A Survey of Semantic Computing: General and Islamic Domain Applications

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ABSTRACT

Semantic searching has already received a substantial amount of interest as a way to search specific contents on the web. The development of ontologies has proven their worth in providing interesting solutions to knowledge validation. This paper presents a general overview about the incorporation of semantic searching in different computing related areas, more specifically its usage in the domain of Islamic knowledge and legal rulings. Semantic computing is basically an approach towards the "relevant and meaningful" search that relies on semantic structures, such as ontological representation. Furthermore, this paper provides a summary of relevant work conducted so far in the said domains. It also focuses on the importance of Islamic Legal Rulings (Fatawa) which are authentic legal documents provided by specialized scholars (Muftis) on different daily life issues in the context of Islam. To find a valid and concluded legal ruling regarding a particular issue is surely not a simple task from an enormous knowledgebase of Islamic Legal Rulings given by different scholars in different times. These collections are so vast mainly due to a couple of reasons; one being the time span since the inception of Islam that spreads over fourteen hundred years and the other being the difference of opinions recorded by different scholars in different stages, places, and time. These arguments clearly justify the need of semantic computing in the prescribed domain and its appropriateness as a mean for searching in case of Islamic Legal Ruling besides the keyword based searching.

Key Words: Semantic Computing, Semantic Searching, Ontology, Islamic Legal Rulings, Fatawa.

1. INTRODUCTION

Today, the world is dominated by science and technology, the knowledge among people is being spread by the WWW (World Wide Web). It is providing, storing and transferring data to the various fields in an effective and quick manner. The web provides a broad environment for different activities, including different formats of publications, but publishing results of textual format prevents computer programs from processing the contents of the articles directly which can enhance the knowledge management tasks efficiently. Scientific terminologies are one of the most prominent components of scientific communication and they are evolving towards more formal knowledgebase that can be processed by computer easily.

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The Semantic Web introduces a general architecture that permits the user records to be easily published and used between different applications, enterprises, and group of people specially [1]. By considering the enclosure of semantic substance available on Web, the main goal of semantic is to convert current web, conquered by scattered and semi-structured material in "conceptual data available on web". Web technologies based on semantic, allow person to generate information put on the Web, database of vocabularies, and generates rules and regulations to access that information. Linked data are authorized by technologies such as RDF (Resource Description Framework), OWL (Web Ontology Language), SPARQL (SPQRQL Protocol and RDF Query Language), and SKOS (Simple Knowledge Organization System). Search accuracy is also improved using Semantic based searching. This improvement in accuracy is due to better understanding of contents to be searched and the appropriate meanings as they appeared in the search on the Web. It thus, generates more precise and significant results. Consequently, there is a slight disadvantage while adopting this strategy, that it is slower than the keyword–based searching.

The General Semantic Searching Architecture [2], as illustrated in Fig. 1, clearly describes the components involved in playing their role for semantic computing and searching. The major aspects are the "User Search Interface" and the "APIs" that initiate the computation process but the core is the "Semantic Search" component that gives away the means to extract the meaning, concept or the context out of the search string besides keywords and shifts them to the "Nodes" based on "Taxonomy" for their relevant usage in the form of text or tags, whether using transformations or mappings. Now these refined mappings and transformations are then properly addressed and utilized by any "Content Management System", social media application or such type of data repository by providing a conceptual description or data modeling by means of different "RDF Libraries", that is again incorporated in any sort of internet based web resource, using a variety of syntax notations and data serialization formats again devised from the same theme of the semantic model used for initial transformation and then be put forward to various front ends using many different "Web Services". In this whole system, Ontology is simply used to describe the knowledge as a set of related information under a certain domain.

