Chapter XIX
Socio-Technical Challenges of Semantic Web:
A Culturally Exclusive Proposition?

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ABSTRACT

The Semantic Web holds significant implications for learning, culture, and non-native speakers, with culture and non-native speakers rarely being addressed in the literature. In that light this chapter goal explores how Semantic Web disseminates learning, and it addresses critical socio-technical and cultural challenges facing semantic web, potential users, and learners using it. The chapter identifies some of the causes of the socio-technical challenges, looking at two major styles of learning and the position of Semantic Web structure in them. The chapter also offers recommendations for addressing selected challenges facing the Semantic Web.

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INTRODUCTION

In general, the Web holds a special place in information communication technologies (ICT) for information sharing among people globally. As a concept, Semantic Web implies and focuses on the new generations of World Wide Web (W3) architecture platforms that use formal semantics to enhance content delivery. According to Stojanovic, Staab, and Studer (2001), Semantic Web implies that designers create content that best suits machine consumption rather than content for human consumption. However, from the standpoint of Berners-Lee (2000), Semantic Web provides an environment in which both human and machine agents communicate on a semantic basis. The Semantic Web can also be viewed from the standpoint of ontology, the organization of learning and services around a small domain of semantically enriched objects. From this standpoint, Semantic Web can partition and organize information and materials into customized learning, then deliver this information to end users on demand, according to users' preferred needs (Stojanovic, et al., 2001).

BACKGROUND

As a basis for intelligent applications, the Semantic Web is integral to achieving the goals of e-learning, distance, and global education. These intelligent applications will enable more efficient information use by drawing upon deep collections of repository knowledge (Schoop, deMoor, & Dietz, 2006). Beyond the internal world of web architecture paradigms, the organization of Semantic Web and its approach to learning holds significant implications for learning—in general, culture, and non-native speakers that are rarely addressed in the literature, however. This chapter addresses the Semantic Web's socio-technical and cultural challenges that are presented to users, learners, and the Semantic Web itself, while it disseminates learning.

The chapter accomplishes this by identifying selected causes of the socio-technical challenges, focusing on two major styles of learning and the Semantic Web structure position in them. Furthermore, to illustrate the nature of the challenges, the authors explore the foundation of knowledge acquisition tracing it as far back to the idea to Plato and Aristotle's positions on universalism and particularism ideologies. These two foundations help to illuminate the importance of culture and the challenges culture poses in Semantic Web deployment as a learning platform. The idea of cultural variation will be provided as a way to illustrate a key pitfall of Semantic Web which revolves around amplification of digital divide when taken together. For instance, human computer interaction (HCI) model of interaction in the Semantic Web environment and for enhancing communication between users and the computer occur at conceptual, semantic, syntactic, and lexical levels (Patil, Maetzel, & Neuhold, 2003). However, there are key discrepancies and mismatches between technology, and user needs and requirements, some of which are attributable to knowledge, general illiteracy, and information communication technology (ICT) illiteracy and different cultural demands. The chapter also addresses some key implications for Semantic Web regarding design, use, and general effectiveness or lack thereof. A call to action for policy makers, IT designers, and Users would also be made. First, however, is the need to offer a general background on the Semantic Web.

Semantic Web

The rise of the World Wide Web (W3) has significantly influenced the way people conduct research, education, commerce, and politics in the global world. Access to Internet and the W3 allows users to search information on billions of topics in infinite ways. However, the impact is not restricted to mere information searches, but the Internet has evolved as a means for bringing

about political reforms and socio-cultural changes in societies. McLaughlin (2003) points to the significant role Web sites play in less than democratic countries to bring about political reforms and change. However, in spite of the great positives the Internet brings, a serious consequence of Web assessable information is information overload. It is not uncommon for one query to produce hits ranging from hundreds to millions of data when searching for information online (de Moor, 2005). For users, challenge shifts from finding information to deciphering the usefulness and relevance of information. Therefore, for Semantic Web to have the intended impact on learning and continued relevance for all world cultures, much needs to be done regarding its complex, changing and imperfect sources of meaning. Great confusion and debate remains about how to model context in Semantic Web in order to achieve it's pragmatic component (de Moor, 2005; Stojanovic, et al., 2001; Mey, 2003).

