

# Information Capture and Knowledge Sharing Systems in the Field of Library and Information Science: The Case of MEDLIB-L in Medicine

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**Abstract:** Professionals using the Internet have various tools with which to capture and share information. Email discussion lists, despite their age, are still one of the main applications that telematic networks use for information to be shared in the social media field. They have not lost their validity even though the arrival of numerous applications associated with other types of social media, such as social networks, microblogging networks, wikis, etc., was often thought to augur their demise. Also, the new culture of Knowledge management, in which people share data, knowledge, and experiences, has, with its technological bases, become an indispensable tool for human interaction. This paper presents the results of a study applied to the medical sector which surveyed the MEDLIB-L discussion list users - specialists in medical information. The primary aim was to determine the usefulness of the various tools they use (social media, literature alert systems, syndication RSS, search engine alerts, new content trackers) to capture and share information of interest and to serve as means of training and learning. A further aim was to determine the quality and usefulness of the messages sent by the professionals of information management in medicine to the list and the usefulness of its message archiving system.

## 1 INTRODUCTION

The process of communication as the transmission of signals and codes between an transmitter and a receiver has undergone alterations throughout history. Technological advances have transformed the spatiotemporal concept of this process deriving from the medium used to establish the transmission. In the first place, the arrival of the telegraph and the telephone changed the form of communication, surpassing postal communication on paper, multiplying the interactions between human beings while reducing the space between them as physical presence was no longer necessary. The telephone allowed speed and efficiency that no other medium had before.

Telematic networks, such as the Internet, have probably had the greatest impact of all on communication between people. The emergence of various applications on these telematic networks, such as e-mail and Web 2.0, have considerably

broadened the core of people who can be contacted more quickly and economically. As a consequence of e-mail, there arose electronic discussion lists which represented a qualitative leap in this communication process. Suddenly a person could get into contact with thousands of people all over the world and generate a dialogue with them in a that had been impossible before. At the same time, newsgroups appeared as another way of putting people into contact who were located in very distant places but were interested in the same subjects.

The arrival of the World Wide Web and of Web 2.0 making it easy for people to insert content into Web platforms meant another radical change in communication by means of technological media. Social media, whose content is generated by their users, have multiplied in the form of social networks, blogs, microblogging platforms (such as Twitter), wikis, etc. However, distribution lists, one of the first social media and which seemed destined to be obscured by this new Web 2.0 reality, have not

disappeared, and in many cases continue to remain in full force.

## 1.1 Email Distribution Lists

Distribution lists are groups of e-mail users who use in their work software that allows messages to be sent so that all the subscribers to the list receive the same message simultaneously (Merlo, 1999). Discussion lists in particular have been operating for several decades, but have rarely been studied. The Scopus database has only sixty records with the descriptor "discussion lists" in the title field. The first studies date from the 1980s. They are related to the technical and descriptive aspects of the system (Deutsch, 1984; Kirstein, 1986). Later studies deal with the informative potential of specific discussion lists (Ste-Marie, 1998), and with their use as an educational tool (Wen *et al.*, 2000). Also interesting are experiences in specific sectors such as the health sector. Wakabayashi *et al.* (2000) published a paper that highlighted the Japanese national transplant system mailing list as a very suitable tool for communication among medical professionals, patients, and family members. Ramos, Rai-Chaudhuri & Neill published a paper about a list for Chronic Myelogenous Leukaemia (2004).

The literature includes many studies dedicated to analysing the content of the messages sent to the lists (Waseleski, 2006; Tonta & Karabulut, 2010).

More recently, Pujar, Mahesh & Jayakanth (2014) demonstrate with an Indian list how this system is still fully valid for Library and Information Science professionals.

Distribution lists can be of different types. Apart from the so-called discussion lists which are dedicated to encouraging subscriber participation, there are also notification lists whose only objective is to serve as a channel for the distribution of news from some type of organism. Although they may use the same software, their objectives are very different.

