
Aspects of Dealing with Digital Information: “Mature” Novices on the Internet

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ABSTRACT

THIS ARTICLE SEEKS TO ADDRESS the following questions: Why do certain people, who are fully information literate with printed materials, become hesitant and even reluctant when it comes to finding something on the Internet? And why do we, information professionals, find it difficult to support them adequately?

Mature users of digital information are often skeptical about the value of the Internet as a source for professional information. Over the years much has been achieved, but many prophecies of the experts on digitalization from the early hours still have not yet been fulfilled. Mature users do possess all skills needed to be digital-information literate, but they need to be assisted in specific areas where those skills are insufficient. They tend to blame themselves even if shortcomings in accessibility of digital sources and computer errors obstruct their search. Operating hardware requires a dexterity that can only be acquired by experience. Instruction should be hands-on; demonstration is far less effective. Special attention should be given to reading and interpreting navigation information on the screen and to the search strategies the Internet requires. Use of imagination and trial-and-error methods are to be recommended in this respect.

INTRODUCTION

The combination of digitalization and electronic communication has provided us with a marvellous, well-nigh inexhaustible source of information: the Internet. Young people who are growing up with the Internet are its natural users, and librarians focus their attention to teaching them how to use the Internet efficiently when they are searching for professional information.¹

Because of this focus on the young, the needs of another group that can benefit from this rich source are neglected. This is the group of mature researchers. They are well-educated, intelligent professionals who are experienced in dealing with information. They are used to working with word processors, e-mail programs, and other computer applications and know how to search databases. Yet, many of them rarely turn to the Internet for information and, whenever they do, they are not able to use it effectively. This is due partly to the researchers and partly to the character of the Internet as a source of professional information. This paper will discuss those two obstacles and what can be done to assist the mature users in overcoming them.

DEFINITION OF MATURE INTERNET USERS

The group described here as “mature” users—so as not to hurt anybody’s feelings about age—consists of professionals thirty and over, with no upper age limit (and some significantly younger than thirty). In my work as a librarian, I was often confronted with the younger category, and in my personal life I am regularly consulted by friends of over seventy, some of them in their eighties. In my experience, there is little difference in type of difficulties according to age, it only gets harder to overcome them. All mature researchers do know their way around printed sources, but have received their professional training before the boom in digitalization and electronic communication. The skills to deal with digital information they picked up along the way as computers slowly penetrated first their offices at work and then their studies at home. The transition was gradual on all fronts: From typewriter to word processor is but a small step and from card catalog to an online catalog is (to the library patron) just a change in how to search the records. The possibility of sending e-mail is a welcome addition to the usual channels of communication, but it is not seen as really “new,” as it is perceived as a written phone message. Yet, in electronic mail and other online applications lies the real giant leap made possible by digitizing information. Thanks to electronic communication, computers can be linked in ever increasing and highly complicated networks, and hyper-linking makes it possible to connect the content of all those computers.

Mature users often do not bother with the Internet as a source, because they know how and where to find what they need efficiently in printed sources. If they do decide to turn to the Internet, they often have great difficulty in finding the desired information. One clear obstacle in searching the Internet is their computer skills, in particular operating a mouse and interpreting the navigation information on a screen.² Another difficulty lies in the difference in search strategies required.

COMPUTER SKILLS

Applications such as word processing are mainly key-operated, while the Internet is very much mouse-operated. Instruction can easily be given

on basics such as the difference between left and right click (command versus dropdown menu). When to use single or double click is less easily conveyed. There is no visible indication, and it usually boils down to experience to know how often to click. Besides, experienced users often are not aware this may pose a problem, as they themselves will recognize and correct any error almost instantly. Many mature users are not very adept at using a mouse, because it takes finely tuned motor control to point a mouse at a specific spot and click without moving away from that spot. The younger a person, the easier it is to train for this control, and the only way to learn is by practicing. But when work has to be done on the computer, poor mouse control is an encumbrance and a nuisance, so people rather rely on their keyboard skills. Playing mouse-operated computer games in which speed does not matter (such as *solitaire*) is one of the best ways to train oneself for mouse skills. It provides an opportunity to practice without the irritation of being hampered in one's work, because the outcome of a game does not have the same importance. But sadly, most mature users are not very enthusiastic about playing computer games.

