A FRAMEWORK FOR EXPLORING RELATIONSHIPS BETWEEN ONLINE COMMUNITY CHARACTERISTICS AND REGULATION PRINCIPLES

Eleonore ten Thij
Justin de Nooijer
Fac. of Science, Information and Computing Sciences, Utrecht University
P.O box 80 089 NL-3508 TB Utrecht
E.tenThij@cs.uu.nl

ABSTRACT

In this paper, we explore a framework for researching relationships between community characteristics and regulation principles. Different regulation principles are supported by different website features. Ultimately, our goal is to help community operators to deepen the appreciation of their community sites by providing empirically validated insights which website features might support their online community best.
We first determined which community characteristics and regulation principles should be considered, based on a literature search. We then analyzed 31 Dutch and English, national and regional online newspaper communities.
Analysis showed some interesting relationships between individual community characteristics and regulation principles. The framework was able to discriminate between two types of community as well, on the basis of our data, but could not relate these types to (sets of) different regulation principles. We will therefore suggest some improvements of our framework.

KEYWORDS

online community characteristics; regulation principles; typology; design

1. INTRODUCTION

Who observes directories of online communities may notice that webspaces for online communities are created, populated, and abandoned on a regular base. Some online communities seem more or less sustainable, others do not manage to even get the critical mass to really get started. We can find (free) community software on the internet with features built in to empower community formation, like profiles to express personal identity and negotiate social identity, or rating and ranking systems to ensure the quality of member contributions, express roles or help building commitment. However, we do not really know that much yet about whether these features indeed succeed in empowering online communities.
Our research seeks to further the understanding of how the design of community sites may effect community formation. In a previous study we researched how categories of website features expressing success factors and guidelines found in the literature contributed to the appreciation of community sites. (Ten Thij, Van de Wijngaert, 2006). This study did not take into account yet, that these categories may take different values for different types of online communities. Different types of communities may develop different sets of regulation principles that need to be supported by different website features. In previous research, we found that members of gaming communities are more appreciative of being engaged in co-developing and maintaining the community site than members of consumer-to-consumer communities are (Ten Thij, 2007). Consequently, gaming communities may be more appreciative of website features allowing members to do so, for instance by means of an elaborated and refined system of privileges to support moderator functions.
    Most typologies found in the literature, however, do not take into account that community characteristics may vary within different socio-cultural settings. For example, from observations and signals from the

newspaper branch in the Netherlands, we can state that the effort of setting up and maintaining an online community is a complicated task: they may attract fewer members than expected, they may show relatively low levels of interaction, or struggle with abuse (spamming, flaming, racial slur). In the literature on guidelines and design principles for online communities (self-)regulation (i.e. policies, rules that engage members in co-developing the community) is considered an important issue (Kollock, 1997; Kim, 2000; Preece, 2003). Newspapers may find it difficult to allow their community to self-organize because their reputation may be at stake, and their staff traditionally is more used to creating content than to supporting interaction. However, online newspaper communities in other countries may very well behave differently, due to different cultural norms and values with respect to community formation and newspaper policies. Likewise, online newspapers covering national or regional markets may also take different perspectives on setting up and managing online communities, since they might differ in how they relate to local communities.

In this paper, we will built a framework for assessing relationships between community characteristics and (self-)regulation principles. The aim of this framework is enabling future research to assess success factors differentiated for specific types of online communities in different socio-cultural settings. Our research questions therefore are:

- *how are community characteristics related to (self-)regulation principles?*
- *are community characteristics differently related to (self-)regulation principles in different socio-cultural settings?*

We will first elaborate on the framework, and then present and discuss the results of a first tentative test of the framework on online communities related to Dutch and British national and regional newspapers.

