Identifying Health Helpers Online

Systems to Determine an Individual's Relevancy in an Online Community

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Abstract:

As more people turn to the Internet for information, they may find themselves reading material from, or participating in, online communities. It is more important than ever that one is able judge the quality of the members of these communities. The paper looks at nineteen online communities, which offered reputation management systems. By including both healthcare and non-healthcare related sites, a variety of processes were noted. There are both simple and quite sophisticated systems. Domain experts were not only directly identified by use of external credentials, but also based on a synthesis of the member's thoughts as to the individual's contribution to the information within the community. No system appeared to be the best, but many that seemed to fit their particular community needs. Reputation management included self-reporting, external credentials, voting, surveys, metamoderation, levels, additional powers within the community, means of motivation, and chance. Along with the overview, there is a discussion of issues regarding simple Information Retrieval approaches as well as weighting, granularity, consistency, evaluation, and when things go wrong. Evaluation of these systems was not part of this overview.

Introduction:

More and more people look to the Internet to seek health information to common problems. A recent study finds that people are more likely to go to the Internet for healthcare information than consult with an expert or a family member.[1] When they do go on the Internet 34% used "social media" as a tool to find information, and of those, 15% used the community media of online forums.[2] When accessing online forums they may not be seeking only information but also to participate in a variety of activities, including social ones.[3] Online forums have the ability to deeply engage the reader. A study concerning product research, found that those who got their information from online forums ended up having a greater interest in the material than from marketing sources.[4]

While there are many types of online communities, I would like to focus on those that easily allow their members to share health information. That said, other, non-healthcare, communities have some interesting features that should be considered.

The volume of messages and number of members for some of these online forums can be considerable. For example, the BrainTalk community[5], which discusses neurological issues such as strokes, has 23,573 members.[6] Doctors Lounge,[7] which hosts clinicians as well as patients, includes over 10,000 articles and has answered more than 30,000 questions.[8] WebMD[9] also hosts a discussion area with clinicians and patients and has 150 support and expert message boards.[10]

People who want quality information have quite a task. To manually determine if a source is credible is laborious.[11] Creators of online communities understand this dilemma and have created reputation systems to help note quality information as well as authors and helpers. There are three thoughts on how is best to go about this. One can create a transparent system that rewards those with quality more power within the community. Against that notion is the idea that a more open contribution system helps because of the diversity of its members, and is less likely to fall into group think. The third way is to create an evaluation system that allows for as many evaluators as possible. The idea is that more evaluators means higher quality.[12] We can see these types being played out in our overview.

Creators of online communities also realize that in order to keep their communities focused, indeed bound them so that they form a *particular* community, they need to be able to hold members accountable for their actions. The community has to have the ability to ostracize members who do not conform.[13]

One way they do this is by creating moderators. "Moderators" denote a functional category for some members in online communities. They are "peace officers", removing posts and possibly banning

members for a period of time.[14] They may also be used to build a sense of community, by posting to their community to show that someone cares, and keeping the discussion going.[15] In this sense, moderators are the helpers of their community.

Those looking to join online communities also realize the importance of moderators and are more likely to join a moderated community that an un-moderated one.[16]

Are moderators experts in their domain? Are they the people with quality information, someone we might trust? As we will see, this depends a lot on the system. Moderators may only be glorified editors based on the volume of their participation, or they may be identified as a true expert externally credentialed, or voted so by their peers. They may be a hub, or an authority, or both. If anything, they have shown an interest in the topic above other's in their community. They have a positive reputation within the community, one that upholds the community's values. As we will see, moderators may not be self-appointed, but can be subject to formal review by the community.[17] If a moderator is not an expert, then they would be the ones to help evaluate and identify those who are. They also help their community with other aspects besides information gathering.

There are numerous was to identify who should be a moderator. Different communities have worked out different systems. Top down systems would have an individual or group dictating who would be the moderator, the expert, the person to trust. We will look at a few that are like that, but another way is to develop a scheme that allows the community itself to decide on who the important people are. Such a scheme would have the benefit of being able to keep up with the quantity of members and volume as well as possibly being self repairing.[18]As with the Hawthorne effect, knowing they are being judged the members and moderators may tend toward more quality interaction.

