From Intermediation to Disintermediation and Apomediation: New Models for Consumers to Access and Assess the Credibility of Health Information in the Age of Web2.0

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Abstract

This theoretical paper discusses the model that, as a result of the social process of disintermediation enabled by digital media, traditional intermediaries are replaced by what this author calls apomediaries, which are tools and peers standing by to guide consumers to trustworthy information, or adding credibility to information. For apomediation to be an attractive and successful model for consumers, the recipient has to reach a certain degree of maturity and autonomy. Different degrees of autonomy may explain differences in information seeking and credibility appraisal behaviours. It is hypothesized that in an apomediated environment, tools, influential peers and opinion leaders are the primary conveyors of trust and credibility. In this environment, apomediary credibility may become equally or more important than source credibility or even message credibility. It is suggested to use tools of network analysis to study the dynamics of apomediary credibility in a networked digital world. There are practical implications of the apomediation model for developers of consumer health websites which aspire to come across as "credible: Consumers need and want to be able to be co-creators of content, not merely be an audience who is broadcasted to. Web2.0 technology enables such sites. Engaging and credible Web sites are about building community and communities are built upon personal and social needs.

Keywords:

internet, consumer health informatics,
information quality, credibility

From disintermediation to "apomediation"

The debate on quality and credibility in the digital age is a result of a social process of disintermediation through digital technologies, and the health industry is no exception: Just as in many other areas of life (e.g., travel industry), information and communication technologies empower consumers and enable them to cut out the middleman or intermediary (travel agents, real estate agents, librarians, pharmacists, health professionals) to access pertinent information or services directly, whenever they need it and where they need it. For instance, on the Internet, consumers can now not only access an unprecedented amount of health information, but increasingly also personal information from their electronic health record [1]. With direct and convenient access to an abundant amount of health information on the Internet, consumers now bypass the expert intermediary and gain direct access to unfiltered information [2]. In this situation, consumers have to assume new responsibilities for assessing the credibility of the information, and intermediaries sometimes defend their role as "gatekeeper" using quality arguments.

As the role of "human" intermediaries diminishes or changes, consumers and patients are finding new ways to arrive at relevant and credible information. This can be human beings (peers) and/or technology (e.g., collaborative filtering tools).

In this paper, the author proposes to refer to these new intermediaries as "**apomediaries**", because they mediate without standing "in between" consumer and services or information. Rather, they "stand by" and provide added value from the outside, steering consumers to relevant and high-quality information without being a necessary requirement to obtain the information or service (Fig. 1). While intermediaries provide "upstream filtering", apomediaries enable and facilitate "downstream filtering" [3]. Apomediaries can help to navigate through the onslaught of information, give additional credibility cues, and provide metainformation. Examples for apomediaries are consumer ratings on Amazon or epinions, technologies like PICS or MedPICS labels and their semantic web successors [4;5] enabling the machine-processable dissemination of such ratings, collaborative filtering and recommender systems such as StumbleUpon.com, and other second generation (sometimes called Web 2.0) Internet-based services that let people collaborate and share information online in a new way - such as social networking sites, wikis, communication tools, and folksonomies.

Disintermediation not only takes place on a society level in health care and other industries, but there are also parallels to the individual emancipation process that takes place for example during puberty, when adolescents strive to become more autonomous and have the desire to reduce the influence of the intermediary (parents), with peers

(apomediaries) partly taking over the role of the former intermediary.

The disintermediation/apomediation model is useful because it allows us to analyze and discuss the implications of the disintermediation process at the societal level, for example for consumers of entire industries (ehealth), and to draw analogies to what is happening at the individual level during adolescence due to the emancipation process from traditional authorities and the use of digital media. These observations are free of judgment – it is not implied that the disintermediated / apomediated model is always better than the intermediated model. Rather, which model is "better" depends on the individual and the respective situations. In the following, the author will first discuss general implications if disintermediation takes place, and will then consider credibility implications.

Table 1 - Dichotomies in the intermediation versus apomediation model.

Intermediation Model	Apomediation Model
Dependency–Paternalistic System–Acute Illness–Pre-adolescent Kids–Illiterate Consumers	Autonomy–Net–Chronic Illness–Adolescents–Literate Consumers
Traditional	Digital
Centralized	Highly Networked
Managed environment	Autonomy, emancipation
Dependence on Intermediaries (physicians, parents)	Guidance by Apomediaries (peers, Web 2.0 technology)
Credibility of Authorities/Experts	Credibility of Peers
Power held by intermediaries	Empowerment of consumers/youth
Source expertise = traditional credentials (seniority, professional degrees etc)	Source expertise = first-hand experience, peers
Message credibility: professional language, message "length is strength", comprehensiveness signifies expert status	Message credibility: Understandable language, "street cred"
Top-down	Bottom-up
More formal learning	More informal learning
Static hubs	Dynamic hubs
Source credibility more important than message credibility	Message credibility and credibility of apomediaries more important than source credibility