2. RESEARCH FRAMEWORK

2.1 Community Characteristics

Our starting point for identifying variables that may discriminate between different types of online communities was Porter (2004), who provides a state-of-the-art pre-defined typology, building upon and attempting to improve earlier typologies. On the first level her typology discerns member-initiated and organization-sponsored virtual communities. Member-initiated communities are characterized by either having a social or professional relationship orientation. Relationships within an organization-sponsored community occur between members amongst each other as well as between members and the organization, and can be of a commercial, non-profit, or governmental nature. On a lower level she formulates a set of attributes to distinguish types of online communities empirically. In our category 'Community Characteristics' we use Porter's attributes, but we do not assume a pre-defined typology. Moreover, the variables are not always made operational in the same way:

- *Purpose*: can take the values 'relation' (*R*), 'entertainment' (*E*), 'action' (*A*), 'support' (*S*), or 'multiple' (*M*). We base these values on Ridings and Gefen 's (2004) research on motivation for participating in online communities and on Preece (2003). We counted and categorized news items on the community's front page, the highest score determining the value.
- *Place*: online (*O*) or hybrid (online and offline) (*H*). We based our scores here on signs of organized offline events on the website, and whether or not members discuss meeting offline.
- *Platform*: can take the values 'synchronous' (*S*), 'asynchronous' (*A*), or 'hybrid' (*H*). The value is determined by the presence of communication tools (chat, message board) on the website.
- *Population*: can take the value 'weak ties' (*O*) for interaction that does not show recurring usernames or apparent relationships. A value 'small group' (*S*) is given when a small number of re-occuring usernames and tight relations (i.e. enquiries about private life) are observed, and the community has fewer than 100 members. A value 'network' is scored when more loosely coupled relations are observed, while spam or flames occasionaly occur, and the community consists of 100 - 300 members. A value 'public' (*P*) is scored when a large number of usernames interact (in subgroups as well), while threads dedicated to flaming or spamming are observed, and the communitiy has over 300 members.

- *Outcome*: characterizes the 'gain' members get from participating in the community. Since we observed in previous research (Hoevers, Meulendijk, 2006) that member-initiated online communities can behave in very much the same way as profit-oriented organization-sponsored communities do, we choose to score the outcome for members as possible values (in stead of for community operators), since outcome may determine motivation to return to the online community. 'Outcome' is probably strongly related to 'Purpose', but they are not necessarily equivalent. The value 'relationships' (R) is scored when offline contact between members is initiated and encouraged. The value 'solutions' (S) is given when members support each other with solving problems (f.e. in support or auction communities). A value 'content' (C) is scored when members only discuss (news) items.

2.2 (Self-)regulation Principles

We define (self-)regulation principles as the policies and rules needed to manage the community's resources, and to generate commitment amongst its members. Kollock (1997) discusses heuristics, drawn from social sciences as well as from experience, that can help community developers to create a lively, elaborate social system. Partly, his 'design prinicples' were derived from Ostrom's (1990) work on non virtual communities ('commons'). Van Wendel de Joode (2005) researched open source communities on the implementation of Ostrom's principles. He grouped them together in 4 more usable clusters, namely *Boundaries*, *Creation of Commitment*, *Collective Choice*, *Appropriation and Provision*. In our framework we define the following categories of (self-)regulation principles:

- *Boundaries* will be characterized by two sub-variables, namely:
  Registration ($B_{registration}$): describes whether or not the community is protected by an entrance regulating system. A score of '1' means anyone can enter the community without registering. A score of '2' means the user is required to complete a short registration procedure (e.g. fill in his or her name, e-mail address and location). A score of '3' means entrance to the community is regulated by ways of an extensive profiling system, in which the users have to fill out many personal details (e.g. date of birth, address, occupation, religion, etc.).
  Specificity ($B_{specificity}$): measures the specificity of the community subject. A score of '0' means the community subject is very general, and therefore will not likely function as a 'natural boundary'; a score of '1' means the community subject is only interesting for a selected audience and will therefore very likely scare off potential intruders, hereby functioning as a 'natural boundary'.
- *Collective Choice* is measured in terms of who is controlling the development of the online community and the content offered on the community site. This variable has also two sub-variables:
  $C_{development}$: is measured firstly in terms of centralized and decentralized control (Walker & Dooley, 1999). Centralized control means a single control point (moderator) determines and dictates the rules and regulations. Decentralized control means multiple control points (community members) use their personal information on the community's state to determine applicable rules and regulations. A score of '1' means the control is centralized and users are not encouraged in any way to submit their opinions; this is the case when there is no notice in the community of users submitting their opinion. A score of '2' means the control is determined by a single control point, but accepting users' suggestions; this is the case when users are presented with the ability to submit suggestions by e-mail or a fill-out form. A score of '3' means the moderators base their decisions on members' input; this is the case when mechanisms such as a 'Community rules and regulations requests-section' on a forum, or a voting poll for the instalment or adjustment of rules and regulations are in place.
  $C_{content}$ measures whether or not users can post content themselves. A score of '1' will mean the automated offering and posting of content is not allowed (on the same level as for example an editor – on crucial pages of the community – though it is allowed in for example a forum or chat situation), a score of '2' will mean posting of content is allowed for only some users (e.g. those with higher rankings when a ranking system is in place, or those who are selected by the editors) and a score of '3' will mean posting is allowed for everyone, including unregistered members.
- *Appropriation and Provision* (Ap): characterizes to what extent rules of 'netiquette' are stated explicitly, and are being monitored, and to what extent rules are in place that (gradually) regulate the consuming of resources by the community members? A score of '1' means there are no explicit netiquette rules, and no formal rules implemented; this is the case when users can consume resources without the community