Some of these systems are dealing with the same sorts issues that traditional Information Retrieval uses to deal with documents. Just as documents are indexed in order to properly find them later, members are rated and categorized so that they can be recommended later. Members that are helpers or moderators could be seen to be people who are more *relevant* to their community.

When trying to sum up what attributes that would help determine one's reputation, time and experience are popular ideas. However, besides these general notions, there is no standard answer for reputation.[19]Many of the systems we will look at attempt to capture these, as well as other, attributes of reputation.

As an aside, we should not confuse the two meanings of the phrase "reputation management." One meaning is that of the systems that help an online community track the reputation of its members. Another meaning belongs to companies that track reputation across various websites and media. That

sort of reputation management is about more about businesses and brands.[20]We are interested in those reputation systems that are exclusive to a particular online community. These are often included within a particular site or software application.

Further, we do not want to confuse the idea of an expert in a community with the idea of having the community as a whole being an expert. This is sometimes known as "crowd sourcing." This idea is when the community together synthesizes and produces information, e.g. the online encyclopedia, Wikipedia.[21] Instead, we are looking to find ways to identify those within the community who are or upstanding quality, the helpers.

Lastly, a note of caution: One's reputation within an online community is often taken quite seriously and personally. Having one's reputation based on an algorithm, or the whims of one's peers can be stressful. However, one site admonishes, "XP (experience point) is an imaginary number granted to you by an anonymous stranger. Treat it as such."[22]

Overview Features in Systems:

I would like to draw attention to several online communities, and how they deal with reputation, moderation, and expertise. We will look at various features of these systems in an order of generally increasing sophistication. However, that is not to say the more sophisticated necessarily do a better job.

Wikipedia, home to a very open structure of engagement, does not have many moderators, nor reputation management. (Less than 2% of registered users are administrator/moderators,[23] a subject, perhaps, for another paper.) However, Wikipedia members have taken it upon themselves to create systems to self-report their own level of expertise. Wikipedia:Babel[24] has member created guidelines concerning how well one can read and write in a specific language, one can then rate themselves as to how good they are.

Caring.com[25] is a site for people to write to each other on health topics. This community allows people to simply suggest a topic and signup to be a moderator.[26] While I could not find more details to this process, it seems that if one is interested enough, one can create their own topic and oversee it. Each post at Care.com allows the reader to select whether it was helpful not helpful. This seems to be a way that the system could track what posts are valuable, but I could not find any of that data available to the community at large. It seems to be just a way for one to create a bookmark.[27] One is able to see an autobiography of the moderator as well as the date their membership began and their recent posts.[28]

An external approach to identifying the quality of a member can be found at Doctors Lounge. In this community there are doctors moderating various health topics. The doctors in the USA are required to

send in their name, profession, license number, expiry date, as well as note that they are licensed to practice medicine in their area, that they have not been debarred, and their license has not been revoked.[29] Users can visit the doctor's profile to see when they joined, their number and frequency of postings, as well as their most active area and topic.[30]

arXiv[31] publishes scientific papers that everyone can access. Their moderators are approved by a moderation committee as well as staff.[32] Thus, they depend on a top down reputation system. This is extended to the paper's they publish. While they do not consider themselves a peer-reviewed publisher, [33] they do have some guidelines as to what the moderators are allow to be published. In order to publish papers on arXiv, one needs to have published other papers in the field.[34] They do not allow comments on the article, but as we shall see, another site does.

Revolution Health[35] has a discussion area monitored by clinicians. They also seem to have their clinicians externally credential, as I could find nothing to the contrary, and a lot of this information is in their profile. While not part of the profile, but located on each post, is the name of poster as well as the total number of posts they have done. [36] Thus, one can see the number of posts a clinician has done. This is a simple way to note experience in the community.

Another site that includes doctors is Medhelp.[37] While I was not able to find how these doctors were credentialed by the site, their profiles seem to be more in-depth than those of Doctors Lounge. Doctors can list their schools, training, certifications, affiliations, numerous background information as well as contact information outside the online community itself.[38] Here the amount of external information in the profile is much more comprehensive, however I am not sure if it is merely self reported.