Figure 1 - Disintermediation and apomediation (circles = apomediaries assisting in "downstream filtering")

General implications of disintermediation

Decreased reliance on the intermediary

Disintermediation enabled or enhanced through technology changes the role of the recipient (consumer, patient, youth), who now has the choice to determine whether, when and how they choose to use the intermediary. The better informed the recipient is (or perceives to be), the better he knows what information or services he needs, the less likely he will need an intermediary. For example, a consumer with a chronic condition (e.g., diabetes) will have a greater knowledge and self-efficacy to critically appraise information found on the Internet than a consumer with an acute illness, and will not need an intermediary. Similarly, an older adolescent eager to learn about sexuality is less likely to rely on an intermediary such as a parent or teacher as filter than a younger child.

With increased literacy (including the ability to distinguish different types of information) and knowledge, i.e., when the receiver is knowledgeable about message content, the effects of source expertise will be attenuated, i.e., the credibility of "experts" and other authorities decreases [6], leading to an interesting positive feedback loop, where consumers learn to rely less and less on experts or intermediaries, preferring apomediation instead (Fig. 2). Again, there are parallels to what is happening during adolescence when youths learn to emancipate themselves from traditional authority figures.
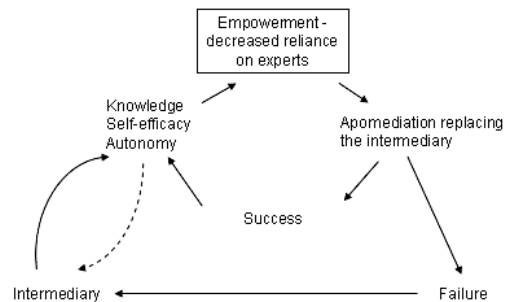

Figure 2 - Dynamic Disintermediation/Apomediation Model: Information is initially mediated and filtered by an intermediary. Once a critical threshold of knowledge, self-efficacy and autonomy is exceeded, apomediation can replace the traditional intermediary, while the recipient still has the option to choose the intermediary in case of failure.
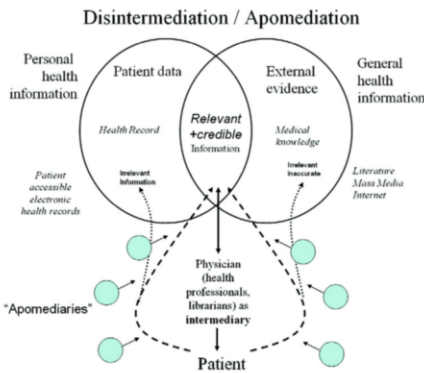
Power shift

As a result of disintermediation, the power-relationship between recipient and intermediary changes. This may create conflicts. For instance, a significant minority of health care providers see their authority challenged, perceive a deterioration in the physician-patient relationship, and fear a negative impact on the quality of health care or health outcomes, although most embrace the shift from a paternalistic to a partnership model [2;7-12]. Parents may be equally irritated when the youths are searching for information on birth control on the Internet rather than discussing these issues with them or a physician.

Concerns have been expressed that more information does not necessarily translate into more knowledge or better

quality (self-)care, in particular as some of the quality and credibility of health information on the Internet clearly does not live up to professional standards. This view fails to recognize apomediation as an alternate mechanism to filter information.

Interestingly, the model presented above (Figure 1) also helps to explain some of the perceptions and frustrations intermediaries (health professionals, parents) often have with the disintermediation process, as they tend to see predominantly the "failures", for instance patients having found irrelevant information on the Internet.

Interpreting the message and filtering for relevance

It is interesting to note that when physicians express discontent about patients bringing stockpiles of "low quality" Internet printouts in the doctor's office, the primary complain is not so much the low quality or credibility of that information in an objective sense, but its *irrelevance* for the specific patient. In one survey 73.8% of General Practitioners said about this information that it was "accurate", and 65% of physicians even said the information was new to them, but many thought that the information often does not apply to that particular patients' condition – in the same survey, only 44.7% said the patient correctly interpreted information [13]. Another survey found that those providers who thought much of the information was often irrelevant also had a more negative view on how the patient-physician relationship was affected [11].

To what degree apomediaries actually succeed in the same way as intermediaries such as physicians or parents to filter information is largely an unexplored area. While there have been data on the "self-corrective" nature of digital media, to the effect that for example inaccurate statements on mailing-lists are corrected by peers [14], relatively little is known to what degree "apomediation" helps to filter *relevant* information and to contextualize information.