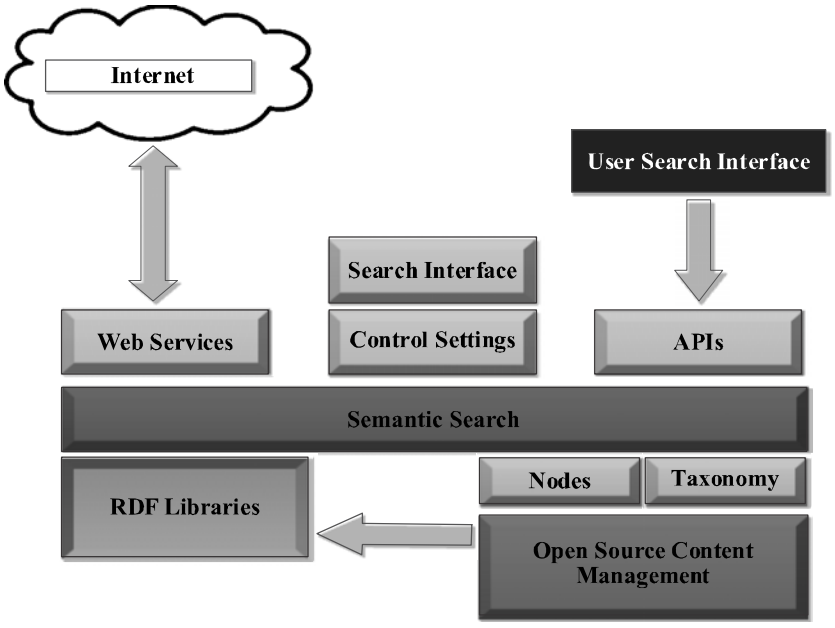

FIG. 1. GENERAL SEMANTIC SEARCHING ARCHITECTURE

1.1 Search Engines

To overcome such communication of documents, the search engines are the fundamental and prominent tool to provide reliable and consistent way to create links among different documents and to provide the user to search for particular information with simplicity using keyword based searching. Search engines are playing an important role in different domains like science, medicine, education, law, religion-based problems, bio-medical, health, news etc.

1.2 Semantic Search

Searching for the desired and relevant information on the web requires intelligent, conceptual and meaningful semantic representation of documents which should give the relevant and desirable information with respect to the user needs as this is a continuous challenge in Information Systems.

Semantic computing is useful in several different domains for processing and transformation of information regardless of any platform with the context of conceptual and meanings. Several applications are developed using semantic computing for making use of this conceptual search in many different areas like education, medical, communication, legal and law documents, business process, multimedia, commercial and general document retrieval and so on. Within these highlighted domains some researchers also focus on Islamic Knowledgebase for information extraction and processing using semantic search.

1.3 Semantic Search Criteria in Islamic Domain

All major religions in the world have some rules and regulations that are followed by its followers. Islam is not an exception. Islam derives its laws from the Holy Quran (the Holy book), and the Hadith and Sunnah (words and deeds of the Holy Prophet Muhammad, PBUH). Another source of reference is Ijtehad (reasoning of qualified scholars, who agree on a single verdict). Thus, the Holy Quran, the Hadith and Sunnah and the Ijtehad are all used to extract Islamic laws. The compilation of rules and regulations extracted from the above mentioned sources are called **Shariah, Islamic Legal Ruling** and **Islamic Jurisprudence** [3]. Islamic Legal Rulings (Fatawa) are principally given by authorized and learned scholars called Muftiyan (Mufti as singular). These scholars give their judgment according to the Islamic laws in the light of "the Holy Quran", "the Hadith and the Sunnah" as well as "Ijtehad" that is a mutual consent about any particular issue by learned scholars [4,5]. All the judgments on any particular matter are issued with the endorsement and authorization of an Islamic Institution, named as Darul-Ifta [3, 6-8]. The language of Legal Ruling (Fatwa) is very formal. In a Legal Ruling (Fatwa), a Mufti takes care of issues which engulf the believer by referring to fundamental documents of jurisprudence [4,5,9]. These topics normally deal with ritual issues; however, in few cases it can also deal with any conceivable topic including all problems and faces of life such as social, societal, political and community-based issues. It also includes problems from daily life and ambiguities in using applications of modern technology.

