Using information technology

to support knowledge conversion process

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Abstract: In documentation process it is well known that the first impulse is to try finding information on the web. Information literacy courses modules teach the strategies and methods to find information on the web. The purpose of this presentation is to investigate information quality assessment of information retrieved on the web. This paper reports on a usage study that was conducted in the autumn of 2010. The study included a survey of master students of Transilvania University of Brasov, Romania, Faculty of Mechanical Engineering, Mechatronics Department behaviour regarding information quality assessment on the web. These four components were analyzed: credibility of content, credibility of site, predictive relevance and veracity assessment. Content analysis and descriptive statistics were used to identify all attributes of quality assessment.

Key words: information technology, web information, information quality, open access, doctoral students

1. Introduction

The web space may be considered the most accessible mean of information dissemination and exchange. Since the printing press revolution generated by the emergence of Gutenberg’s movable-type printing press, now there is the greatest adjustment of information productivity and dissemination in informational society. There are also the biggest opportunities of its multiplication, dissemination and accessibility. The problems that occur from all this information that is accessible on the Internet arise from the quality of information. It is the easiest and the cheapest thing to keep us informed due to the Internet. Scientific information must be assessed and only what is of quality must be taken into consideration. What does quality of scientific information mean?

Many users think that the web space is a virtual library and that is why they implicitly use the web [6]. The quality of information depends only on information veracity but information can be veracious when it is according to a standard or a model if we take into account the definition in Merriam-Webster Online Dictionary [2]. The most used criteria in assessing the web resources are the ones in Figure 1.

Fig. 1: Criteria of assessing web pages
Chasse says that there are ten criteria of assessing scientific publications, namely: originality, logical cogency, compatibility with generally accepted disciplinary ethics, concise and clear writing style, theoretical significance, mathematical precision, pertinence with the present research studies in the field, multiplication of research techniques, coverage of the existent literature, applicability in practice or problem applying in the field [1].

Fink-Shamit [3] proposes assessing scientific information quality on the Internet through the following components and attributes (Figure 2):

![Assessing scientific information quality](image)

Fig. 2: Components of information quality assessment

2. Marketing research regarding scientific information quality

2.1 Method and research hypotheses

At Transilvania University of Brasov, Romania, there was carried out a marketing research survey regarding scientific information assessment within the research department of Advanced mechatronic systems. It took place in the 1st semester of the academic year 2010-2011. The respondents were master degree students, Ph degree students and post-doctoral students of the above mentioned department. The students have a course of information literacy in their university curricula during the 1st semester of the 1st year. The course comprises in the analytical curriculum: elements of assessing the information on the web, strategies of information searching, elements of university ethics, methods of citing, rephrasing, citing styles. Elements of scientometrics were not introduced in curricula four years ago when the students were undergraduates in their 1st year of study. Research hypotheses were:

- Respondents have qualities of researchers.
- Respondents have experience in achieving a research project.
- The university puts at their disposal scientific databases during their undergraduate period of time, thus respondents are able to make the difference between databases, library online catalogues and web.
- Respondents have knowledge regarding scientific information quality.

Starting from these hypotheses and using the electronic questionnaire which was edited by the help of the open source SurveyMonkey software programme, http://www.surveymonkey.com/MySurveys.asp there was projected the electronic questionnaire which contained ten questions of the following types: open questions, questions using Likert’s scale and characterization questions.

The respondents received the invitation to take part in this survey on the communication addresses of the groups they were belonging to and the link for solving the questionnaire.

The research population has the following structure: 43 undergraduates, 11 – 1st year master degree, 20 – 2nd year master degree, 10 – PhD degree, 2 – post-doctoral students. 27 students in the following structure answered: 11 – 1st year master degree, 10 – 2nd year master degree, 4 – Ph degree, 2 – post-doctoral students.
The research is validated from the number of participants' point of view.

2.2 Data gathering and interpretation

Data gathering was made automatically due to SurveyMonkey that offered centralized results of the answers. There are presented further on the data resulted for each question:

- Concerning the documentation sources that were used by respondents, 81% used the Internet as a documentation source, 14.8% - library catalogues and only 3.7% - attended courses.
- 66.7% of respondents preferred the online sources as information sources, 48.1% traditional sources and 14.8% media sources.

- The majority of respondents, 74.1%, had a medium level of knowledge regarding assessment of scientific information, only 14.8% had a high level and 11.1% had a low level.
- The most important criterion of assessing scientific information taken into consideration by 37% of respondents is the number of citing obtained by an article, the author’s name is the second criterion taken into account by 30.8% of respondents, the third criterion – 29% is the review/journal in which it is published and for 26.9% of respondents the criterion that counts regards the references in the article bibliography (Figure 3).

