

Digital libraries' Developers and their Suitability: A Case Study

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Abstract: *This paper concentrates on evaluating the suitability of those who are involved in the development of digital libraries. Specifically, it aims to study the system analysts; those who are responsible for gathering system requirements, with the goal of determining how these requirements will be accommodated in the system. For this purpose, extensive communication between end-users and analysts is essential in order first to gather and then to analyze and understand end-users' information needs. A case study conducted attempting to evaluate the developers of the Social Science Information Gateway (SOSIG). SOSIG is an online catalogue of Internet resources on subjects related to social sciences. Results showed that there was a differentiation in the answers provided by end-users and the project manager, though it would be naïve to conclude that the project manager of SOSIG was not aware of users' information needs.*

Keywords: *Digital libraries, Evaluation, Systems developers.*

I. INTRODUCTION

With the rapid expansion of online information technology, the growth of available electronic information, and increased user needs for online information sources, digital collections have mushroomed and digitization is pervasive in all types of libraries. There is no doubt that end-users have quick and direct access to vast amounts of electronic information. But, at the same time, users have to identify and evaluate this information on their own in order to satisfy their information needs.

Unfortunately, results are not so positive. There is a large body of literature claiming that most end-users have not increased their ability to seek for information. It would not be exaggeration to call them as *simple seekers* with limited use of advanced searching techniques and no use of available information systems in their full potential (East, Sheppard and Jeal, 1995; Monopoli and Nicholas, 2000; Monopoli and Nicholas, 2001; Monopoli *et al*, 2002; Covi and Kling, 1996). Few users recognize that they are inexperienced in using on-line searching tools or have problems suggesting appropriate keywords. The majority of users do not realize that a low return of 'hits' from searching may be because of a poor search strategy employed. They are more likely to attribute this to the information system coverage rather than realize that better use of the system

by using the available searching techniques may yield better results (McCathey, 1995).

Taking all the above under consideration and trying to include the whole concept in a small in length sentence, we would say that no matter the growth of the number of digital libraries, there are still a great number of users who are not familiar with using specific digital libraries or do not use most of digital libraries' services provided. So the question is: how is it possible to develop useful and usable to full capacity digital libraries or have users who can be characterized as efficient seekers?

The development of an information system such as a digital library is a time-consuming procedure known as *systems development life cycle (SDLC)*. SDLC is a conceptual model that describes the stages involved in an information system development project, from an initial feasibility study through maintenance of the completed application. Various SDLC methodologies (models) have been developed to guide the processes involved, however in general an SDLC methodology follows the following main four (4) phases: a) system analysis, b) design, c) implementation and d) maintenance (Center for Technology in Government, 1998).

II. AIMS AND OBJECTIVES

This research studies the first phase of an information system development, the system analysis. For the purpose of this study, developers who are involved in the first phase are called as system analysts. Among their responsibilities is to gather system requirements, with the goal of determining how these requirements will be accommodated in the system. At this point, extensive communication between end-users and analysts is essential in order first to gather and then to analyze and understand their information needs. The outcome of this communication is responsible for creating systems that are capable of satisfying users' information needs.

Based on the fact that analysts have an important role to play in the development of digital libraries, how are we sure that we have involved the right analysts for collecting, but mostly for analyzing and understanding users' information needs? The selection of the right people is one of the main principles for digital library development (McCray, A.T. and Gallagher, M.E., 2001). Therefore, this study aims to set up a discussion for the quality of system analysts focusing on evaluating

their rightness for participating in the development of digital libraries.

III. METHODOLOGY

For the purpose of this research, a case study was designed aiming to study those who are involved in the development of a digital library (development team).

A good example of a digital library is the *Social Science Information Gateway* (SOSIG) (<http://www.intute.ac.uk/socialsciences/>). Developed in 1994, SOSIG is an online catalogue of Internet resources on subjects related to social sciences, such as education, philosophy, and politics. It is focused on offering a quick and easy way of finding quality-networked information that can support the users' work.

Four (4) people involved in the creation of SOSIG, but for this study it would be more appropriate to provide only the answers of the project manager, the person who was responsible for getting closer to users and analyzing their information needs. The others were: a) the technical supporter, b) the cataloguer and software developer and c) the editor (add, delete and update records). Research took place in October 1999.

The project manager was invited to complete a short online questionnaire divided into two sections (six questions). The first section aimed to obtain information on developers' backgrounds regarding their gender, age, area of study and their responsibilities in the creation of SOSIG. The second part of the questionnaire planned to get information on whether developers have an idea of how end-users perceive digital libraries. Specifically, respondents were provided with a table that listed a number of advantages and disadvantages concerning accessing information in digital form. For each line, respondents were asked to assess the statement on a scale of one (1) to five (5), where 1 was an advantage and 5 was a disadvantage. There was also the 'don't know' option (DK). These characteristics were the following: no need for commuting (Statement 1), no librarian to teach how to use the equipment (Statement 2), possibility of 24-hour access to the collection (Statement 3), no personal contact with other users (Statement 4), quick and direct access to information (Statement 5), no librarian to assess user's background and information needs (Statement 6), limited wear of the collection (Statement 7), adequate knowledge of computer skills is required (Statement 8), no physical contact with information (Statement 9), information can be held in more than one place (Statement 10), there is access to unique historical information where physical access is not allowed (Statement 11), it might cost to have access to information (Statement 12), there is the possibility of unrestricted number of "loans" (Statement 13), information is available in a variety of formats (Statement 14), computer equipment is required (Statement 15), time spent in front of monitor (Statement 16), information can be accessed by many users simultaneously (Statement 17), privacy (Statement 18) and online help (Statement 19).

