Expert information for non-experts

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Expert knowledge for non-experts: Inherent and contextual risks of misinformation

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One of the most significant aspects of Internet, in comparison with other sources of information, such as libraries, books, journals, television, radio etcetera, is that it makes expert knowledge much more accessible to non-experts than the other traditional sources. This phenomenon has often been applauded for its democratizing effects. Unfortunately, there is also a disadvantage. Expert information that was originally intended for a specific group of people – and not in any way processed or adapted to make it fit for a broader audience – can easily be misunderstood and misinterpreted by non-experts and, when used as a basis for decisions, lead to unhappy consequences. Can these risks be diminished without limiting the informational freedoms of the information providers and without imposing paternalistic measures regarding the receivers of the information?

Keywords: Ethics of information, quality of information, reliability, trust, ethics and epistemology

1.   INTRODUCTION

Part of the risks of sharing expert knowledge with the general public is caused by the non-experts' inabilities to recognize and assess the reliability or unreliability of expert information or information that is being presented as expert information. In this paper, I will suggest some distinctions and a general conceptual framework, which may offer starting points for non-restrictive and non-paternalistic solutions of problems regarding quality of online information.

What exactly is quality of information? It is necessary to ask this question because a clear concept of quality will help to formulate policies for solving the practical problems allegedly caused by flaws of online information. The notion of quality, however, is an ambiguous one. The term is traditionally used to refer to characteristics of an underlying substance, e.g., weight, colour and shape, or to properties in general, including formal or superve-

nient ones. Today, in everyday language, the concept of quality has gained additional or, should we perhaps say, a more specific meaning. Sometimes, quality is simply identified with goodness. More often, however, the term is used in a familiar, though slightly less specific way, i.e., to refer to the value of something with respect to its intended use.

When applied to data or information, quality is often defined in terms of criteria of truth, accuracy, conformity with facts plus this type of usefulness or functionality. Authors like Frawley, Piatetsky-Shapiro and Mattheus (1993) and Berti and Graveleau (1998) already extended their notion of quality to cover the degree of fulfillment of specific interests and preferences of individual users. A common characteristic of both of these accounts is that they do not specify the relationships between the criteria of functionality and the other criteria. The connection between the two types of criteria might, however, shed new light on the problem of quality assessment.

Discussions on issues of quality and quality assessment with regard to information tend to be rather short and clearly aim at particular short-term results. These results can vary from the introduction of new instruments offered by providers to enable users to assess the quality of the information involved, such as certification, to direct efforts to increase different forms of awareness among users of quality issues related to information – media competence or information literacy, as they have been labeled. Deepening the discussion on quality, however, might enable us to find more sophisticated solutions for problems of information quality assessment. It might also give us an opportunity to develop a broader perspective on these issues, which, in turn, might put us in a position to combine and fine-tune a variety of partial solutions.

I would like to contend that the discussion can be clarified and deepened with help of what is basically a three-dimensional account of quality. Such an account would be one in terms of reliability, functionality and significance. In the subsequent sections, I will first expound this account and then turn to the questions of how it may help to solve problems concerning quality assessment and how it may broaden our approach. In doing so, I will emphasize the importance of the user-perspective.

Before setting out, I must make a preliminary methodological remark concerning this undertaking. It might be the case that, after ample discussion, I will need to revise certain parts of the proposed account. It might even be the case that disconnecting the concepts of reliability, functionality and significance might, in the end, make more sense than trying to keep them under the umbrella of quality. What I think is valuable, nonetheless, is the process of analyzing the three dimensions of quality of information and their mutual relationships to clarify quality-related problems and their solution. What counts is: giving substance to the debate on quality of information and finding starting points for solutions. The exact itinerary is of minor importance.

2. RELIABILITY

Reliable information is information that we would be justified in believing. Reliability must be distinguished from truth. Reliable information is not necessarily true, since it is possible that at time t_1 we are justified in believing it, whereas at some later time t_n this information appears to be false: "[D]iscovering that a belief is false does not necessarily mean that, at an earlier time, people were not justified in believing it or that it was wrong to trust it. What is

reliable, trustworthy, justified is a matter of what we already know." (Vedder & Wachbroit, 2003: 211).

Assessing reliability of new information builds on preexisting knowledge. This claim is an epistemologically normative one. It is not to be identified with the factual tendency of many people in everyday life to use the fit or coherence between new information and what they already know as an indication of the reliability of the new information (Vedder 2002, 2003a). The coherence between new information and previously existing knowledge of one individual can be purely contingent, as long as it is not clear whether his preexisting knowledge is justified.

