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INVESTIGATING THE IMPACT OF OFFLINE EVENTS ON GROUP DEVELOPMENT IN AN ONLINE SPORTS COMMUNITY

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ABSTRACT

The literature on online communities suggests those communities that grow successfully have members who create and share common bonds and common identities. Our goal in this research-in-progress paper is to better understand the impact that shared experiences have on user activities in online communities. We use PLS in a preliminary analysis of the relationships between page views at the online community BigUfans.com and real-life events that affect the online community's members. The preliminary results suggest that our model accounts for 60.4% of the variance in page views on the site and 27.2% of the contributions (e.g. message board posts) to the site.

Keywords

Online communities, Website design, Group development theory, and Group Collaborations

INTRODUCTION

Online sports communities continue to grow in popularity and sophistication as a means for geographically dispersed followers to stay connected. Online communities (OCs) are often used as a source of knowledge and a repository of information from which members draw on their real-life experiences. These OCs offer a way for people with common interests to actively participate in sharing of information, debating relevant (or irrelevant) topics, forging online connections, and building a sense of being part of a vibrant virtual community. But for these communities to exist there needs to be active participation by the members.

College sports message boards are particularly representative of popular OCs. For example, on February 7, 2007, more than 70 million visitors logged onto popular college fan sites owned by Rivals.com to discuss college football (Skretta 2007). This level of interest is also present, albeit on a smaller scale, in fan communities such as BigUfans.com¹, the subject of the present study. Owners of fan websites that operate for profit are typically interested in increasing the number of page views in order to increase their revenues from the site. Toward that end, this study begins a line of action research to investigate how site owners can increase page views and thereby revenue for their site. In this paper we investigate the effect that events related to the community interest have on page views of the site. The object of such research would be to provide insights to the owners of those sites to assist them in maximizing page views and revenues.

The rest of the paper is structured as follows: First, we briefly describe group development theory. Second, we present the research questions. Third, we present the empirical context for the research study. Fourth, we present the research method and dataset. Finally, we give a preliminary analysis of the data and offer concluding remarks.

LITERATURE REVIEW

Many studies are conducted on online communities (e.g. Clark et al. 2007; Harper et al. 2007; Iriberry and Leroy 2009; Ren et al. 2007; Sassenberg and Postmes 2002). One major concern for OCs is that they may start out strong but eventually a once-relevant niche loses momentum and the community loses its vibrancy. This loss of vibrancy results in a loss of page views and therefore revenue. Identifying why this occurs and taking counter-measures can help the site owner maintain and increase page views and thereby revenue. Studies have examined reasons for decreases in community member activity (Harper et al.

¹ BigUfans.com is a pseudonym.

2007), OC life cycles (Iriberry and Leroy 2009), moderation techniques impacting community growth (Ren and Kraut 2007), and indications that virtual communities may not be entirely virtual (Rothaermel and Sugiyama 2001). Group development theory (Back 1951) has the concepts of common bond groups and common identity groups. Back identified three reasons someone would want to be in a group: (1) personal attraction between members (common bond); (2) personal attraction to the group activity (common identity); and (3) prestige of being in the group. The notion of common bond and common identity translates to the online world as well (Postmes and Spears 2000; Ren et al. 2007).

Common identity. Common identity is where “members feel a commitment to the online community’s purpose or topic” (Ren et al. 2007, pp. 381). Reasons for common identity are social categorization and interdependence. With social categorization members of a group exist due to a shared identity such as a group dedicated to those suffering from cancer. Interdependence occurs when the group exists for a common purpose or some goal (Ren et al. 2007).

Common bond. Common bond “implies that members feel socially or emotionally attached to particular members of the online community” (Ren et al. 2007, pp. 381). Reasons for common bond are social interaction, personal information, and similarity. Social interaction occurs during messaging or group forums. Users may find attraction to a person in the community through these interactions. The attraction might be due to favorable ideas shown during posting or support shown by replying positively to a post. Similarity is when one finds another person that might have similar tastes, ideas, notions, or features. Similarity can be a reason why a user continues to be in an OC (Ren et al. 2007).