A similar but longer questionnaire was given to the users of SOSIG, which asked from them to evaluate the same table of the aforementioned statements. Then, a comparison of users' and the project manager' replies revealed whether those who were responsible for creating digital libraries were actually aware of the way that users perceived digital libraries.

IV. RESULTS

A. End-users

Characteristics: One hundred and thirty one (131) SOSIG users responded to the survey. 55.7% of them were female, 42% of them male and 2.3% of them did not answer to this question. Results showed that SOSIG was used by all age ranges included in the questionnaire (17-65+). However, it was especially popular with the 25-34 age group and less popular with those over the age of 55 years old and over (Table 1). Regarding occupation, the largest group of respondents was information scientists, accounting for 29.8% of the sample. 16% of the respondents were undergraduate, postgraduate, or research students, 12.2% were lecturers or professors, and 11.2% were research staff, such as research fellows or assistants (Table 2). The category *other* includes occupations such as Webmasters and managers. The 'don't know' (DK) and 'blank' categories represent the respondents who either did not give an answer or for whom the responses were incomplete.

17-24	17	13.0
25-34	41	31.3
35-44	31	23.7
45-54	33	25.2
55-64	8	6.1
65+	1	0.8

Table 1. Age of end-users (%).

Student	21	16.0
Research Staff	15	11.5
Academic	16	12.2
Information Scientists	39	29.8
Don't know (DK)	17	13.0
Other	23	17.6

Table 2. Occupation of end-users (%).

Internet experience: The vast majority of respondents were regular Internet users. 85.5% of the respondents indicated that they used the Internet daily and 8.4% weekly. Only 6.1% used the Internet occasionally. Both men and women proved to be regular Internet users. 94.5% of women and 92.8% of men specified that they visited the Internet on a daily or weekly basis. In addition, all age and occupation groups seemed to be frequent users of the Internet. The most frequent users were: females, those aged 35-44 and research staff. 100% of those aged 35-44 and 93.3% of research staff accessed the Internet every day.

However, two-thirds of users experienced problems when obtaining information from the Internet. These problems varied from the quality of information on the Internet and the difficulty of users to obtain information that met their information needs, to technical issues such as how long it takes for a page to be downloaded. Men and women users both experienced problems with the Internet, but women seemed to have the greater difficulties. 71.2% of women indicated that obtaining information from the Internet was either moderately easy or difficult while the percentage of males was 54.6%. Regarding age and occupation groups, those aged 17-34 and the 'don't know' category and student seemed to face more difficulties in obtaining information from the Internet than the other groups.

When users were asked to specify their problems a sizeable majority (64%) stated that their main problem was the overload (too much information available); 45.3% mentioned that they did not have the time required to search for information they needed, 44.2% cited slow speed of access to the service, 26.7% indicated that they were unfamiliar with searching methods, 18.6% mentioned the lack of online help and 14% referred to the cost of searching the Internet.

Respondents were also free to specify any other problems encountered while they were using the Internet. 32.6% of the respondents mentioned their difficulties. Among these difficulties were: the fact that information provided is not evaluated and there are some technical problems, such as it takes time for a web page to be downloaded.

Advantages and disadvantages of digital libraries: 74.8% of the respondents identified the possibility of 24-hour access to the collection as the main advantage of digital libraries. More females would appreciate to have all day access than males. Other important advantages were the fact that digital libraries might provide quick and direct access to information and information can be accessed by many users simultaneously - 65.6% and 63.4% of the respondents chose these respectively. In addition, respondents seemed to identify as advantages that there is no need for commuting, information can be held in more than one place, there is access to unique historical information where physical access is not allowed, there is the possibility of unrestricted number of 'loans' and information is available in a variety of formats. At these cases, the majority of the respondents weighted with numbers 1 and 2.

The higher scored disadvantage was the possibility of users to pay in order to have access to information. 29% of the respondents decided that it is definite disadvantage. More women identified this as a problem than men, while all occupation groups seemed to be unwilling to pay. However, academic staff, the *don't know* occupation category showed to be less disappointed on paying for information than the other groups provided. Concerning age categories, less worried were those aged 55-64. Only 12.5% stated that

paying for information is definitely a disadvantage. On the contrary, those aged 17-24 were the greater supporters of characterizing it as a definite disadvantage.

