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Article

Inside Technology: Opening the Black Box of Health-Website Configuration and Content Management

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Abstract: Given the existing divide related to Internet skills and types of Internet use, it is safe to assume that a large proportion of the population uses the Internet for health purposes in a partially productive fashion. We suggest that in addition to user characteristics, another factor that inhibits productive Internet use, and thus contributes to the existing gap, is related to the ways in which the technology is configured. The goal of this study was to explore the processes that webmasters and content managers use for constructing and producing, or selecting content, for health websites. Interviews conducted with 23 website builders and managers of websites that represent public and non-public health organizations revealed that they do not plan or conduct activities for content needs elicitation, either in the design stage or on an ongoing basis. Rather, these professionals rely on a "self-embodiment" standard, whereby their and their cohorts' expectations determine the quality and functionality of the websites' structure and content. Hence, target groups beyond their social sphere are disregarded, and instead of new opportunities, new cleavages are created. We recommended that government, public and non-public stakeholders work to establish construction standards, to ensure that health websites meet the needs of varied end-user populations.

1. Introduction

As the Internet continues to affect more and more of social life, less and less will remain free of its influence. Even as the Internet takes on an increasingly important role in our daily routines, the question of its mirroring or transforming the social divide remains a matter of vigorous academic debate. Unfortunately, for the most part, this debate does not involve a substantive discussion of the technology's construction processes, even though there are always several potential paths for developing Internet websites, and the choice between paths is often determined by the social forces at play [1].

According to several sociologists, people's use of the Internet as an important source for making health-related decisions is an indication of their having adopted an "Internet-oriented lifestyle", which leaves different "footprints" on the users' lives, manifested in an increase of social and financial returns [2–5]. A survey conducted in the USA by Horrigan and Rainie (2006) [6] and titled the "Major Moments Survey" found that the size of the Internet footprint on the user's life increases dramatically as the individual's level of education increases. This finding suggests that although the gap related to Internet access has narrowed, the divide related to Internet skills and *types of use* still exists [4,7]. Most of the findings about the partial use of the Internet are explained by users' characteristics such as low digital skills [8,9], eHealth literacy [10,11] and users age and education [12,13]. We suggest that factors other than user characteristics inhibit productive Internet use and are responsible for the existing gap. Specifically, the characteristics of the technology itself play a vital role in constraining or enabling the range of potential users and uses.

The use of health websites is a form of self-directed self-service; it does not necessitate payment and is intended to serve a broad range of needs, both the needs of the parties involved in building the websites as well as the needs of its potential users. Analysis of the characteristics of online medical resources is complicated, due to the numerous "players" involved, including government ministries, health institutions, insurance companies, drug companies, hospitals, community clinics, private clinics, and providers of various paramedical services, as well as healthy citizens, patients, and caregivers who are the consumers of all of the services available. Each of these constituents has different and varied needs for information, and each "provider" has in mind specific applications for the electronic medical resources that digital information consumers will draw upon.

Furthermore, although millions of people are using the Internet, only a small group of people are responsible for the web applications, systems or site into which content is created by institutions or by Internet users [2,13,14]. This leaves an opening for possible gaps in terms of language and content between the needs of potential users and the health websites or portals intended to serve them. The literature about E-Commerce webmasters and content managers' practices is by far more prevalent than the literature related to health-website webmasters and content managers' best practices and their content selection process, despite the fact they share a big responsibility for surfers' health, as many people tend to trust the information they find online [15,16].

In this article, we elaborate on the manner in which the processes involved in the construction of health websites are determined by a hidden, perhaps even an unconscious agenda, or—at the very least—by the basic assumptions of those in charge of producing the content and structure of health websites. An unfortunate consequence of this unconscious agenda is the exclusion of a range of users, characterized by different cultural backgrounds and diverse levels of digital and eHealth literacy.

Before elaborating on these issues, we provide a brief insight into our theoretical framework and previous research in the field. Then we describe the current study`s methodological approach, and finally analyze and discuss the study's findings. The article's closing discussion expands on technology's characteristics significance in mirroring social divide.

1.1. Theoretical Framework

Feenberg [17], in his 2002 book *Transforming Technology*, asks whether human beings must submit to the harsh logic of machinery or whether technology can be fundamentally redesigned to better serve its creators. He answers that the real issue is not technology *vs.* progress *per se*, but the underlying assumptions which are embedded in these resources which usually remain unnoticed. Feenberg (1999) [18] used the term "black box" to describe the process of configuring a technology. In this process, all those involved in the design "meet and apply their influence, by extending or withholding resources, assigning purposes to new devices, fitting them into prevailing technical arrangements to their own benefit, imposing new uses on existing technological means, and so on…" (p. 10). However, once the black box is closed, its social origins are quickly forgotten and are no longer called into question; indeed, they are taken for granted.

In order to capture technology design inquiry, Feenberg (1999) [18] has suggested the term "technical code", referring to the underlying assumptions that are built into the technology. Few researchers have observed website use through this theoretical prism. To the best of our knowledge, only Flanagin *et al.* (2000) [19] applied Feenberg's technical code perspective to demonstrate the manner in which the subtle choices and values of designers are manifested in Internet technology. The dissection of the Internet via a technical code analysis offers a fresh understanding of the construction of the technology and those affected by it.

1.1.1. Building a Website and Website Objectives

According to the literature, website building is done by identifying clients, defining the website's objectives, and selecting appropriate content [20,21]. Furthermore, after the website starts operating, the level of its effectiveness is measured not only by the time a customer takes to carry out actions, but also by the degree to which the website serves the needs of its users [22].

Identifying Clients and Objectives

In heterogeneous societies, it is important to consider whether health websites should be universal, or tailored to accommodate the diversity of the population. Studies that examined websites' usability among different cultural groups found that components related to security policies, policies protecting the user's right to privacy, and news presentation may be universal and neutral. In contrast, any aspect pertaining to the website design and content should be sensitive to cultural differences, which may pertain to language, gender, ethnicity, religion or other characteristics of the target audience or audiences [23–27]. The flipside of this is reflected in "the black box". In other words, the way the website and its content are built reflects the way the prospective user is perceived; hence, the absence of cultural sensitivity becomes conspicuous.

Indeed, research has shown that people tend to return to websites when the content is personal and corresponds to their social identity [15].

eHealth management constitutes a transition from face-to-face medical counseling, in which the patient's confidence is based on a relationship or acquaintance with the counselor. Consequently, the identity of an online counselor presents a challenge of trust, because it is unclear who is actually giving the advice. As a result, building confidence (for example, by authentication of the credentials) constitutes the foundation underlying the entire process. Research has shown that when users have a specific motivation driving their search for medical information, the information is more carefully screened and is associated with building trust. Sillence, Briggs, Harris and Fishwick (2006) [15] found four factors that promote trust: the look and sense of the website, the presence of recognized images or objects, the professionalism of the information, and the degree to which it matches the search.

