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# ONLINE COMMUNITY USER INFLUENCE: A STUDY USING USER STATUS

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## ABSTRACT

This research in progress will try to understand the relationship between user influence and status of users in an online community. For online communities a major issue is how to continue to grow and sustain the viability of the community. Oftentimes online communities will gain popularity and then lose that popularity due to stagnation in the number of new users and loss of interest by current users. This research tries to understand how the status of the user plays in the influence of the high level users and the vibrancy of the online community. We measure the influence of the user by using a pseudo Hirsch index to measure the interest of the users posts and use the status of the user in the online community to gauge the user status in the online community.

## Keywords

Hirsch index, influence, online communities, replies, threads, user status, views

## INTRODUCTION

How can a website owner continue to maintain the vibrancy of an online community (OC)? Maintaining vibrancy is a constant fundamental question that all owners of successful OC websites have. Once a website has garnered interest and gained a fundamental amount of users, the health and vibrancy of the website is dependent on the use, submission, and interest in the website by the users. However many OC websites tend to die a gradual death as users start to post less and less, and interest in their OC wanes to where activity levels gradually decline to where new material is rarely posted.

For a “fan” community website that does not rely on a tangible product that the website is ‘selling,’ the reliance on material posted by users is more crucial and the understanding of how an OC can continue to be relevant is crucial. The owners of this type of website know the importance of a constant stream of news and opinion posting by the users and the reasons for most users to read the websites. Typically these websites rely on advertising that is directly related to the number of users that visit and read material on the OC website.

There is a lack of research that looks at measuring user contributions. This paper continues the research on the use of Hirsch statistics (Young, Takeda and Cuellar, 2011a; Young, Takeda and Cuellar, 2011b) to measure the contribution levels by users. We utilize the measures proposed by Young et al. (2011a, 2011b) to see whether high level users, measured by their user status, are really the ones that are influential in the OC. The rest of the paper is organized as follows. First we give an overview of past research, then we explain the research context and the user status levels. Third we explain the measures that we use, and propose how we intend to collect and analyze the data. We finish with a summary and conclusion.

## LITERATURE REVIEW

In this paper we use ‘Online Community’ (OC) to mean “aggregation of individuals or business partners who interact around a shared interest, where interaction is at least partially supported and/or mediated by technology and guided by some protocols or norms” (Porter, 2004). In our paper the shared interest is a university sports team. The individuals are the fans of this university who are geographically dispersed around the globe. The technology used is a website created as a means to create a forum for fans of this university and support/mediate their opinions, questions, and answers about their collective interest in the university sport team.

The owner of this website (an author of this paper) has been able to use the growth in interest in the use of the internet and the associated decrease in technology costs to be able to easily create, maintain, and promote the site’s OC. Generally,

website owners may increase their revenue from advertising by showing an increase in interest and, ultimately, usage of their OC. The literature suggest that OC success is tied to user participation (Assmann, Sandner and Ahren, 2009; Cothrel and Williams, 1999) or a sense of being in a community (Zhang 2010). While user participation is key, garnering high levels of participation does not guarantee the health of the OC over time and user participation is not static (Mousavidin and Goel, 2009) and other research suggest that OC's evolve in a distinct community lifecycle (Iriberry and Leroy 2009). The challenge that OC owners face is to what factors about the OC allow the OC to have a long lifecycle or extend the length of the vibrant period of the OC's lifecycle. Also, status is described as a way for businesses to shift through flotsam and jetsam to find potential ideas (Fuller, Bartl, Ernst and Muhlbacher, 2004; Gangi, Wasko and Hooker, 2010).

One gap in the literature is the limited research conducted on small, independently owned OC's with only hundreds or thousands of users. Conversely, much research has been conducted on larger more popular OC's such as Facebook, Friendster, MySpace, or eBay (Clavio, 2008).

Two other gaps are the limited research in understanding what drives page views in a smaller OC and how to measure influential users in an OC. Past research in this stream begun to address this issue (Young et al., 2011a; Young et al., 2011b). We utilize the measures identified this research stream.

The fourth gap is the lack of measures to identify influential users. Young et al. (2011a, 2011b) identified the Hirsch index, a bibliographic measure, as a potential way to be modified and used to identify influential users. This pseudo-Hirsch measure is a way to measure both the number of contributions to an OC and the uptake of those ideas via 'replies' to the posting and 'reads' of the posting. Explanation of the development of the measure is done in the measures section below.

The literature is full of research that is based on user status and how it relates to online community usage. There is research on the evolution of the hierarchy of user status (Stewart, 2005), the incentive of posting to OC's (Cheng and Vassileva, 2006) and the use of status as an incentive (Cheng and Vassileva, 2005), as well as the role of seeking status and gift giving to increase status online (Lampel and Bhalla, 2007). This extant research on user status finds that most OC's use a direct measure of frequency of contribution as the methodology to measure the status of the user.