stimulating them to return the favour of making resources available. A score of '2' means there are few explicit netiquette rules, and some basic rules which cover the most basic aspects of community behaviour (e.g. controlling the amount of resources consumed), and they are brought to the attention of the user before he can consume the resource; this is the case when, for example, the user has the ability to consume only a certain amount of resources in a certain period of time. A score of '3' means there is an extensive explicit netiquette, and the ruling system is advanced and contains graduate appropriation; this is the case when specific groups of users are subject to specific sets of rules, for example moderators are bound by fewer rules than newly registered members.

- *Commitment (Co)*: Are there specific benefits for users which are aimed at provoking interaction or return visits? These benefits are not direct profit as discussed previously, but the 'extras' aimed at seducing members to revisit the community. In other words, what is offered by the community to its members in addition to the profit related to the community's purpose, in order to make it more interesting to engage in and continue interaction? A score of '1' means there are no benefits (other than the obvious interaction with like-minded people), '2' means there is basic functionality such as a news-letter or RSS feed, and '3' means there are advanced benefits, such as community-related (offline) events such as an excursion or just an organized meeting in a pub, or a chat-session with an expert .

2.3 Research Population

To analyze relationships between community characteristics and (self-)regulation principles within different socio-cultural contexts we randomly selected by means of a web search 31 Dutch and English online newspaper communities with both national and regional coverage (6 Dutch national (all national online newspapers), 9 Dutch regional, 7 English national and 9 regional online newspaper communities). The online communities differed in size and age within all groups.

Preliminary qualitative analysis showed that in this group there were no online communities primarily dedicated to entertainment or action. None of them allowed members to post content freely, other than on fora or chat rooms but some online newspapers allowed selected or higher ranked members to do so. Only one online newspaper community supported both synchronous and asynchonous communication, all others only supported asynchronous online communication.

3. RESULTS AND ANALYSIS

In this stage of developing the framework we did not yet formulate any specific hypotheses. We merely wanted to explore whether we would be able to find any significant relationships at all, thus testing the general applicability of the framework for discrimating between types of online communities within different socio-cultural settings.

Our informal "common sense" expectations were that regional online newspaper communities would show more small group relationships, since we felt that discussions would concern locally bounded interests, that would likely more directly affect members than subjects more related to (inter)national issues. Additionally, we expected that for the same reason members of regional online newspaper communities would more likely meet each other offline as well, and that relationships would more often be the 'gain' of participating in the online community. As a consequence, we expected that regional online newspaper communities would be more specific, and show less explicit rules of appropriation and provision. As far as differences between English and Dutch online newspapers are concerned, our informal expectations were that rules of appropriation and provision might be less explicit in Dutch online newspaper communities, since Dutch culture might be more oriented towards consensus building (Bakker, 2006).

