



# A Study on the Quality of Central Library Websites of Government Universities in Iran, based on Fuzzy Interface System

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### ABSTRACT

This study aimed to assess and rank the quality of central library websites of government universities in Iran based on the fuzzy deduction system. Statistical society includes independent central library websites of government universities in Iran (n=55) that were managed by *Ministry of Science, Research and Technology*. A survey method research was used for the aim of the study. Moreover, a check list and MATLAB Software were used. Among content criteria, website title was the most important one and among structural criteria, searching in continuous catalogue of the library was the most significant. Classic assessment of findings showed that central library websites of University of Shahedand Sahand University of Technology had the highest quality; on the contrary, central library websites of (ShahidAbbaspour) Power & Water University of Technology and Gorgan University of Agricultural Science and Natural Resources had the lowest quality. Findings of fuzzy deduction system showed that central library website of University of Shahed had the highest quality; however, central library website of (ShahidAbbaspour) Power & Water University of Technology had the lowest quality among other websites. Comparison of classic assessment and fuzzy assessment of central library websites of Iran showed that in an assessment based on the fuzzy deduction system, more precise results are obtained and websites are correctly ranked. In addition, websites can be ranked based on low, medium and high quality. Therefore, it seems that fuzzy deduction system is a better method for assessing and ranking the quality of university library websites.

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### Introduction

Based on the different advantages of websites, including decreasing the availability time to information and organizing the information exchange, they are useful in other various areas. Websites should have a certain structure to meet the needs of users and to offer them services that have added value (Huang et al, 2006; Sohrabi&Raeesi, 1389). Different kinds of website services include: personal, informational and searching; these can be provided with membership in websites, creating username and password, email, searching, chatroom, notice boards, messages, news, information and so on. Consideration of these services in web design with the aim of giving information to the users efficiently and effectively is one of the main solutions to meet user needs and help them to find what they are looking for. University libraries provide students, professors and staff with information services and sources in an environment where teaching, learning and searching are supported (George, 2005; Alibeig et. al. 1390).

With the rapid development of worldwide network of Internet as an instrument for organizations to get information, university libraries like other organizations have made an effective effort to offer their services and other informational sources, using the websites (Rekik&Kallel, 2013; Alibeig et. al, 1390). Therefore, library website assessment can be helpful for libraries to offer their services in a better way. Since all studies concerned the library website assessment has been quantitative and only based on a mere yes-no answer, this study is a qualitative one and is based on a mathematical model to assess

all the criteria in a spectrum of yes to no. For this reason, a model of fuzzy theory, with no base of zero and one to assess and analyze websites, is proposed.

### Statement of the Problem

Since its introduction, worldwide web has played an important role in different applied areas such as commerce, education, industry and recreation and today, many organizations offer their services using the website services (Rekik&Kallel, 2013; Su et. al, 2012; Alibeig et al. 1390). In the past, users of traditional libraries entered the libraries to use services such as study salons, equipment, books or consulting services; however, with the development of worldwide network and electronic services, libraries tried to offer the possibility of virtual entrance using websites for the users. Now, users can enter the library and use many long-distance services at home or at their workplaces (Alibeig et. al. 1390). In Iran, efficient web design in universities is seriously considered because of the significance of library websites and some valuable efforts have been made. However, there are some problems regarding these websites yet. Website design of Iranian libraries is less integrated and efficient than the foreign libraries. One of the reasons for this is that in creating these websites, certain principles and standards of library websites have been ignored. Therefore, website features, especially library websites, should be considered to help the users in a dynamic and efficient way to benefit from various services (Farajpahlou&Saber, 1386).

The most important aim of website quality assessment is to provide quantitative results which are authentic, understandable

and trustworthy for interested people; as well as qualitative features should be organized and modeled using the fuzzy model for website quality assessment. This study tries to emphasize that website analysis and assessment should not be based on a mere yes-no answer but they should be based on a mathematical model to assess all criteria in a spectrum of yes to no (Lee & Ahn, 2009; Qi, 2010; Molazadeh, Sadeqian & Sobhanmanesh, 1388). Since some methods and classic models for website assessment and analysis were used before with no consideration of structural criteria and content criteria, this study tries to propose a model of fuzzy theory for assessment and a more authentic analysis of websites in a qualitative manner not quantitative one. Therefore, this study mainly tries to discuss the quality of independent central library websites of government universities in Iran based on fuzzy logic.

