Toward Semantic Web engineering: Future of Web Technologies

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Abstract— objective of this paper is to provide an overview semantic web engineering development with respect to their application, technologies, quality factors, and measures. Basically, web Engineering is the application of systematic, disciplined and scientific approaches to development, operation, and maintenance of Web-based applications. Web engineering attracted attention of many people like web developers, clients, government agencies, users, academics and researchers. In addition, this novel field has attracted professionals and researcher from other related disciplines such as software engineering, distributed systems, computer science, and information and image retrieval. Web engineering proposes methodologies to design implement and maintain Web applications but these methodologies lack the generation of meta-data. Huge information on web is machine readable but not machine understandable. To make contents machine understandable, concept of the Semantic Web is introduced to make content machine understandable. Key goal of Semantic Web engineering is to provide machines with a more precise understanding of data.

Keywords— Web Engineering, semantic web, software engineering, distributed systems, computer science, information and image retrieval

I. INTRODUCTION
It is both a practical approach and a growing collection of theoretical and empirical research in Web application development. Web engineering is a holistic approach, and it deals with all aspects of Web-based systems development, starting from conception and development to implementation, performance evaluation, and continual maintenance. Building and deploying a Web-based system involves multiple, iterative steps. Most Web-based systems continuously evolve to keep the information current and to meet user needs. As mention earlier, Web engineering represents a proactive approach to creating Web applications. Web engineering methodologies have been successfully applied in a number of Web applications.

Web based systems
Web-based systems change and grow rapidly in their requirements, contents, and functionality during their life cycle. Web based system development is a continuous activity without specific releases as with conventional software. Thus, a Web-based system is like a garden, it continues to evolve and grow [14]. Web based systems are divided broadly into two categories, like Simple Web-based systems and advanced Web-based systems. Simple Web-based systems are primarily textual information in non-core applications. Its information content are fairly static, have Simple navigation. Such systems have infrequent access or limited usefulness, Limited interactivity and functionality. It is stand alone systems doesn’t have High performance requirement, Security requirements. Simple Web-based systems are developed by a single individual or by a very small team. Now, we talk about advanced web applications which are basically dynamic Web pages because information changes with time and users needs. It contains large volume of information which is difficult to navigate and find information. It is integrated with database and other planning, scheduling and tracking systems. High performance and continuous availability is a necessary for advanced web based system. Requirement of advanced web based system includes a larger development team with expertise in diverse areas, risk or security assessment and management, Needs configuration control and management, necessitates project plan and management, requires a sound development process and methodology, user satisfaction vital. In advanced web based system, web site/application is main communication medium between the organization and users.

II. BASICS OF SEMANTIC WEB
Semantic web basically introduce to make large information repository on web machine understandable in order to retrieve proper and relevant information. Semantic web parameters Semantic web have a several parameters such as content, Conceptual perception, environment and Resource utilization. (a) Content: Semantic web encompasses actual content along with its formal semantics. Here formal semantics are machine understandable content, generated in logic based languages such as Web Ontology Language. Through formal semantics of content, computers can make inferences about the data i.e., to understand what a data resource is and how it relates to other data. In today's web there is no formal semantics of existing contents, these content are machine-readable but not machine understandable. (b) Conceptual Perception: Current web is just like a book, having multiple hyperlinked documents. In book scenario, index of keywords are there in each book but context in which those keywords are used is missing in the indexes. There are no formal semantic of keywords in indexes. To check which one is relevant, we have to read the corresponding pages of that book. Same is the case with current web. In semantic web this limitation will be handled via the concept of ontologies, where data is given well-defined meanings, understandable by machines. (c) Environment: semantic web is the web of ontologies having data with formal meanings. The semantic web is about having data as well as documents that machines can process, transform, assemble, and even act on data in useful ways. (d) Resources Utilization: There are a lot of web resources that may be very useful in our everyday activities which are easily locate and use in semantic web world.

III. NEED OF SEMANTIC WEB ENGINEERING
The World Wide Web is an information repository with virtually unlimited potential. However, this potential is relatively untapped because it is difficult for machines to process and integrate this information meaningfully. in recent times, researchers have begun to explore the potential of associating web content with explicit meaning, in order to create a Semantic Web. Rather than rely on natural language processing to extract this meaning from existing documents, this approach requires authors to describe documents using a knowledge representation language.

IV. RELATED WORK
Content base image retrieval system for lung cancer Semantic web tools is design the Nubian Ontology for Nubba civilization [1]. An important objective of the pilot study was to investigate the capability of the tools which help in developing semantic web services such as multilingual Dictionary and information retrieval services to design Nubian Ontology. TobBraid Composer was used as a tool in this study to test if it supported Nubian letters.