Islamic Legal Rulings (Fatawa) shows links and relationships among different Islamic problems on the basis of the Imams (religious scholars) and also among the different sects of the religion Islam [5]. In such cases, for any kind of Islamic problem, there is an answer, which is provided under the authentication of different Legal Rulings (Fatawa) that clearly provide the idea relating to the solution of the problem asked by the user. For instance, in Islam, there is a concept of Haram (Prohibited) as well as Halal (Permitted) which is very critical and foremost important aspect with regard to the faith, but is addressed according to the understanding of different sects and school of thoughts [9].

This paper discusses the basics of semantic searching and detailed research on related work in the prescribed domain and explains the importance of the entitled area and highlights the research gap in the area of Islamic Legal Rulings (Fatawa) for semantic computing.

2. SEMANTIC COMPUTING: GENERAL APPLICATIONS

During the survey it is assessed and realized that there is not much work available in the area of Islamic Legal Ruling, in fact, it is more justifiably uttered that there is none present in the context of semantic computing. Since the recognition of semantic computing many researchers have identified the straight forward but efficient implication and application of semantic representation in various areas of technical and social sciences [10]. Many different authors have even proved its benefits and utilized its concept, even in the domain of religious affairs and knowledgebase.

2.1 General Ontologies

Ontologies are the main source to gather information of specific domain by describing concepts in the domains and relationships that are held between those concepts.

In the paper [11], authors have identified few basic issues with broad example on ontology creation. Different questions are identified like role of semantic web, and how they are defined. The design issues related to ontology construction i.e. the basic concept, Ontology Life Cycle, Ontology Development and Reasoning, Ontology Building Stages and different relevant problems and tasks are discussed at length. Protégé is used as a tool for building the Ontology, which uses classes and sub-classes.

Many researchers, like in [12-15], also used semantic computing and created ontologies in different domains to get more advantages out of the concept based search. Following discussion further elaborates such uses.

The document representation framework is a basis for information retrieval [16] and is under investigation by researchers for many types of documents including Legal documents [17-19], Holy-Quran related documents [20-23], multimedia contents [24] and commercial document retrieval [16,25,26] etc.

In the paper [27], the authors present their views about the SBPM (Semantic Business Process Management) which is a method of enhancing the degree of automation in the conversion between business requirements of an enterprise and actual process space of the same enterprise. The approach for enhancing the level of automation of BPM is taken as SBPM which characterize the different domains of an enterprise by the use of Ontology Languages and Semantic Web Services frameworks.

In the paper [28], the authors present their ideas about the OBIES (Ontology-Based Information Extraction System) which is the extension of simple IES (Information Extraction System). In simple IES, different types of information are retrieved from natural language text by processing such information automatically. But OBIES is totally based on knowledge representation and has the ability to support the development of the Semantic Web together with the Ontology based management, control and presentation.

Semantic web also plays an important role in modeling electronic publishing in the field of Biomedical Sciences. Therefore, in the paper [29], the authors shed some light on biomedical ontology as a precise concept, named as Biomedical concept system that ranges from terms used to list scientific literature to extremely proper computational ontologies like Open-GALEN. Mainly in Biomedical Sciences, newly research methods encounter the conventional Scientific Method research. The methods like DNA microarrays and proteomics let researchers and scientists to execute a huge amount of data quickly and swiftly, preferably using the benefits of semantic computing techniques.

Multimedia, with its commonly used types like audio–video, and graphics, is also another domain in which semantic computing is playing a vital role. Searching and finding contents over the web relevant to multimedia is a rapidly growing area of research and development. In the paper [30], the guidelines specifying how to design a web based information system especially for multimedia contents are

presented. These specifications emphasize on the close association of the collaborative multimedia based tagging along with the semantic technologies. Moreover, the paper is focusing on the tasks of producers, that are also responsible to adjust meta-data to the contents of multimedia and then connecting them to domain relevant ontologies. Browsing with the help of ontology based methodologies and designed tags are also discussed, and their relationships with social media are further analyzed. WESONet project was also discussed as a main tool for collecting videos. Lastly, the paper discusses about a search engine, as a practical application based on the hybrid design, inducing the ontology catering to the domain of universities, courses and conferences, as modeled by the authors.