Ideally, health websites, especially those run by public health organizations, should be inclusive, aimed at extremely wide sections of the population, regardless of the expense involved in understanding and reaching disparate groups. Accordingly, the webmasters and content managers require guidance regarding the types of users the websites should be targeting.

Content and Structure

Given that the need for information is the central motivation of human activity, it is important to examine how information is presented, both in terms of content and in terms of form [27,28]. Handling a website's content requires cooperation between designers, creators, content authorizers, and website managers [29]. In many respects, it is similar to managing a "virtual production line" comprised of numerous processes, which must be streamlined in order to maximize its operation.

Once the prospective clients and the goals of the website have been defined, one of the ways to determine the type of website content that best corresponds to these definitions is to consult with experts (not necessarily professionals) in relevant fields. These experts can advise on the type of information necessary, the manner in which it should be structured so as to facilitate users' access, and suggest appropriate elicitation strategies so as to further refine the content selection process [30]. Proctor *et al.* (2001) [30] described 12 elicitation strategies, e.g., interviews with users, verbal analysis of protocols, questionnaires, focus groups, ethnographic studies, *etc.* They concluded that for optimal effectiveness and the inclusion of a wide range of potential users, it is best to combine these methods.

The structuring of content on a website refers to the way the content is presented [30], which can be either hierarchically, sequentially, or as a network. Although a hierarchical structure is easier to navigate and can be easily altered and adjusted, the network structure is more flexible, and therefore it can be designed to meet the preferences of a wider range of potential users; however, it requires more maintenance efforts [31]. In general, preliminary planning of website content structure can make it easier for users to navigate through the website and find what they need, provided that user feedback is collected early in the process, and that content organization is then altered and improved, based on the input received.

1.1.2. The Problem: Framing the Process

Very little research addresses the structural aspects of work processes for website maintenance and management. The term webmaster is relatively new. According to Guenther (2005) [32], the role of a

webmaster may be very vague, especially in the case of large websites that employ a content coordinator, a person to provide technical support on the server, writers, and editors. A survey conducted among 232 webmasters revealed that they had excellent technical skills, but lacked organizational and managerial skills (communication, management, teamwork, and customer-service skills, as well as skills for working with end users). This observation is not surprising, considering the findings of a study that analyzed 800 want-ads seeking webmasters, which demonstrated that starting from the recruitment process, employers emphasize technical skills, practically to the exclusion of all other skills [33]. Indeed, Havelka and Merhout suggest that there is little consensus regarding the critical knowledge, skills, and abilities which are important or critical for IT workers [34]. They assumed that a website developer would require stronger skills in programming and code development, architecture, and communications networks than in content management. Similarly, Hite and Railsback (2010) [35] claimed that "to meet the needs of a variety of audiences, website developers must have a diverse set of technical web development skills" (p. 108). To summarize, the roles and responsibilities of webmasters, in general, and of health webmasters, in particular, are ambiguous, and ignore the need for "soft" skills, which can enhance webmaster's sensitivity to the diverse population of end-users.

Hence, we maintain that the design and content selection processes used by webmasters and content managers to configure health websites can be consequential. Their work affects more than just the end product; it also organizes users and subordinates them to a technocratic order.

1.2. The Goal of the Study

The purpose of the current study is to explore the process through which health-website webmasters and content managers produce and facilitate consumption of website content. It attempts to uncover the hidden, or the basic underlying assumptions of those in charge of producing the content and structure of health websites.

The proposed exploration will enable us to understand the social logic of eHealth websites in their current form, by making explicit the assumptions, values, and norms that are literally built into these websites, and by exploring other existing possibilities. Flanagin *et al.* (2000) [19] referred to this process as "reverse engineering". Two assumptions underlie this line of exploration. (1) Technology is a dimension of society, rather than external force acting on it. The configuration of each component corresponds not only to a technical logic, but also to the social logic of its selection [18]; (2) Technologies are not just means subservient to independently chosen ends; in practice, they form a specific way of life. Technology "has no singular essence, but is socially contingent and could therefore be reconstructed to play different roles in different social systems" [18] (p. 7).

2. Method

This research uses a phenomenological approach, which attempts to understand the significance of events in which people are involved [36–38]. We wanted to learn what people have to say in "their own words". The process of collecting data was open and inductive, in order to explore the cultural world of website builders. They are, in essence, our informants regarding the processes involved in the design and maintenance of websites, assuming that the way a website is built draws its meaning from this population. We conducted 20 semi-structured in-depth interviews with participants who were involved in building,

managing, and making decisions regarding health websites. The interviews with different people who were responsible for building and maintaining the websites allowed us an interpretive understanding of the manner in which they viewed the task of website building and the website's users.

In a preliminary stage, we conducted three interviews in order to validate the interview's open-ended questions.

2.1. The Interviewees

In order to select the participants according to the websites they serviced, we conducted the following stages:

(a) We mapped all Hebrew-language health websites that existed in the summer of 2009.
(b) In order to choose health websites with the largest traffic volume, the software programs Alexa Page Rank and Page Rank Checker were used.
(c) The websites were selected to represent the major types of health organizations available in Israel.

After contacting all the selected organizations, we mapped the website staff and contacted them to arrange for an interview, explaining the goal of the study. All interviewees contacted agreed to cooperate and to voluntarily devote their time to be interviewed. The interviews were conducted at the organization represented by the particular website serviced by the interviewee and lasted between 60 and 90 min. All interviews were recorded with the permission of the interviewees and transcribed. Details regarding interviewees, the type of websites and the organizations represented are shown in Table 1.

Table 1. Interviewees according to their organizational affiliation.

Type of website	Number of interviewees	Number of website
Associations	2	1
Hospitals	4	3
Governmental offices	4	1
* HMOs	7	2
Non-governmental medical information websites	6	4
Total	23	11

* Health Maintenance Organizations.

2.2. The Open-Ended Semi-Structured Interview

After conducting a literature review, the semi-structured interview was composed. The questions are included in Appendix.

Questions that were formulated based on the literature review are presented with the source in brackets.

2.3. Content Analysis

In order to portray the webmasters and content managers' reported work patterns and attitudes related to their end-users, we conducted a conceptual content analysis of the interviews transcription, counted the

frequency of the concepts occurrence and drew meaning from that. The transcriptions were organized according to the interviewee answers to the questions. This analysis was followed by a Relational content analysis that goes one step beyond the identification of concepts, and attempts to find meaningful relationships between the occurrences of the concepts. Coding of data in this way is a *deductive* approach to analysis, in order to test the data against existing theories. Categories to the content analysis were derived from the questions posed to the interviewees and form their answers. We used the Atlas.Ti 5.2 Toolkit [39]. Twenty one concepts were identified as described in Table 2.

Table 2. Concepts' frequency and attribution to further analysis.