Lists may be open to anyone who wants to participate or closed to certain people and/or groups. They may also be moderated or un-moderated. In the former case, there are moderators who read the messages before they are distributed, thus endowing the list with greater quality. In 1994, a survey was conducted of several discussion lists, including the moderated PACS-L (Public-Access Computer Services) list which has since disappeared, and the un-moderated ASIS-L (American Society for Information Science) list. Although the respondents indicated that both lists were satisfactory, the quality

of the messages and their usefulness in everyday work was greater in the PACS-L moderated list than in the ASIS-L (Castro & Muñoz-Cañavate, 1994).

In discussion lists, not all subscribers participate in active discussions. Irvine-Smith (2010) pointed out that many subscribers simply search the lists with the general purpose of gathering information that can be summarized as "keeping abreast of current trends", specifically, to know what others' thoughts and opinions are..

## 1.2 Knowledge Management

Knowledge management is a culture, possible in all types of organizations, in which human resources play a fundamental role. People can share information, knowledge, and experiences to achieve their objectives through interaction with their peers. Knowledge management needs four components: people, processes, organization, and tools (Cannon, 2016).

We find that knowledge management, as a process for collecting and sharing intellectual capital, whether tacit or explicit, among the staff of an organization or between organizations to promote their collaboration, needs tools that may technological or non-technological. Information and communication technologies are at the heart of discussions on knowledge management. Indeed, technological advances in this field facilitate the exchange, diffusion, and integration of knowledge, and allow information to be easily codified, communicated, assimilated, and stored. Computer and communication infrastructures allow the exchange, integration, and creation of knowledge. The technologies that support knowledge management can be grouped into four main areas: (a) content management; (b) collaboration tools; (c) business information; and (d) databases and repositories.

The Internet has multiple tools and applications that serve both to transfer knowledge and to preserve it.

Distribution lists are a good example of such tools. They serve as a platform for people to communicate, collaborate, and transfer knowledge quickly, regardless of distance. They are also sources that contain data, information, knowledge, and experiences of all kinds, and the content can be stored for later retrieval.

Lists can serve for learning, although, as noted by Cavaleiro & Bruillard (2010) in a study of several French lists managed by France's Ministry of Education, for this to take place it requires a climate

of freedom without the rigidity of an official institution behind the list.

## 2 OBJECTIVES

The objectives of the present study were to determine:

- a) The current usefulness of discussion lists with respect to other systems such as social media, e-mail alert systems, search, that allow professionals and researchers to receive information useful for their everyday work.
- b) Subscribers' opinion on the usefulness of all these types of systems, not just discussion lists, for them to be able to share knowledge with their peers.
- c) The usefulness of ten bibliographic alert systems.
- d) The level of quality and utility of the MEDLIB-L list for its users, and their use of its message archive system.

## 3 MATERIAL AND METHOD

To obtain the MEDLIB-L subscribers's opinions, a questionnaire was prepared and distributed online through the Google Drive platform. It was distributed in the first half of May 2017. First the list editor was informed of the intention to send the questionnaire. After a message explaining the study to all the subscribers with a link to the online questionnaire, they were all sent two reminder messages during the following week.

A Likert scale of 1 to 5 was used for all the items of the questionnaire, with option 6 left for "do not know" or "no response".

The questionnaire was divided into seven blocks, as will be described below. In blocks two, three, and four, the options 1 to 5 ranged from "Not at all satisfied" to "Fully satisfied". In block five, they ranged from "Poor" to "Very good", and in blocks six and seven, from "Never" to "Very often".

### 3.1 Online Questionnaire

The online questionnaire was structured into seven blocks:

- a) 1st block. Respondent's data (nationality and profession).

- b) 2nd block. Utility of the following electronic media as means of receiving information of use for everyday professional work. In this case, they were asked to value their satisfaction with the following systems for receiving information: distribution list, Facebook groups or individuals on Facebook, LinkedIn groups or individuals on LinkedIn, Twitter, External lists of other Twitter users, discussion groups (e.g., groups.google.com), syndication RSS, E-mail alerts of new items and updates to websites, publications, repositories, Search engine alerts (e.g. Google Alerts), New content trackers (e.g., Copernic Tracker). The options were from "Not at all satisfied" to "Fully satisfied".