In the paper [12], there is a strong emphasize on utilizing the power of semantic computing for Education Systems, along with proper use of Artificial Intelligence. The challenges faced by semantic web based education system are also mentioned such as extensibility, contextualization, integration and reuse of contents, interoperability, dynamic sequence of learning and contents etc. This research gives a comprehensive computational model for the development of Semantic Web Based Education System. A reference model by using a case study is also introduced to define the computational model. Adaptive web based educational system with its major types like instructional model adaptation, presentation adaptation and adaptive interactions are also elaborated. Major problems as are faced in building any adaptive web based systems are specified as distribution of services, complexity, cost, difficulty of sharing materials interactive tools etc. Ontologies and domain model ontologies are discussed briefly with Pedagogical model ontology and Interaction ontology. Agents are described in detail with different types such as Mediator, Controller and Society agents. Layers are also focused upon such as authoring layer and application layer.

In the paper [31], there is a development of an Ontology of Wireless Sensor Networks. It presents the concepts of core sensors and their observation from the environment and network parameters like temperature, latency, frequency, resolution etc.

In the paper [32], the author highlights the emerging Semantic Web Application areas with a concise discussion on semantic web technologies for knowledge management and E-commerce. Relationships between the peer to peer and semantic web are also discussed briefly. It also emphasize on problems faced for such an E-commerce solution like ontology mapping, versioning, and instantiation. Advantages as pointed out by the authors are chiefly in different service aspects of identification and configuration.

In the paper [33], the authors focus on latest trends in Semantic Web. It answers many questions related to semantic web and technologies. The author broadly describes 5 major categories in detail that are Tools and Languages, Ontology, Demographics, Production and Ontology Size. It also discusses ontology editors and ontology languages and shows a graphical representation of their popularity. Reasoning Engines are also discussed and ontology domains are also touched upon. Different visual graphs are produced showing methods, techniques, reasoning engines and ontology domains. Ontology survey results are also discussed as they were conducted expressing views of the majority. In the end, the proposed work describes an elementary checkpoint of the domain, status and trends in the Semantic framework.

Two advancements for representing communication context of the Semantic Web are discussed in detail in the paper [34]. First advancement is the Description and Situation Ontology of context that provides an approach to context rectification through separation of affairs and its interpretation on a virtual context known as description. Second one is that the Ontology of Communication is made up of using Description and Situation as its framework and draws a line between theory of interpretation and communication from semantic web model. Besides these couple of issues, Motivation is

also discussed briefly and Modeling Ontology based communication is also touched upon. The author then presents development of the ontology related to communication and highlights how it may be applied and adapted as an application system.

2.2 Legal Ontologies

Creating legal ontologies is also an area in which semantic computing is effectively modeled and efficiently applied. Different people have developed different kinds of legal ontologies to make searching easier than keyword based searching [10].

In the paper [35], different applications of legal ontologies are discussed that ranges from information system to knowledge work system. Various examples are highlighted comprising of the applications of Legal Ontologies, included in the domains of information retrieval, translation of legal documents, automated classification and documents summarization, question and answering, decision support and decision making, and agent technology etc. Among all these ontology applications, the most extensively found application of ontologies is based on the information retrieval.

2.3 Islamic Ontologies

The growing demand of Islamic awareness not only by the Muslims but non-Muslims alike has led to development of ways to extract knowledge out of Islamic sources. Many applications have been developed but most of them uses keyword based search techniques to fetch results. On the other hand, few researchers have made use of semantic search to extract information from the Holy Quran. But still there is a lack of adequate linked data to provide a better description of concepts found in the Holy Quran.

After the Holy Quran the second most authentic and important source in the domain of Islamic jurisprudence is the collection of the sayings, deeds and customs of the Holy Prophet Muhammad (PBUH), that are commonly known as the Hadith and Sunnah.