A second important skill is the ability to interpret the navigation pointers on the screen. In applications there is a certain convention in the use of symbols and the position of information on the screen that helps operate the program. A menu bar is at the top, an arrow to the right means "forward" and a tiny picture (two squares and some horizontal lines) indicates a print button. Any number of actions may cause to appear on the screen a dialog box that contains information on how to proceed. (Often the content of dialog boxes is not very clear, but that is another matter, not considered here.) In many programs, however, there is no clear indication on the screen how to exit safely at any given moment.

Navigation information on the Internet often does not comply with these conventions. Every designer of Web pages decides what is the ideal way to present the navigation pointers. A search button may be disguised as a signpost or a dog or a magnifying glass; a help button as a question mark or a life buoy, and so on. Interpreting icons on the Internet calls for enough imagination to match a designer's creativity. Even the feature that is at the core of Internet navigation, the hyperlink, is often not easily recognizable due to graphic design. To find links and hot spots one needs to move the mouse across the screen and check where its shape changes to indicate something clickable.

How important it is to "read" a screen effectively may be illustrated by an example of a friend of mine who is an accomplished digital-information literate but could not find what he was looking for because the buttons to browse the hit list were in an unusual place on the page.

BRUSHING UP

When librarians are assisting mature users in brushing up on their computer skills, they need to be aware that these mature users witnessed

the birth and growth of digital information. They know that predictions regarding new possibilities often are too optimistic, and their own experience of not being able to find what they are looking for only confirms this impression. A less apparent complication is that mature users can be quite insecure about the skills they *do* possess. When one is used to being in control, it is unpleasant not to be able to master a machine. Even when technology fails, as it frequently does, mature users often feel that they themselves are probably to blame.

Instruction must be hands-on. A "Let me just show you how to find it" demonstration usually is executed far too quickly, because the demonstrator knows where to look, and does not need to read the whole screen to locate the navigation information. Besides, as stated previously, using a mouse can only be learned hands-on. Instruction on how to read a screen should also encompass encouragement to use imagination and exploratory behavior: guess what icons are meant to symbolize or click them just to find out what they are for; move your mouse around to locate clickable objects and click to find out what happens.

In manuals it is important not only to list steps. Every action must be described in detail to make sure that a procedure can be executed correctly. Apart from this, it is important to describe what the results of any action should be, to enable the user to check whether he or she is still on the right course.

CHOOSING A SOURCE

Choosing which source is best suited to fulfill one's need for information is complex. All kinds of considerations come into play:

- Do I know a source in which I expect to find the answer to my question?
- Can I go straight to a document (content-source) or do I need a reference source (such as a catalog) to locate it?
- Can I get hold of a document, once located?
- Is the source reliable?
- Will I be able to consult it again?

The very first consideration is decided by the experience and expert knowledge of the researcher. Mature researchers know their way around the traditional professional sources such as bibliographies, handbooks, catalogs, and professional databases. But someone who does not yet have this overview will nowadays probably turn to the Internet for a preliminary search. Depending on the success of this Internet search and the standard the researcher requires for his information, many leave it at that. The possibility to assess the reliability of the information that is found in the search is a deciding factor in whether a search needs to be extended.

There is a large gap between printed and Internet sources with respect to the assessment of their reliability. In printed materials, the title page of

a document provides information about the author and the publisher and both have their reputation at stake where quality is concerned. If no name is connected to a document, or if the author has published it independently, it is not so obvious what kind of quality may be expected, since there is no claim to responsibility. These printed materials are referred to as "grey literature."³ Digital sources, such as databases or e-magazines, that are published and maintained by large institutions or by publishers, do have the name of their publisher as a hallmark for quality. For Web sites, on the other hand, there is no consensus yet on how to indicate the responsibility for its content. The domain of a large company or institution will often be taken as an indication of "corporate" responsibility, but it is rare to find an "imprint" of some kind that gives information on the actual person who is responsible for the content of a page. In this regard most of the information on the Internet is more or less "grey" by nature.

Once located, digital documents usually are more readily available than printed matters. With printed materials access to the actual source is determined by possession, and, consequently, by the opening hours of the library. Digital sources like databases are quite often licensed. Their availability will probably be restricted by passwords or IP recognition, but usually they can be searched from anywhere on the intranet of the organization. Internet sites are available 24/7 and at any place in the world, as long as you have a means of hooking up to the Internet.