- c) 3rd block. The above electronic media and knowledge management. In this case, the respondents were asked to value their satisfaction on five questions related to knowledge management, learning, and peer-to-peer contact using the applications of the previous block. The choices were from "Not at all satisfied" to "Fully satisfied".

- d) 4th block. Utility of the following literature alert systems for receiving information in everyday professional work. The respondents were asked for their satisfaction with the following bibliographic alert systems for receiving information in their everyday professional work: Google Scholar, Web of Science, Scopus, Mendeley, PubMed, Journal Tocs, F1000 Prime, Sparrho, and Research Gate. The options were from "Not at all satisfied" to "Fully satisfied".

- e) 5th block. Quality of the MEDLIB-L list messages. They were asked to value the quality of MEDLIB-L messages, from "Poor" to "Very good".

- f) 6th block. Utility of the Medlib-L list's messages for the respondent's everyday work. They were asked to value the usefulness of the MEDLIB-L messages for their everyday work, from "Never" to "Very often".

- g) 7th block. Utility of the MEDLIB-L archives via the Web interface. They were asked to value the use of the MEDLIB-L message archive system, from "Never" to "Very often".

### 3.2 MEDLIB-L

Nancy Start created the MEDLIB-L discussion list in 1991. In August 1995, she transferred it to the Medical Library Association (MLA). The list, which had been housed at the University of Buffalo, was transferred to the University of Vermont in 2007. Its purpose is to provide support and help to

the health information management community and to the medical library sector (James, 2016).

It is an un-moderated list, meaning that all the messages sent to this forum may be distributed to all the subscribers. This may cause dysfunction in the quality of the content (textual errors or irrelevant messages). But communication is faster since there are no intermediaries. Despite this, there are some list rules and a policy that subscribers must comply with. Indeed, the coordinators of the list may expel a subscriber who does not comply. The norms are available at <http://www.mlanet.org/p/cm/ld/fid=377>.

Schoch & Shooshan carried out a survey in MEDLIB-L in 1997. They found that most participants claimed to read at least 41% of the messages, fewer than 20% claimed to read from 91% to 100% of them. Some respondents reported feeling overwhelmed by the number of messages, and considered that there was a need for a moderated list (Schoch & Shooshan, 1997; James, 2016). This is in line with the results of the study by Castro & Muñoz-Cañavate (1994) on several moderated and un-moderated lists.

The MEDLIB-L norms imply some principles that allow a certain management of the content by the subscribers themselves. For example, it is expected that those who send a request for help to the list in solving some problem should then publish a summary of the responses they received.

The profile of MEDLIB-L subscribers is primarily from English-speaking countries. And, although the number of subscribers has declined by 18% from 1997 (with 2700 subscribers) to 2016 (with 1970 subscribers) which may be due in part to the omnipresence of other social media such as Facebook and Twitter, their activity is still clearly present (James, 2016).

## 4 RESULTS

The survey received 52 responses, whose results will be presented below following the same structure as the seven blocks of the survey.

### 4.1 General Data of the Respondents

Regarding nationality, as is shown in Figure 1, the majority are from the United States (77% of the respondents), although there are users from other countries such as United Kingdom, Canada, New Zealand, Brazil, Belgium, Spain, and Morocco.

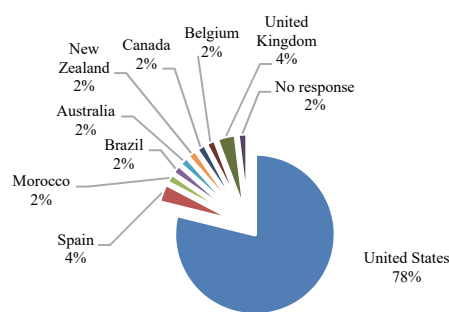


Figure 1: Nationality of respondents.

Regarding the respondents' professions, they were mostly medical librarians (94.2%), although 3.8% were teachers, and 2% were of other professions, such as information scientist.