<table>
<thead>
<tr>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Response Count</th>
</tr>
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<tbody>
<tr>
<td>Author name</td>
<td>30.8% (8)</td>
<td>30.8% (8)</td>
<td>7.7% (2)</td>
<td>30.8% (8)</td>
<td>26</td>
</tr>
<tr>
<td>Article references</td>
<td>26.9% (7)</td>
<td>42.3% (11)</td>
<td>26.9% (7)</td>
<td>3.8% (1)</td>
<td>26</td>
</tr>
<tr>
<td>Number of citations</td>
<td>37.0% (10)</td>
<td>29.6% (8)</td>
<td>22.2% (6)</td>
<td>11.1% (3)</td>
<td>27</td>
</tr>
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<td>Publication were</td>
<td>29.6% (8)</td>
<td>33.3% (9)</td>
<td>25.9% (7)</td>
<td>11.1% (3)</td>
<td>27</td>
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<td>article is edited</td>
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Fig. 3: Data analyse of question: Order by importance next evaluation scientific information criteria (1-most important, 4-less important)

- Some definitions of respondents regarding credibility were:
  "First of all the credibility degree of an information source is given by the reputation this source has gained as regards systematic checking through an editorial mechanism which varies in accordance with the source specific, the published and assumed statements. On the whole, the credibility degree of an information source is usually associated with tradition/experience or the age of that information source in academic environment."
  "Credibility of a source depends on the author’s or authors’ credibility on one hand, and on the credibility of the publication on the other hand."
  "In my opinion credibility of a source mostly depends on the author’s/ authors’ credibility and on the credibility of the publication as well. The written article must be based on competent..."
and true publications in order to cover all the significant points of view.”
"Credibility is closely connected to the bibliographical sources that were used.”
"Credibility is a feature of a piece of information followed by proofs.”

Concerning the criteria of assessing the credibility of the web pages, 65.4% of respondents think that the most relevant criterion is the site actuality, 37% think that another criterion of relevance is the site organization, 26.9% think that the assessment criterion is relevant and 23.1% the author’s contact data. (Figure 5)

<table>
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<tr>
<th>Goal</th>
<th>Response Average</th>
<th>Response Total</th>
<th>Response Count</th>
</tr>
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<tbody>
<tr>
<td>Content</td>
<td>45.38</td>
<td>1,180</td>
<td>26</td>
</tr>
<tr>
<td>Template and accessibility</td>
<td>21.20</td>
<td>530</td>
<td>25</td>
</tr>
<tr>
<td>Cost</td>
<td>16.40</td>
<td>410</td>
<td>25</td>
</tr>
<tr>
<td>Copyright restrictions</td>
<td>22.65</td>
<td>589</td>
<td>26</td>
</tr>
</tbody>
</table>

Fig.4: Importance of web pages evaluation

| Check site address            | 26.9% (7)        | 34.6% (9)      | 26.9% (7)      | 11.5% (3)      | 26             |
| Author contact data           | 23.1% (6)        | 30.8% (8)      | 26.9% (7)      | 19.2% (5)      | 26             |
| Site’s actuality              | 65.4% (17)       | 19.2% (5)      | 3.8% (1)       | 11.5% (3)      | 26             |
| Site’s organization           | 37.0% (10)       | 25.9% (7)      | 29.6% (8)      | 7.4% (2)       | 27             |

Fig.5: Data analyse of question: Order evaluation criteria of web page credibility by relevance
(1- most relevant, 4-less relevant)
– The largest weight, 46.38%, which the respondents gave in assessing the web pages containing scientific information is represented by content, 27.8% - goal, 22.65% - copyright restrictions, 21.2% - form and accessibility, 16.4% - cost. (Figure 4)
– Data correctness is aimed by 81.5% of respondents when they assess the content of a scientific article, 51.9% assess originality and bibliographical references, 48% - quality of language, 44% - evolution of the presented phenomenon and 3.7% - reviewers.
– The criterion having the largest weight in analyzing a blog or a web page is actuality – 32.8%, followed by the aspects that were dealt – 31.67%, depth, presentation level – 30.8%, if explicit goal is present – 21.88% and format – 20.525.

2.3 The research conclusions

Analysing the gathered data, the conclusions are the following:
– The Internet is the main documentation source of the future researchers trained within the department. Only one participant uses the professors’ courses as a documentation source.
– The online sources are the respondents’ favourite sources which yet are not too far from the traditional sources. The media sources begin to become favourites just for few respondents.
– The level of knowledge on assessing scientific information is medium.
– The number of citing obtained by the article represents the first criterion of assessing the information quality of a scientific article.
– The credibility of an information source depends mostly on the authors’ credibility, on the bibliographical sources that were used and on the credibility of publications.
– The site actuality is considered the most relevant criterion of assessing web sites.

– Content represents the largest weight in assessing the web pages containing scientific information.
– The most respondents are interested in data correctness when they evaluate a scientific article.
– Actuality is the criterion having the largest weight in analysing a blog or a web page.

3. General conclusions and recommendations

As some general conclusions, the research hypotheses have been validated as well. The respondents possess skills of researchers and have an above medium level of knowledge concerning scientific information assessment. The scientometric assessment of scientific articles matches the first criterion of assessing quality, namely the number of cites. The fact that the most respondents use the Internet as a source of documentation imposes its usage as a mean of communicating and disseminating scientific information. Open access to information with all the aspects regarding institutional digital repository and reviews/journals in open access must be promoted continuously. The respondents are familiarized with this knowledge and thus there can be noticed the maturity with which they are assessing the quality of a web site, a scientific article and the obtained definitions regarding the credibility of a source. The recommendation is to promote the sources in open access, the institutional digital repositories which contain quality scientific information and which have reached the number of 2200 recorded repositories in OpenDOAR-Directory of Open Acces Repository, http://www.opendoar.org/[4] and the reviews/journals in open access, the ones that are recorded in DOAJ-Directory of Open Access Journal,[5] 6922 journals, 3134 journals searchable at article level, 617328 articles, http://www.doaj.org/. The University of Transilvania has developed an institutional digital repository, and the Ph degree
theses and master degree dissertation papers are available in open access (Figure 5).

Fig. 5 Institutional digital repository of the department Advanced mechatronic systems

References