Thus, the bibliometric measure is a better indicator of highly influential users in the OC. We therefore propose the use of the pseudo-Hirsch measure as a better way to identify the user status and will compare this to the current user status of an OC of a college sports fan website.

## RESEARCH CONTEXT

BigUFans.com is a fan website for Big U and their athletic teams. Within the website is an OC where users can post messages and information to other users of the website. There are five major websites dedicated to Big U but BigUFans.com is the largest free and independently owned community for Big U fans. The site was created in 1999. BigUFans.com's primary source of revenue is banner advertising. BigUFans.com has several third-party ad aggregators (such as Google AdSense and Burst Media) that sell and deliver ads to BigUFans.com. BigUFans.com is owned by an alumnus of Big U. There are 23 moderators and four administrators of the website. Both moderators and administrators evaluate content and monitor the message boards for any spam, duplicate threads, and incendiary posts. When troublesome posts are found the moderators/administrator removes such posts. They can also ban users if warranted. Feedback from users of BigUFans.com tends to be positive on the fact that its message boards tend to stay on topic and are free of flaming, incite inducing, and advertising posts.

Big U is a university in the southeast U.S. The school has athletic teams that compete in NCAA Division I and the major sports are football, basketball, and baseball. The school is very competitive in football and the majority of fans post about the football team in the message boards. During the 2009 football season (August through January) the site averaged 2,094,226 page views, 2,219 new thread topics, and 151,286 unique visitors per month. The average visitor viewed 6.6 pages per visit. On an average day the site was visited by 1,075 registered users and added 13 new members. The demographics are 92% male, college educated (72%), and middle to upper income (71%). During the football off-season the site averages 30,000 – 40,000 page views per day. During this time (April 9, 2010 through June 14, 2010), of the signed in users, less than 4% created a new thread and less than 30% posted a reply.

Currently BigUFans.com gives status to users dependent on their posting activity. Anyone that creates an account and signs in is considered to be a 'citizen' of the OC. But depending on the amount of activity (in the parenthesis) a user can reach the following status: BigU Scout Team (0 or more), BigU Third Team (13), BigU Second Team (50), BigU First Team (250), BigU All-Conference (1000), BigU All-American (2000), BigU Hall-of-Fame (5000). The breakdown of users is shown in table 1. To gain status on the BigUFans.com a user must sign in and then create a thread or post a reply to a thread to get their posting counted towards a higher status.

User Status	Count
Scout Team	20363
Third Team	1348
Second Team	1086
First Team	586
All-Conference	173
All American	118
Hall of Fame	44
Administrator	5
Moderator	13
Banned	856

**Table 1. User Status Breakdown**

## MEASURES

These are two main categories of variables needed for our measures: Message Board and User Variables.

**Message Board Variables.** A ‘post’ is the first contribution or any reply within a thread. A ‘thread’ is a collection of posts including the first contribution and replies to that contribution. A ‘thread’ is the seed to a discussion that garnished one or more replies. An individual ‘post’ can be a ‘thread’ when it is the first ‘post’ without a reply. The reply is a ‘post,’ as well, but is not a ‘thread’. Thread id is used to uniquely identify a specific ‘thread’. Reply count is the number of replies to a ‘post’. Thread ‘views’ is the number of views that each thread receives.

**User Information Variables.** Post ‘user id’ is the unique identification of a user that created a post. ‘Threads created’ is the number of threads created by an individual user. ‘User status’ is the status of the user at the time that the data is pulled from BigUFans.com.

A simple count of postings is not particularly useful as people may post ‘fluff’ posts in order to gain status, or ‘fluff’ posts in general are counted towards the user status regardless of intent. While posts do create a notion of vibrancy, the real postings that have influence are the ones that garner views by other users. Thus, these influential posts gain responses and create lively discussion. We use the Hirsch index to measure the amount of user influence.

In bibliometrics the Hirsch index (h-index) utilized citation counts of all the publications by a subject to measure the impact of that subject on the field. The h-index measures both the amount of work that a subject has published as well as the impact of that body of work using citations by other researchers to measure the ‘influence’ of the subject. Formally the h-index is defined as: “A scientist has index h if h of his/her  $N_p$  papers have at least h citations each, and the other ( $N_p - h$ ) papers have no more than h citations each.” (Hirsch 2005).

The h-index is responsible for creating a buzz in the bibliometric field spawning other measures such as the g-index (Egghe 2006) and the hc-index (Sidiropoulos et al. 2006). While there is debate as to the validity and usefulness of the h-index and other h-family of indices, areas such as information systems, chemistry, physics, and economics have used this measure to show influence of the researcher (Glanzel, 2006; Truex, Cuellar and Takeda, 2009). The h-index is becoming accepted in academics as a measure of influence.