RESEARCH QUESTIONS

The importance of this research is to explore how an interest-based website can increase page views through creation or taking advantage of major events. Management of events in the life of the community can increase activity on the site which impacts revenue to the site. By identifying how the website members behave, this study can identify when and how a website owner might address different events. Koh et al. (2007) suggests that these communities must consider ways to sustain interest, viewership, and contributions in the community. Community size also is an important factor in the community’s survival. Therefore, it is important to understand how to use events that occur offline to create growth within the OC. Thus, we have several research questions we wish to explore:

RQ1. How do real-life vs. website events in interest-based website visitors’ lives influence user participation?

RQ2. How can interest-based websites take advantage of the real-life common events to increase user participation?

We believe that the reason members are active in sites like BigUfans.com is both common bond and common identity based. With common bond, the attractiveness of the community is most likely social interaction and similarity. Since personal information disclosure is not required, members participating due to personal information are likely low. While not required, some users do disclose additional personal information such as cell phone numbers when someone has an extra ticket to a sporting event that they want to give to another fan of Big U. Optional information disclosed in member profiles includes geographic location, occupation, and personal interests.

With common identity the site can be categorized as being both social categorization and interdependence. Many members of the site are alumni of the university, live in the proximity of the university, or have been lifelong fans, thus giving a common identity via attendance to the university or living in the community. Most members of the site are fans of the university and thus have a common goal (interdependence) cheering for their university at sporting events and thus wishing team victory.

While some groups may have prestige, the website currently under study does not have any prestige associated with its membership. Due to this fact we did not use Back’s (1951) third reason for someone wanting to be in the group.

THE EMPIRICAL CONTEXT

BigUfans.com is an independent website and home to the largest free gathering place for fans of Big U’s athletic teams. Big U is a public university in the southern United States with enrollment of over 25,000 total students and over 100,000 living alumni². Big U competes in the NCAA at the highest levels in many sports. BigUfans.com is a free interactive social networking community created by an alumnus (and one of this paper’s authors) of the university. The website is not affiliated with, supported, or endorsed by Big U. This OC is typically most active in months related to the college football season (September through January). During a 180-day period of 08/01/2009 to 01/31/2010, the site had an active membership 3,079 users that accessed the site during this period. As of 4/15/2010, there was a total (active and inactive) membership count of 21,392. Approximately 20% of all visitors on any given day logged-in as registered members. The other 80% were non-

² According to the Big U (pseudonym) .edu website

members and members who did not login and thus were unable to contribute. ‘Anonymous’ postings by a visitor not logged in were not allowed. Users were not required to disclose any private information to the public or members of the community.

During the 2009 college football season, the site averaged 2,094,226 page views and 151,286 unique visitors per month. Visitors spent on average 8 minutes 41 seconds on the site per visit during the season and viewed an average of 6.6 pages per visit. Each day an average of 1,075 registered members logged into the site. Each day during the college football season, on average, 13 new members registered, 73 new topic threads were created, and 1,022 new posts were created. BigUfans.com is unique (as compared with the vast majority of large sports fans websites) in that all content and message boards are freely available to all visitors. Approximately 90% of the revenues for BigUfans.com come from click-throughs to advertisers. Merchandise sales account for the remainder. Click-throughs is a function of having many people view the site. Users regularly visit the site to read and comment on news and interact with other fans. We believe that the common experiences of a Big U fan tend to generate page views surrounding major events in the life of a Big U fan. There is a base level of approximately 40,000 page views regardless of events (e.g. 30,000-40,000 that reflects a general interest in BigUfans.com. Events cause the number of contributions to increase, which, in turn generates additional contributions and page views.

Research Model and Variables of Interest

Page views are one measure of success for websites. For interest-based communities like BigUfans.com increasing the page views is an important goal and is linked to site revenue. Other measures that OC designers closely monitor are sign-ins and sign-ups. Common events in the life of the community and its members can influence the page views for the site. Thus, our conceptual model is presented in Figure 1.