Concepts	Overall number of statements	Number of classified statements
Content management		
Updating	31	28
Initiation	56	52
Approval	74	62
Content management responsibility	34	34
Content professional responsibility	15	14
Content production	66	51
Content & editing consideration	73	67
Content procedures	62	57
Content organization	51	43
Websites & content quality		
Websites Quality	54	50
Content Quality	22	22
Digital Literacy		
Digital literacy characteristics	20	15
Digital literacy sensitivity	24	24
Age		
Age sensitivity	8	8
Age characteristics	20	18
eHealth literacy		
eHealth characteristics	11	11
eHealth sensitivity	36	36
Cultural sensitivity	18	18
End-user characteristics (beside age)	20	16
Marketing & economic factors	71	61
Motives	63	59

The data were analyzed and interpreted in an iterative process and new categories were created when necessary. Responses that could not be classified under any of the existing categories were classifies as "other". A coding scheme was developed and sentences were re-read according to the new scheme.

3. Findings

3.1. Health-Website Content as a Marketing Tool

The basic goal of any website is to convey information [40] which constitutes its contents. Website content management is one of the greatest challenges that website builders and webmasters face [41,42], and researchers and website professionals alike agree that the quality of a website is determined by its content. Interviewees stated that the website is a tool, a branch of the marketing or the public relations department, and the website content is one of the means of positioning the organization within the sphere of the media:

> *At every professional discussion about promoting a particular issue, the [organization's] website is an integral part of the repertoire of means at our disposal for conveying information… in other words, just as a press release plays a major role in our mission, so does the website.*

Similar statements were made by an interviewee of a different organization: "…I'm treated like a journalist… that is, anything that gets sent to journalists and reporters… anything you see advertised was forwarded to me by the organization's spokesperson and I immediately uploaded it to the live website…".

3.2. The Initiative to Produce and Publish Content

Initiatives to produce and publish content can come from sources either within or outside the organization. Out of 21 interviewees, 16 provided information about the sources that initiate the publication of content on the organization's website (the remaining five interviewees were webmasters and claimed that they were not responsible for producing content). An analysis of the responses revealed five sources that initiate the production of health-related website contents. These sources are presented in Table 3.

Table 3. Sources that initiate the production and publication of content on health websites by types of portal/website.

Initiative type	Source of initiative	Health portals representing Non-Public Organizations [a]	Health portals representing Public Organizations [b]
Internal sources	Website manager and staff	√	√
	Health professionals who are employees of the organization [c]	-	√
	Employed content providers [d]	√	-
External sources	Other organizations or individuals from outside the organization	√	√
	Reaction to special events	√	√

[a] These portals represent organizations that do not provide face-to-face services; [b] Health maintenance providers and hospitals affiliated with public health systems, associations, and government offices; [c] The employees who provide face-to-face services; [d] Individuals whose job is to provide content.

In the two types of websites (public and non-public), participants reported that initiatives for content came from both internal and external sources. Internal initiatives may come from the website manager and staff or from other employees of the organization who also provide face-to-face services. In health portals representing non-public organizations, initiatives can come from the experts who provide content. External initiatives may come from organizations or individuals seeking to use the portal to promote a particular issue, or from the website's managers responding to an event.

Findings indicate that in both types of websites, initiatives come from a combination of internal and external sources; however, content initiatives are more likely to originate from within the organization in the case of large public health organizations. Internal sources for content initiatives may be categorized as planned initiatives or as initiatives that arise in reaction to events. The following quotes demonstrate internally planned initiatives for content in websites of public health organizations. "The process of creating content is that we (*i.e.*, the website manager and the marketing professionals)—along with the staff—define topics… we have a staff of writers who are experts in various fields—physicians, dieticians, nurses…". "Certain elements from within the organization (not the management)… decided that they consider something important and they are prepared to invest the necessary resources… because they really care; it's important to them, and they're willing to invest in it".

The following is an example of internally planned initiatives in portals of non-public organizations:

> *I'm not a big press office with a staff of employees and reporters. I have several directions and places where I can find articles… I see what's going on, what's being discussed, and I ask someone to write about it…. For example, I want to reinforce a particular topic, so I asked for articles from ten doctors…".*

The next example relates to an external initiative that arose in response to specific events in Health Maintenance Organizations (HMOs) of public health systems: "When Avian influenza made the headlines, I asked to receive written material on that… the incident with Similac (a brand of infant formula) will also be uploaded to the website's homepage today…". Another example of an external source of content initiatives: "People familiar with our website and who visit it regularly have asked if I would be willing to post certain contents… we discussed it…and now they occasionally send me contents… and we are willing to do this service for them…". One of the participants reported an initiative from an external source for content on a non-public website:

> *Most of the articles posted aren't written by us; we receive them either from a hospital spokesperson or from a public relations office (promoting certain pharmaceutical companies), or possibly from medical specialists… Most of it is from physicians who wish to promote their research or their image….*

There were almost no examples of initiatives from registered users of the website, with the exception of a forum of participants. Two factors emerged as unique to content-creating initiatives on websites belonging to public *vs.* non-public health organizations. First, the interviewees see themselves as responsible for balancing the information on the website so that it equally represents all of the units of the organization. If they feel this balance might be compromised, they initiate a search or a request for content from the poorly represented units of the organization. While website managers' aim is to ensure that their organization's unique aspects are sufficiently highlighted on the website, their efforts are not always met

with adequate cooperation on the part of their co-workers, especially from the experts in the organization. A second challenge that content managers in the sphere of public health organizations face in terms of content initiatives is to recruit experts, such as physicians and health professionals, who are "technophobes" and who therefore—unlike their technically savvy counterparts—refrain from contributing content.

3.3. Producing Content

Decisions on website content are reached following a preliminary process of planning and preparation. There are several challenges involved in preparing website content: determining what information is needed and how to elicit it; organizing and structuring the content; finding the best methods for retrieving the information; and presenting the content effectively to the user. In the current study, a couple of content-creating patterns were observed: content production involving cooperation between the website manager (or someone in an equivalent technical role) and an expert (e.g., physician, lawyer, dietician), or cooperation between the advertising/content editor and a team of experts, including, for example, a physician, a dietician, a social worker, and a psychologist. However, none of the interviewees described a content producing process that was tailored to the users' needs, or which relied on prior data collection or preliminary mapping of users and their requirements.

Methods of producing health-related content that were mentioned in the interviews included the translation of materials from other foreign language websites, based on an agreement between the organizations; translation of content from Hebrew into Russian and Arabic; original content written by experts on a particular topic; preparation of video clips; use of articles from the media; interviews with physicians; the collection of existing materials from a variety of sources; following up on an issue published in the media; and the utilization of information retrieved from the organization's hard-copy informational or promotional materials. These content production methods can be categorized according to the content's originality: *original vs. isomorphic* or *mimetic*, and the degree of planning involved: *planned vs. eclectic*, thus rendering also the combinations of planned and original content, and eclectic and isomorphic content.