We find similarities to posting in an OC and academic publishing. First, a user posting is similar to a publication by a researcher. For the OC we have two measures that are similar to the citation of a paper. We are able to measure the ‘replies’ similar to the citation and we are also able to measure the ‘views’ or the posting being read by an individual user. The ability to measure the ‘views’ is an advantage of the OC that we do not see in bibliometrics. While it is impossible to see if a researcher has ‘read’ another researchers article with the OC we can see if the posting has been ‘viewed’ or in essence opened to be read. So we are able to find two types of h-indices for the OC.

We termed the two new measures as the hr-index (replies) and the hv-index (views). To compute the hr-index one must first take each user in the OC and rank the user’s threads started by the number of replies each thread has garnered. The user has an hr-index of hr where they have at least hr threads with hr replies and the remaining threads have hr-1 replies or less. For example, if a user has an hr-index of 100 then that means the user has started at least 100 threads that have gained at least 100

replies or more each. So this is an index of both productivity and impact via replies. The process for obtaining the hv-index is the same except the thread are sorted and counted using views instead of replies.

For each of the indices we use Google analytics and the site's message board database to export the data to excel and list by the thread id, authors user id, user status, the number of replies, and the number of views to the thread. The data will be then fed into a Java program to rank and list the replies and views. The two lists will then be analyzed to create an hr-index and hv-index for every user that has created at least one thread.

## RESEARCH PROPOSAL

We propose to take hr and hv-index data from the BigUFans.com website and compare this to the user status. We hope to compare the hr, hv-index numbers with the status to see if there is a correlation between status and influential postings. We suspect that there will be some correlation between status and high hr, hv-index numbers because one must post a number of threads to gain a high hr or hv-index but that the correlation will not be that high as there will be many users with high status that have little influence on BigUFans.com in general.

We realize that the hr and hv-indices will be magnitudes higher than the h-index that a researcher might see with their publications. This is due to the fact that publications are much harder to publish than thread postings, and citations take much longer to garner compared to 'replies' and 'views' on an OC.

## SUMMARY

This paper extends past research by Young et al. (2011a, 2011b) as well as research on user status and their contributions in OC's. Two pseudo h-indices the hr and hv-indices were used to measure the influence of the user. We propose to compare the influence measures with actual user status of the posters to see if their status matches up with their influence measures. We expect some correlation due to the fact that in order to gain hr or hv-index numbers one must post and therefore posting leads to higher status in the OC. But we also expect that highly influential posts to come from posters with lower status.

There is a risk in translating the h-index to OC's. First the OC hr and hv-indices are bound to be higher in numbers compared to the bibliometric h-index. This is due to the fact that is more difficult to publish in academics and getting cited by others in academic publishing. While the hr and hv-indices are tied to thread initiation, replies and views to these threads, which is much easier to gain in a shorter period.

There are also a couple of limitations to trying to translate the h-index to OC's. The views are just clicks on a thread and downloading the thread to a computer screen, and are not necessarily a reading of the thread. Second the reply may be a genuine reply to the thread or may be off topic to the thread. We believe that there are two reasons to overlook this limitation. First, the administrators of BigUFans.com are dedicated to the integrity of the message board and minimize the replies to run off topic. Second, in order to assess each reply one must sit and read all threads and replies to see if they are indeed replies to the original thread. This is not in the spirit of the creation of the h-index. The h-index was created to allow a quick assessment of influence and to avoid having to read all articles published by an author. In the same notion we use the hr and hv-index to allow us to measure influence without reading all threads. We believe that the hr and hv-indices should be applied in the same spirit as the h-index.

We realize that this research was conducted on a college sports fan site and may not be generalized to other types of OC's. But we believe the contribution of the use of hr and hv-indices to OC's and as a measure of user status can be generalized to other types of OC's. We also note that this was done on a college fan OC and not a traditional business website. We argue that with the competition of college fan websites and the revenue dollars generated this type of OC is a legitimate business site and worthy of research.

Another problem with the current application is that users that have been on the website longer have the ability to gain higher status and hr, hv-indices. A similar second problem is that there might be users that contributed little up to this point but created threads that have garnered much discussion. The second problem is the 'one hit wonder' problem where there is a problem in how to assess the user who has created a thread that spawned a discussion with many replies (one hit). These are two common problems with the h-index and were dealt with the g-index (Egghe, 2006) that addressed the time issue and hc-index (Sidiropoulos et al. 2006) which addressed the one-hit wonder issue. Perhaps future studies can look at a comparable g-index and hc-index for OC's and their application but we feel for this study a progressive step of using the hr and hv-index to measure status was sufficient.