### 4.2 Utility of the Electronic Media as Means of Receiving Information

One of the main objectives was to determine the role of discussion lists as a medium for the reception of information in a professional environment in comparison with other systems. The results are presented in Table 1. They point to discussion lists such as MEDLIB-L as being one of the most useful media. It is obvious that the respondents were active list users, since the questionnaire was sent out through the mailing list itself.

Table 1: Means of receiving information of use in everyday professional work.

	1. Not at all satisfied	2. Not very satisfied	3. Moderately satisfied	4. Very satisfied	5. Fully satisfied	6. No response or do not use
Distribution list (email) (Ej. Medlib-l)	0.0%	3.8%	13.5%	38.5%	44.2%	0.0%
Facebook groups or individuals on Facebook	11.5%	9.6%	17.3%	11.5%	3.8%	46.2%
LinkedIn groups or individuals on LinkedIn	15.4%	11.5%	19.2%	7.7%	1.9%	44.2%
Twitter	0.0%	13.5%	23.1%	5.8%	5.8%	51.9%
External lists of other Twitter users	1.9%	5.8%	7.7%	1.9%	5.8%	76.9%
Discussion groups (e.g., groups.google.com)	13.5%	1.9%	15.4%	1.9%	7.7%	59.6%
Syndication (RSS)	9.6%	3.8%	19.2%	7.7%	3.8%	55.8%
E-mail alerts of new items and updates to websites, publications, repositories	1.9%	7.7%	19.2%	34.6%	32.7%	3.8%
Search engine alerts (e.g., Google Alerts)	3.8%	3.8%	17.3%	11.5%	11.5%	51.9%
New content trackers (e.g., Copernic Tracker)	7.7%	1.9%	5.8%	0.0%	0.0%	84.6%

Thus, 96.5% of the users were satisfied with discussion lists when the three options "Moderately satisfied", "Very satisfied", and "Fully satisfied" are added together.

In decreasing order, and with these three options merged thus reflecting users' satisfaction with the different tools, the other media are ranked as follows: notification lists (e-mail alerts and news from websites, journals, etc.) (86.5%); search engine alerts (40.3%); Twitter (34.6%); Facebook (32.6%); content syndication (30.7%); LinkedIn (28.8%); discussion groups (25%); lists created on Twitter (15.3%); and new content trackers (5.7%).

### 4.3 Electronic Media and Knowledge Management

As presented in the introduction of this paper, Internet tools have made it possible to dynamize knowledge management processes, with what this means for knowledge transfer and learning. In recent years, a number of studies have been published that demonstrate the relationship between employees' use of social media and their creativity from adopting a knowledge management approach (Hemsley & Mason, 2011; Bharati, Zhang & Chaudhury, 2015; Sigala & Chalkiti, 2015).

The questionnaire included five explicit items about the usefulness of the media included in the previous section for decision-making in their everyday work, capturing the experience of their peers or transmitting their own, establishing contact with peers to carry out joint projects, and training and learning. The results are presented in Table 2, and are described below.

Table 2: The above electronic media and knowledge management.

	1. Not at all satisfied	2. Not very satisfied	3. Moderately satisfied	4. Very satisfied	5. Fully satisfied	6. No response or do not use
Question 1	0.0%	5.8%	17.3%	44.2%	26.9%	5.8%
Question 2	0.0%	3.8%	9.6%	42.3%	36.5%	7.7%
Question 3	0.0%	7.7%	9.6%	40.4%	32.7%	9.6%
Question 4	9.6%	5.8%	17.3%	25.0%	7.7%	34.6%
Question 5	3.8%	9.6%	19.2%	36.5%	23.1%	7.7%

The questions were as follows:

- Question 1 "The above electronic media provide me with the appropriate information for me to make decisions in my everyday (professional or academic) work".

- Question 2 "The above electronic media allow me to capture the experience of other colleagues".

- Question 3 "The above electronic media allow me to pass on my experience to other colleagues".

- Question 4 "The above electronic media, have allowed me to make contact with other colleagues to develop joint projects".

- Question "The above electronic media, serve me for day-by-day training and learning".