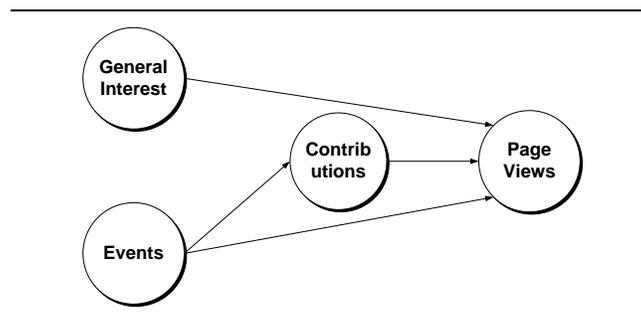


Figure 1. The Conceptual Model

Dependent Variable. *Page Views* are measured as the number of views of a page recorded each day on BigUfans.com.

Independent Variables. Four types of events variables were developed by creating a dummy variable (1/0) for each day. Specifically, event data is indicated two days before an expected event occurred, the day of the event, and the two days following the event. Where an event occurred that was unexpected, the event and the two following days were coded as being for that event. For example, if an expected major event occurred on a Saturday, Thursday and Friday would be the prior-to-event, Saturday would be the event, and Sunday and Monday would be post-event.

Major Events consist of football games against the biggest rivals, post-regular season games, and football recruit signing days. In our research, this includes games against the three biggest rivals for Big U. Games played after the season, such as conference championships and bowl games, and head coaching changes or NCAA penalties are considered as major events. The variable is dichotomous for every day in the data set with 1 being a major event occurred on the day and 0 indicating no major event occurred on the day. *Minor Events* consist of games against smaller rivals and other, less impactful school events. These consist of all other games that Big U plays, announcements by the school regarding player eligibility, or relatively minor announcements about Big U regarding players or recruits. The variable is dichotomous for every day in the data set with 1 being a minor event occurred on the day and 0 indicating no minor event occurred on the day. *Adverse Events* include losses to major rivals or unexpected losses to minor rivals. Losses to major rivals and unexpected losses to minor rivals are of significant interest to fans. The variable is dichotomous for every day in the data set with 1 being an adverse event occurred on the day and 0 indicating no adverse event occurred on the day. *Expected Events* include wins over minor rivals. The interest of the fan base in Big U is atypically high during football season, but less so for expected events. The variable is dichotomous for every day in the data set with 1 being an expected event occurred on the day and 0 indicating no expected event occurred on the day. *Articles* indicates publication of an article by a popular BigUfans.com columnist. This variable was coded 1 on the publication day of the article and 0 for all other days.

Mediating Variable. *Contributions* are the number of member posts contributed on the website each day. These are measured using website data from the BigUfans.com's message board control panel. Contributions include all new posts created by members each day across the website and are not limited to only posts in the football board.

Control Variable. *Days* indicates number of days since the start of collection of the website data. This was a control variable created to parse out the effect of expected growth in the site over time.

Hypotheses

Membership provides the privilege of posting on the site. Visitors are not required to be signed in to read content and postings on the site. However, since the site's primary purpose is to create a place for fans to interact, the dependent variable should increase as the participation in the site increases. Thus, *H1: The number of contributions mediates most of the influence of events on page views.*

In the life of the site, major events will provoke members to participate in the life of the site. In fact, the level of activity of the site, as measured by page views, sign ins, sign ups, new threads, new posts, and unique visitors, is expected to increase during the period surrounding major events. Thus, *H2a/b: Major events generate a greater number of page views (contributions) than other events.*

While minor events are not as special as major events, the minor events are still going to generate an increase in the activity of the website compared to non-event days. Because of the common identity that members and non-members share, we expect to see greater activity on the site when adverse events occur. Thus, *H3a/b: Minor events generate a greater number of base-level page views (contributions) than non-event days* and *H4a/b: Adverse events generate large increases in page views (contributions) above those in major or minor events.*