One simple way a community can identify its helpers is for its other members to say so. The Wikipedia notes comments, sometimes in a round about way,[39] on a person's profile. Thus, when looking up the details of a member, one can see comments that others had made about them. In the Wikipedia community this may even take the form of member created awards that they give to each other.[40]

Medhelp uses a separate system for their non-clinician members. Similar to Wikipedia, one can leave comments about a member in the member's profile. One can also categorize the type of note they are leaving from a standard set (E.G. Thank You, Hugs, I Can Relate,…) The totals of the various note types are listed in the member's profile.[41] This give the reader a quick look into the type of comments that have been left. Medhelp's note types are all on the positive side, but do give some insight as to the collective thinking about this particular member. It might be interesting to see if one could use comments to calculate a type of impact factor for individuals. The number of comments one received over the total number of comments in the community of topic, for a given period. However, I could not find that sort of calculation.

One way for members to rate an individual in their community is by *singular transaction*. An example of this would be eBay. Both the buyer and seller have the opportunity to rate each other in several categories for the singular transaction they participated in. These rating are averaged and displayed as a series of up to five stars with the profile of each member, along with the number of ratings.[42] Thus, one can see how the members of the community rate each other on a per transaction basis.

Instead of allowing only feedback for singular transactions, the community at Our Health Circle[43] allows multiple members to awarded points an individual's comment. Our Health Circle is an online support community, not particularly oriented for clinicians to also be moderators. Regular users may post topics and comments, but only Power Users, who have gained enough points from their fellow members, are allowed to start new areas of discussion. Our Health Circle's policy is to make sure that active users are quickly able to achieve Power User status.[44]

While sites like Our Health Circle allow multiple people to rate all members, it should be noted that Doctors Lounge and Medhelp do not seem to allow members to rate doctors. While the doctor's reputation may be verified externally and displayed, their reputation within the community may not be. Since some people do not go to online communities for only medical information, external medical credentials may not be a satisfactory way to identifying these doctors as helpers. However, at the Revolution Health site I noticed a rating feature on one doctor's profile. On the profile was an area for User rating and an Overall rating area.[45] This may allow for some sort of rating for the doctor. However, the example I found was not being used.

The BrainTalk community, uses vBulliten software[46] to organize their community. This software has a number of features to help individuals identify the relevancy of a member. A member's profile includes the typical information such as their join date, number of posts, last visit, and an autobiography. They also include a *User Rank*. The User Rank is based on the number of posts they have done, and can be configured to display a number of stars based on the number of post from them. (E.G. one star for 10 posts, two stars for 30, etc…)[47]

vBulliten software has a further scheme called User Reputation. This is based on the ratings, both positive and negative points, other members give to the individual's post or comment.[48] VBulliten then uses the total points to place their members into categories.(E.G. "0=User is an unknown quantity at this point", 250="User is a jewel in the rough", "minus10=User has a little shameless behavior in the past", etc…)[49]

PLoS, Public Library of Science,[50] is another open access publisher of scientific papers. Articles are peer reviewed before publishing. They allow members to comment on the papers as well as rate them in three categories (Insight, Reliability, and Style) on a scale of 1 to 5. Ratings are averaged and

displayed with the number of raters alongside the article. [51] One is able to view the comments and go to the profile of the commenter. However, they do not display total ratings for the members, or authors.[52]

As we noted WebMD has an external policy to certify clinicians. However, in the profile, including clinicians, they show the more recent posts of the individual as well as the average rating for that post.[53] They do not have a over-all rating for an individual.

Trusera[54] is another website that encourages people to share their medical stories. It also allows comments on these stories. They allow one to append one of three types of compliments (a blue ribbon, heart, or a set of tools) to the post. In the member's profile, the totals for each of these categories are displayed.

Also in Trusera's profile one can see the individual's connections to other people. These are other members that have agreed to link to each other, a friend's network. While this sort of linkage could be used for reputation based on Page Rank, Web Impact Factor, or other perhaps a variant of a citation based scheme, I could not find an example of this. Another feature is that one can see the individual's bookmarks, links to information they consider important.[55] While the only positive nature of the categories makes may make it difficult to discern negative issues associated with the member, the other information helps one determine their level of relevancy to the community. Knowing who and what a member considers important shows how helpful they may be.