Credibility implications

The shift from intermediaries to what the author proposes to call apomediaries has implications for credibility constructs. Some credibility implications and research questions arising from the disintermediation/apomediation model are discussed in the following.

Explaining group and situational differences

Disintermediation usually means that people can, but must not use the intermediary, leading to groups of people who (or situations where people) continue to use intermediaries, trusting a more central authority, and others where people use apomediaries, relying on more decentralized, "networked" mechanisms to infer credibility (reputed, tabulated etc.). Reviewing audience factors in Web credibility research, Metzger [15] reminds us that "credibility is highly situational" and that "demographics, Internet use and reliance, and issue involvement have been found to influence perceptions of the credibility of Web-based information". The disintermediation/apomediation model hypothesizes that factors such as self-efficacy and perceived or desired autonomy (freedom from authority and

capacity to make an informed decision) play a critical role in information seeking and credibility assessment behaviour. In other words, autonomous individuals are more likely to choose an apomediation model, and apomediation in turn increases autonomy. Navigation in the digital world requires and at the same time enables a high degree of *autonomy*.

As mentioned above, there are parallels between certain groups of consumers who prefer a more paternalistic patient-doctor relationship and pre-teen dependent children on one hand, and empowered consumers and teenagers striving for autonomy on the other hand. For example, a chronically ill patient is more autonomous than a traffic accident victim, and will be more likely to seek out information from peers. A pre-adolescence teenager is more dependent on parents and other authority figures than an older teenager, who deliberately seeks autonomy and questions authority – in this developmental stage, apomediaries such as peers and peer-to-peer technology gain in attractiveness and relevance.

Teenagers, people with chronic illnesses, educated people all share a common desire and capacity for autonomy, hence their credibility assessment heuristics are more on the right side of Table 1 above. On the other hand, younger kids, seniors, incapacitated people, people with acute diseases etc. are more likely to willingly submit themselves to a system in which they are dependent on intermediaries. The model proposed here theorizes that the desire for autonomy or perceived autonomy are predictors for differences in the interpretation of credibility cues (e.g., formal professional credentials versus "street cred") and differences in information seeking and verification behaviours, and explains differences between pre-Internet and Internet generation, information seeking strategies of chronic versus acute patients, pre-teens versus teens, and illiterate versus literate consumers.

What is argued here is that variables like *autonomy, self-efficacy and knowledge* (thought to be predictors for embracing disintermediation) are presumably correlated with *motivation* (issue involvement, including knowledge and personal relevance of some topic) and *ability* (e.g., cognitive abilities, literacy, time), which, according to the elaboration likelihood model (ELM) of persuasion [16], affect message processing and, thus, influence message effects and credibility judgments. The ELM theorizes that higher issue involvement (motivation) and ability (which together affect what is here called autonomy) will lead to more effortful processing of a message (central route to persuasion), while lower motivation and ability will favour a peripheral route, where environmental characteristics of the message, like the perceived credibility of the source, presentation, or the attractiveness of the source are the primary credibility cues. An extension of this model has been proposed (though not empirically tested) by Fogg and Teng, who hypothesize that people with lower motivation and ability (those who are persuaded through a peripheral route) are more likely to adopt a binary evaluation strategy (credible or not credible), whereas people with higher motivation and ability employ a spectral evaluation strategy [17]. Thus, if we accept that in

most cases autonomy is highly correlated with general motivation and ability, and if we accept that these variables also predict whether or not somebody chooses to emancipate themselves from a gatekeeper, and if we believe the predictions made by the ELM and its extensions, then the line of argument presented above becomes clear.

Boosting credibility through disintermediation

"Direct", unmediated information is often is perceived as more credible because with "greater apparent mediation comes greater opportunity to impute motives and intentions of the communicator" [18], which is one of the most cited reason for why (live) television is perceived as more credible than newspapers [15]. In other words, disintermediation has the potential to increase the credibility of information. This is particularly true the health care field, where many consumers have a "healthy" (and sometimes not completely unjustified) mistrust in a system where doctors are paid per service, and where payers are under considerable cost-pressures leading to a perceived rationing of publicly available services. In addition, many consumers view the traditional health care system as being biased against alternative medicines [19], as health care professionals are incentivized to offer expensive therapies for which they are reimbursed more generously, as opposed to therapies which are "natural" but for which they cannot charge much. Such mistrust creates the desire to bypass the intermediary, and boosts trust in information which can be received without intermediaries.

While youths will rarely rationalize their mistrust against traditional intermediaries in a similar way, questioning and mistrusting traditional authorities is a natural part of adolescence, and information mediated through traditional authorities is often perceived as biased.