We also expect to see a difference between the common bond and common identity events as well. For both events we expect to see increased activity but not the same dependent variables will be affected. For common identity events we expect to see an increase in contribution across all dependent variable measures. Thus, *H5a/b: Common identity events generate more page views (contributions) than non-event days.*

For common bond events, one must already be familiar about the person (in our case the staff writer) in order to feel some attraction. So new user events will not play a factor for common bond events. Thus, *H6a: Common bond events generate more page views (contributions) than non-event days.*

PRELIMINARY ANALYSIS

Method. To test the hypotheses, we examined the relationship between page views at BigUfans.com and the occurrence of certain events. We collected usage data from BigUfans.com and time periods measured by days and proximity to associated relevant events categorized as being positive/negative and minor/major events. We used Partial Least Squares (PLS) methodology as implemented in SimplePLS (Ringle et al. 2005). PLS is a second generation data analysis technique (Gefen et al. 2000) which tests not only the structural model but also the measurement model in a single analysis rather than two unrelated analyses as in the first generation techniques. Additionally, PLS is able to identify path loadings across the entire model in a single run as opposed to multiple runs required using regression techniques. This results in a more rigorous analysis than using factor analysis and regression alone (Gefen et al. 2000, p. 24). Similar to regression analysis, PLS seeks to show rejection of a null hypothesis of independent variables having no effect on the dependent variable while accounting for a significant amount of the variance in the dependent variable (Gefen et al. 2000, p.27).

Data. The data set was made available by the owner of the site (one of the researchers) to the research team. Data includes directly measured data from analytical tools located on the site, including Google Analytics, 24/7 RealMedia, and vBulletin message board software. Google Analytics and 24/7 RealMedia place a small code on each page delivered to viewers of the site and then collect various types of data. Data collection occurred during the timeframe of July 2004 through May 2010

Analysis. The data collected was analyzed using the SmartPLS Software (Ringle et al. 2005). A structural model was created and the analysis was performed by running a PLS analysis with using the path weighting scheme and other standard settings. To get the path significance, a bootstrap analysis was performed by creating 1000 item samples and then collecting 200 samples. Since the data is single indicator variables collected from an automated system, no testing of the measurement model is required. A structural model was developed in PLS and the model accounted for 60.4% of the variance in page views and 27.2% of the contributions. Both are very high values. The results of the PLS analysis is presented in table 2 and figure 2.

Path Analysis. The path analysis shows that all of the paths tested were significant except for the path from adverse major events to page views (see Table 2). The significant variables had a direct effect on page views and on contributions.

However, the model shows negative significant direct paths for the events to page views. This is indicative of suppression. In this event it indicates multiple contradictory processes are occurring. For, example it is possible two different groups have different responses to events. One group perhaps may not view many pages, but when an event occurs it causes them to increase their page views, while another group has high page views, but when an event occurs, it causes them to stop viewing the site temporarily. The suppression effect indicates that additional research and theorization is necessary to specify all of the entities involved in this model (Shrout and Bolger 2002). To evaluate H1, H3, and H4 additional research is required.

Path	Original Sample (O)	Sample Mean (M)	t-value
Note: * = p<0.05, ** = p<0.01			
Adverse Major Event _ Page Views	-0.0627	-0.0574	1.6266
Adverse Major Event _ Contributions	0.2155	0.2079	4.2470**
Adverse Minor Event _ Page Views	-0.0919	-0.0907	2.3081*
Adverse Minor Event _ Contributions	0.1976	0.1965	3.3500**
Contributions _ Page Views	0.8115	0.8145	28.0585**
Article _ Page Views	0.1131	0.1114	4.5121**
Article _ Contributions	0.1466	0.1494	4.2490**
Non-Adverse Major Event _ Page Views	-0.0660	-0.0677	2.0270*
Non-Adverse Major Event _ Contributions	0.2736	0.2741	5.5468**
Non-Adverse Minor Event _ Page Views	-0.1197	-0.1185	4.6478**
Non-Adverse Minor Event _ Contributions	0.2874	0.2894	8.4160**
Control Variable: Ctrl_Day _ Page Views	-0.0432	-0.0423	2.1399*