Islamic Legal Ruling (Fatwa) helps common people to ask scholars about common problems and get their judgment on it. It helps followers to stay up to date and informed them about what is prohibited and what is permitted. It gives them better understanding of their religion. Islamic Legal Rulings (Fatawa) are official documents that are signed and stamped by the religious scholars and the institution, the Darul-Ifta [6].

3. SEMANTIC COMPUTING: ISLAMIC DOMAIN APPLICATIONS

3.1 Work on the Holy Quran

In the paper [36], a semantic based searching method in the domain of the Holy Quran is discussed. It describes the use of the Quran Ontology along with different relationships and limitations. This extends the opportunity to users to semantically search and find a verity of verses related to their query from the Holy Quran, rather than using the traditional keyword based searching. The system proposed in this paper is composed of a Quranic concept based semantic search model. That model incorporates semantic web methodology to model Quran knowledge and, uses ontology to link the concepts found in the Holy Quran with various relationships that exist between these concepts like, for instance, with various verses of the Holy Quran where they are referred to, discussed or mentioned. A computational model to represent the Arabic-lexicon using ontology is also discussed, which is the root of semantic theory in the said model. It is then related with linguistic domain and the obtained data from the Holy Quran along with the annotation of these concepts with various properties and restrictions. These properties and restrictions will be used by the search model to infer over a given query. Users can search semantically for desired verse or knowledge from the Quran semantic-model that consists of 14 concepts, called sub classes in the transcribed model. RDF is used as a prescribed way to elaborate structured knowledge as it enables the applications to switch information on the web with holding

predefined true meanings. Inducing RDF also gives an opportunity to users to represent their ontology with a set of nodes that are associated with the relevant directed edge. These nodes are shown as triple-base representation in the prescribed model to signify Quran ontology. Each triplet is assigned a web address. The nodes signify a variety of concepts found in the Holy Quran. The edges are the relationship or properties of the concepts. Proposition logic rules are also applied.

In the paper [37], the authors focus on extraction of knowledge from the Holy Quran and use a methodology based on ontology to add semantic search functionality and other relevant features in the Holy Quran. To describe the contents and its explanation Quran has a very distinctive and elite style. There are explicit as well as implicit styles of explanation that depend upon the nature of topics under discussion. The paper also identifies a major problem, as faced in developing the system, that arises when the Holy Quran refers animals as behavior, or it is giving similarity to people or they are mentioned in according to their basic structures. Sample domain ontology is developed using Protégé and SPARQL queries that is used to represent and define the role of ontology for the specific framework and different models consisting of Quranic WordNet and relevant ontologies domains.

This paper [37] also highlights this very argument that keyword searching capability of the Holy Quran is not that much suitable and effective than a semantic based searching. The proposed framework is divided into layers of distinct modules. Each module emphasizes that the Holy Quran should be used for the purpose of explanation and to commit this purpose more effectively they are linked with the Semantic Web Rule Language.

In the paper [21], authors have devised an extraction model of Islamic conceptual knowledge related to the topics of the Holy Quran which are available on the web as natural language text. This is done by designing methodologies using different rules and techniques. The researchers have considered two very basic forms of distinctions, the Muhkamat and the Mutashabihat, of the Holy Quran. Muhkamat are some things or concepts which are only known to Allah SWT and Mutashabihat refer to some things that have different meanings but are ambiguous in their declarations. The authors gathered all things in one platform which results in high complexity. This is due to the fact that every Ayat (verse), word and Mutashabihat has sub-relationships i.e. different meanings at different places as there are many sub-domains in the Holy Quran even within a topic or concept.

In the paper [22], the authors have conducted their research in two phases: keyword search module and concept search. For concept search, authors have extracted fifteen phases or themes from Quran. However, in reality there are much more categories lies within the information, knowledge, phases and themes of the Holy Quran only, where each one of them may be inducted to create the ontology.

In the paper [23], the authors have considered the word "Al-Haqq" and based upon this, mention the related concepts and their occurrences, which is 227 times, in the Holy Quran spread out in diversified forms and places. The authors also suffice in their study that Quran ontology consists of three principles.