After scoring we used Chi-Square test to calculate significant relationships ($p < 0.05$). Since we have only limited space here, we will present significant relationships only (see also Table 1, for results on chi-square tests):

- English online newspaper communities have a broader scope (multi-purpose), than the Dutch, that more often have just a singular purpose;

- Dutch online newspapers' communities have a more specific subject, which may serve as a natural boundary for visitors. This result also corresponds with that presented above. Dutch online newspaper communities may tend to aim at a specific target group (f.e. well-off singles or parents);
- English communities point out more explicitly and specifically which rules and behavioural norms their members and visitors have to comply with, and the consumption of content (e.g. the reading of articles, access to archives) is subject to a more advanced ruling system: there is a significant relation between country and the implementation of rules of appropriation and provision; The relationship between a community's purpose and whether or not posting of content (besides on a message board) is allowed (and if so, by whom) is significant as well. Only seven communities allow posting by certain types of members, four of which main purpose is information discussion, one is multi-purpose, one is relationship- , and one is support-oriented. The last two mentioned allow only content submission by registered members. All others do not allow submission of content whatsoever. So, the majority of information discussion and multi-purpose-related communities do not allow posting content. For information-related communities this might be explained by the newspapers' fear that members may post content that is less fact-based than news items written by professional journalists, thus threathening their reputation. This opposed to relationship communities, where one's submitted content is like an advertisement of his or her personality: submitting false or erroneous content in this case only affects the other members' opinion about the submitter, and whether or not they would want to engage in conversation and possibly a relationship with the advertised person;

Table 1 Chi-square tests Community characteristics and (self-)regulation principles[1]

Chi-Square test	Pearson Chi square	df	Asymp. Sig. (2-sided)	Likelihood Ratio	Asymp. Sig. (2-sided)
Country and Purpose	9.950	3	.019	11.179	.011
Country and Subject	4.045	1	.044	4.154	.042
Country and rules of Ap. and Prov.	7.306	2	.026	7.635	.022
Purpose and posting content by members	9.318	3	.025	9.018	.029
Population and Posting content by members	10.561	3	.014	9.521	.023
Purpose and Creation of Commitment	19.129	6	.004	11.177	.083
Outcome and creation of commitment	13.772	6	.032	14.697	.023
Outcome and rules of Ap. and Prov.	15.795	6	.015	18.910	.004
Coverage and rules of Ap. and Prov.	12.930	2	.002	15.696	.000
Coverage and registering for entrance	12.291	2	.002	15.995	.000

[1] N = 31

- The posting of content is also related to the size of a community's population. Smaller communities (small group and public) seldom allow posting of content, while 'no group' communities and large networks show a more diverse image. Because the data do not provide a clear insight as to what might cause this phenomenon, we are hesitant to draw conclusions on this point. Contrary to the findings, one

might expect the small-group communities to allow posting of content, for the mutual bonds most likely are tighter and trust could be less of an issue, as opposed to large communities where lots of members remain on the fringes, more or less anonymous. On the other hand, larger online newspaper communities may have more resources available to monitor the posting of content, and acquire and maintain the required software, and therefore allow posting more often;

- Table 1 shows a significant relation between a community's purpose and to what degree commitment from its members is stimulated by offering benefits. Information discussion communities tend to offer no extra benefits, while multi-purpose communities either do not offer any benefits, or offer extensive benefits such as expert chat sessions;
- *Creation of commitment* also shows a significant relation with *Outcome*. Generally, where the outcome consists of content, nothing is done in addition to the presentation of this content, to create commitment from members. The data also clearly show that communities whose outcome consists mainly of relationships and support, have more events aimed at binding members to the community;
- Table 1 shows a significant relation between outcome and the implementation of rules of appropriation and provision. The data show that communities where the outcome is generated content generally do not have any rules of appropriation and provision implemented. Relationship- and support-providing communities do have such systems implemented;
- *Coverage* has significant relations with the implementation of rules of appropriation and provision and members having to register for entrance to the community. The implementation of an appropriation and provision system is either not done or done to a moderate degree (scores of 1 or 2) in regional communities, whereas nationwide communities far more often have an advanced (score of 3) ruling system. Nationwide communities either allow everyone to enter, or request an extensive profile to be filled out upon registering; this latter request is not very common in regional communities.