Of the 11 organizations represented in this study, only one, a public health organization, prepared website content that matched the category of planned and original content. Only one website, which represented a non-public organization, produced content that was eclectic and isomorphic (imitative). Six of the websites, *i.e.*, the majority (6/9, among them both public and non-public organizations) used combined (unplanned original and isomorphic) content production methods.

3.4. Editorial and Content Considerations

The term *content considerations* describe the process of deciding which content is selected for publication and the reasons behind each choice. Many of the interviewees found it necessary to explain the reasons for rejecting certain content. In response to a direct question, 17 interviewees described the considerations that guide them in selecting content for website publication.

"We choose content that is *appropriate*" was the most common answer provided by interviewees working on content on both types of websites (public and non-public health organizations). *Appropriate* meant important, current, relevant and interesting to the web surfers, as these statements demonstrate:

"I won't publish [content] if I don't think it would interest the web surfer…", "first to be promoted are things found in the media or in the focus of public discussion". Thus, importance and interest are prime considerations; importance is determined by the topic (the broader the topic, the more important it is). "The degree of interest in the content, I [the interviewee] assess on the basis of using a software program for [website] statistics that assesses public interest…".

Answers provided by interviewees who work on nine different websites presented a recurring theme, which we referred to as *self-embodiment*: website builders and developers use themselves and their associates as a standard for judging the quality of content and technology, as will be explained. Another issue that emerges is whether relying on the number of visitors entering specific web pages is an appropriate method for assessing what is "important", "current" and "relevant" to web surfers. How do people working on a website determine the users' needs and surfing capacities? The answer to this question lies in the website managers' perceptions of the end users.

The second most popular consideration in selecting content for publication is the amount of content published. Interviewees' responses did not vary according to the type of website they managed. An abundance of content is important for variety, for attracting web surfers, and for the purpose of transparency, as these statements indicate: "from my perspective, articles are the most important element on the website"; "…articles attract an enormous amount of web surfers"; "Nowadays, nothing is unpublishable…"; "the policy of our office is openness"; "as many topics as possible, so that as many people as possible will find something of interest upon entering the website".

The third consideration of increasing the organization's profits through website content was mentioned directly and indirectly by the interviewees: all of the interviewees representing organizations that provide face-to-face services (e.g., hospitals) noted that a major consideration in choosing content was to expose the organization to new potential patients, in other words, the motivation to market the organization and its unique features. Their goal is for "people to know what to expect, to know about the kinds of services we provide here…". Another interviewee stated: "Ultimately, the organization's goal is to market itself; the goal of the people on the other end [the web surfers] is to find as much information as possible on whatever interests them…". Other responses conveyed a similar notion of drawing consumers' attention to the organization and its departments: "I want [the web surfer] to know what very few people know [about the organization], that there's a ward that handles day-to-day problems [in addition to the more renowned rehabilitation services], a diagnostics department, a diet center…". One interviewee noted the type of content that they refrain from publishing (*i.e.*, lack of transparency) so as not to cause financial losses to the organization: "In this field, there are lots of things that we avoid exposing to the public, even simple things like [HMO] member benefits, or the organization's decision to use second-generation drugs…".

Interviewees representing websites of private organizations noted that website content means money; thus, the greater the activity on the website the more money it generates. The mechanism for increasing the number of website visitors is to write keyword-guided content and to include a wide variety of health topics. "The more people you reach, the greater the [website's] exposure, and by extension, the greater your income…".

Other content selection criteria that were mentioned at a lesser frequency and without distinguishing the type of website represented included the following: public health considerations (prevention, promoting awareness, providing service to web surfers) were mentioned by four interviewees, and the

quality of content was mentioned by six interviewees. These are examples of statements made: "…it's important to publish many articles on prevention, early detection…"; "…there are things that are important exceptions, and we want the public to notice and be aware of these…". Interviewees concerned with content quality wanted to present reliable, professional, and balanced content (unaffected by the interests of pharmaceutical companies, for example): "the extent to which the information, according to my assessment, is professional, balanced, unadulterated by PR (public relations)-related motivations…", "the issue is not whether the content suits the organization's agenda, but whether it is generally appropriate, on a professional level…".

The term *editorial considerations* suggest that editing is part of the production process; accordingly, interviewees were asked if editorial issues were considered and if so, what kind of editing was involved. Seven interviewees from both website types indicated that content on their sites was edited in order to present it in a more popular register, so that the wording is clear and pleasing to read and the text is accessible and friendly: "…the way the information is conveyed is very important. If it's basically incomprehensible, then no matter how important the content, I'll refrain from publishing it…"; "this medical information needs to be presented in colloquial language, so if I'm given something written in professional lingo, I'll try to sort it out with the author and simplify its presentation…"; "part of our job on the Internet is to provide users with a pleasant web surfing experience, so that they enjoy the things they see…". It should be noted that those who "judge" the wording and the overall effect of the surfing experience are the teams employed website maintenance.

3.5. The Personalization of Processes

Many of the interviewees indicated in their responses to various questions that the processes for preparing content for the website on which they worked depended on "the people involved", rather than on existing procedures. Three areas were noted as "depending on the person in charge": the importance that the organization attributes to its website, and, consequently, the budget it allocates for website management; measures of proper website management; and website and content usability.

Interviewees from two different websites said that funds allocated for the website are subject to the good will and the personal interest shown by certain decision makers within the organization: "…management should be holding the reins in these procedures, spearheading these efforts… I saw this in 2003; when the hospital manager thought it [the website] was important, things gained momentum—big time, but if not, then nothing gets done…"; "…it really depends on whether the organization's manager really understands the significance of the website…"; "…for example the area of pharmaceuticals: they appointed a pharmacy student…she was really fond of the subject [of the website] and she could really relate, so we were able to make some significant progress in that area". Interviewees from the same two websites also said that due to the fact that there was no official position [of website manager], and given the lack of clearly defined criteria (such as a recognized standard) by which to assess [the quality of] websites, both management and assessment of websites was subject to the website manager's personal approach, preferences, background knowledge, training, and interest in the Internet medium.

> *Without ignoring the contribution of commercial and marketing concerns, I myself come from the field of information technology, which places a great deal of emphasis/value*

on the information that the health consumer or the customer at the hospital receives… to me that's important… I can't cut any corners when it comes to that [i.e., to the quality of information provided].

Interviewees affiliated with nine different websites claimed that they use themselves and/or people they know to gauge the effectiveness of a website's technology or content. The interviewees in this study revealed that instead of a process equivalent to Beta testing, *i.e.*, assessing the effectiveness of a health-related website by subjecting the site and its content to a wide range of potential users, the website team members and their friends served as both potential end users and the assessors of the findings, not only judging the site's usability and effectiveness, but also assessing the relevance of the contents in light of their own needs. This process then replaces the normative procedures of mapping the needs and abilities of a wide range of potential users, as the following quotes demonstrate.