MAIN FOCUS

According to Berners-Lee, Hendler, and Lassila (2001), the Semantic Web makes its most contribution by making the W3 more relevant by adding structure and logic. In essence, Semantic Web creates structure by establishing rules for reasoning and organizing data before they can be shared and used by distributing agents. As indicated earlier, the key to Semantic Web is ontology (i.e., shared meanings and services), which can be used to improve accuracies of Web searches and service discovery and delivery. The claim or the underlying assumption of ontology is that by selecting the right concept for a given task or shared knowledge, in theory should become more effective and efficient. However, that is precisely the challenge, in theory, it ought to work, but in reality, there are several factors that hinder the accuracy and performance of ontology in Semantic Web. For instance, scholars allude to the fact that in practice, the Semantic Web needs to take into account the issue of semantic and pragmatics of the Web (e.g., de Moor, 2005, Kim & Dong, 2002; Reppenning & Sullivan, 2003; Singh, 2002a; Spyns & Meersman, 2003; Stojanovic et al., 2001). The next section examines some technical challenges with the Semantic Web.

Technical Challenges

In an attempt to make Semantic Web a reality, one begins with extensible markup language (XML) which provides the structure and syntax rules. In addition to the XML, challenges remain with the notion of resource description framework (RDF) which addresses the actual semantics or meaning. However, problems exist in deciding how much XML would accomplish and to what degree functionalities of the Semantic Web must be relegated to RDF (Stojanovic, et al., 2001; Veltman, 2004). At the same time the details of what RDF content looks like in Semantic Web is always in question, thus, adding to the mystery. One of the primary challenges with the Semantic Web is that the platform or architecture layer is always changing. For instance, Veltman (2004) notes that the fundamentals shifted from standard generalized markup language (SGML) to XML, to Unicode plus uniform resource identifiers (URI). Without getting overly technical, *ontology* enters the picture to speak to the difficulties in sense-making (i.e., shared meanings and services). Among these different types of platforms, the issue of meaning was never really addressed by an ontological perspective. As a matter of fact platform designers have relegated ontology to the idea of logic, that is, the most common meaning associated with a given idea or concept, to the extent that all other forms of meaning are deemed subjective and perceived as non important. Therefore, the limitation put on meaning by reducing it to logic creates pragmatic and contextual difficulties. Sowa (2000) refers to this problem as *semantic primitives*.

However, different fields, communities, and cultures have different terminologies and meanings for similar words (Olaniran, 2007a, & 2007b). Furthermore, while it is true that logic may be ideal and perhaps solve some of the challenges with computer-to-computer communication and interactions, and may even offer solutions to science and technology, there remains the challenge with the needs of *culture* where human-human, human-computer, and other instances of human-computer-human interactions (i.e., Veltman, 2004) are the norms remain unaddressed. Therefore, this paper shares some of Veltman's concern about Semantic Web as presented below.

The issue of culture is especially problematic to Semantic Web and is, in essence, an Achilles' heel that IT designers and theorists fail to consider thoroughly in the development of the Semantic Web. Culture however, is the essence of human existence and development. Significant body of literature has identified the need for understanding culture and its implications in knowledge based learning and in the world of globalization and technologies (Hofstede, 1980, 1991; Gudykunst & Kim, 1997; Olaniran, 2004, 2007a, 2007b). Veltman (2004) concurs that "since every culture focuses on some aspects of knowledge and ignores others, history is essential to understand both the sources of our views and the limitations of the frameworks or worldviews with which we present them" (p. 9). The idea of culture can be traced as far back to Plato and Aristotle who were the foundational figures of Western philosophy using the ideas of *universals* and *particulars*. Plato emphasized the importance of universals while Aristotle focused on the particulars. More importantly, is the globalization and technological trends demanding increase need to digitize information in an attempt to make it more widely available and assessable. According to Veltman (2004) the ideas of universals and particulars came to the fore fold when oral knowledge is shifting to hand-written knowledge.