Reliability in the epistemologically normative sense that is under discussion here is a matter of proper justification. In Vedder and Wachbroit (2003), Robert Wachbroit and I distinguish "content criteria" from "pedigree criteria" of reliability. By "content criteria", we mean the conditions or criteria of reliability that are a function of the content of the information itself. Among these are the criteria of evidence which mostly belong to the domain of experts – people familiar with the subject or with a specific educational background or experience. Other examples of content criteria are logical criteria and, arguably, subject-matter criteria.

In general, most people cannot base their assessments of reliability on content criteria. Many determine reliability by pedigree criteria, the conditions or criteria of reliability that relate to the source or intermediary of the information. These have to do with their authoritativeness and having been experienced as credible in the past.

Pedigree criteria are not only used by non-experts. Experts use them as well. A large part of the training of experts consists in introducing them to the appropriate pedigree criteria applicable in their field of expertise (through courses on how to use libraries, instruments and sources).

Pedigree criteria are established by credibility-conferring institutions. These institutions can be very wide-ranging, from well-organized institutes to broader – sometimes intricate and tangled – networks of cultural and societal arrangements. Perhaps principal ones among the former are the academic institutions, such as universities, medical schools, law schools, etc. Among the broader cultural and societal arrangements are specific conventions and historically grown patterns and traditions of specialization, divisions of labor and of authority. Here, one may think of the traditions that form the cultural basis of the well-organized credibility-conferring institutions, but also of traditions and

conventions that are independently active, e.g. certain reputations and small-scale practices and usages, such as the custom of relying on the advice of parents and grandparents in family matters.

In section 5, I will explain that many problems regarding reliability of online information on the Internet are not problems of information *lacking* reliability, but of receivers misperceiving or not perceiving (un-) reliability. In order to pave the way to that discussion, I will first, give some attention to the dimensions of functionality and significance of information. These dimensions introduce the users' perspective.

3. FUNCTIONALITY

Functionality of information should be defined in terms of the connection between the information involved on the one hand, and the purposes of the receivers (including groups and organizations of receivers) on the other. Functionality must not be confused with reliability of information itself. The functionality of information does not influence its reliability. It influences the *importance* of the information and of its reliability and it affects the degree of urgency of quality enhancing measures. If we say that information is functional, we mean that the information has, in some way or another, a positive bearing on the ways in which the receivers' purposes can be realized. In other words, referring to information as functional information means that the information contributes to the realization of the receivers' purposes. Functionality ultimately depends on the purposes of the receivers. That does not mean that it falls into a totally subjectivist category. In order to ascertain whether information is functional for an individual we need not always know the specific purposes of particular individuals. The purposes of individuals can depend on highly individual tastes and preferences; but they can also be related to the common needs and interests of the human species, communities and groups. Some purposes and objectives can be presumed to belong to all or most members of the human species, communities and groups on the basis of their characteristics and needs. Thus, information can be functional merely for specific individuals or it can be functional for everyone or for groups of people.

Perhaps contrary to ordinary usage, I would like to stipulate the notion of functionality of information as an all-or-nothing notion. Functionality, in my view, should not be considered as a matter of degree. Information is either functional or not.

However, it may be useful to make a distinction between functional information as such on the one hand and functional information that is essential – or essential information – on the other. Functional information that is essential is information without which the purpose involved cannot be realized. In the next section, I will specify the notion of essential information further by distinguishing it from significant information. I will also explain that functional information can have different degrees of significance and that essential information can be, but is not necessarily highly significant.

Although reliability of information is not dependent on its functionality, functionality, in a way, is dependent on reliability. In order to be functional, information must, at least in some way or another, be suitable to be grasped and understood by the receivers involved: it must have some structure, some clarity, must make some sense. This capacity of the information itself, however, must be present whatever the purposes and aims of the receivers might be. In this shallow sense, functionality is dependent on reliability.

4. SIGNIFICANCE

Just like functionality, the significance of information has to do with the importance of the information and its reliability. It can also be defined in terms of the connection between the information involved and the purposes of users (including groups and organizations). Significance adds a degree of urgency to functionality. The statement "Information x is functional" just tells us that x is useful with regard to some purpose of a certain individual or a group. "Information x is significant" tells us that knowing x is important because it is functional for a specific purpose that is considered to be important. Significance is a matter of degree. Information can be more or less significant, depending on the importance of the types of purposes for which it is relevant.

It is critical, whether we take what one might call the subjectivist perspective or what one might refer to as the objectivist perspective. In the subjectivist point of view, the significance of information will depend on the individual's appreciation of the purposes for which the information is relevant. The more important the receiver considers his or her purpose to be, the more significant the information will be for this purpose. From the objectivist view, the receiver's exact estimate of the importance of the purposes is irrelevant. The objectivist will measure the importance of the purposes against external

standards, such as a certain ranking of basic human needs or a certain view of the good life, for example. For instance: The more a purpose meets an external standard of basic needs of members of the human species, the more significant the information will be considered that enables the user to realize that specific purpose.