Table 2. Results of Bootstrapping Analysis

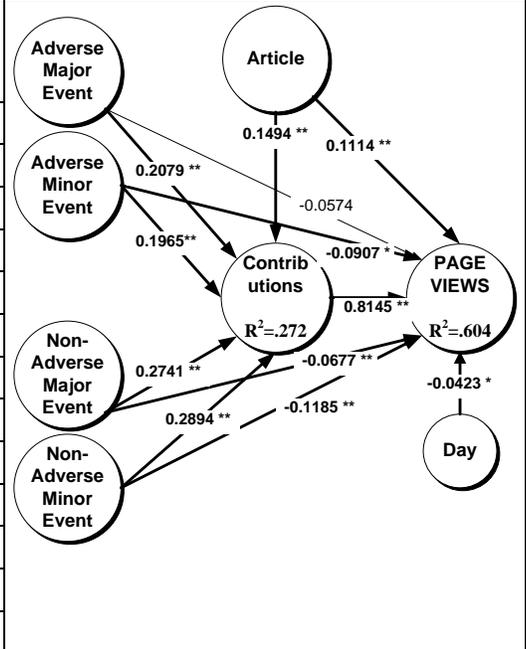


Figure 2. Model Analysis Results

The betas of major events and minor events are approximately the same for both their effects on contributions and on page views indicating that their effects on both of those are about the same. Thus, H2 is not supported. For the publication of an article, the results show a partial mediation effect. The total standardized effect of the article on page views is .2321. The beta of .1131 for the article variable yields a partial mediation effect of approximately 49% (Shrout and Bolger 2002). This indicates that the effect of the articles is split; half drives page views to the article itself and the other half drives contributions and comments about the article. The control variable, *Day* has a significant, negative beta indicating that over time, general interest in the site is declining which contradicts the observed growth in page views over time. This could be a suppression effect with other variables or it could mean that general interest in the site is declining over time. However, a core group is strongly committed to the site and actively viewing and posting contributions on the site. The high beta for contributions to page views shows the major contributor to page views is the number of postings on the site. The number of postings is driven by articles posted as well as by events that occur to the team over time.

CONCLUSION

The goal of this research is to contribute to our understanding of how interest-based websites can take advantage of events that affect the website’s visitors. Preliminary results show that events that occur in the life of the community have a significant effect on contributions to the site and, through contributions, the page view count. The effect of articles posted on the website is partially mediated by the contributions in their effect on page views. Our work builds upon prior work on group development theory in two significant ways. First, this research applies to interest-based OCs. A general commercial site with no natural interested-based community will have different dynamics than an interest-based site. Second, our study uses group development theory for understanding how these shared experiences impact the life of an online sports fan community. The increase in interest-based OCs has provided users with common identities and common bonds the ability to share their experiences together, even while geographically dispersed. Many OC owners are interested in creating sites that grow and generate income. Understanding target areas to take advantage of offline events can be an important contribution.

We ran PLS analysis on data collected from a university sports fan site. We found support for the hypotheses (H5 and H6) that Common identity and Common bond events generate more page views than non-event days. We found weaker support for the hypotheses (H1, H3, and H4) that The number of contributions mediates most of the influence of events on page views, Minor events generate a greater number of page views than other events, and Adverse events generate large increases in page views above those in major or minor events. There needs to be further study to analyze these three hypotheses. Finally we found no support for the hypothesis (H2) Major events generate a greater number of page views than other events.

This research primarily studied the aftermath of events. Some of the questions that remain unanswered by this research are (1) the effect of the different kinds of events on click-throughs; (2) the effect of the event on the number of page views prior to the event; and (3) understanding the effect that different types of visitors to the website have on page views and contributions. These questions will be investigated in future research.

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