In many other research works like [11,13,21,22,38-40] there is a particular focus on the above mentioned Islamic domains that consist primarily handling of the Holy Quran and the Hadith by creating ntologies and using semantic computing to retrieve those knowledgebases.

3.2 Work on the Hadith and Sunnah

In the paper [41], it discusses the two main components of every Hadith, the chain of the people from whom the Hadith has received and the actual text of the Hadith itself. A Muhaddith, that is a scholar of Hadith and Sunnah, judges the authenticity of any Hadith based on these two

components. A practical application, e-Narrator is presented in the paper that takes Hadith text and results in a full chain of narrators'. This whole work uses the leverage of semantic web ontology.

In the paper [42], an implementation of a system is presented that produces a tree based GUI for a particular Hadith with its chain of narrators. This work is mainly shaped as an extension of the authors' previous work done using semantic ontology, justifying better results with this strategy.

In the paper [43], exploration of each component of Hadith is covered and as an application the Ontological model is utilized for judging the authenticity of the chain of the narrators of any particular Hadith, referred to as Isnad by the author. This model helps in discriminating or categorizing a Hadith for acceptance based on its Isnad.

Besides these works, though they are also of the same type and relate to only one aspect of the very extensive domain of the Hadith and Sunnah, not much research is found in this area.

3.3 Work on the Islamic Legal Rulings

Startlingly, not much research has been done to create ontology from Islamic Legal Rulings (Fatawa) knowledgebases. The Islamic Legal Rulings (Fatawa) provide solutions to problems of daily life in the light of Quran and Hadith. However, these rulings are mainly available in image and in different diversified forms, placed in separate places by many renowned and distinguished Institutions of the world [7,8], making them hard to be accessed, processed and then utilized for further knowledge referencing.

The process of digitization of Islamic Legal Rulings (Fatawa) is, hence, the need of time [44, 45]. Though, it has been started in some Institutions [7,8], however, it is still in its infancy with many critical issues like limited accessibility and the challenge of authenticity.

4. SUMMARY OF THE SURVEY

Currently, the web is a collection of information but does not provide intrinsic support for processing this information yet. There are different models, techniques and strategies involved to avail advantages out of this information dump. Semantic computing is one of the said ways, and is a better one, that describes the semi structured depictions and illustrations, and provides different ways to mechanize this process.

It is an intelligent approach in accessing and applying the heterogeneous and distributed information, thus, enabling software products to create a balance between user needs and the information sources available. Semantic web enabled services are shaping the future of internet and making a huge impact on the daily life of the web users.

It can easily be analyzed and verified after the research work reported in this survey that semantic-web paradigm can change from an idea to a mature product and become a real and material solution, too.

Table 1 tabulates the briefs of the description of all the referenced research papers and articles. This tabulation segregates the papers and articles according to the application domains as worked upon by the relevant authors.

Table 2 below shows the targeted research gap as duly established and verified by partitioning the referenced research papers in different areas of Ontology wise representation. This also reflects that the work in the context of semantic computing for Islamic Legal Ruling is still an area where no prominent work has been reported. This conclusion is also highlighted by the grey color in the rightmost column of Table 2.

A list of current strategies, techniques and technologies as followed in the referenced research papers are depicted in **Table 3.** These results clearly justifies the importance and leverages of the semantic computing especially based upon the Ontology models in the current era for the domain of the Islamic Knowledge and Information. It also becomes obvious that the third important aspect that is the Islamic Legal Rulings or Jurisprudence or Fatawa is not represented by any researcher for semantic computing.