This block of questions highlights the importance that MEDLIB-L users give to the group of tools set out in the questionnaire, most of them being social media (distribution lists, social networks, microblogging), and search and alert systems. The sum of the options "Very satisfied" and "Fully satisfied" confirms this: 71.1% of those surveyed consider that these tools provide them with adequate information for decision making; 78.8% said that they allow them to capture the experience of their peers; 73.1% state that they also allow them to transmit their own experience to peers; and 59.6% that they are useful for training and everyday learning. Only the use of the tool to establish contact with people oriented to developing joint projects had a lower figure – 32.7%.

### 4.4 Literature Alert Systems

Regarding the bibliographic alerts that were represented by ten different tools, the conclusion to be drawn is that they are very little used except for PubMed, a search system developed by the National Center for Biotechnology Information (NCBI) in the National Library of Medicine (NLM). It has access to the bibliographic databases compiled by the NLM. This exception is logical since it has a direct thematic relation with the profile of MEDLIB-L users.

Table 3: Utility of alert systems for everyday professional work.

	1. Not at all satisfied	2. Not very satisfied	3. Moderately satisfied	4. Very satisfied	5. Fully satisfied	6. No response or do not
Google Scholar alerts	1.9%	0.0%	11.5%	15.4%	11.5%	59.6%
Web of Science alerts	3.8%	1.9%	7.7%	0.0%	3.8%	82.7%
Scopus alerts	1.9%	0.0%	5.8%	1.9%	5.8%	84.6%
Mendeley alerts	1.9%	5.8%	0.0%	0.0%	0.0%	92.3%
PubMED alerts	0.0%	5.8%	5.8%	28.8%	25.0%	34.6%
Journal TOC alerts	3.8%	1.9%	13.5%	26.9%	13.5%	40.4%
F1000Prime alerts	1.9%	0.0%	1.9%	0.0%	0.0%	96.2%
Sparro alerts	1.9%	0.0%	1.9%	0.0%	0.0%	96.2%
Research Gate alerts	5.8%	3.8%	11.5%	15.4%	1.9%	61.5%

#### 4.5 Quality of the MEDLIB-L Messages

Regarding the quality of messages sent to this list, although 30% of the users did not respond to this question, it should be noted that more than 50% chose options 4 and 5 which reflect satisfaction with the messages. However, one would have to consider whether the lack of moderation in this list, and therefore the absence of filters to prevent certain messages from being forwarded to all the subscribers, may be the reason why the number of respondents satisfied with the quality of the messages is not higher. This finding is in line with the study by Schoch & Shoosham (1997) of MEDLIB-L and the aforementioned study by Castro & Muñoz-Cañavate (1994).

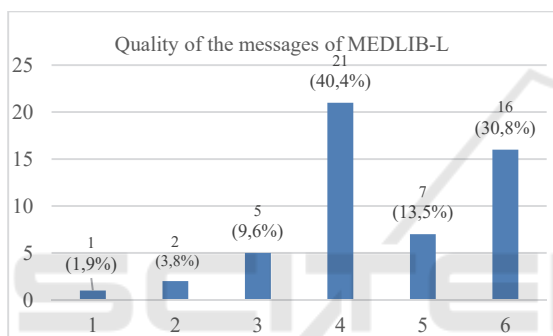


Figure 2: Quality of the messages of MEDLIB-L.

#### 4.6 Utility of the MEDLIB-L Messages

The results and reflections from the previous section can be applied to this block of the questionnaire (Figure 3) concerning the usefulness of the MEDLIB-L messages for everyday work. Thus, while we understand that the existence of moderation in discussion lists is likely to contribute to an improvement in their quality and usefulness as an information tool, MEDLIB-L is still clearly seen as being useful.

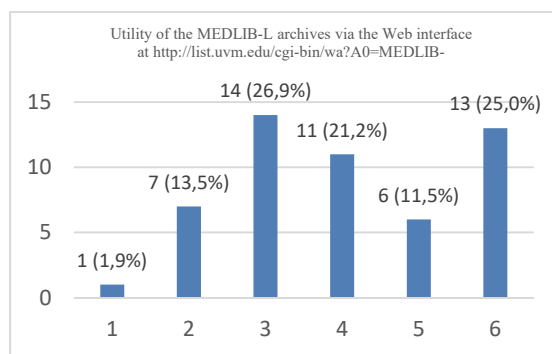


Figure 3: Utility of the Medlib-L list's messages for the respondent's everyday work.