#### Research Questions

- a- How central library websites of government universities in Iran are ranked based on the fuzzy logic?
- b- What are the most important content criteria and structural criteria of central library websites of government universities in Iran, respectively?

#### Methodology

This is an applied survey study. This kind of study uses a scientific approach for a small group to obtain the results and generalize them to the larger groups. The aim of this study is to identify key success factors of central library websites of government universities in Iran and to prioritize them using consensus of Theoreticians and experts in this area.

#### Research Society

Research society in this study includes independent central library websites of government universities in Iran that are managed by Ministry of Science, Research and Technology. Using the website of Ministry of Science, Research and Technology, 55 independent websites were identified. Because of the small number of websites, sampling was not carried out.

#### Instruments and Methods of Data Collection

Data were collected using a documentary and survey study. Documentary study was considered for review of theoretical bases and to draw an initial framework using the books, authentic papers in ScienceDirect, ProQuest, Scopus, papers in scientific-research Journals, national and international conference papers; for survey method, a checklist used by Saberi in his MA thesis (1386) was used.

#### Validity and Reliability of Data Collection Instruments

Since the checklist (used by Saberi, 1386) had been designed and applied before, its validity had been assessed. Regarding the reliability after the analysis of content criteria and structural criteria in websites, their Cronbach's alpha was 98%.

#### Data Analysis

Data analysis is one of the main parts of a scientific study (AlaqemandanMotlaq, 1391). In order to make the checklist fuzzy, its elements are included in paired comparison table; then the experts were asked to identify the priority of the elements (seven experts answered). After identifying the general score (average of each criteria) of each element, their existence in the websites were considered. Then the elements were replaced by the obtained weights of each content criteria and structural criteria. Finally, the general score of each content criteria and structural criteria for each website were inserted into MATLAB Software.

In fuzzy analysis of data three approaches can be distinguished. First algorithmic approaches that are fuzzy kinds of classic methods such as assessment fuzzy clustering, fuzzy regression and so on; second, knowledge-based approaches

that are similar to fuzzy control systems or fuzzy expert systems. Third group are fuzzy neural networks approaches. In this study algorithmic approaches were considered (AvazzadehLotfabadi, 1390).

#### Findings

##### Rankings of Central Library Website of Government University in Iran based on Classic (non-fuzzy) Method

Data in table 1 shows the ranking of central library websites of government universities in Iran based on the classic (non-fuzzy) method; it shows the total content criteria and structural criteria, too. Based on this table, central library websites of University of Shahed and Sahand University of Technology have the first rank with 24 (%82.75) content criteria and structural criteria; University of Damghan and Ferdowsi University of Mashhad have the second rank with 23 (%79.31) criteria; central library websites of Shahid Beheshti University, Jondishapour University of Technology and University of Kashan have the third rank with 22 (%72.86) criteria; and central library website of University of Ilam, Tarbiat Modares University, University of Tehran, University of Semnan, Shahid Madani University of Azarbaijan, University of Allameh Tabataba'i and University of Mohaghegh Ardebil have the fourth rank with 21 (%72/41) criteria; central library websites of (Shahid Abbaspour) Power & Water University of Technology and Gorgan University of Agricultural Sciences and Natural Resources have the lowest quality with only five (%17.24) criteria and then, central library website of University of Guilan with six (%20.68) has the lower quality.

##### Ranking of Central Library Website of Government University based on the Fuzzy Deduction System

There are five stages in the process of fuzzy deduction system design:

- Making the input variables fuzzy: in this stage, input reception and determination of their membership degree in each fuzzy set should be carried out by membership functions. Output in this stage is a fuzzy degree between zero and one that determine the rate of input membership in a fuzzy set.
- Using the operators (and, or): in this stage, fuzzy operators are used for combining the correctness degree of the parts and producing a number as a correctness degree. The number resulting from this process is used for output function. Therefore, logic operators "and" and "or" are used for clarifying operators.
- Deduction from introduction to the result: in this stage the weight of each rule is determined, after allocation of enough weight for each rule, reasoning method is implemented. Consequently, a fuzzy set is produced by the membership function. Process input is reasoning about a number and its output is a fuzzy set.
- Combination of results of rules: since in fuzzy deduction system, decisions are made based on all rules, the rules should be combined so that the output of each rule combines in a fuzzy set. Output in this stage is a fuzzy set for each output variable.
- Defuzzy method: input of this stage is a fuzzy set (in the stage of combination of results of rules) and its output is a number for each output variable because the result of combination of fuzzy sets is a range of output amounts and an output amount should be created using the non-fuzzy methods such as center of mass (Sohrabi & Raeesi, 1389).