Naboj[56] is a site that allows one to review articles currently posted to a different website, arXiv discussed previously, they call this "Dynamical Peer Review". They also list the articles that have been rated the highest, on a scale of 0 to 5.[57] However what is most interesting is that they go the next step-metamoderation. One can select whether a review was helpful or not[58] and then, perhaps most importantly, one can get a list of the top reviewers.[59]

Another community that has listed their highest rated members is Second Life.[60] Second Life is a virtual world, and unlike most of the communities we have looked at, communication is more synchronous and is not archived. In Second Life one had to pay to rate someone, the idea was that it makes for more consideration if it is going to cost a member to rate an individual. Ratings were in three categories, Behavior, Appearance, and Building (building objects in the virtual world). Ratings were done in a point system with no limit as to the number collected. To encourage the members in these categories, in-world money was doled out according to how high a rating a member had. Not only was there a leaderboard where one could keep track of the highest rated member, each member would have their rating displayed in the profile.[61, 62]

While not rating members in an online community, the developers at the Gaming Index have some

interesting ideas on rating games. Their online community rates computer games. One aspect is that they incorporate a weighting system. When there are a small number of ratings, each score can move the average considerably. So they incorporate a "bayesian" weighting system based on the margin of error when there is a small sample size. They also give greater weight to those who rate more and are closer to the norm. If a member rates and comments, then their rating is given greater weight as well. [63]

Slashcode[64] is another type of software that runs online communities. Slashcode includes profiles of members. It displays that individual's comments and the ratings those comments have gotten, although the ratings are not summarized for an over all member score. However, profiles also include lists of the individual's Friends and Foes. These are people the individual wants to see or not see posts from.[65] While it helps the individual filter the content, it also allows others to see who a member thinks is relevant or not.

I should make a quick note about Slashcode's "karma" and an important distinction about online communities. Karma is a way to reward for being a good member of the online community, or a method of punishment. It is mostly based on the ratings one's comments have gotten. Karama can go both up and down. Karma is also effected if a member's original stories are published on the site, and metamoderation of a member's ratings by others.[66] High karma allows one to be a moderator in the online community. This moderation ability last for 3 days then expires.[67] An individual's karma is not available to the community nor oneself. Karma's purpose is to allow for crowd sourcing. It helps the community identify the relevant information and not individuals. Karma is not a public reputation score.

Slashcode sites, such as the community news site Slashdot,[68] are not trying to present authoritative information. Nor are they trying to preserve the authority, or reputation, of a particular member. The concept is that authoritative information should go through official channels. The Slashdot community is set up so that it is the community that selects the information that is relevant to them.[69]

Scoop software,[70] runs such site as SciScoop.[71] SciScoop is another community news site but focuses on science. Scoop software includes profiles of its members. However, it goes further than Slashcode in that it allows for easy searching of a member's comments from their profile.[72] While not giving members an all-around score, Scoop does make it easier to research a member's relevancy.

Another take on ratings within Second Life, but applicable to other online communities, is the third party rating system, TrustNet's Avatar Scanner.[73] It attempts to incorporate an individual's preferences into the rating of strangers. As one member rates another and that member rates a third, the first member is given the second's rating of the third, a stranger. However, the stranger's rating will only be a fraction of what others have given them. For example, if I rate Mary a 10, and Mary rates Mike a 3,

then when I meet Mike for the first time, he will have a rating of 0.3. As there are more people between myself and the stranger, their rating will be a lower fraction.[74] Ratings can also be negative. Those whom one has a low opinion of, do not effect ones ratings of strangers. In this case, if I rate Bob a -1 and Bob rates Dave 5, I do not see any score for Dave when I meet him.[75] It is as if you have an evaluation panel of your friends. As such these ratings are not universal to the community, but are different for each member.