"There's a project [called] disease management, which aims to help patients with a chronic disease, such as diabetes, monitor and manage their disease online. When we discussed this project at a management meeting, we talked about the fact that these patients are often elderly and, unlike us who were born connected to a laptop, they often lack access to the Internet, and therefore it's important to take them into account when planning. As it happens, my father is a diabetes patient, and another team member also had a parent with diabetes. So we ended up using the example of our parents as a sort of criterion in the planning process, without them even being present or participating in the discussion…"

"How do I know [who the readers are]? … I don't know who they are. I think about myself and the things that interest me and what might interest the people around me…" "How do I know which topics [to choose]? First of all, I don't have an answer for you… as I mentioned, if I get stuck… first of all I think about the things that interest me, not necessarily things related to my life, just the kind of things I find interesting…"

"I think it's user-friendly—to me it seems user friendly. This is the configuration I would want [to find on a website]. But is it what others would prefer? I don't know? No…no, don't know…"; "…my consideration when editing is to make sure it's interesting and that I find it intelligible. If I can understand it, anyone can understand it".

In a similar manner, interviewees representing four different websites said that their selection and organization of topics was based on a gut feeling and common sense:

If someone [a physician in a public organization] approaches me and wants to upload various content to the website, I don't even wait for the committee meeting… first [I exercise] common sense. I place a lot of value on my own common sense…

An interviewee from a private organization stated "part of the job of publishing information and of being a journalist is to have a feel for things, an intuitive sense, to sense things… to know if what's going on is relevant…". Also in regard to website design and construction, some of the interviewees claimed they rely on feelings, rather than on guiding principles or procedures, when considering the website's structure, user interface, and design.

3.6. Structural Aspects of the Work Process—Roles and Responsibilities in Health Websites

In the current study, 11 of the 21 interviewees held the position of webmaster. With the exception of one non-publically held website, all of the represented websites made the distinction between the role of website designer and that of webmaster. The website builder and designer were not held professionally or administratively responsible for contents on the site. In hospital websites, only one person was in charge of the website (often in a part-time position); HMO websites employed no more than two people, as was the case in the two large public health organizations. Three of the four private health organization websites employed one person to coordinate all the website-related work, and only the website of one private health organization employed a staff of ten (full and part-time employees). There are other positions, in addition to those mentioned previously, such as forum managers and specialists (physicians) who are responsible for a certain type of content. In the latter case, this is a secondary role for these physicians, and in public health organization they do this job voluntarily. In summary, the resource allocation for website management was meager in most surveyed organizations, insufficient to carry out the standardized procedures of preference elicitation among end-users.

3.7. Professional and Managerial Responsibility for Website Content

As the following description demonstrates, a distinction between the professional and the managerial aspects of website management and maintenance is warranted. The study interviewees were queried about website and content management in general, and were asked to describe what happens between the moment someone presents an initiative related to website content and until that content is published. They were also asked who has the authority to decide which content is ultimately published. In their responses, 16 interviewees referred to administrative responsibility and seven referred to professional responsibility regarding website content.

The webmaster is usually responsible for the administrative aspect of website content:

First of all, I'm [the webmaster] responsible for content... I consult with others; I'm a member of the organization's management team; I have a direct boss; I have the hospital manager;...I don't interfere with the professional content,... for example, I'll ask the head of a ward to describe the ward, and I don't interfere with that input.

In some of the websites of large public health organizations, there was a firm connection (usually due to the organizational configuration) between the webmaster and the public relations officials within the organization: "…I manage the information center and am responsible for the website… There is a website manager who is responsible for the technical aspect of the website…"; "…I'm [the webmaster] part of the PR department". In many of the public organizations, it was the spokesperson that authorized website content: "as far as we're concerned, we consider publishable anything sent to us that is approved by the spokesperson…"; "…the spokesperson's office team provides me with content. I'm on their mailing list… I get the content from them, and that's about it".

Most of the webmasters interviewed indicated that the responsibility for the professional website content on health websites is shared according to subject matter, and two of the webmasters noted that they refrain from taking professional responsibility for the content. In addition to the administrative information regarding the organization's hours, activities and services, there is also medical content regarding health

promoting behaviors, diseases, medications, *etc.* The responsibility for each type of content is assigned to two different people with distinct positions within the organization. The following statements demonstrate the distinct responsibilities.

> *There's information in here about the organization… this information comes from various sources… there's information from the organization's management. There are updates from advisory committees… there's information about diseases… about the [organization's] branches… if something changes, the webmaster is informed and then uploads the information, but they [the various branches, wards, units] are the ones responsible…*

"Articles are written by the professional experts, who are held responsible…". "I [the webmaster] don't intervene in the professional content…". An excerpt from the answers of an interviewee from a public health organization (already quoted above): "As far as we're concerned, we consider publishable anything sent to us [by the ward heads] that was approved by the spokesperson…".

There is a considerable difference between the websites of public health institutions and those of non-public organizations in terms of content authorization. At public health institutions, people in various positions within the organization are authorized to manage content: "the content management system is such that several people can be authorized to edit [and upload] content…". In non-public organizations, the webmaster publishes content received from and authorized by professionals: "The job of the content editor is to provide content according to my instructions…medical content is reviewed by physicians and legal content is reviewed by lawyers…".

Content authorization was judged to be outside the realm of website builders; rather, it is related to the authority that approves the content to be uploaded, as will be explained herein. Interview responses indicated that it is understood that website builders do not deal with the content on the site; rather, they find out from the content coordinators the type of content that will be used and then train a member of the organization's staff to upload and download content to and from the website.

One of the website builders interviewed stated: "the entire issue of the website content… the organization sent a content person who attended the relevant meeting in which needs were discussed. That person will have input and make recommendations regarding what should be published online…what type of content…" Regarding the need to update content, one of the interviewees said:

> *There was a really big website that I built—it really took a lot of work; I'm not going to update the contents: the company owner has a secretary, and he or she should be the one to update the website.*

3.8. The Authority on Website Content

The study's findings indicated that the authority on website content is not necessarily related to the formal or official position of responsibility, described in the previous section. Alternatively, the authority over website content is split according to the various topics, and thus the person in charge of providing answers on forums, creating, approving, and uploading content might not be the person officially appointed to the task of content management.

In seven of the 11 websites represented by the study's interviewees, the content manager was authorized to create content either with the assistance of or pending the approval of the experts in the various fields.

Thus, for example: "…most often the information that goes online comes directly from the experts themselves or else they have approved and authorized it for online publication", and "physicians write the health-related information". A physician who contributes to one of the sites said: "I wrote all of the content on the website [pertaining to the physician's area of expertise]…".