For this reason, MATLAB Software was used for data analysis in order to assess quality of central library websites of government universities of Iran.

Data in table 2 shows that how many central library websites have content criteria. Data shows that 56 university

websites (98.24) have website title; 53 university websites (%92.98) have library news and notices; 51 university websites (%89.47) have library introduction; 49 university websites (%85.96) have a continuous catalogue of library sources; 48 university websites (%84.21) have the contact us page and 47 university websites (%82.45) have data bases and sources as the most number of content criteria.

Data in table 3 shows that how many central library website of universities have the structural criteria. Data in this table show that central library website of all universities except one have the correct spelling and grammar; of 52 universities (%91.22) have the loading and material availability speed and ease of website navigation; central library websites of 50 universities (%87.71) have text eligibility and using a suitable font; 48 websites (%84.21) have the search possibility in their continuous catalogue of libraries; 45 websites (%78.94) are retrieved by search engines; 43 websites (%75.43) have the user-friendly interface and 42 websites (%73.68) have the search engines for searching into the website content.

Data in table 4 shows that regarding the content criteria, central library website of University of Shahed has the highest score with 443.53. After that, central library websites of Ferdowsi University of Mashhad and Amirkabir University of Technology have the third rank with 392.39.

Concerning the structural criteria, central library website of University of Semnan has the first rank with the score of 444.36. After that, central library website of Sahand University of Technology has the second rank with 418.22. Central library website of Shahid Madani University of Azarbaijan has the third rank with 416.94; central library website of University of Shahed, Ferdowsi University of Mashhad and University of Allame Tabataba'i have the fourth rank with 414.94.

The total scores of content criteria and structural criteria show that central library website of University of Shahed has the first rank with score of 858.47; central library websites of Sahand University of Technology and Ferdowsi University of Mashhad have the second and third ranks with scores of 832.46 and 807.33, respectively.

Question 1: How central library websites of government universities in Iran are ranked based on the fuzzy logic?

Figure 1 is an overview of fuzzy deduction system. In order to define membership function of fuzzy deduction system in this study, a useful triangular function was used. For each membership function, three language expressions of low, medium and high were considered; the website quality was considered as a fuzzy set that was resulted from the assessment of input indexes (content criteria and structural criteria). Therefore, system output that showed the website quality was considered as a fuzzy set that its membership functions are defined like other fuzzy sets (Sohrabi & Raeesi, 1389). The way low, medium and high language expressions were defined in each of three fuzzy sets (two inputs of structural criteria and content criteria and one output of quality rate of each website) is seen in figure 2. Inputs that are the weight of structural criteria (46) and content criteria (534) and the output of each website was considered in a range of 0-100. If the output of each website was equal or below 35, the quality of website is low or if it is equal or lower than 65, quality of website is medium or if it is equal or lower than 100, the quality of website is high.

For the fuzzy reasoning, deduction rules were needed. These rules were expressed as "if...then". Therefore, for complementing fuzzy deduction system of the study, fuzzy rules that are as the heart of fuzzy system should be defined (Sohrabi & Raeesi, 1389). These rules described the relationship

between defined fuzzy sets in fuzzy deduction system and the way they influenced on the quality of central library websites of universities. In other words, input data of fuzzy deduction system were changed through these rules to the output data. Fuzzy rules designed based on the obtained scores of structural criteria and content criteria that are mentioned before. Based on this, nine fuzzy rules were determined:

- 1-If the content is medium and structure is low, the quality of website is low.
- 2-If the content is low and structure is low, the quality of website is low.
- 3-If the content is medium and structure is high, the quality of website is medium.
- 4-If the content is medium and structure is medium, the quality of website is medium.
- 5-If the content is high and structure is high, the quality of website is high.
- 6-If the content is high and structure is medium, the quality of website is high.
- 7-If the content is high and structure is low, the quality of website is medium.
- 8-If the content is low and structure is medium, the quality of website is low.
- 9-If the content is low and structure is high, the quality of website is medium.