Thus, the shift from oral to written, print, digital, multimedia, and multi-modal knowledge is creating new possibilities in knowledge domain and dissemination. An example of such a new possibility is e-learning. In the context of universals and particulars are logical rules, particularly, the notion of relations. Logical rules like "relations with," "relations to," and "in comparison to," allow one to develop an understanding and definition of a concept. However, outside the context of universals and particulars, a logical but rather imperfect what of understating a concept is to define it in terms of what it is (Lytras & Naeve, 2006; Veltman, 2004). Dahlberg (1995) on the other hand, offer four categories of definition including: 1. Abstraction (e.g., something is a), 2. Partition (something a part of), 3. Opposition (something is not), and 4. function (something is about). Unfortunately, no one particular dictionary that offers comprehensive definition at these four levels of distinctions. Thus, the problem of acceptable definition persists and is germane to the Semantic Web. Assuming that "context-free" facts and logical rules are adequate is problematic because of the impossibility of describing data enough for use in "arbitrary applications" or technology (Braun, & Schmidt, 2006; McCool, 2005; Singh, 2002a).

The universal is considered static (Veltman, 2004) and can easily be incorporated into machine language or metaphors. On the other hand, the particular is constantly changing, and thus, termed organic metaphors. Thus, when considering services or knowledge dissemination via electronic platforms, it makes sense, and it is easier to separate the changing from the static. More importantly, the universals or the unchanging aspects are more amenable to program into machine as objective elements that can be easily assessed than the particulars or subjective components. This problem creates challenge in the sense that by separating or not accounting for the different particulars, the target audience for whom

Semantic Web is designed becomes limited at best or are removed altogether (Olaniran, 2007a; Veltman, 2004). Although, a suggestion might be why don't we come up with new sets of particulars that all cultures can relate? Unfortunately, this approach is not feasible; simply because it will be impossible to understand and preserve past classification from different cultures. On the other hand, creating a new classification schemes is believed to be insufficient to understand *how* and *why* earlier cultures use different ways of organizing knowledge (Veltman, 2004).

From another perspective, the shift from oral to written results in what has been viewed as a decline of dialogue (Ong, 1958). This is true as some cultures and societies, such as those found in Somalia, did not have any written form of language until after World War II, though the society existed millennia prior to that time. At the same time, the shift from written to print or digital culture is putting tremendous emphasis on linear and analytic thinking (McLuhan, 1962) which characterize the tenet of most e-learning and other human–computer interactions. The challenge, in essence, is in how to use the digital media content in a way that preserves and keep alive the awareness of different historical and cultural modes of perception. More importantly, how to use the new technology (i.e., Semantic Web) to address different ways of thinking that is not limited to mere access to information, but rather relate to different belief systems and different way of knowing including mindsets and varieties of world views. After all, information cannot be understood unless the historical content and the dialectic that creates it is understood (Lytras & Naeve, 2006; Stutt & Motta, 2004).

The quest for meaning is an age old idea and began prior to the development of Semantic Web itself. It has been argued that without meaning, there can be no shared understanding or communication (Veltman, 2004). Thus, meaning is important, the challenge however, is that the process of meaning is problematic in machine contexts when considering different elements that are involved, specifically, the idea of culture. Berners-Lee (1997) was on the right track when he outlines the need for Semantic Web to go beyond access to information to one that accesses different methods of knowledge. However, the implementation of Berner-Lee idea varies from technologists or artificial intelligence narrow view of definition to humanists' ideology of inculcating all human knowledge and experiences (see also Veltman, 2004).