Some additional questions that future research may be able to address are (1) What is the effect of specific events with BigU on user participation? (2) What is the effect of events with BigU on the number of page views (replies) prior to and after the

event? (3) How are revenue and the effect of different types of users to visit the website related? (4) How does the users hr and hv-indices change over time? (5) can we generalize our findings to OC's of different types?

We feel that this research is relevant to both the user and developer of OC's. First the research showed that most OC's use a simple count for user status. While this is the defacto method at this point we feel that developers of OC's would be interested in the actual influence of user participation in an OC. From the user point of view a better measure of user status would better assess the posting authors and allow user to use the user status measure more accurately.

## CONCLUSION

This research is part of a overall research stream that is trying to find out how developed OC's can continue to grow and generate page views and interest of the community and stay viable in the eyes of the users. The current study tried to address the issue of OC's from the user point of view. In particular the study addressed the issue of user status and whether users with high status are truly influential to the OC. User status is relevant to the users as user status is an important indicator of how well you are contributing to the OC. Owners of OC's would be interested in this research to find out whether a simple count of contributions really is a good measure of influence.

## REFERENCES

1. Assmann, J., Sandner, P., and Ahrens, S. (2009) Users' influence on the success of online communities, in: *Proceedings of the 42nd Hawaii International Conference on System Sciences*.
2. Cheng, R., and Vassileva, J. (2005) User motivation and persuasion strategy for peer-to-peer communities, in: *Hawaii International Conference on System Sciences*. Hawaii.
3. Cheng, R., and Vassileva, J. (2006) Design and evaluation of an adaptive incentive mechanism for sustained educational online communities, *User Modeling and User-Adapted Interaction* (16:3), pp. 321-348.
4. Clavio, G. (2008) Uses and gratifications of internet collegiate sport message board users. D., Indiana University.
5. Cothrel, J., and Williams, R. (1999) On-line communities: Helping them form and grow, *Journal of Knowledge Management* (3:1), pp. 54-60.
6. Egghe, L. (2006) Theory and practice of the G-Index, *Scientometrics* (69:1), pp. 131-152.
7. Fuller, J., Bartl, M., Ernst, H., and Muhlbacher, H. (2004) Community based innovation: A method to utilize the innovative potential of online communities, in: *Hawaii Internation Conference on System Sciences*. Hawaii.
8. Gangi, P.M.D., Wasko, M.M., and Hooker, R.E. (2010) Getting customers' ideas to work for you: Learning from Dell how to succeed with online user innovation communities, *MIS Quarterly Executive* (9:4), Dec. 2010, pp. 213-228.
9. Glanzel, W. (2006) On the H-Index--a mathematical approach to a new measure of publication activity and citation impact, *Scientometrics* (67:2), pp. 315-321.
10. Hirsch, J.E. (2005) An Index to quantify an individual's scientific research output, *Proceedings of the National Academy of Sciences of the United States of America* (102:46), pp. 16569-16572.
11. Iriberri, A., and Leroy, G. (2009) A life-cycle perspective on online community success, *ACM Comput. Surv.* (41:2), February 2009, p. 29 pages.
12. Lampel, J., and Bhalla, A. (2007) The role of status seeking in online communities: Giving the gift of experience, *Journal of Computer-Mediated Communication* (12:2), pp. 434-455.
13. Mousavidin, E., and Goel, L. (2009) A life cycle model of virtual communities, in: *Proceedings of the 42nd Hawaii International Conference on System Sciences*.
14. Porter, C. (2004) A Typology of virtual communities: A multi-disciplinary foundation for future research, *Journal of Computer-Mediated Communication* (10:1).
15. Sidiropoulos, A., Katsaros, D., and Manolopoulos, Y. (2006) Generalized H-Index for disclosing latent facts in citation networks, *arXiv:cs.DL/0606066* (1), 07/13/2006.
16. Stewart, D. (2005) Social Status in an open-source community, *American Sociological Review* (70:October), October 2005, pp. 823-842.
17. Truex, D., Cuellar, M., and Takeda, H. (2009) Assessing scholarly influence: Using the hirsch indices to reframe the discourse, *Journal of the Association for Information Systems* (10:7).
18. Young, B., Takeda, H. and Cuellar, M. (2011a) Investigating the impact of offline events on group development in an online sports community, in: *Southern Association for Information Systems (SAIS)*. Atlanta, GA.
19. Young, B., Takeda, H. and Cuellar, M. (2011b) All contributions are not created equal: Measuring user influence in online communities with hirsch indices, in: *International Federation For Information Processing Working Group 8.2 Organizations and Society in Information Systems Workshop (IFIP 8.2 OASIS)* Shanghai, China.

20. Zhang, Z. (2010) Feeling the sense of community in social networking usage, *IEEE Transactions on Engineering Management* (57:2), pp. 225-239.