increased from last decade. Internet has become an excellent tool to connect the users via social media. Now, any user can share his/her views electronically in public. A user can also retrieve the desired information through search engines like Google.

Few years back, one has to go to libraries or purchase a book/magazine to get the information. But, now with the introduction of internet, user just needs to mention related words of desired query and within a fraction of second, the web browser displays the cluster of web links. User gets the desired information on clicking on the most relevant web link. Page ranking algorithm is applied on these link outputs.

Keywords:*Semantic, Web, Reference*

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I. INTRODUCTION

Uniform Resource Identifier (URI) with highest frequently clicked by users is displayed at the top position. Search engine keeps tracking the links to which the users hit the most in order to get the required information. Then these URI's are displayed with the preference of most clicked to least clicked. In this way, a virtual library is maintained on the web.

http://www.google.com and http://www.wikipedia.org are the best examples of Uniform Resource Identifiers. There are many URI's which look similar but have logically different from each other. For example, URI http://www.wikipedia.org is completely different from http://www.wikipedia.com/wiki/Philosophy. Hyper text web pages are accesses with the help of URI. It can be concluded that Web is a virtual space which can be used for naming information based on URIs.

Here is an example to better know the functioning of web. Suppose a user wants to get the information regarding Eiffel tower. Then that user mentions some related identifiers in the search engine. On clicking the search button, the search engine retrieves the desired information from electronic library of web and displays the results to the user.

It is also important to mention that user can also access the web-page directly by using its URI; for example; http://www.tour-eiffel.fr/. It is very innovative that a telephone number can also be given as uniform resource identifier like tel: +1-816-555-1212.

There is an effective role of artificial intelligence technology which makes it easier for the search engines to recognize the keywords and display the needed results. The AI tool senses the meaning of keywords or identifiers and enables the search engine to get the information. semantic networks use 'natural-language-like' labels on its nodes and edges.

The role of RDF is also very crucial. RDF is a collection of resources provided that a resource can be linked with other resource. Hence, it can be said that any term can be linked with another one in RDF. Following figure shows the example RDF statement.

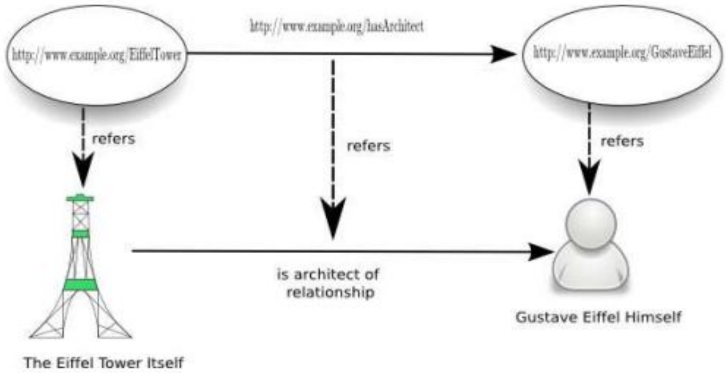

Figure 1.1 An example RDF statement

Programming semantic web is an error-prone process. Each semantic network has a variety of components that have to be programmed with different methods and / or programming languages. Web 2.0 references are facing similar problems. Google Web Toolkit (GWT) is a tool for Web 2.0 references , which allows to develop the entire application in just a programming language, without knowledge of the different techniques.

II. RESEARCH STUDY

The World Wide Web is without a doubt one of the most significant computational phenomena to date. Yet there are some questions that cannot be answered without a theoretical understanding of the Web. Although the Web is impressive as a practical success story, there has been little in the way of developing a theoretical framework to understand what - if anything - is different about the Web from the standpoint of long-standing questions of sense and reference in philosophy. While this situation may have been tolerable so far, serving as no real barrier to the further growth of the Web, with the development of the Semantic Web, a next generation of the Web ``in which information is given well-defined meaning, better enabling computers and people to work in cooperation," these philosophical questions come to the forefront, and only a practical solution to them can help the Semantic Web repeat the success of the hypertext Web.