Rate Point is used to rate websites, but at one time they also had software that allowed Second Life members to rate and have ratings for other members. As a member rated things, Rate Point compares what they were rating to other member's ratings. Rate Point then attempt to rate things for a member that have not been introduced to before based on other members who are similar.[76]

Everything2[77] is an online community of user submitted content on just about everything.[78] Profiles are available for members with many of the basic data we have seen before. This includes ranking individuals into levels. However, unlike other systems we have looked at earlier, these levels are based on a complex system of factors *and chance*. Factors include: The number of write-ups the members have done. The individual's write ups as voted on by other members. (Members are limited to a certain number of votes per day, based on their level.) "Cooling" points that are given only by higher level members. (They too are limited, based on their level to the number of those they can give away a day.) And XP that are points garnered from conforming to the style guide, voting, participating in projects, granted by "god groups' and also by chance.[79] With Everything2 we see a complex attempt to use ranking to not only identify helpers but to direct the community.

General Issues

While we have looked at several online communities or software, there are some additional issues that should be noted.

One simple way has been proposed to judge the quality of a raters is that the average of their ratings tend towards the average.[80] Given enough ratings, the highs and lows will balance each other out. This is also true for over all ratings by the community, the more raters you have the better quality the final rating is.[81]

One needs to be careful about simply averaging points when creating ratings. In a study concerning product reviews at Amazon.com, it was found that averaging scores would not properly represent the quality of a product. The reason for this is that buyers with extreme positive or negative opinions are more likely to post their opinions than buyers of moderate opinion.[82] The authors propose a dual point system that offer a better predictor than weighted or a simple mean.[83]

When trying to increase the volume of ratings, and quality, one needs to consider the motivation of the raters. A study about the online store shows that their rater's motivation is "to brag and moan".[84] However, online communities that tie their rating systems to the member's reputation or additional features/power are offering different types of motivation.

Another concern is about the granularity of the ratings. People, generally, do not rate on the lower portion of the scale. If there are only 5 rankings to rate something, this tendency lessens the number of rankings people would typically use. Increasing one's rankings to 10, one allows for better discernment.[85]

It has also been found that making the ratings distinct helps create consistency between raters, or individual raters over time.[86] Thus, one should include descriptions for the various rankings (E.G. 5 = Excellent, 4 = Above Average, 3 = Average, etc…)

It is more than possible that rating systems can go wrong. We looked at Second Life's original rating system earlier. That system has since been disbanded and no other internal system has been put in its place. There were several causes that lead to this. There was always a threat that the cost of rating people would go up, and it did.[87] This spurred people to rate each other before the price went up, and then once the price went up it was more expensive for new people to catch up. Friends would gather together for rating parties where they would rate each other up.[88] People did not give too much thought to the categories so that "triple ratings" were common.[89] Other's might band together and give a person a mass of negative ratings out of revenge and not for poor community norms.[90] There were also concerns that the rating categories were meaningless in light of other aspects of the community.[91] In an attempt to remedy some of this, Second Life stopped paying bonuses paid on ratings.[92] Then they stopped including negative ratings.[93] Finally, they disbanded the whole rating program altogether.

Conclusion

In this overview we have looked at many different communities. Each community had one or more features in place that a person could use to identify quality people within the community, helpers. Some took the top down approach, only allowing people to post that the staff deemed appropriate, others required external certification. Many communities would at least give various details about their members so that one could judge their quality. Many communities used a variety of ways to allow the members themselves to identify who their quality members are.

We noted how sites that are interested in publishing information that is important to their members could use similar tools but use them for crowd sourcing and not publicly available for reputation. We

saw that sites that do not include rankings of their members or articles can have rankings "forced" upon them by other sites. We also noted issues of weighting, granularity, consistency, motivation, and when reputation systems go wrong.

While I could not find some of the typical Information Retrieval processes, such as impact factor, page rank, or web impact factor, it seems that they may be properly applied and perhaps helpful to these communities. Issues such as indexing, evaluation, and categorization are being used and addressed.

When people search the Internet for healthcare information, there are a number of tools that they can use that will identify those in the online communities that are helpful. I imagine in the future these will become even more sophisticated and draw upon even more techniques form the Information Retrieval community.

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