#### 4.7 Utility of the MEDLIB-L Archives

Most discussion list management software has storage systems for the messages sent to the list, sometimes accompanied by a search engine. These tools convert the knowledge accumulated in the messages into information of interest for the future, not only for the immediate moment of their sending, distribution, and reception. The survey result was that 73% of the users use this system, thus demonstrating its usefulness.

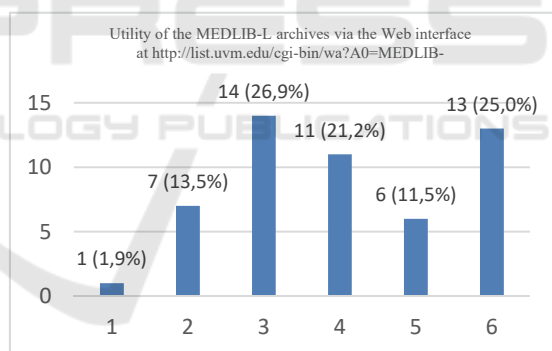


Figure 4: Utility of the MEDLIB-L archives.

### 5 CONCLUSIONS

The users surveyed were mostly US librarians. Their opinion thus prevails over that of other countries. With respect to the usefulness of the various media for the reception of information, discussion lists such as MEDLIB-L stand out as being the most highly valued, although there may have been a direct relationship of this result with the channel through which the questionnaire was distributed (the MEDLIB-L discussion list) because all the respondents were direct users of this tool.

The result is not without its relevance however, since the massive arrival of the new Web 2.0 social media was seen by many to augur the progressive disappearance of discussion lists as a tool, something which has not occurred. The social media Twitter, Facebook, and LinkedIn are also used, but their importance is less. The "search engine alerts" (e.g., Google Alerts) are highly valued, but the importance of "new content trackers" such as Copernic Tracker is just residual.

With regard to the usefulness of this group of social media (distribution lists, social networks, microblogging, etc.) as technological tools that favour knowledge management and learning, the respondents were mostly satisfied with them. They especially considered that these tools provide adequate information for decision making, and allow them to capture the experience of their peers and to pass on their own experience. They also note these tools' usefulness for training and everyday learning, albeit to a lesser extent.

PubMed is the most used bibliographic alert tool, which fits in with the thematic profile of the list's subscribers – professionals of information management in the medical field.

Finally, the respondents approved of the quality of the MEDLIB-L messages and their usefulness, albeit at percentages which suggest that if MEDLIB-L were a moderated list then the degree of satisfaction would be greater. They make moderate use of a tool which allows the knowledge generated by the discussion list to be saved: its archive system.

Thus, distribution lists should not be contrasted with other applications based on social networks. Each is a different way of communicating and interacting, but they all permit the transmission of information and knowledge. They can all form communities of practice, that is to say, groups dedicated to sharing knowledge and the learning this implies through the interaction among their members. Wenger et al. (2002), in their paper entitled *Cultivating Communities of Practice*, defined different roles for the users of these communities, from the figure of the coordinator to the more active members and others who are peripheral. Likewise, subscribers to discussion lists acquire similar roles, from list administrator to the more active users who ask, write, and respond, and those who only read but can not do without a source of knowledge such as that provided by the distribution lists corresponding to a thematic area. Such a list is in all cases a platform for collective learning.

Distribution lists not only transmit formalized and structured information from individuals or institutions, but also non-formalized information, simple comments, which can generate feedback with the interaction of subscribers, and the result can be stored as if it were a memory in the file system of the software that manages the distribution list.

This paper aims to revindicate distribution lists which seem to have been relegated as against the new media corresponding to the so-called Web 2.0. Indeed, due to their simplicity and ease of use, we believe distribution lists will survive.

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