Socio Cultural Challenges

More specific to issue of e-learning is the need to explore how culture influences learning such that mere access, which has a challenge of it own as far as Semantic Web is concern, influences content and learning as whole. For instance, Olaniran (2007a) illustrate the effect of culture on e-learning using the Hofstede's dimensions of cultural variability (see also Van Dam & Rogers, 2002). In particular, the uncertainty avoidance dimension and e-learning identifies security and risk as a primary concern in some cultures. For instance, while e-learning is expected to be seen in high-risk or innovative culture as something intriguing and potentially fun, motivational, and interesting; in a low risk cultural environment, the same technology can be perceived as dangerous or counter culture (Olaniran, 2007; Van Dam & Rogers, 2002). From another standpoint, certain cultures view authority or power differently (Hall, 1976; Hofstede, 1980). For instance, in a power distance culture (i.e., a measure of inequality in a culture), contrary to high equality culture where the expectation, is that knowledge is shared equally across the society and people; high power distance culture, recognizes the uneven distribution of power in the society.

The different approach to power, in essence, becomes contradictory to the aim of e-learning and

the Semantic Web technologies that power it. For instance, different learning styles surface within different cultures. In particular, technology architecture such as Semantic Web is seen as convenient way to accomplish the aim of constructivist idea (e.g., Weigel, 2003) of making learning fun, easy, and for giving greater control to students about learning. However, in a power distant culture, such approach is counter to cultural demands of the culture and at times confusing and often frowned upon. Thus, "*telling*" or learning style that emphasizes hierarchical transfer of skills from authoritative teachers to students is the norm in power distant cultures (Olaniran, 2007a; Richards & Nair, 2007).

Furthermore, it has been suggested that it might be difficult to get people to use certain technology in power distant cultures where status dictates every aspect of interpersonal communication (e.g., Devereaux and Johansen, 1994; Olaniran, 2007b). For instance, in African culture, where significant emphasis is put on relationships, it was found that when e-mail was used for communication and interactions, people follow through in person or other communication media such as telephone to make sure that messages were indeed received (McConnell, 1998), and had the desired effect (Olaniran, 2001). Although, following through with more traditional medium may be less cultural than McConnell suggests, it has been shown that culture influences how communication medium or technology is used. For instance, Japanese designers consider cultural factor by acknowledging that not all types of communication can be supported by communication technology systems (e.g., internet or Semantic Web). Furthermore, the use of technology for supporting group project or collaborative work in Japan demands that, groups must first meet physically to establish a trust environment before interacting via technology medium (see also Barron, 2000; Olaniran, 2007a).

The role of culture on e-learning and Semantic Web can be drawn from explanation provided by Paul Kawachi. Kawachi (1999) argues that the Japanese lags and do not embrace e-learning as a result of their language structure. Specifically he indicates that Japanese language, developed early in life, is more susceptible to right brain learning mode (i.e., visual and memorization skills) when compare to left brain (i.e., analytic and argumentation skills). As a result, the W3 is primarily used for searching and printing-out information for reading or translating and secondarily for entertainment and games (Kawachi, 1999).

In summary, when there is no fit between technology and culture the diffusion and eventual acceptance of the technology will be seriously handicapped regardless of whether its Semantic Web or not (e.g., Green and Ruhledder, 1995, Mesdag, 2000; Olaniran, 2007a, 2007b). From transitioning Semantic Web within the context of globalization and ensuing e-learning, significant emphasis must be put on remediation of the challenges of Semantic Web identified above such that content must match the needs of users (in both learning styles and cultural preferences). Thus, the key to resolving cultural problems is to recognize cultural differences and associate technology use with the prevailing cultural values, structures, and activities within these different environments. As is, the Semantic Web is designed with the goal of one size fits all and for content to be applied universally such that individuals irrespective of cultures or unique preferences are able to use it. However, different societies have developed their own vocabularies to meet their unique needs. The different vocabulary, however lack formal semantics. Stojanovic et al (2001) contend that regardless of the time and money put into creating training material (e-learning content) the content is useless if it cannot be indexed or searched with ease. At the same time, content in Semantic Web is only as good as users' parameter or query. For instance, simple keyword search are only useful when users have a clear idea of what they are looking for and the information fits into generally accepted definition (a precisely defined semantic).