A new factor to be taken into account, related to the Internet, is the question of whether the same information may be consulted again on a future date, at the same site. This may seem to be rather a strange consideration, but the Internet is a dynamic source that is not only being added to but is also being taken away from. A document, a page, or even a whole site may disappear as suddenly as it became available. Even more treacherous is that the content of a document may be altered unnoticeably and without notification. This instability in availability is mainly due to the fact that the content of the Internet is governed by supply.⁴ A printed document, however, once acquired, is available for an unlimited space of time.

CONTENT OF THE INTERNET

As mentioned, the content of the Internet is almost exclusively based on supply. Sites are put online by organizations, businesses, and individuals who feel they have something to share with the rest of the world. This is why there is such a variety of information to be found: reference and full-text information, commercial and not-for-profit information, common-interest and strictly personal information, professional and recreational information, Internet art, and so forth. It is also why there may be an overload of information on one subject and nothing at all on another. And it is the main reason why there are no standards for design or description of content that might improve access to the content.⁵

All in all, the Internet contains a chaotic and unstable abundance of information, with hardly any structure or logic to it. This is in contrast to sources such as bibliographies, indexes, and (digital) databases, that encompass a limited number of subjects and are highly structured. Searching structured bodies of information calls for different search strategies than searching unstructured ones.

SEARCH STRATEGIES

Because of their structured nature, search strategies for printed materials and digital databases can be defined clearly. This does not mean, however, that those strategies are always uncomplicated and searching a printed source may also be laborious. On the other hand, the lack of structure within the Internet makes it necessary to use one's own strategies.

Structured Sources

Reference sources such as catalogs and indexes are ordered alphanumerically or by subject and are devised with the express purpose to be searched. A printed source is accessible through a limited number of entries. Author and subject are the most common, but a library catalog may also provide access by call number. The entries are ordered according to strict rules, that can get quite complicated. In an index of author names, for example, my name will be filed under "D" in American catalogs, while in a Dutch catalog you will find me under "R". Diacritical marks that indicate vowel mutation also give rise to a different order. An o-umlaut, "ö", should be filed under "oe". Diacritical signs can be resolved automatically in digital indexes, but most people do not know how to produce them on a keyboard anyway. In older sources, spelling may also differ, and forgotten conventions may have to be rediscovered. (Few will remember the Prussian rules for ordering titles in a catalog.) If a printed source is to be searched full-text, the only help available is from the table of contents and the index, otherwise the only way to search it is reading it from cover to cover.

A digital database can be searched through the same entries as a printed one, and through additional entries such as (key)word, title, ISBN, etc., according to which fields have been made searchable. However, the number of databases in which the records can be searched full-text is increasing rapidly. This means that one no longer needs to bear all filing rules in mind. When a database also contains full-text information, the advantage of a full-text search is even greater. The enormous Dutch dictionary *Woordenboek der Nederlandsche taal*, the production of which took over a century, has been published both in print and digitally. It is known to contain synonyms that are only discussed in the explanation of other words and that have no entry of their own. With a full-text search, these words will turn up all the same, and their meaning is clear from the head entry of which they are a part. Here the possibility of a full-text search gives a clear added value to the dictionary.

The Internet

From a very early stage it was clear that surfing alone would not be sufficient to unlock the information on the Internet when looking for something specific. Special tools had to be built to search sites, and standards had to be agreed upon to make information accessible for these search engines. A lot of progress has been made in both areas, with varying levels of success.

To guide search engines without confusing humans, certain information was placed in metatags that are not immediately visible in the Web presentation of a screen. This has proven to be a mixed blessing. On the one hand, a search engine can find the information efficiently, but on the other hand it often is unclear for users why a page has come up in the search. (Commercial sites, in particular the shadier ones, take advantage of the possibility to include neutral key words that allow them to pop up in hit lists of perfectly innocent searches.) Individual site owners rarely are aware of the important role metatags can play in the traceability of their sites.

The progress made in developing search engines is encouraging. The interfaces are getting more user-friendly and, thanks to Web crawlers, the results they come up with are getting better. It has also become possible to search for different types of media: text, images, and sound. But no matter how good a search engine is, none of them covers all of the Internet and because they also overlap, a great part of the Internet remains unexplored during any search. Another confusing factor in the use of search engines is that some are designed to execute general searches, while others only search preselected sites. This selection improves the quality of the search results, but does restrict the quantity.