Respondents were also worried about the time spent in front of a monitor. 22.1% of them evaluated it as a definite disadvantage, while another 28.2% weighted it with the number 4. Those aged 55-64 and the 'don't know' occupation category were least worried about spending time in front of the monitor.

In addition, end-users seemed not to appreciate the possibility that there is not personal contact with other users and librarians. 26% of the respondents characterized the lack of communicating with users as a definite disadvantage. Academic staff and information scientists and those aged 35 and over were more worried about not having personal contact with other users compared to the other occupation and age groups. The lack of contact with librarians in order to teach them how to use SOSIG was valued it as a disadvantage mainly by students, research staff and information scientists and the 25-34 and 35-44 age groups.

Other disadvantages were: the lack of physical contact with information, the need of computer skills knowledge in order end-users to be able to use any computerized information system and the lack of librarians to assess user's background and information needs. At these cases, the majority of the respondents weighted with numbers 4 and 5. However, respondents showed to be less worried about the necessity of computer equipment existence. The majority of them (35.1%) chose number 3, providing a neutral behavior (Table 3).

	1	2	3	4	5	DK	Blank
1	48.9	20.6	10.7	3.8	2.3	0.0	13.7
2	7.6	10.7	24.4	18.3	25.2	0.0	13.7
3	74.8	11.5	6.9	0.0	0.8	0.0	6.1
4	6.1	6.1	27.5	22.1	26.0	0.0	12.2
5	65.6	17.6	6.1	2.3	0.8	0.0	7.6
6	4.6	6.1	27.5	25.2	20.6	9.9	6.1
7	18.3	10.7	26.7	9.9	5.3	0.0	29.0
8	10.7	13.0	30.5	22.9	12.2	5.3	5.3
9	7.6	3.8	35.9	26.7	10.7	9.2	6.1
10	50.4	23.7	8.4	3.1	2.3	0.0	12.2
11	48.9	29.0	6.9	1.5	3.8	0.0	9.9
12	9.2	10.7	20.6	19.8	29.0	6.1	4.6
13	47.3	20.6	11.5	4.6	2.3	0.0	13.7
14	41.2	32.8	11.5	6.1	2.3	0.0	6.1
15	9.9	10.7	35.1	17.6	16.8	0.0	9.9
16	8.4	9.9	24.4	28.2	22.1	0.0	6.9
17	63.4	17.6	8.4	3.1	0.8	0.0	6.9
18	26.7	19.8	25.2	6.1	3.8	10.7	7.6
19	26.0	21.4	27.5	8.4	1.5	0.0	15.3

Table 3. Advantages and disadvantages of accessing digital information (end-users) (%).

B. Project Manager

The project manager was female belonged to the age group 25-34. Her area of study was Humanities, Social Sciences, Information and Library Studies. The higher scored advantages were (number 1): there is no need for commuting, the possibility of 24-hour access to the collection, the quick and direct access to information, information can be held in more than one place, there is access to unique historical information and information can be accessed by many users simultaneously. She answered that users would not show a great interest in the lack of online help, the no physical contact with information, the limited wear of the collection, the cost of accessing information, the need for computer equipment and the lack of privacy. Regarding disadvantages it is worth mentioning that she did not score any with number 5, while the only statement weighted with number 4, was the fact that users have to spend time in front of a monitor in order to have access to digital libraries (Table 4).

	1	2	3	4	5	DK	Blank
1	√						
2		√					
3	√						
4		√					
5	√						
6		√					
7			√				
8						√	
9			√				
10	√						
11	√						
12			√				
13		√					
14		√					
15			√				
16				√			
17	√						
18			√				
19			√				

Table 4. Advantages and disadvantages of accessing digital information (project manager) (%).

V. CONCLUSIONS

Results showed that there was a differentiation in the answers provided by end-users and the project manager. The most important one was the fact that the project manager believed that end-users would not evaluate any of the provided statements as a definite disadvantage of digital libraries, neither the possibility of paying in order to gain access to digital information nor the lack of communication with information scientists or other users who might have similar information needs nor the time spent in front of a monitor. On the contrary, end-users identified a number of reasons that might prevent them from using digital libraries in the future. The higher scored disadvantage was the possibility of giving

money in order to have access to information. This implies that end-users seemed to be reluctant to pay, while the system analyst believed that users would have a neutral behavior and would not mind to give money to use a digital library. In addition, end-users seemed not to be grateful of loosing the personal contact with other users and librarians. But, the project manager indicated that the lack of this communication is rather an advantage of digital libraries than a disadvantage.

At the same, it would be naïve to conclude that the project manager of SOSIG was not aware of users' information needs. Further research would be necessary in order to verify these results. Results can be retained and potentially reevaluated for use in future projects or as a starting point for further ideation in future projects. One of these ideas would be the possibility of involving the system analysts in the evaluation process. The suggestion is to introduce a new evaluation strategy, the *developer-oriented evaluation*. This strategy would emphasize the role and quality of system analysts focusing on understanding whether they are the *right people* and most importantly setting a number of criteria for evaluating their rightness.

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