Technology access is another factor contributing to adoption and acceptance for eLeaning (Olaniran, 1993, 2007; Vaughan & McVicar, 2004; Wahid, 2007). The level of access to technology especially in less economically developed countries (LEDCs) has been written about extensively and it reinforces the digital divide between economically developed countries (EDCs) and the LEDCs. An erroneous assumption that is often made about technology especially by designers and programmers is the fact that individuals around the world have similar and easy access to technology and internet. Consequently, content providers create content for e-learning in particular, without regards to the issue of bandwidth (Olaniran, 2004, 2007a; Wahid, 2007). Along the same line of reasoning is the fact that Internet access cost a lot more in the developing countries when considered in proportion to income. Individuals or users may have to travel several miles to access required e-learning curriculum, which does not bold well in motivating potential users to adopt the technology. Also, the lack of proficiency in English, creates hindrance to internet adoption in certain countries (Olaniran, 2007b; Wahid, 2007). Furthermore, the patterns of technology adoption differ between men and women. For example, Wahid (2007) using the technology acceptance model in a study among Indonesians found that adoption of technology among men is affected by the *perceived usefulness* while women's adoption is based on *ease of use*. Access problems also impede the frequency of use and lack of comprehension of basic commands and protocols to be successful and to facilitate adoption that results in continue usage of technologies (Olaniran, 1993, 2001).

Along with general access, culture plays a significant role in how people perceive technology (as indicated earlier in this study). For instance, the challenge in what a new technology innovation such as e-learning can offer and the hindrance by traditional (local cultural) approach is not to be taken lightly. People fear new things despite the fact that change itself is a constant in human life. However, in high power distance culture, people tend to see technology system as threatening to their traditional learning methods. The perceived threat creates anxiety about technologies and consequently the ensuing negative reactions in using them.

Other social problems exist with semantic problems that transcend culture. With the transitioning from print to digital media comes information overload. Information overload addresses the issue of navigating the Web through enormous archives of data from books, newspapers, films or videos among others. Google for instance currently, index more than three billion Web pages (Stutt & Motta, 2004). Learners have always been faced with the challenge of having to sort through array of material and to evaluate information. But the advent of digital information creates exponential leap in the amount of information that learners and users must work with. Though the need to sort through massive information led to the development of most visited search engines and Semantic Web tools such as Google and ontology based search (Stutt & Motta, 2004).

Information authentication, the difficulty sorting good information from bad, increases in complexity in lockstep with web growth. Outside of traditional or conventional indexing facilities such as librarians and information archivists, there are many Web sites where information can be gathered. Although, some digital archivists maintain objective standards, there are several however with ulterior motives. Stutt and Motta (2004) puts it more succinctly when they argue that some of this archivist have "axe to grind." Some sites provide themselves as valid and impartial research data sources, but they are funded by other commercial interests to perpetuate their causes and goals (Stutt & Motta, 2004). For example, a website purportedly about Martin Luther King is actually sponsored by a white supremacist group.

Based on the amount of information, it is often problematic to match learners with material that is relevant to their needs at a given point especially when attempting to customize course content or information delivery. At the same time, efficiency is lost in the amount of time spent on the matching process. Semantic Web and e-learning also face challenge with the need to provide support for learners (formal or informal). For example in the traditional classroom, students know to go to the instructor or a designated person who is more experienced than the learners to obtain answers to questions. Whereas, in online forum, learners may have to rely on technology or large informal groups of users (Stutt & Motta, 2004) that may or may not have the correct answers or at times offer conflicting information that must be sought through.