The most important techniques for Internet searches are:

- Start simple. First try `www.<organization>.<country>` or `.<com>` etc. before trying anything else.
- Be imaginative. Try as many different terms and phrases as you can think of. By using advanced search forms or boolean operators, you can combine terms.⁶
- Do not rely on one search engine in particular. Different engines search different parts of the Internet and will come up with differing hit lists given the same search phrase.
- Do not rely on search engines alone. Find a page that offers links and enables you to surf the Internet. These starting pages are compiled by humans and link to selected sources.
- Keep track of where you find something useful for later reference. Some search paths are difficult to duplicate and sometimes you may wonder whether it is your fault that you cannot find something again, or that the information has disappeared altogether.

- Be aware that an Internet nanny may be installed on a computer in a library, at work, or at some other public place. Internet nannies will filter search results for undesirable sites, often without giving notice of their interference. Depending on the humans who maintain the nannies' indexes, they may be more or less strict on certain terms. An amusing example of the dangers of filtering is the Dutch word "borst" (breast) that may cause sites to be barred for understandable reasons. However, "Borst" also happens to be the name of a secretary of state.
- Always, always, always be aware that there is more. Just because a search term cannot be found does not mean that it does not exist. One may be missing out on the most important document.

REFERRING TO INTERNET SOURCES

If the desired information has been found and should be referred to, the following information needs to be included:

- The URL and the full title of the site and, if possible, the exact subpage;
- The date on which the source was consulted;
- Any name or indication of responsibility (the source-view should be checked for information in metatags).

The most important consideration when deciding which source to consult is what type of information the researcher is looking for. Regular sources, in which responsibility for the content is clearly stated, are easier to find and handle than grey literature. The type of carrier for the information, a digital or a printed source, is secondary to the type of information it contains. The more experienced a researcher is, the quicker and more accurate the search will be. Due to the abundance of information of all kinds on the Internet and the lack of structure, it may be difficult to find something useful at all. When searching a structured database, one needs to keep in mind what the rules of that specific database are. When searching the Internet, search strategies should be adapted according to necessity. The Internet is a rich source, but does have limitations.

ASSISTING THE MATURE INTERNET USER

Librarians as a professional group are in the fortunate circumstances of being able to evolve their information literacy techniques in pace with the development of the Internet. Not all professionals have the same opportunity to keep themselves abreast of the latest innovations, nor do they need to do so on the same level as information professionals. When they are motivated to find information—like the address of a colleague abroad—most will teach themselves how to handle the Internet by trial and error. They do cope, but can improve a lot on their skills with a little help. Only very few people will not want to use the Internet at all once they understand its possibilities. Librarians can offer assistance on an individual or on a group level.

Individual Level

If a mature researcher is of the opinion that the Internet has nothing to offer that cannot be found in another way, it may be time to acquaint him or her with some unique advantages of the Internet. The best way to motivate someone to use a new tool is by showing the added value of that tool. The obvious advantages of the Internet are its availability and the diversity and quantity of information it offers. Apart from that, it is possible to download information for later reference and for quotation in any document one is currently working on. (The question of copyright and intellectual property will have to be dealt with, however.) Interactive tools on the Internet provide options like direct document delivery that the researcher can use in the comfort of his or her own study. To encourage someone's enthusiasm, it is important to be realistic about the possibilities. Disappointment is a powerful demotivator.

Instruction should be aimed at giving insight into two characteristics of the Internet: the nature of the information it provides and ways to navigate this information. When it is clear that information on the Internet is unstructured and diverse in nature, an information literate person will know that he or she needs to adapt his or her search strategies, but it will be necessary to pay special attention to what degree. The Internet calls for a far more imaginative approach than any other source. It is also important to clarify the ways in which navigational information can be presented. To find one's way around, it is essential to be able to find, interpret, and use the navigational pointers on a screen. Also the difference between surfing and searching must be explained. When surfing one departs from a (known or accidental) starting point. If links (and the starting page) are chosen carefully, this may take one efficiently to the right destination (though it may also lead one astray in about two clicks). On the other hand, there are the search engines. Using these calls for a careful and imaginative choice in search terms. The common sense approach of typing in the most likely URL often may prove to be the quickest and most efficient way, but it leaves little room for serendipity and the joy of finding something unexpected and unlooked for.