It would not be very fruitful to try to argue conclusively for or against one of these two conceptions of significance. I consider the restriction to either the subjectivist or the objectivist version of significance as highly artificial. It is far more important to be aware of both interpretations.

Let me finish this section by explaining the difference between essential information and significant information. Significant information is not necessarily essential, nor is essential information necessarily significant. A piece of information's being essential means that getting to know that piece of information is a necessary condition for the realization of a specific purpose. That purpose, however, can be trivial (according to external standards). In that case, the information, although essential, is also trivial. Of course, the opposite also holds true: When the purposes and the information are significant, the information can, but need not necessarily be, essential.

5.   RECOGNIZING RELIABILITY

Now we can take up the thread of the argument in section 2 again. The distinctions made so far can help us to understand certain problematic phenomena that are related to the assessment of information in general and to the assessment of online information in particular.

As regards problems of reliability there are strictly speaking generally two types:

a   People lack the necessary expertise to assess information on the basis of content criteria and they also lack the necessary expertise to assess information on the basis of pedigree criteria. In this case the problems are due to a lack of competence of the users.

b   People lack the expertise to assess information on the basis of content criteria and it is impossible for them to test the information with the help of pedigree criteria. This is the case when the users are, in principle, competent in using pedigree criteria, but the information is presented in such a way that there are no indicators or markers of conformity with pedigree criteria.

Problems with reliability of information can be variations of both themes. The broad accessibility and the many-to-many character of online information, however, put these traditional flaws in a new perspective.

Because of the many-to-many character of online information, the very possibility of adequately recognizing pedigree criteria is often lacking where the Internet is concerned (Vedder 2001). Often, a content provider is anonymous or merely a virtual identity, as the influence of individuals in providing information on the Internet is diminishing, whereas the influence of intelligent systems is increasing. Also, the lack of traditional intermediaries, such as libraries, librarians, specialized publishers, has a negative influence on the capabilities of information seekers to assess the reliability of information. These kinds of factors often leave the users without clues or any indication whatsoever about the character, background, and institutional setting of the content provider. An additional complication to the problem is the phenomenon of globalization, which is inherent to online information. Even when the recipient has some information about the content provider, the individual might be unable to estimate the credibility of that provider, simply because the individual will often not be acquainted with the relevant backgrounds and institutional settings from completely different cultures. The recognition procedures and traditions that make up the institutional basis of pedigree criteria may be different in different cultures. A recipient from culture A may not recognize the procedures and traditions of the provider's culture B. It could even be the case that if the recipient from one culture were able to recognize them, he or she would not accept them as credibility conferring patterns.

The broad accessibility to information also causes different types of reliability-related problems with regard to online information. Information and communication networks like the Internet are media that enormously enhance the accessibility of information. Many people and organizations are able to disperse information through these networks. For many more information is very easy to find. People do need not to go to libraries anymore; they do not need to order books and journals and lumber a heavy pile home. Complete libraries, books and journals are available by clicking a mousebutton. The communication channels between experts and specialists (e.g. university libraries, journals etcetera) used to be only accessible to these selective groups. Now, these channels are often bypassed as the information is available on publicly accessible websites and not on web-

pages with specific access requirements such as authentication procedures. This means that many individual users for whom information was not originally intended and for whom that information was traditionally off-limits, are now able to find it.

In section 2, I already referred to the fact that, in practice, many people tend to assess the reliability of information, at least in part, on the basis of the fit or the coherence of the new information with the information that they already have: The degree to which the new information is in accordance with information that is already available, the degree to which the new information reinforces or supports the available information and vice versa. Depending on whether the person involved is an expert or a non-expert, the required coherence may concern information on the specific subject of the new information or general background information. Of course, the degree of fit itself is a reliable indicator of the quality of the information only if the information already present with the user is itself reliable as well.

Non-experts tend to gain ever more and easier access to information originally intended for an expert audience. That is why problems relating to reliability of information are not exclusively problems that are intentionally or unintentionally caused by content providers or problems inherent to the information. Whereas experts may rightfully use their criterion of fit with regard to this type of information, non-experts are not able to do the same when they are confronted with information that is originally intended for use by experts. Similarly, whereas experts may be well-equipped to recognize the pedigree criteria that are typical for this specific type of information, non-experts will be confronted with many more difficulties in recognizing them.