According to the current study's cohort, those in position to approve the publication of content were the webmaster (2 organizations); an administrative authority from management (4 organizations); or both an administrative and an expert authority (2 organizations). [Content] is approved by those physicians [who wrote it], by the information center; actually it is approved by all of the authorities around here, for example the management…

Interviewees representing five different websites referred questions posted on the website forum to the relevant authority:

> *…For example, in the Pediatric forum… there are practically seven people who provide answers. There's a dietician who's an expert… and there's the pediatrician and the endocrinologist… There's no way that anyone who is not an M.D. would be authorized to do what they do, [to answer queries].*

An interviewee from a public organization noted that the webmaster does address non-medical questions on the forum. Based on the answers of interviewees representing three different websites (two belonging to large public organizations), the authorization to create and publish content on these websites spans a range of policies or systems for website content management: at one end of the continuum are the organizations that employ *rigid guidelines* prior to the authorization and approval of content for publication: "all of the distinguished and renowned experts [in a particular field] communicate the information to me. I seek the approval of those in charge, and based on this, I also help prepare information pamphlets…". At the other end of the continuum there is *no process* in place, such that virtually anyone could upload content, and it is not really clear who, if anyone, is in charge: "the content management system is such that I can actually authorize people to upload and edit the content themselves. There are several people here whom I've trained so that they can upload content on their own...". These patterns open up some questions related to reliability and accuracy of published content.

3.9. Accuracy and Reliability

The interviewees were asked whether accuracy and reliability were important considerations in the publication of medical information, and the degree to which they were strict about verifying that the information published was in fact accurate and non-biased. Representatives of all of the websites except one, which belonged to a small non-public organization, emphasized the importance of publishing information that is reliable and accurate. An interviewee representing a large private organization's website commented: "…that is, if I get an article that touches on medical issues, I'll pass it on to a physician for review and… that's how I work. Since I have no medical training…". Another interviewee noted:

> *I never just copy and paste what I receive without first checking that it [the information] is suitable, reliable and appropriate". An interviewee representing a public organization noted: "...our commitment is to demonstrating reliability; we stand behind every written word.*

The fact that we are a government website, a government hospital… everything published must be 100 percent accurate.

However, there is a distinction between the accuracy and reliability of health-related information and that of administrative information (e.g., visiting hours or the location of a specific clinic). In websites of large public health organizations, the health-related information is produced by physicians and other experts (dieticians, psychologists, *etc.*); consequently, the interviewees were not anxious about the accuracy of the medical information: "…about the accuracy of medical information…I have no clue. I rely on them (the experts); that's to their credit…". The challenge the interviewees face pertains to the accuracy and reliability of administrative information, since the processes required to present accurate and reliable information are not always clear.

In contrast, in websites of non-public organizations, the challenge is not about the accuracy or reliability of administrative information; rather, it is about presenting accurate, reliable and up-to-date medical information, particularly given the abundance of information dispersed for PR purposes, by establishments propelled by various other motives: "…When I find materials published by pharmaceutical companies, even though the material may quote a statement made by an M.D., I can't rely on that 100 percent, because they [the persons quoted] are remunerated one way or another…". In the words of yet another interviewee:

I can tell when a PR agency is trying to promote a certain product or medication, I'm very attentive so as to avoid these [on the website], because… we're trying to present a clean and objective approach/image, and not to promote any particular product or medication.

3.10. Updating Website Information

One of the greatest challenges in website maintenance is updating the online content. The literature distinguishes between static and dynamic information. The content on the website of a public organization contains administrative information intended for those who seek its services, as well as a scrollbar featuring the latest news. Interviewees in the study were asked if they update the website contents, and if so, which content is updated and at what frequency. Seven websites were represented in the responses to this question, providing information on whether updates are systematic or random, the difficulties encountered in this task, and the importance attributed to content updates (or expressed in a set organizational policy). Analysis of the responses indicates that in all but one large organization, which has a set policy for handling content updates, website information is updated randomly or not at all. Possible explanations for this pattern can be found in the following excerpts.

(a) Absence of a clearly defined updating policy: a specialist responsible for the content in a particular area of expertise gave this response when asked whether the organization had a policy for updating website content "No, I wasn't informed of a policy… I'm not aware of any such policy, I don't know…".

(b) Reliance on a responsive approach: "I consider updating the news scroll a kind of update."

(c) We posed the question: "what do you do to make sure that you get the necessary information for updating the website?" The reply was: "look, we… it usually is sent to the spokesperson's office, that is, … somehow to my department… and then somehow to me…".

(d) The importance attributed by the organization to website updates: "I can't leave the date as December 31st if today is January 1st! …Anything related to information… co-workers pass it on to me, internal information, from the branches, from the spokesperson. I drop whatever I'm doing and immediately upload it to the site. That's how I trained the others, as well, they're used to it… if 30 min go by without my updating [website content], people check to see what's going on with me…".

(e) To avoid spending resources on an old website, when a new one is being planned for the upcoming year: "I haven't dedicated any time or effort to it, because anyway, I'm rewriting the content for the entire hospital… Yes there are inaccuracies, period! Outdated information, services that we may or may not offer—I can't bother with that now…".

3.11. Responsibility for Users' Health

3.11.1. The Agility and Interactivity of Websites

Organizations using traditional means for transmitting information fail to take into account the Internet's advantage of interactivity. A website's technological features can be utilized both by those responsible for maintaining and updating the site, as well as by its users. A brief review of the technology's affordances and their pertinence to the current study reveals the following features: real-time response, virtual cooperation, mass cooperation, and the modularity of the technology, all of which can be adapted to address the users' needs [43], yet mostly underutilized in the surveyed organizations. Websites can function as arenas for cooperation, exchange of information and for obtaining feedback from users regarding the extent to which they value the website content; these practices enable the users to shape the content to some degree. An interactive website allows users to respond and react to the website content and it allows those maintaining it to alter or add information in response to users' input. For this purpose, the website needs to have "areas" where interaction is possible. One of the notable applications that enable this interactive function is the forum. Seven of the 11 websites reviewed in this study were equipped with a forum:

> *One of the things we did was to add open forums, where anyone could post anonymously. There are some forums on which people feel uncomfortable about disclosing their personal details and identity… so we don't require them to provide such personal details….*

Among the changes that the interviewees were planning to make on their websites were the addition of a forum and the increase of forum activity. In order to do so and keep the forum "alive", there needs to be a content manager, who answers questions and maintains an ongoing dialogue with the users: "…I'm hoping we'll soon be able to upload the forum and post users' questions, as soon as we have a content editor to manage this…"; "…the [hospital's] website enables people to ask questions before they arrive… to communicate their questions and complaints…".