FUTURE TRENDS AND IMPLICATIONS

The Semantic Web and technologies at large need to be pragmatic to be effective and useful. Specifically, the Semantic Web must be sophisticated enough to address how different cultures categorize, classify, organize their worlds and interactions that exist within them. The globalization trend or the idea of one world is not helping the situation much; as we live in a world where developed countries with population less than one third of the world controls resources and are transplanting their cultural ideals to the rest of the world as the norm via technologies. Consequently, traditional distinctions are constantly being eroded (Hovy, 2002)

One way, by which Semantic Web is attempting to resolve the challenge of the distinctions is ontology. Ontology usually is attributed to generic meaning and knowledge that can be used in different applications. Ontologies contain semantic networks of concepts, relations, and rules that define the meaning of particular information resources (de Moor, 2005; Lytras & Naeve, 2006). However, to be effective, it is argued that ontology needs not be too restrictive or tightly linked to a particular purpose or user group (Spyns, Meersman, & Jarrar, 2002). The challenge, however, is that ontology is not an end itself, because one of the major purpose of the Semantic Web is to provide access to Web services, but semantic approach for describing, discovering, and composing Web services is not adequate. Services or contents can not be described without paying attention to how it will be used (i.e., pragmatics) because a "community of service" almost always use services in novel and unintended ways. To this end, de Moor (2005) argues that social mechanisms are needed for evaluating and discovering trustworthy providers and consumers of services by taking into account the contexts and interactions in the composition of service applications (Kim & Dong, 2002; Lytras & Naeve, 2006; Mey, 2003; Singh, 2002a; Singh, 2002b). The usefulness of ontology is in the eye of the users or what de Moor calls the "eyes of multiple beholders"—the communities and individuals within them using ontology for a specific and collaborative purposes.

Furthermore, human communication is important in meaning negotiation that characterizes Pragmatic Web. Conceptual approaches discussed in this paper can be use to augment but not necessarily automate human meaning interpretation and negotiation processes. De Moor (2005) offer Language/Action Perspective as a way forward in modeling more complex and realistic communicative interactions by stressing the coordinating role of language. This perspective, in particular has led to various proposals for human/agent communication-based collaborative models and systems (e.g., Harper & Delugach, 2004; McCarthy, 1996; McLaughlin, 2003; Weigand, & de Moor, 2003). While ontologies are important for the semantic and Pragmatic Web development, much of the research addresses

representation and reasoning. However, there is the need to also address ontology methodology issues in an attempt to bring Semantic Web to a pragmatic level. According to de Moor (2005), the process will include the human process of modeling, selecting, using, and changing meanings for collaborative projects. At the same time, e-learning and the educational sector, along with other public agencies and industrial sectors have similar needs for a common competency ontology that can be used for developing customizable training pathways. The Pragmatic Web, therefore, becomes an extension of Semantic Web in the next phase and evolution of W3. It is true that for the Semantic Web to accomplish its claim and potentials, more work must be done on its pragmatics. For instance, simple keyword queries maybe problematic in e-learning forum where it is noted that the viewpoints and the knowledge levels of the author and users of learning content may be completely different (Stojanovic et al., 2001). Specifically simple keyword queries do not always pick up synonyms, abbreviations, different languages (e.g., house & haus) or morpohological variations and the query context. The context of use for extracting meanings stored in ontology should be better understood. After all, the central component of the Pragmatic Web is meaning and the process of negotiation that it entails and thus, it should be connected to the Semantic Web in terms of selection and representation. One way of addressing such challenges is to establish and define corresponding relations in keywords in the *domain ontology* (Stojanovic et al., 2001*)*. Also, finding out how meaning negotiation process works is helpful to pragmatics of the Web and for creating automated or support systems for meaning negotiation (de Moor, 2005). The attempt to move research from meaning representation to meaning application and usage should be given considerable focus (i.e., from semantics to pragmatics). This approach would help in network applications where individuals or communities of users are able to immerse themselves by tapping to their full collaborative potential. For example, the idea of multiple knowledge neighborhoods (i.e., locations in cyberspace) where learners and groups can meet with goal of learning about certain topic is suggested (Stutt & Motta, 2004). In essence, members can belong to more than one community or groups. The Semantic Web can be aimed at supporting the different communities by providing specific ontologies for them either through topics, tasks, practices and others, the Web can aim at providing an acceptable "*lingua franca"* for each community. Consequently, the targeted ontologies could result in fewer problems in developing, negotiating, and shared understanding than when attempted to offer global ontologies (Stutt & Motta, 2004). The key to its potential effectiveness lies in the fact that each knowledge neighborhood will address its own specific needs; however, the option for sharing content with other communities can still be maintained. Communicating across boundaries of different communities cannot solve the cultural and cross-cultural challenges; however, it can offer a buffer where members from different communities may help synthesize and translates information or concepts to other community members. In other words, membership in different communities can allow learning objects or ontologies to be flexible in addressing local and outside community needs. The key is that the learning objects is able to take on different meanings in different domains and social worlds (Star & Griesemer, 1989; Stutt & Motta, 2004).