Continuing on this latter point: In order to be able to see whether information satisfies pedigree criteria, we need to have a certain expertise. Depending on the specific type of information, this expertise can be widely shared and consist of experience and an understanding of, for instance, our cultural context. But it can also be the expertise that is typical of certain specialists who have received thorough education or training in a certain field. There are two causes of the inability to recognize pedigree criteria. It may be the case that the receivers of the information themselves are unable to find and recognize these criteria because they do not know where to look for them. This may be due to the fact that they are not acquainted with the credibility conferring system behind the criteria or to the fact that they have not been taught where to

look. In any case, they lack the required expertise to recognize the markers as markers of reliability. Another cause of deficient recognition, may be more trivial and be situated in the piece of information itself or its presentation due to a deficient visibility of the criterion or, generally, the deficient presentation of the criterion.

6. THE FUNCTIONALITY AND SIGNIFICANCE OF RELIABLE INFORMATION

In the previous sections, I have distinguished reliability from functionality and significance. With regard to reliability I have distinguished content criteria and pedigree criteria. I have defined functionality as contributing to the realization of purposes of people. With regard to functionality, I have distinguished between functional information as such and functional information that is also essential, i.e., a necessary condition for the realization of the purpose involved. Significant information is functional information that contributes to the realization of important purposes. Significance can be measured against highly individualistic purposes, but also against external standards, e.g. those that represent a taxonomy of human needs.

With help of these distinctions, it might be argued that where questions of general policies with regard to quality assessment of online information are concerned, problems regarding significant – as measured against external standards – and essential information should receive priority. It would be useful to elaborate on this point and to draw the rough contours of a typology of different kinds of information that may be considered to represent essential significant information for eveyone and for different groups of people. Although this may be a vast project and a cumbersome undertaking – which certainly exceeds the purposes of this paper – it should be kept in mind that even a modest start might already prove to be fruitful, as it could give us a hunch on the directions in which we should seek. As only an indication with regard to the reliability of online medical information, it would probably make sense to say that, in general, medical information should be reliable. More specifically, however, if people look for information on diagnostics or therapeutic treatment because they have a severely ill member of the family or friend, they should be able to feel sure that this information conforms to high standards of reliability.

Interestingly, the typology of essential and sig-

nificant information is not enough. As we saw, only part of the problems with regard to the assessment of online information is primarily caused by the providers, e.g., through the presentation of the information. Often, the initial cause of the problems is the incompetence of users. Therefore, what is necessary is

1   The creation of new credibility-conferring systems, such as certification systems, allowing us to use pedigree criteria with regard to (online) information, when such systems are lacking
2   Raising the visibility of indicators or markers of reliability of information (according to pedigree criteria)
3   Raising expertise and background knowledge in all users (to enable them to recognize reliability on the basis of pedigree criteria)
4   Raising the awareness of the varying qualities of information.

With regard to online information, pedigree criteria and the underlying credibility conferring systems are still largely lacking. In the few cases in which they are already present, they are based on traditional credibility conferring systems. This is the case, for instance, when well-known brand names are used on the Internet or reference is made to well-known names and titles of newspapers, journals and broadcasting networks on websites. Also some new systems have been developed. There are, for instance, some certification systems that support labels or certificates which appear on web pages indicating that the information is reliable or that the provider conforms to a self-imposed code guaranteeing reliable information. Generally, an organization or authority that has been especially established, backs-up these systems to license information providers to use the label or certificate.

As regards medical information, however, many of these initiatives have been shown to be poor, ineffective and generally deficient. One of the problems is that the systems supporting these markers are not well-established and too dependent on one form of expressing reliability or, simply, on one licensing authority (Gagliardi, Jadad, 2002). Other problems relate to the intricacies of the systems with which the general public is not familiar, often, the public does not trust the systems to be persistent or viable (Vedder 2002 and 2003a and b). Of course, one must take into consideration that the new media, such as the Internet, lack the long and rich history of credibility conferring systems that have been developed over the decades and centuries for information dispersed through other media.

With regard to certain types of online information, it may be useful to start thinking anew about credibility conferring systems and ensuing markers of reliability of information. When developing such a "second generation" of quality systems, it may prove useful to pay more attention to the traditional credibility conferring systems than seems to have been done in the past. Meticulous study of the complicated patterns and network structure that seem to be characteristic for the traditional systems could be of help when trying to work out systems that will not shut-down as soon as one licensing authority disappears. It could also help to find ways of involving experts and the general public and to gain their trust.

The perspectives of the users/receivers of the information should be taken into account in order to decide for what kind of information these markers and basic systems are needed, and which kind of information should meet what degree of reliability. The designers of the marker systems should have some sense of the functionalities and the significance that information may have for users. Last, but not least, because in real practice, the degree of fit plays an important role as a criterion for assessing reliability, efforts to introduce new systems for quality assessment run the risk of becoming idle as long as they are not combined with raising the degree of information and education of experts and the general public.

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