An overview of fuzzy rules is shown in figure 3. Figure 4 shows the fuzzy deduction system of the study. Each line of the diagram shows a fuzzy rule. The first two columns of diagrams from left are related to input rules (Ifs) and third column is related to output and website quality (then) that is defuzzy output. Amounts and inputs were mentioned above each column. The result of using these fuzzy rules was calculated automatically by software and the Centroid method. Figure 5 shows the three-dimension output of these rules. This system helps the users and managers to do fuzzy assessment of website based on the authentic criteria in an international level and to create a better approximation of the website status.



Figure 1: Membership functions of fuzzy sets of deduction system of the study

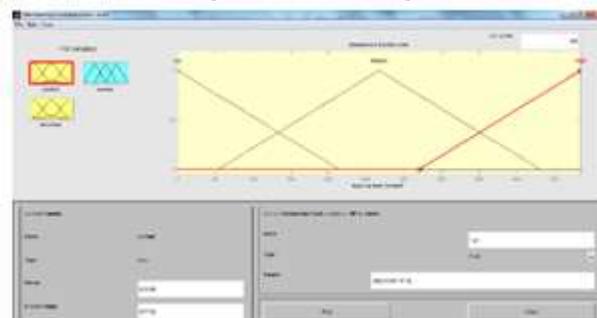


Figure 2: An overview of inputs, inference engine and outputs of a fuzzy deduction system

**Table 1: Classic (non-fuzzy) Ranking of Central Library Website of Government University in Iran based on Total of Frequency Distribution and Frequency Percentage of Content Criteria and Structural Criteria.**

University	Total of Content Criteria and Structural Criteria of Websites	
	Frequency	Frequency Percentage
University of Shahed	24	82.75
Sahand University of Technology	24	82.75
University of Damghan	23	79.31
Ferdowsi University of Mashhad	23	79.31
University of Shahid Beheshti	22	75.86
Jondishapour University of Technology	22	75.86
University of Kashan	22	75.86
University of Ilam	21	72.41
Tarbiat Modares University	21	72.41
University of Tehran	21	72.41
University of Semnan	21	72.41
Shahid Madani University of Azarbaijan	21	72.41
University of Allameh Tabataba'i	21	72.41
University of Mohaghegh Ardabili	21	72.41
Amirkabir University of Technology	20	68.96
Sharif University of Technology	20	68.96
University of Economic Sciences	20	68.96
University of Qom	20	68.96
University of Isfahan	19	65.51
University of Sistan and Baluchestan	19	65.51
Shahid Bahonar University of Kerman	19	65.51
Industrial University of Isfahan	19	65.51
Imam Khomeini International University	18	62.06
University of Zabol	18	62.06
University of Zanjan	18	62.06
University of Golestan	18	62.06
University of Malayer	18	62.06
Shahid Rajaee Teacher Training University	17	58.62
University of Alzahra	17	58.62
University of Jiroft	17	58.62
Sirjan University of Technology	17	58.62
Iran University of Science & Technology	17	58.62
Vali Asr University of Rafsanjan	17	58.62
University of Hakim Sabzevari	16	55.17
University of Kharazmi	16	55.17
Birjand University of Technology	16	55.17
Sari Agricultural Sciences and Natural Resources University	16	55.17
University of Kurdistan	16	55.17
University of Mazandaran	16	55.17
University of Birjand	15	51.72
Payame Noor University	15	51.72
Institute for Advanced Studies in Basic Sciences (Zanjan)	15	51.72
Shahid Chamran University of Ahvaz	15	51.72
Khaje Nasir Toosi University of Technology	15	51.72
University of Imam Sadiq	14	48.27
University of Bu Ali Sina	14	48.27
University of Shiraz	12	41.37
University of Persian Gulf	12	41.37
Shiraz University of Technology	12	41.37
University of Hormozgan	12	41.37
University of the Arts	11	37.93
University of Guilan	6	20.68
Gorgan University of Agricultural Sciences and Natural Resources	5	17.24
(Shahid Abbaspour) Power & Water University of Technology	5	17.24

**Table 2: Frequency Distribution and Frequency Percentage of Content Criteria of Central Library Website of government Universities in Iran**

Content Criteria of Websites	Frequency	Frequency Percentage
Website title	56	98.24
Library news and notices (e.g., future plans)	53	92.98
Library introduction	51	89.47
Continuous catalogue of library sources	49	85.96
Contact us page	48	84.21
Data bases and sources	47	82.45
Work hours of library	32	56.14
Forms for application, suggestions and so on in the website	30	52.63
Continuous use of reservation and borrowing the books	29	50.87