When one is working with the Internet on a daily basis, it may be difficult to empathize with the problems of someone who only ventures there occasionally. Especially with mature users, it should suffice to explain to them only once how to work the system, because they are intelligent, well-educated professionals. But all computer skills are mastered through regular use only. When someone keeps needing support for the same operations, it does not mean that he or she is unable or unwilling to learn, but that he or she just does not use the Internet that often. Most mature users hesitate to ask for support because they feel embarrassed by their lack of competence. (And some of those who need support are younger than one would expect.)

Group Level

On a group level, two lines of action may be followed to support the user: Providing tools and providing structure.

A convenient tool for the user is a manual that one can consult at the very moment support is needed. A good manual gives step-by-step instructions on specific actions that include descriptions of the desired result of the actions, so the user can benchmark what he or she is doing. A manual will have to be updated regularly so digital publication seems the obvious choice, but publication should not be online solely, as the Internet is the very place where users will have difficulties consulting it. Including URLs in a manual is inadvisable, as they tend to change.

It is impossible to organize the unstructured body of information that the Internet is, but librarians can provide structured entrances to that information. Most libraries offer link pages on their site. Librarians assess newly found sites before adding them to the listed links. They often make a short description of the content of information that the link leads to and they check regularly whether the site is still available. Being librarians, they categorize and order the links they offer. This is an excellent way of assisting all library patrons, both the actual and the virtual, because patrons can rely on the quality of the information being offered.

CONCLUSION

The questions posed at the beginning of this article can now be answered.

Why do certain people, who are fully information literate with printed materials, become hesitant and even reluctant when it comes to finding something on the Internet?

These "certain people" are mature researchers who feel they do not really need the Internet, because they know where and how to find professional information in printed documents and digital databases. The Internet is just another source and using it calls for search strategies and skills which they have not yet mastered as fully as needed. As the amount of useful information is growing, mature users are getting interested in learning the necessary skills.

Why do we, information professionals, find it difficult to support them adequately?

When a mature researcher asks for support, we usually assume that the main problem lies in some aspect of missing computer skills. In reality, there are two problems that are part of the Internet itself. First, it takes experience to navigate the Internet. Recognizing and interpreting navigational pointers on the screen takes training and so do surfing and searching the Internet. Second, use of the Internet involves dealing with an extremely unstructured source, and search strategies need to be adapted. If

the focus is placed on these underlying problems, library support will be far more effective.

In short, to assist mature researchers in expanding their information literacy competencies to include the effective use of the Internet, librarians need to:

- Demonstrate the added value of the Internet as a source;
- Explain the nature of the Internet as an unstructured, dynamic body of very diverse information;
- Offer training in necessary navigational skills;
- Offer training in search strategies;
- Make Internet sites available in a structured way and with a quality mark by building links into Web pages.

ACKNOWLEDGMENTS

For Hans, my favorite mature Internet user.

NOTES

1. An interesting contrast to the problem discussed in this article is that young people tend to forget, ignore, or even be ignorant about the printed sources that are at their disposal. "If it cannot be found on the Internet it does not exist, and if it does, it cannot be important," seems to be their attitude. Teachers and librarians should address this issue and make sure that printed sources are being referred to right until the very moment this presumption comes true, if ever.
2. Keyboards pose no problem. The use of command keys became common knowledge through word processing. Even the difference between "delete" and "backspace" is no longer a mystery to anyone.
3. Lack of precise information also makes grey literature more difficult to locate and to refer to.
4. Many of the suppliers of information on the Internet are individuals. In search of professional information, most people will rarely consult individuals other than friends or colleagues. But when it comes to the Internet, they rely on perfect strangers.
5. Libraries, whose objective it is to provide information to their patrons, should try to look at their sites from the visitor's point of view. Usually, the first links on the homepage of a library lead to practical information about the organization, the location of the physical library, its staff, the composition of their collection, lending rules, etc. The online catalog most often is only the third or fourth item listed. If a search option is presented on the homepage, it often is not quite clear what exactly will be searched by clicking the button; the site, the catalog, the Internet? As a visitor, my first interest always is whether this particular library can provide me with the information I need; all else is secondary. So from the point of view of demand, I would argue that the catalog should be the very first item.
6. It is an art to narrow your search down in such a way that the search engine only comes up with the one hit.