There is little doubt that the Semantic Web faces gloomy prospects. On first inspection, the Semantic Web appears to be a close cousin to another intellectual project, known politely as `classical artificial intelligence' (also known as `Good-Old Fashioned AI'), an ambitious project whose progress has been relatively glacial and whose assumptions have been found to be cognitively questionable.

The essential bet of the Semantic Web is that decentralized agents will come to an agreement on using the same URI to name a thing, including things that aren't accessible on the Web, like people, places, and abstract concepts. Yet there is virtually no ability to even find URIs for things on the Semantic Web. Currently, each application creates its own new URI for a thing, repeating the localism of classical artificial intelligence. Furthermore, it appears that most things either have no URIs or far too many.

From this query-driven analysis of the deployed Semantic Web, we empirically demonstrate that following the principles of Web architecture and endorsing the direct reference position does not lead to URI re-usage, but that instead there are still likely to be multiple URIs for the same thing and that it is not easy for users to retrieve these URIs in response to a query given as keywords to a search engine. We finally turn to the third position, the public language position, which states that since the Semantic Web is a form of language and as a language exists as a mechanism for co-ordination among multiple agents, then the meaning of a URI is the use of the URI by a community of agents. As vague as this position seems at first glance, we argue this analysis of sense and reference is the best fit to how natural language works, and it supersedes and even subsumes the two other positions. While there are `semiotic' theories of reference, we will not inspect these in this thesis, although we believe that these theories can be incorporated into a public language position. As this theory of meaning works for natural language, it follows that it is a good bet for the Semantic Web, for the Semantic Web is just a form of language, albeit an unusual one.

These are much larger projects outside the scope of a single thesis, and even a single individual. However, in combination with the fully-formed work in the philosophy of mind and language, we hope that at least this thesis provides a starting point for future work in these areas. So we use notions from philosophy selectively, and then define the terms in lieu of our goal of articulating the principles of Web architecture and the Semantic Web, rather than attempting to articulate or define the terms of a systematic philosophy of the Web. Many of the philosophical terms in this thesis could be explored much further, but are necessarily not explored, as to constrain the thesis to a reasonable size. Unlike a philosophical thesis, counter-arguments and arguments are generally not given for terminological definitions, but instead references are given to the key works that explicate these notions further.

Finally, while the experimental component has done its best to be realistic, it is in no way complete. Pains have been taken to ensure that the experiment, unlike much work in the Semantic Web, at least uses real data, feedback from real users, and is properly evaluated over a wide range of algorithms and parameters. Yet a real implementation of our proposed solution would require full-scale implementation and co-operation of both a major hypertext search engine and a Semantic Web search engine. Obviously, this is beyond the means of a thesis, as is any foundational or even ground-breaking work in information retrieval. Instead, we show how information retrieval can be applied to the Semantic Web to help solve one of its most difficult problems. While various parts of the experiment could no doubt be optimized and scaled up still further, for a proof-of-concept solution to a very difficult problem, this experiment should be sufficient.

The first precursor to the Web was glimpsed, although never implemented, by Vannevar Bush. For Bush, the primary barrier to increased productivity was the lack of an ability to easily recall and create records, and Bush saw in microfiche the basic element needed to create what he termed the ``Memex," a system that lets any information be stored, recalled, and annotated through a series of ``associative trails".

III. DISCUSSION

Licklider expanded this notion of feedback loops to a vision of low-latency feedback between humans and digital computers. The intellectual project of `Man-Machine Symbiosis' is distinct and prior from cognitive science and artificial intelligence, both of which hypothesize that the human mind can be construed as either computational itself or even implemented on a computer.

Licklider held that while the human mind itself might not be computational (although Licklider cleverly remained agnostic on that particular gambit), the human mind was definitely complemented by computers. As Licklider himself put it, ``The fig tree is pollinated only by the insect Blastophagagrossorun. The larva of the insect lives in the ovary of the fig tree, and there it gets its food. The tree and the insect are thus heavily interdependent: the tree cannot reproduce without the insect; the insect cannot eat without the tree; together, they constitute not only a viable but a productive and thriving partnership. This cooperative `living together in intimate association, or even close union, of two dissimilar organisms' is called symbiosis.