Introduction of library services (current informing services)	22	38.59
Asking questions (electronic reference services)	20	35.08
Frequently Asked Questions (FAQ)	17	29.82
Last update date	4	7.01
Address of website manager	1	1.75
website Index	0	0

**Table 3: Frequency Distribution and Frequency Percentage of Structural Criteria of Central Library Websites of Government Universityin Iran**

Structural Criteria of Websites	Frequency	Frequency Percentage
Correct spelling and grammar	56	98.24
Loading and material availability speed	52	91.22
Ease of website navigation	52	91.22
Text eligibility and using a suitable font	50	87.71
Searching in continuous catalogue of the library	48	84.21
Ease of website Retrieval using the general search engines	45	78.94
User-friendly interface	43	75.43
Search engine for searching in library website	42	73.68
Suitable Website address (URL) and domain	37	64.91
Link between library homepage with mother institute homepage	35	61.4
Link to different parts of the library	33	57.89
Website map	14	22.56
Link between library homepage and libraries homepage	9	15.78
Print capability	2	3.5

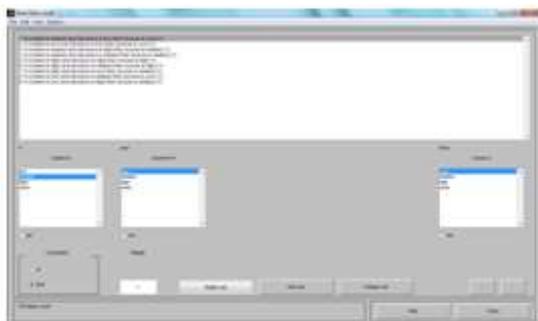
**Table 4: Scores of Content Criteria and Structural Criteria of Central Library Websites of Government UniversitiesinIran**

University	Total Scores of Content Criteria	Total Scores of Structural Criteria	Total Scores of Content Criteria and Structural Criteria
ShahidRajae Teacher training University	324.82	300.39	625/21
University of Shiraz	231.4	187.96	419.36
University of Isfahan	329.82	33.09	692.91
University of Alzahra	288.82	325.7	614.49
University of Imam Sadiq	238.97	279.81	518.78
<i>University of Ilam</i>	374.24	349.52	723.76
BualiSina University	220.83	295.25	516.08
University of Birjand	215.12	305.52	520.64
Imam Khomeini International University	309.1	338.67	647.77
Payame Noor University	228.83	317.38	546.21
Institute for Advanced Studies in Basic Sciences (Zanjan)	322.39	211.97	534.36
<i>TarbiatModares University</i>	385.96	352.23	738.19
University of Tehran	374.24	337.65	711.89
University of Jiroft	282.25	335.67	617.92
University of Hakim Sabzevari	238.97	363.09	602.06
Persian GulfUniversity	204.84	251.25	456.09
University of Kharazmi	27.25	304.38	571.63
<i>University of Damghan</i>	414.24	378.94	793.18
University of Zabol	324.11	320.96	645.07
University of Zanjan	324.11	305.52	629.63
<i>University of Semnan</i>	301.54	444.36	745.9
University of Sistan and Baluchestan	364.39	304.38	668.77
University of Shahed	443.53	414.94	858.47
ShahidBahonar University of Kerman	368.11	308.23	676.34
<i>ShahidBeheshti University</i>	385.96	381.65	767.61
ShahidChamran University of Ahvaz	210.12	246.39	456.51
ShahidMadani University of Azarbajjan	324.11	416.94	741.05
Industrial University of Isfahan	328.82	361.38	690.2
Amirkabir University of Technology	392.39	335.67	728.06
Birjand University of Technology	233.97	365.09	599.06
<i>Jondishapour University of Technology</i>	391.67	392.51	784.18
Khaje Nasir Toosi University of Technology	318.11	236.97	555.08
<i>Sahand Universityof Technology</i>	414.24	418.22	832.46
Sirjan University of Technology	276.1	335.67	611.77
Sharif University of Technology	306.97	410.22	717.19
Shiraz University of Technology	220.55	210.26	430.81
University of AllameTabataba	335.25	414.94	750.19
Iran University of Science & Technology	295.25	322.67	617.92
University of Economic Sciences	352.68	374.52	727.2
Sari Agricultural Sciences and Natural Resources University	220.55	337.8	558.35
Gorgan University of Agricultural Sciences and	141.98	83.28	225.26