Reinstating trust in the intermediary

It can also be hypothesized that transparency confirms the trustworthiness of intermediaries who "step aside" allowing and perhaps even facilitating direct access to information and transparency. In other words, once disintermediation has taken place, disintermediation has the potential to reinstate trust back to the intermediary if information provided through more direct channels proofs to confirm the information the intermediary used to provide. For example, health professionals who allow and actively encourage patients to access their own electronic health records help to reinstall patients' trust in the medical system. If however the information now obtained from other channels is perceived to contradict information from the former intermediary, then the trust-relationship will be undermined. For example, youth accessing information on issues of sexuality through the Internet will loose trust in parents and teachers if this information contradicts the information these intermediaries have provided.

Experiential credibility

While traditional wisdom from credibility research suggests that perceived "accuracy" is a hallmark for message credibility [15], it would be a mistake to assume that "accuracy" means evidence-based information based on scientific studies and that evidence-based information

based on research would automatically have more credibility for consumers than anecdotes. In a focus group analysis with patients using evidence-based health information, Glenton and colleagues found that "participants described how they often made treatment decisions in a context of great pain and despair. Under such circumstances, they often had little energy to seek out written information and were sometimes too desperate to care what the research might have to say. Instead, they often gathered information about treatments through the personal anecdotes of friends and neighbors, and, in most cases, this experience-based information was considered to be more relevant than the evidence-based information" [19]. Not only is experiential information from apomediaries and peers more *relevant* for patients, it is hypothesized here that it often is also more or at least equally credible as information based on research.

Similarly. the notion of "source expertise" as being communicated primarily "through the comprehensiveness of a web site's information, its professionalism, and its sponsor's credentials" [15] is questionable in the health care context and perhaps in many other apomediated environments used by "autonomous" individuals. Here, "expertise" is not only expressed by credentials such as professional degrees and qualifications, but also first-hand experience. *Experience-based credibility* can be seen as one additional dimension of source credibility. Past research has identified that similarity in attitudes with the speaker as well as liking positively influences credibility perceptions. What might be added is that similarity of *experiences* (in the health care context: similarity of symptoms, diagnoses etc.) adds to credibility perceptions. In the context of youth, this is expressed by the term "*street cred*", which has been defined as "commanding a level of respect in an urban environment due to *experience* in or knowledge of issues affecting those environments" [20].

Applying network theory to apomediaries: credibility hubs

Apomediaries can be seen as highly complex networks of individuals and tools guiding consumers to credible information. While "networked" tools are often seen as a more equitable, democratic structure (as opposed to a system with intermediaries, who hold most of the power), network theory [21] teaches us that credibility networks are scale-free networks, where a rich-gets-richer phenomenon leads to the emergence of highly influential hubs, which in our context could be called *credibility hubs*. That is, not all apomediaries are equal, there are some apomediaries which have more influence than others. In the networked, apomediated model, some "nodes" (players or tools) become (or cease to be) credibility hubs in a more dynamic and fluid fashion than in the traditional model, where there is usually one intermediary whose credibility is influential and relatively stable.

In a "networked credibility" model with apomediaries as nodes, former intermediaries do not disappear completely, they are just one of many apomediaries, with a seemingly equal chance of becoming a "credibility hub", but in reality, they are more connected and have a better chance in ending up as a credibility hub,

For instance, a professional medical organization has a pre-existing social network which leads to other organizations linking to their website, leading that website to appear on top of Google, leading to more people linking to it, etc.

An interesting psychological phenomenon is that people attribute statements they believe to credible sources. For example, participants of an experiment who were exposed to a statement many times (and hence believed it) were more likely to attribute it to Consumer Reports (a credible source) than to the National Enquirer (a not so credible source) [22]. Such mechanisms may further increase the trustworthiness of credible sources, leading to a further rich-gets-richer phenomenon.

Conclusion

This paper discusses the idea that as a result of disintermediation, traditional intermediaries are replaced by what this author calls apomediaries, which are tools and peers standing by to guide consumers to trustworthy information, or adding credibility to information. It is hypothesized that in such an environment, tools, influential peers and opinion leaders are the primary conveyors of trust and credibility. In this environment, *apomediary credibility* may become equally or more important than source credibility or even message credibility. It is suggested to use tools of network analysis to study the dynamics of apomediaries in a networked digital world.

There are practical implications of the apomediation model for developers of digital media such as websites for consumers. Governments and other "authorities" – while certainly having credibility due to brand name recognition - do not typically do a very good job of creating "credible" Web sites – they always look and sound like government Web sites, and they lack the "edge" and the "street cred" that consumers and in particular youths are looking for to keep them engaged.

Good Web sites allow consumers to share their voices and connect with others in a safe, positive, supportive, possibly moderated, online community. Consumers need and want to be able to be co-creators of content, not merely be an audience who is broadcasted to. Engaging and credible Web sites are about building community and communities are built upon personal and social needs.

Acknowledgement

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