So far our framework did show some interesting relationships between community characteristics and (self-)regulation principles. As a next step we tried to determine if the framework can indeed discriminate between types of community. We ran a Latent Class Analysis (LCA) that assumes that every cluster can be described by a chance distribution over the attributes *Purpose*, *Place*, *Population*, and *Profit*, while presupposing that these attributes are independant. We estimated models with different numbers of clusters, and it turned out that a model with two clusters gave the best BIC score (BIC (log-likelihood) = 262.10). A BIC score of a model M is calculated as follows:

$BIC(M) = -2*L(M) + npar(M) *\log N$, where $L(M)$ is the value of the log-likelihood function under model M, evaluated in the maximum, $npar(M)$ is the number of parameters, and N is the number of observations. The lower the BIC score, the better the model (Lazarsfeld, 1968, Vermunt, 1997).

Table 2 Cluster results from latent class analysis

Cluster 1 Information oriented	Cluster 2 Multi-purpose
AD	Volkskrant Parship
Metro	Daily Mail
NRC Handelsblad	Daily Mirror
Telegraaf	Daily Express
Trouw Moderne Manieren	Nieuws Op Urk
Daily Telegraph	Texelse Courant
Financial Times	The Argus
Sunday Mirror	Cambridge News
Guardian Unlimited	East Anglian Daily Times
De Stentor	Herts & Essex News
Leeuwarder Courant	Manchester Evening News
BN De Stem	The Cumberland
Brabants Dagblad	
Goors Nieuws	
Noordhollands Dagblad	
De Gooi- en Eemlander	
This Is London	
Daily Record	
Reading Evening	

Table 2 shows the clusters resulting from the LCA. We then tested wether clustering and variables were independent – wether the distribution of the variables over the clusters was the same for both clusters -, using Chi-square and Fisher exact tests. (see Table 3. *Platform* was excluded, since it scored the same on 30 papers).

Table 3 Contribution to clustering: Chi-square and Fisher exact test clusters and community characteristics variables

Variable	Chi-square, sig.	Fisher exact, sig.
Purpose	.0003	0
Place	.0000	0
Population	.9102	1
Profit	.0010	0

As we can see in Table 3 *Purpose* and *Place* contribute most to the clustering. *Population* hardly contributes to the clustering., which seems odd, considering that *Place* does. We will reflect on this later on.

From this we may conclude that the framework – on the basis of these data - can discriminate between a type of community that is information oriented, in which members meet each other online (Cluster 1) and a type of online community that is multi-purpose, in which members are not only interested in the information provided, but also form relationships, offer each other solutions to problems, and meet offline as well (Cluster 2).

However, these clusters were not confirmed when we performed LCA on (self-)regulation principles. Here a single cluster model gave the lowest BIC score (BIC (log-likelihood) = 285.65). We also did not find any significant differences between the individual or combined (self-)regulation principles for the two clusters (using independent t-tests). The framework may not contain the right categories to capture interesting differences in (self-)regulation, or the scoring itself may not have been flawless. In other words, the scoring method may not be sensitive and valid. Also our basic assumption that specific community characteristics relate to specific (self-)regulation principles may be false. On the basis of these data though, we must conclude that the framework is not fit yet to detect systematic relationships between types of online communities and different (self-)regulation principles.

4. DISCUSSION AND CONCLUSION

We have presented a framework for detecting relationships between online communities characteristics and (self-)regulation principles in different socio-cultural contexts, and explored its value by analyzing a number of Dutch and English national and regional online newspaper communities. The exploration resulted in some possibly interesting data and relationships, indicating answers to our research questions, which we summarize here:

- English online newspaper communities tend to have a multi-purpose function, whereas Dutch online newspaper communities serve a singular purpose. Next to that Dutch online newspaper communities tend to be more specific in their subjects. English online newspapers tend to offer a greater variety of services, like entertainment (playing games and watching video's), movie renting or dating, seem to partner with a number of commercial service companies, such as loan-offering or car-selling companies. They also offer a more extensive 'react-to-news items' functionality. This may be explained by different cultural norms towards independency of newspapers. Dutch newspapers might fear that partnerships with other commercial organizations would be regarded as endangering their objectivity, while English newspapers might feel less restricted in this respect. Additionally, it may be understood as a difference in perspective on what constitutes 'a third place' (Oldenburg, 1991). This should be researched though within a broader cultural and qualitative analysis;
- Possibly, because of this broader scope (multi-purpose function) and overall subject generality of English online newspaper communities, we found that English communities – far more often than Dutch communities – have implemented a more advanced appropriation and provision system of rules and

behavioural guidelines. Lacking a clearly perceivable boundary, they are more likely to attract a more heterogeneous group of members, in which it is more difficult to negotiate rules and norms informally. It may also confirm our expectation that Dutch online newspaper communities would be less explicit in stating rules of netiquette, since Dutch culture seems oriented towards consensus building (Bakker, 2006);

- The majority of online newspaper communities, especially information discussion and multi-purpose communities, and smaller communities, do not allow members to post content, and are also restricted in collective choice. This may be related to the afore mentioned difficulties newspapers may experience in allowing self-organization;

- Multi-purpose-, relationship- and support-oriented communities more often offer extra benefits to stimulate commitment than information discussion communities do. Possibly, the consumption of newly offered content itself is rewarding enough to make members return to the community. Multi-purpose-, relationship- and support-oriented communities organize more events. One can easily think of the benefits of such events for their members: relationship communities organizing offline meetings in local venues where singles can meet up, and support-providing communities offering the help of an expert in a chat session, etc.. Additionally, information discussion communities are comparatively more accessible in as far as they require less applyance with explicit rules of appropriation and provision. This makes sense, for the content in relationship and support communities can be far more privacy sensitive (consisting of extensive personal profiles including email addresses and pictures, or extensive descriptions of personal problems that are presented to members for the sake of obtaining a solution for a problem) than the content of an information discussion community (which mainly consists of opinions on news items). Thus, the consumption of the privacy sensitive information is (and probably should be) subject to more and more advanced rules;

- On the subject of access control, regional newspapers tend to have less constraints than national newspaper communities. Nationwide communities either allow everyone to enter, or request an extensive profile to be filled out upon registering, this latter request is not very common in regional communities. An explanation for this phenomenon can be that nationwide communities, asking for an extensive registration procedure also offer members access to archives, and may have relationships or support as (a) sub purpose(s), while regional newspapers do not. Our expectations that regional online newspapers would show more small-group relationships, more offline meetings, and fewer and less explicit rules, were not confirmed. This might mean regional online newspaper communities do not support existing local communities to a great extent;

Our approach, being explorative, still has some major weak points as well. Though it seems able to capture relationships between individual community characteristics and (self-)regulation principles, it is not able yet to relate types of online communities to (sets of) different (self-) regulation principles: we did find two different types of online community, information oriented and multi-purpose, but these types showed no systematic relationships with (sets of) different (self-)regulation principles.

We feel we can improve our framework by: (1) a better construction of variables: *Purpose* and *Boundary*, *specificity*, have been scored nominally, but would probably better be scored ordinally. This might accentuate the difference and relationship between both components; (2) a more advanced way of gathering data: several variables lend themselves better for data collection through member input by means of a questionnaire. *Purpose*, *Population*, *Outcome*, *Collective Choice*, and *Appropriation and Provision*, as far as informal rules are concerned, are good examples of this. Additionally, data on *Population* may be gathered by an automatic social network analysis of the postings contributed by members. This would also partly enable us (3) capturing the dynamics of online communities: online communities evolve constantly, are subject to experimentation, and quite often restricted in life span (even during the period this research was conducted, we have noticed (sections of) communities closing down due to abuse). It is also more than likely that communities have changed, evolved or shut down during the time that has passed since this research was conducted.

In previous research we found some empirical support for guidelines and design principles found in the literature in terms of appreciation factors, expressed in categories of website features (see Ten Thij & Van de Wijngaert, to appear). These categories of website features showed significant relationships with appreciation of online community sites. Once proven valid, this framework may be used to empirically assess relationships between community characteristics within different socio-cultural contexts, and appreciation

factors of online community sites. We would thus further a research informed design of community sites, and possibly help members to reach their goals as well as community founders to improve the appreciation of their sites.

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