PAD uses the semantic web technologies in different ways: First it publishes parts of the social network data as Linked Data[2]. It uses semantic web sources for automatic annotation of the social network entities with resources on the semantic web. Finally it uses the semantic web sources to collect required background or domain knowledge for the purpose of recommending items to the social network users.

Social Web applications are engineered around users sharing personal information with their connected peers. They provide generic privacy settings which user specify with whom their information can be shared. Trust has to be taken into consideration when applying privacy settings. Privacy Preference Framework in social semantic web is provided more fine-grained enforcement of access control when sharing information [3]. This ensures that users' personal information is accessed only by the intended third parties.

The optimization of the whole supply chain passes inevitably by better mastery of flow, especially the couple physical-informational flows. To do this, an approach for tracking and tracing flows of supply chain is presented with semantic web services [4].

Reverse engineering is usually used to recover missing and up to date models of a software system to support its comprehension when changes are required to maintain or evolve it. Model driven engineering approaches have been recently proposed to develop more quickly web applications with a high design quality and maintainability. Integrating reverse engineering techniques with model driven web engineering methods originates evolution approaches that would reduce the evolution effort while improving the quality of the modified web application. Such an evolution process exploits the models recovered by reverse engineering as the inputs of a model driven web engineering approach to design and implement the modified/evolved version of the application. This paper describes a general process for the model driven evolution of web applications, suitable for any model driven web engineering method.

Semantic web, the future of all web technologies has its roots on ontologies. web usage patterns as is introduced as a novel source of semantics in ontology learning[6]. This methodology combines web content mining with web usage mining in the knowledge extraction process. Therefore, both the web user's and web author's
perspectives are captured with respect to the web content, which ultimately leads to extraction of more realistic set of conceptual relationships.

Semantic Web Services are enriching Web services with machine processable semantics. To be implemented with less effort, SWS can reuse syntactic and semantic descriptions hidden under the source code of Web applications already developed. a framework for reengineering Web applications consists in reverse engineering Web applications towards conceptual models specified with a proposed UML profile, from what syntactic and semantic descriptions of new SWS are generated[7].

Civil Engineering Management plays an important role in any project for saving money and utilizing time efficiently. a semantic web service-oriented model is presented for civil engineering management, aiming to integrate different civil engineering management-related web services and provide flexible project management by using a central decision making component[9]. The proposed model is based on Web Service Modeling Ontology and its execution environment.

Semantic Web is an extension of current web in which web information resources are accompanied with their formal semantics, understandable by machine. The ontology is the recommended mechanism by W3C for these formal semantics and it is considered as a backbone of every SW application. a technique for ontology design is introduces during SW application engineering process [10]. By incorporating this technique, existing web applications design methods may easily be upgraded for SW applications.

Design engineering educational framework using ShareFast is presented [12] using an open source, client/server application for document management system based on workflow, as e-learning tool. The association between design documents and workflow is described by metadata based on semantic Web technology. The client software offers a workflow editor to create and edit workflow.

Cognitive models proposing architectural and knowledge-based requirements are agents to structure ontological models for cognitive profiling in order to increase cognitive awareness between themselves, which in turn promotes flexibility, reusability and predictability of agent behavior; thus contributing towards minimizing cognitive overload incurred on humans. The semantic Web is used as an action mediating space, where shared knowledge base in the form of ontological models provides affordances for improving cognitive awareness [13]. The vast majority of Web services on the Internet lack explicit and sufficient semantic information. As a result, we cannot provide all the relevant services during service discovery, and have difficulty in service composition.

an automated approach to semantic annotation for Web services is based on the DBpedia knowledge base [15]. Through rich, open Linked Data resources, and taking advantage of the DBpedia Ontology, a consistent and cross-domain ontology, and its application DBpedia Spotlight which match the appropriate Linked Data concepts to the corresponding parameter concepts of Web services. The annotated Web services contain the same semantic relationships as those within their corresponding Linked Data resources

V. CONCLUSION

In this paper, we focus on need, evolution and current development of semantic web engineering. Huge information on web is machine readable but not machine understandable. To make contents machine understandable, concept of the Semantic Web is introduced to make content machine understandable. Semantic web is an extension of the current web. Semantic web, the future of all web technologies has its roots on ontologies. Semantic web contains both web of documents containing data and web of ontologies. Semantic web Engineering includes all activities involved in the design, implementation, deployment, maintenance and evolution of a semantic Web application.

REFERENCES