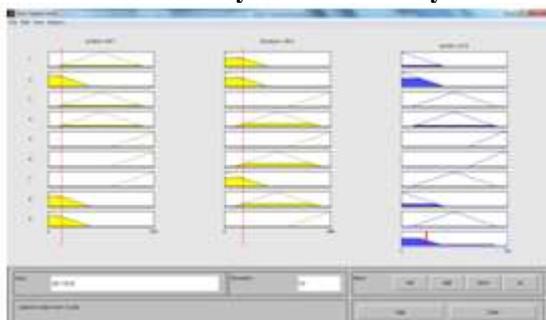
Natural Resources			
<i>Ferdowsi University of Mashhad</i>	392.39	414.94	807.33
University of Qom	414.24	284.39	698.63
<i>University of Kashan</i>	374.24	379.37	753.61
University of Kurdistan	266.97	304.38	628.35
University of Golestan	324.11	304.38	628.49
University of Guilan	141.98	115.84	257.82
University of Mazandaran	296.11	282.52	578.63
Mohaghegh Ardabili University	364.24	378.94	725.18
University of Malayer	317.96	335.67	653.63
University of Hormozgan	192.55	234.97	427.52
University of the Arts	126.69	284.39	411.08
Vali Asr University of Rafsanjan	266.97	361.38	628.35
(Shahid Abbaspour) Power & Water University of Technology	69.71	80.84	150.55

**Table 5: Ranking of Central Library Websites of Government Universities of Iran Resulting from Fuzzy Deduction System**

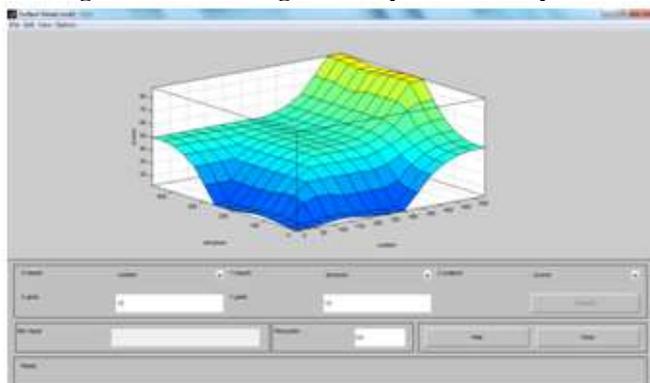
University	Score of Fuzzy Deduction System	Quality
Shahid Rajaei Teacher Training University	50.3	medium
University of Shiraz	50	medium
University of Isfahan	50.8	medium
University of Alzahra	50	medium
University of Imam Sadiq	50	medium
<i>University of Ilam</i>	52.1	medium
Buali Sina University	50	medium
University of Birjand	50	medium
Imam Khomeini International University	50	medium
Payame Noor University	50	medium
Institute for Advanced Studies in Basic Sciences (Zanjan)	50.1	medium
<i>Tarbiat Modares University</i>	57.1	medium
University of Tehran	55.3	medium
University of Jiroft	50	medium
University of Hakim Sabzevari	50	medium
Persian Gulf University	49.2	medium
University of Kharazmi	50	medium
<i>University of Damghan</i>	57.5	medium
University of Zabol	50.3	medium
University of Zanjan	50.3	medium
<i>University of Semnan</i>	50	medium
University of Sistan and Baluchestan	53.7	medium
University of Shahed	69.2	High
Shahid Bahonar University of Kerman	54.2	medium
<i>Shahid Beheshti University</i>	56.5	medium
Shahid Chamran University of Ahvaz	49.8	medium
Shahid Madani University of Azarbaijan	50.2	medium
Industrial University of Isfahan	50.7	medium
Amirkabir University of Technology	57.5	medium
Birjand University of Technology	50	medium
<i>Jondishapour University of Technology</i>	57.4	medium
Khaje Nasir Toosi University of Technology	50	medium
<i>Sahand University of Technology</i>	61.1	medium
Sirjan University of Technology	50	medium
Sharif University of Technology	50	medium
Shiraz University of Technology	50	medium
University of Allameh Tabataba'i	51	medium
Iran University of Science & Technology	50	medium
University of Economic Sciences	52.7	medium
Sari Agricultural Sciences and Natural Resources University	50	medium
Gorgan University of Agricultural Sciences and Natural Resources	35	Low
<i>Ferdowsi University of Mashhad</i>	57.5	medium
University of Qom	61.5	High
<i>University of Kashan</i>	54.9	medium
University of Kurdistan	50	medium
University of Golestan	50.2	medium
University of Guilan	41	medium
University of Mazandaran	50	medium
Mohaghegh Ardabili University	52.1	medium
University of Malayer	50	medium
University of Hormozgan	48.5	medium
University of the Arts	39.8	medium
Vali Asr University of Rafsanjan	50	medium
(Shahid Abbaspour) Power & Water University of Technology	23.9	Low