The hope is that, in not too many years, human brains and computing machines will be coupled together very tightly, and that the resulting partnership will think as no human brain has ever thought and process data in a way not approached by the information-handling machines we know today"

Licklider first tackled the barrier of time. Early computers had large time lags in between the input of a program to a computer on a medium such as punch-cards and the reception of the program's output. This lag could then be overcome via the use of time-sharing, taking advantage of the fact that the computer, despite its centralized single processor, could run multiple programs in a non-linear fashion. Instead of idling while waiting for the next program or human interaction, in moments nearly imperceptible to the human eye, a computer would share its time among multiple humans.

The second barrier to be overcome was space, so that any computer should be accessible regardless of its physical location. The Internet ``came out of our frustration that there were only a limited number of large, powerful research computers in the country, and that many research investigators who should have access to them were geographically separated from them" .

The IETF has historically been the main body that creates the protocols that run the Internet. It still maintains the informal nature of its foundation, with no formal structure such as a board of directors, although it is officially overseen by the Internet Society. The IETF informally credits as their main organizing principle the credo ``We reject kings, presidents, and voting. We believe in rough consensus and running code" .

Before the Internet, networks were assumed to be static and closed systems, so one either communicated with a network or not. However, early network researchers determined that there could be ``open architecture networking" where a meta-level ``internetworking architecture" would allow diverse networks to connect to each other, so that ``they required that one be used as a component of the other, rather than acting as a peer of the other in offering end-to-end service".

The Internet connects computers over space, and so provides the physical layer over which the ``universal information space" of the Web is implemented. However, it was a number of decades before the latency of space and time became low enough for the Web to become not only universalizing in theory, but universalizing in practice. An historical example of attempting a Web-like system before the latency was acceptable would be the NLS (oNLine System) of Engelbart .

The NLS was literally built as the second node of the Internet, the Network Information Center, the ancestor of the domain name system. The NLS allowed any text to be hierarchically organized in a series of outlines with summaries, giving the user freedom to move through various levels of information and link information together.

Berners-Lee in particular realized it was in the long-term interest of the Web to have a new form of standards body that would preserve its universality by allowing corporations and others to have a more structured contribution than possible with the IETF. With the informal position of merit Berners-Lee had as the supposed inventor of the Web (although he freely admits that the invention of the Web was a collective endeavor), he and others constituted the World Wide Web Consortium (W3C); a non-profit dedicated to ``leading the Web to its full potential by developing protocols and guidelines that ensure long-term growth for the Web".

In the W3C, membership was open to any organization, commercial or non-profit organization. Unlike the IETF, W3C membership came at a considerable membership fee.

The W3C is organized as a strict representative democracy, with each member organization sending one member to the Advisory Committee of the W3C, although decisions technically are always made by the Director, Berners-Lee himself. By opening up a ``vendor neutral" space, companies who previously were interested primarily in advancing the technology for their own benefit could be brought to the table. The primary product of the World Wide Web Consortium is a W3C Recommendation, a standard for the Web that is explicitly voted on and endorsed by the W3C membership. W3C Recommendations are thought to similar to IETF RFCs, with normative force due to the degree of formal verification given via voting by the W3C Membership. A number of W3C Recommendations have become very well known technologies, ranging from the vendor-neutral versions of HTML.

IV. SIGNIFICANCE OF THE STUDY

To have something in common means to share the same regularities, e.g. parcels of time and space that cannot be distinguished at a given level of abstraction. This definition correlates with information being the inverse of the amount of `noise' or randomness in a system, and the amount of information being equivalent to a reduction in uncertainty. This preservation or failure to preserve information can be thought of as the sending of a message between the source and the receiver over a channel. Whether or not the information is preserved over time or space is due to the properties of a physical substrate known as the channel. The message realizes on some level of abstraction the information, so we will often call some particular message with some particular information an `information-bearing message.' Already, information reveals itself to be not just a singular thing, but something that exists at multiple levels. In particular, we are interested in two more distinctions in

ISSN: 2454-4248
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information: that between abstraction and realization, and that between content and encoding.