Websites exhibit different attitudes towards the forums. In the two public health organizations, the forum and the ability to answer users' questions through it was considered only one of the many available means that these organizations used to demonstrate their openness and willingness to listen to and address the needs of the users, since queries were received also through emails and phone calls. Interviewees referred to the forum as "a quick bridge" between the treating physicians and their patients, a vehicle that

is "self-managed". The use of "talkbacks" is another indication of a website's interactive quality, as it allows users to reply to posts and add from their own information and knowledge. Only interviewees from one small organization mentioned talkbacks as a means of interactive communication.

Another way in which users interact is by providing feedback about the site itself.

3.11.2. Organizing the Content on the Website

According to the literature, the structuring of content on a website refers to the way the content is presented [30], typically organized either hierarchically, sequentially, or as a network. Preliminary planning of website content structure can make it easier for users to navigate, provided that users' early feedback is collected and used, and that the content organization is indeed improved in accordance with the input received. Furthermore, one of the standards for measuring the quality of a website is the degree to which content presentation suits the needs of the website users; consequently, the structuring of website content is considered very significant.

Interviewees in the current study were asked about the main consideration or the principle behind the structuring of content on the website, whether they would want to change it and, if so, how. Interviewees from nine websites, representing public and non-public organizations, responded that the organizing principle (on a current or on an upcoming website) was ease of use/usability/user friendliness. An interviewee from a non-public organization said "simplicity of form is important when the site is used by older people or by people for whom the world of the Internet is still new". In response to the question "Why is the content set up this way? What was the guiding thought that led to the current organization of the site?", an interviewee from a public organization said:

> *Why is it set up like this? So that everyone can find the place [on the website] that best suits his or her own interests. There is something on family issues and something on women's issues, information for older people ...everyone finds their own niche..."*

Studies on the design of a user-friendly environment suggest that this task requires a plan based on a guiding principle and that it should take into account user feedback; however, none of the interviewees described such a meticulous process. In the case of four public organizations' websites (two of them of large organizations), there was no guiding principle for organizing the content:

> *"...I have the feeling that someone entering the website doesn't necessarily click right on these, but I have no ...I don't know, I don't actually know if it's so, that is, I hope they do, but I'm not sure... and there is... it could be arranged differently. All told, we do get positive responses to the website, and now and again people call to tell us how much it helped them; but again, it'll have to be set up slightly differently..."*

Here is another example:

> *...Look, one of our problems, and I won't try to hide it, is that we? are so involved in running the business... the solution to your question about content may be to hire someone that will be on staff, someone whose job will be—a content writer who will be able to enlighten us, give us some new perspective, someone who would say—'hey, you know, what you need is...' and that way I wouldn't have to keep switching back to my journalist's hat..."*

Other content organization considerations mentioned by individual interviewees included the following: "whatever the content dictates"; technical limitations; respect for certain department managers in the organization; and issues that the organization seeks to promote. Notably, none of these considerations relates to users' ease of use or needs.

The interviewees' responses to the question regarding how the content was organized on the website revealed a high degree of variance. Only one response representing one website stated that the content was organized according to the target audience: "…everyone can find the place that best suits his or her own interests. …" Four interviewees indicated that the content is organized according to the institution's internal organization: "it [the website] is set up according to the hospital wards—there's the surgical ward, internal medicine ward, and each ward has its departments…"; two interviewees said it was organized according to information type. One of those who noted that the content presentation followed the hospital's organization expressed disapproval and claimed that a change was being planned. Eight other participants also expressed their discontent with their website's current organization and noted that it needed to be changed:

> *We'd like to improve this [current content organization], precisely because we added more and more information over the years, and more and more medical services; the material now really needs to be organized, so that you and I can easily find just what each of us is looking for.*

An interviewee from a public organization said

> *We haven't really processed the material and presented it yet, because it isn't… in the current website structure it isn't possible. So in my mind's eye, I have it organized according to the target audience, but for that to happen, the whole thing needs to be stirred up and re-done, according to topics.*

When we asked what would be the desired content structure, some thought it should be organized by health topic:

> *There's no doubt we need to find another way to organize and present the content, because this way one can't find… a lay person might not know that ophthalmology is part of the surgical ward, so we'll need to organize it by subject: eye-care; ear, nose and throat; cancer; not everyone knows to search for oncology, or to look for it in internal medicine.*

In contrast, others thought the content should be organized according to the target audience:

> *…If you typed your query in English, you'd get to the English language website, in Russian—you'd be directed to the Russian site; if you typed in children, you'd get to the pediatrics website, geriatrics—would take you directly to the appropriate site, and each site would be built to fit the needs of the population it serves.*

3.11.3. General Perceptions About Who Are the End Users.

Interviewees were asked to describe their target audience. Most of the respondents had an upwardly skewed assessment of the number of Internet users in Israel in general and health consumers in particular. These are some of the definitions they gave of the concept of *target audience*: "The entire population…",

"the general public…", "all Israeli citizens…", "from youth upward…", "people all over the globe…" three respondents added a more limited definition to the above definition of target audience: "The clients of these organizations…", and three others defined *target audience* using social categories such as "families", "parents", "pregnant women" *etc.* The expert's perception of the end users is crucial, since it determines both the configuration and the content of the information needed by various users [44]. Thus, *end-user segmentation*—the process of dividing groups into subpopulations according to the approach required to induce behavior change [45], provides a basis for content adaptation. Researchers use a number of terms to describe tailoring. Tailoring involves the development of interventions that conform to specific personal characteristics (e.g., gender, age, culture, attitudes, behaviors, abilities) and often consists of adapting existing materials and programs for different subpopulations [46]. Five interviewees stated that women surf the web for health topics more than men do; three interviewees suggested that the Israeli-Arab population spends less time surfing than does the Israeli-Jewish population. Participants gave conflicting estimations regarding the ages of health-website surfers, and had no information about the distribution of surfers' ages. Seven interviewees assessed surfers' digital orientation as low and eight participants estimated that surfers' health literacy level was low. These participants claimed that they adopted a range of techniques to ensure that health information presented on the site would be understood.

The following excerpts provide a sense of the array of responses interviewee gave on this issue. One participant admitted, "I really don't know who has a hard time [surfing the website] and who does not, nor do I have any way to find out with the existing tools..."; one interviewee approached the issue thus: "At this point, I think of my end users much like I regard the end users of Yediyot Achronot [the local daily newspaper with the largest readership]". Yet another respondent demonstrated a more reserved and resourceful attitude, saying "at this very moment, without examining the data first, I won't try to draw any distinctions [between types of end users]...".

> *Look, I see myself as a user, like when I need a physician's attention. So we talk [with colleague] about what they see, and then we try to approach this from the users' point of view and consider how they could benefit from this. It would be very complicated for me now to run a user survey, to appeal to the population to find out what they would want and how they would want it...*

Cultural sensitivity is a critical factor in communication and must be taken into account if the website is to be an effective vehicle for communication in a cross-cultural context. Practicing cultural sensitivity means disseminating information in a manner that conforms to visible cultural/ethnic characteristics, as well as to norms, values, beliefs, and relevant historical, environmental, and social forces that characterize the target population [46]. Five interviewees said that it was important to present information in other languages, but only three of them actually addressed the issue. Five interviewees alleged that "there is no economic justification…", four interviewees stated "there is no need to translate…", two interviewees noted "it's difficult to translate all the material…", and five interviewees said that they are aware of the need not to offend certain surfers (via pictures or text); however, none of the respondents attempted to involve the users in determining the clarity of content or in making it culturally suitable.