**Figure 3: An overview of defined fuzzy rules for fuzzy deduction system of the study**



**Figure 4: Final design of fuzzy deduction system**



**Figure 5: A three-dimension picture of final design of fuzzy deduction system**

Data in table 5 shows that based on fuzzy deduction system, University of Shahed with score of 69.2 has the highest quality; central library website of Sahand University of Technology and university of Qom with scores of 61.6 and 61.5 are the nearest ones to high quality; Central library websites of (ShahidAbbaspour) Power & Water University of Technology and Gorgan University of Agricultural Sciences and Natural Resources have the lowest quality with scores of 23.9 and 35, respectively; central library websites of University of the Arts and University of Gilan with low scores of 39.8 and 41, respectively have the low quality. Other central library websites of government universities have the medium quality.

### Conclusions & Discussion

Question 2: What are the most important content criteria and structural criteria of central library websites of Government Universities in Iran, respectively?

Among content criteria of central library websites of government universities of Iran, the highest scores are related to website title (average of 58.42), the last update date (average of 51.14). Continuous catalogue of library sources (average of 46.42) and address of website manager (average of 44) and frequently asked questions (average of 40) have the highest scores.

Among structural criteria of central library website of government universities of Iran, searching in continuous

catalogue of the library, search engine for searching in library website as well as suitable Website address (URL) and domain, each with averages of 46.71, 44, 40.42 have the first to third scores, respectively.

Therefore it can be concluded that among content criteria, website title is the most important criteria and among structural criteria, searching in continuous catalogue of library is the most important structural criteria. As it was predicted, website title that plays a key role in website marketing and searching in continuous catalogue of library which has a considerable impact on using libraries, had the highest scores.

It should be noted that in some studies (Biokozkan, Arsenian, Irtec, 2010; Hatami, 1390; Herrera-Viedma, E. et al, 2006; Herrera-Viedma, E, 2007; Noori & Bakhtiari, 1388; Sediqi, 1387) website content was analyzed.

Question 2: How central library websites of Government University in Iran are ranked based on the fuzzy logic?

Based on fuzzy deduction system, University of Shahed has the highest quality with score of 69.2; central library websites of Sahand University of Technology and University of Qom have the highest quality with scores of 61.6 and 61.5; central library websites of (ShahidAbbaspour) Power & Water University of Technology and Gorgan University of Agricultural Sciences and Natural Resources have the lowest quality with scores of 23.9 and 35, respectively; central library websites of University of the Arts and University of Gilan with scores near to low (39.8, 41 respectively) have low quality. Other central library websites of government universities have the medium quality. Therefore, central library website of University of Shahed based on fuzzy deduction system has the best quality and central library website of (ShahidAbbaspour) Power & Water University of Technology has the lower quality than other websites.

Comparison of classic assessment and fuzzy assessment of central library websites of government universities of Iran showed that in assessment based on fuzzy deduction system, more precise results were obtained and websites were ranked based on quality assessment of low, medium and high. So, it seems that fuzzy deduction system is a better method for assessing and ranking the quality of central library websites. because In other studies (Herrera-Viedma, E. et al, 2006; Hidalgo et al, 2007; Kabir & Akhtar Hosein, 2012; Molazadeh, Sadeqian and Sobhanmanesh, 1388; Rakeike & Kallel, 2013; Sohrabi & Reesi, 1389; Wang & Huang, and Tessing, 2004) it was showed that fuzzy methods of assessment are better for services and quality assessment of websites. It should be mentioned that other studies (Akhtar Hosein & Kabir, 2012; Hatami, 1390; Qi, 2011) considered websites ranking based on the different fuzzy methods.

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