TABLE 1. DESCRIPTION OF REFERENCED RESEARCH PAPERS / ARTICLES APPLICATION DOMAINS

Referenced Papers	Descriptions
[1,13,16-19,24-26,29,30,32-34, 44,45]	Used semantic web in different domains (Biomedical Sciences, Collaborative Tagging to multimedia Web IS, Web Application Areas, Intelligent SW Search Engines, Text Retrieval, Document Representation in Page Decomposition, Frontiers in Legal Drafting Systems, Automated Drafting of Self-explaining Documents, Multimedia Content/Knowledge Representation/Semantic Indexing, Information Retrieval, Information Seeking) to get the advantage of concept based search.
[11,14,15,27,28,35]	Concept of creating ontology in different domains (BPM, Legal/Law, OBIE, Intelligent Web of data, Knowledge and Information Representation, IR).
[3,6,21,39,40]	Islamic knowledge Ontology including Fatwa/Ijtehad in the field of Islamic Economics/Finance, Fatawa/Religious rights, Context Sensitivity in Islamic Information Mining, Ontological Representation of Islamic Knowledge framework, Ontology Development in Islamic Knowledge.
[20-23, 36-38]	Created ontology and used semantics to retrieve the knowledge bases from Islamic domain that consists primarily of Holy Quran. Muhkamat and Mutashabihat
[41-43]	Extract Islamic conceptual knowledge related to Sahih Hadith which is available on the web as natural language text.
[16,25,26]	Commercial document retrieval and information retrieval
[17-19]	Legal documents and document representation
[31]	Wireless Sensor Networks ontology

TABLE 2. CONCLUSION OF REFERENCED RESEARCH PAPERS SHOWING THE TARGETED RESEARCH GAP

Referenced Papers	Ontological Representation Areas								
	Information Retrieval / Extraction	Multimedia	Biomedical Sciences	Legal / Law	Communication	Commercial Documents	Islamic Knowledgebase/Information		
							Quran	Hadith	Legal Rulings /Fatawa
[20-23, 36-40]	✓	X	X	✓	X	X	✓	X	X
[41-43]	X	X	X	X	X	X	X	✓	X
[29]	X	X	✓	X	X	X	X	X	X
[16, 25, 26]	✓	X	X	X	X	"	X	X	X
[24, 30]	X	✓	X	X	X	X	X	X	X
[17-19, 35]	X	X	X	✓	X	✓	X	X	X
[31]	X	X	X	X	✓	X	X	X	X
[14, 15, 28]	✓	X	X	X	X	X	X	X	X
X = Not Available ✓ = Available									

TABLE 3. TECHNIQUES AND TECHNOLOGY USED IN REFERENCED RESEARCH PAPERS OF ISLAMIC DOMAIN

Islamic Knowledge/Information (Quran/Hadith) Referenced Papers	Technology Used			
	Ontology	NLP	Meta Tagging	Annotation
[36]	✓	✓	X	✓
[37]	✓	X	X	X
[21]	✓	✓	X	X
[22]	✓	✓	X	X
[38]	✓	X	X	X
[39]	✓	X	X	✓
[40]	✓	X	X	✓
[23]	✓	X	X	X
[20]	✓	X	✓	X
[41]	✓	X	X	X
[42]	✓	X	X	✓
[43]	✓	X	X	X
X = Not Available ✓= Available				

5. CONCLUSIONS

Semantic searching creates many new and exciting application areas of semantic computing. In the future, this wide range of application areas will make Semantic searching an integral part of Internet. Many researchers are currently engaged in finding different efficient ways in developing a semantic searching and computing mechanism.

To summarize, the document representation framework for Islamic Legal Rulings (Fatawa) is a critical need of this era and a better solution in providing the right knowledge of Islam for the peace and respect to the humanity. Due to these facts this research topic requires more attention and consideration for further investigation. There is lot of room for new research and innovation in this area that needs to be addressed due to its social and dynamic nature and benefits, making it more suitable to cope up with new and rather sophisticated problems of today's world where everything is changing very quickly and new problems are arising day by day.

As per the analysis and detailed investigation it has been ensured that most of the work has not even discussed the Legal Rulings searching and computation. Therefore, Legal Rulings is still grossly unexplored.

The Islamic Legal Rulings (Fatawa) computation is more apt to be based on semantic searching rather than keyword-based searching. Furthermore, it is evident from the above reviews and the survey closure that the Islamic Legal Rulings (Fatawa) representation has not been targeted yet and has a high potential for research in the area of document representation framework.

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