Examples of interviewee responses follow: "Anyone who enters a heath website has to have a reasonable level of Hebrew to cope..."; "Ethiopians can't read or write in Amharic either" and "People who don't speak the language tend not to surf the web".

3.12. Summary

The use of the Internet redefines health services for those who are able to use it; yet this redefinition is relevant only to some of the population. Even though there are established standards for building and maintaining sites, they are not used. The sources used for creating or gathering content do not relate to user needs, but rather reflect the need to showcase the organization. This lack of adherence to standards allows various factors such as organizational interests to determine the sites' structure and content production practices. Despite statements about the range of the user population, in reality no attempt is made to adjust the sites to the needs of disparate populations.

4. Discussion

The purpose of the current study was to explore the processes through which webmasters and content managers facilitate and produce content and structure in large health websites in Israel. Given that using the Internet for health purposes is considered a productive purpose, which increases social returns for the user, it is important that this technology be as inclusive as possible and well suited to meet the needs of various user groups. The basic assumption of this study was that the personal characteristics that have been found to prevent potential users from taking advantage of this technology are not the only obstacle to optimal website use. Rather, the technology's construction process, which results in the way the technology is configured, might be yet another factor that determines who stands to benefit from having Internet-oriented lifestyle, and who is left behind.

Our theoretical lens was inspired by Pinch and Bijker (1987) [47] who demonstrated that the choice of the exemplary design of the bicycle was selected from a range of alternatives using a code reflecting specific social values. Technology experts often see themselves as benefactors of the human race, due to their vital role in preserving the technical culture that produces what they consider the best practices for optimizing human efficiency. We wanted to apply Feenberg's "black box" (1999) metaphor in the context of health websites in order to understand the social logic embedded in their configuration [18], and contrast it to the best practice guidelines in websites content management.

A content analysis of 23 in-depth interviews with health webmasters and content managers of the largest health websites in Israel revealed that the control of design and content selection is restricted to a small dominant group, despite the fact that those websites provide information and services to thousands of people. Moreover, there is no encounter between the designers and the users who are bound together by the use of the technology.

The content analysis revealed that there is no planning of activities related to website design, nor is there a process for eliciting content needs; rather, the theme of "self-embodiment" emerged. Specifically, webmasters and content managers use themselves, their family members, and their friends as a standard for gauging the quality and usability of web content and structure. Target groups beyond their social sphere are disregarded. Thus, the standards for managing websites are largely a matter of personal attitudes and perceptions, professional background and education, and general interest in the Internet. The choice of content and its organization are determined by common sense, rather than by guiding principles related to site building, user interface, and overall design. Although interviewees paid lip service to design procedures, by describing user comfort as the guiding principle in web content organization, none of them

described a process for surveying potential users' preferences regarding content organization. Furthermore, interviewees had no knowledge about user segmentation based on various relevant characteristics, even in organizations that provide F2F health services and thus could easily provide webmasters and designers access to this information.

The "self-embodiment" process used by professionals involved in structuring, creating, and selecting health-website content in fact creates new cleavages, rather than new opportunities. This approach inevitably excludes large portions of the population from using information and services provided by health websites, because some users are characterized by varying levels of digital and eHealth literacy. These excluded groups are not part of a conscious collective that develops an identity and can influence technical design through choices and protests. These groups are invisible, with only a latent consciousness of their commonalities. Unless those in power, *i.e.*, government, public, and private stakeholders, work together to establish durable standards that yield enhanced adherence to basic professional practices, and allow varied end-user populations to access the sites and have a say in the design of content and structure, these populations will continue to be excluded. To the best of our knowledge, our paper makes a unique attempt to show the "price" of ignoring end-users' needs and self-embeddedness of webmasters and content mangers perceptions. There are many articles and books related to website accessibility efforts to disabled users; however, since users with low digital literacy and education are invisible and lack a social categorization, their needs are ignored.

A main practical implication stemming from our findings is that it may be too soon to assume that professional protocols and standards (e.g., preference elicitation in the design stage) are well ingrained in the practices of webmasters and content managers. Professional ethics and conduct are not yet fully developed in this budding practice [48], and self-regulation of practice has proved insufficient, at least according to our findings. Clearly, some external regulation is called for, possibly in the form of formal standardization, which may encourage website managers to pursue more comprehensive goals in terms of design practices, daily editing and production, and collaboration with their end-users. The initiators and monitors of such standards could be either professional bodies of web design, consumer health organizations, or even authoritative bodies such as governmental agencies. The latter have a challenge to develop a virtual environment sensitive and responsive to growing groups of end-users.

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Author Contributions

Esther Brainin wrote the first draft of the article. Efrat Neter revised the first draft. Both Esther Brainin and Efrat Neter contributed equality to the research proposal.

Appendix

Guideline Questions for the Semi Structured Interviews

(a) Please provide us with a short description about the organization.
(b) What are the goals of the website?

(c) Who is the website targeting and who is the end user?

(d) What are the central abilities and skills needed to do the job? [49]

(e) What are the primary considerations in choosing content? [26,48,50]. Are there guiding principles that dictate the desired content scope and the way in which the information is organized?

(f) What are the main metrics for evaluating site quality and content?

(g) What, in your opinion, are the quality metrics from the perspective of users, and what are the users' needs vis-à-vis the site?

(h) Is there an aspiration to meet different quality metrics (e.g., content reliability) and, if so, which? [51,52]

(i) Which principles guide the choice/creation of content? Does the content choice reflect a worldview, personal, or organizational agenda?

(j) What objectives do you delineate for yourself when choosing/creating content? (Quality? Customer satisfaction? Popularity?)

(k) Regarding graphic elements on the site and in the content directed at the target audience [23,53,54] -do you use it? If yes - for what purposes?

(l) Is there a particular characteristic or outline of the site's specific target audience? On what is it based?

(m) Is there conscious targeting of a specific audience or users when creating or choosing content?

(n) How does the characteristic or designation of the target audience impact your considerations during the process of creating or choosing content?

(o) Are different audiences being targeted (age, language, culture, accessibility, digital orientation, and orientation in general) and if so, how is this expressed on the site?

(p) To what extent does the [interviewee's] work have to be coordinated with other position holders: site builders, site customers and managers, site designers, or other central figures in the organization? [29,49].

(q) Interviewee's demographics, and professional background

(r) Job description (What are the job's major challenges)?

Conflicts of Interest

The authors declare no conflict of interest.

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