Furthermore, there is need for knowledge charts—which are constructed using ontologies but geared towards graphical representation of content summaries and interpretations, Due to several possible meta learning in any course structure, it is suggested that there needs to be a way to automate knowledge chart construction (Stutt & Motta, 2004). As work in human language technology continues, emphasis on supporting extraction

of argument structures from text is paramount (Sereno, 2003; Kurtz & Snowden, 2003; Stutt, & Motta, 2004; Vergas-Vera & Moreale, 2003) along with a new form of browsers to search the Web. Vergas-Vera and Moreale (2003) conducted and reported on a study about extracting arguments from students essays, and there is ongoing work "ClaimSpotter"—for automatic extraction of scholarly claims among other ScholOnto project. Increase use of RSS feed for extraction of content and documents are also gaining popularity. At the same time, there is ongoing work in Semantic Web browsers to augment successful knowledge navigation. A case in point is the "Magpie" semantic browser which originated as a means of assisting in sense-making for users and to provide access via contextual menu for complementary database or sources of knowledge that can be used in contextualizing and interpreting information on Web pages. However, Stutt & Motta (2004) warns about limitation of magpie that it is limited to instances of knowledge contained in its database, such that there needs to be a way to extend its concept recognition abilities. Development and extension of semantic browser's concept recognition abilities would allow phrases referencing a project and those of texts in different languages can be identified together as concept instances while given a broader concept domain.

In essence, the Semantic and Pragmatic Webs relate to each other on broad array of socio-technical dimensions. We call this relationship onto-covariation, the usability and relevance of the Semantic Web to users in diverse contexts. Like that of the mathematical correlation, no relationship between the semantic and pragmatic would equal zero, while a perfect relationship between these two entities would be 1. So defined, one can theorize about causes of phenomena (like those mentioned above), measure the relational aspects among components of the Semantic and Pragmatic Webs, and test usability models. Once successfully modeled, remedial efforts can be efficiently targeted to either the semantic or Pragmatic Webs with greater probability of effective improvements. Finally, onto-covariation pushes the Semantic and Pragmatic Webs even further—to the practical. Understanding how the partitioning and organization of information covaries with the semantic biases of diverse cultures will no doubt drive future development and usability of the Semantic Web.

CONCLUSION

Significant challenges exist within Semantic Web to be used for e-learning and service provision. Some of these challenges are technical and some are social. Thus, this paper alluded at some of the social technical challenges facing effectiveness of the Semantic Web. Ontology issues within Semantic Web and the pragmatics of Semantic Web were addressed as well. In addition, effort is made to offer few approaches that can be used to alleviate some of the problem especially in the light of some cross-cultural challenges that may continue to persist even with the best of intention from technology capabilities.

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KEY TERMS AND DEFINITIONS

Culture: Consists of different value preferences that influence communication interaction and how people create meaning.

E-Learning: Involves the process of knowledge dissemination and acquisition taken place over electronic networks

Globalization: Involves economic and socio-cultural ideas where organizations are able transcend national geographic and cultural boundaries through convergence of space and time in attempt to accomplish goals.

Ontology: Represents the organization of learning or course materials and services around small domain of semantically enriched objects Semantics

Pragmatic Web: Focuses on meaning and the process of negotiating meaning.

Semantic Browser: Search browser for determining the contextual use of concepts.

Semantic Web: Implies the process or idea where content is made suitable for machine consumption rather than content that is only fit for human consumption.