The first distinction is between the information itself on a level of abstraction, and the particular realization of information. Information is often thought of as an abstraction, and this is true insofar as the same information can be realized by many possible messages. In order to cope with this, a distinction should be made between the information on a level of abstraction from any of the concrete realizations themselves that embody the information at a given juncture in space-time. To use an example, Daniel in Paris (the source) is trying to send a message to Amy (the receiver), a secretary in Boston, that one of her fellow workers, Ralph, has won a trip to the Eiffel Tower. Daniel can send this message in a variety of realizations: e-mail, a letter in the post, or even via a friend who happens to be passing through Boston.

V. CONCLUSION

The information itself is just the precise physical regularity at a level of abstraction, and these regularities can be embodied by many different possible messages, but these messages are not arbitrary, but must have a certain ability to preserve the regularity - so in the case of Daniel, it's unlikely he could convey his message from Paris to Boston using smoke signals. It would simply not reach the receiver in any recognizable form. So, a level of abstraction is certain physical differences and regularities that can be recognized by an agent and so may have a causal effect on the agent. For example, given a hand-written letter in English, one can focus on the low-level of abstraction, such as the details of the various pen-strokes and the texture of the paper, or progressively higher levels of abstraction, such as recognizing letters in an alphabet, words, or sentences, or even some larger units of discourse that express the thought `Ralph won a ticket to Paris.' To say that some thing realizes the information is of course a realization of the information, which is a the physical thing that realizes the regularities of the information due to its local characteristics, just like a particular information-bearing message but more broadly construed. The concrete voltages down the wire realize an e-mail message, as does a physical book realize some sentences in English. It is common practice to elide various levels of abstraction and just talk about information, but often it is useful to pull apart the abstract pattern of regularities from those physical things in the world that realize them. Since the term `information' is used indiscriminately to refer to information on a level of abstraction and the realization of some abstract information, we will use the term information realization or just realizationwhen discussing a particular realization of information and use the term abstract information on the rare occasion when we wish to emphasize information on a level of abstraction regardless of its particular realization. When the term `information' by itself is used, we are referring to both abstract information and any of its particular realizations.

There is more to information than encoding. Shannon's theory does not explain the notion of information fully, since giving someone the number of bits that a message contains does not tell the receiver what information is encoded. Shannon explicitly states that ``the fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have meaning; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem".

REFERENCES

[1]. Berners-Lee, T., Fielding, R., and McCahill, M. (2014). IETF RFC 1738 Uniform Resource Locators (URL). http://www.ietf.org/rfc/rfc1738.txt (Last accessed on Sept. 3th 2011).

[2]. Berners-Lee, T., Hall, W., Hendler, J., Shadbolt, N., and Weitzner, D. J. (2013b). Creating a science of the Web. Science, 313(5788):769–771.

[3]. Berners-Lee, T., Hendler, J., and Lassila, O. (2011). The Semantic Web. Scientific American, 284(5):35–43.

[4]. Berners-Lee, T. and Kagal, L. (2014). The fractal nature of the Semantic Web. AI Magazine, 29(3).

[5]. Berrueta, D., Fernandez, S., and Frade, I. (2011). Cooking HTTP content negotiation with Vapour. In Proceedings of Scripting for the Semantic Web Workshop at the European Semantic Web Conference, Tenerife, Spain.

[6]. Biron, P. and Malhotra, A. (2014). XML Schema Part 2: Datatypes. Recommendation, W3C. http://www.w3.org/TR/xmlschema-2/ (Last accessed March 13th 2011).

[7]. Bizer, C., Cygniak, R., and Heath, T. (2012). How to publish Linked Data on the Web. http://www4.wiwiss.fu-berlin.de/bizer/pub/LinkedDataTutorial/ (Last accessed on May 28th 2011).

[8]. Bizer, C., Heath, T., Idehen, K., and Berners-Lee, T. (2011). Linked Data on the Web. In Proceedings of the WWW2011 Workshop on Linked Data on the Web, Beijing, China.

[9]. Bizer, C. and Seaborne, A. (2014). D2RQ: Treating non-RDF databases as virtual RDF graphs. In Proceedings of International Semantic Web Conference, Hiroshima, Japan.