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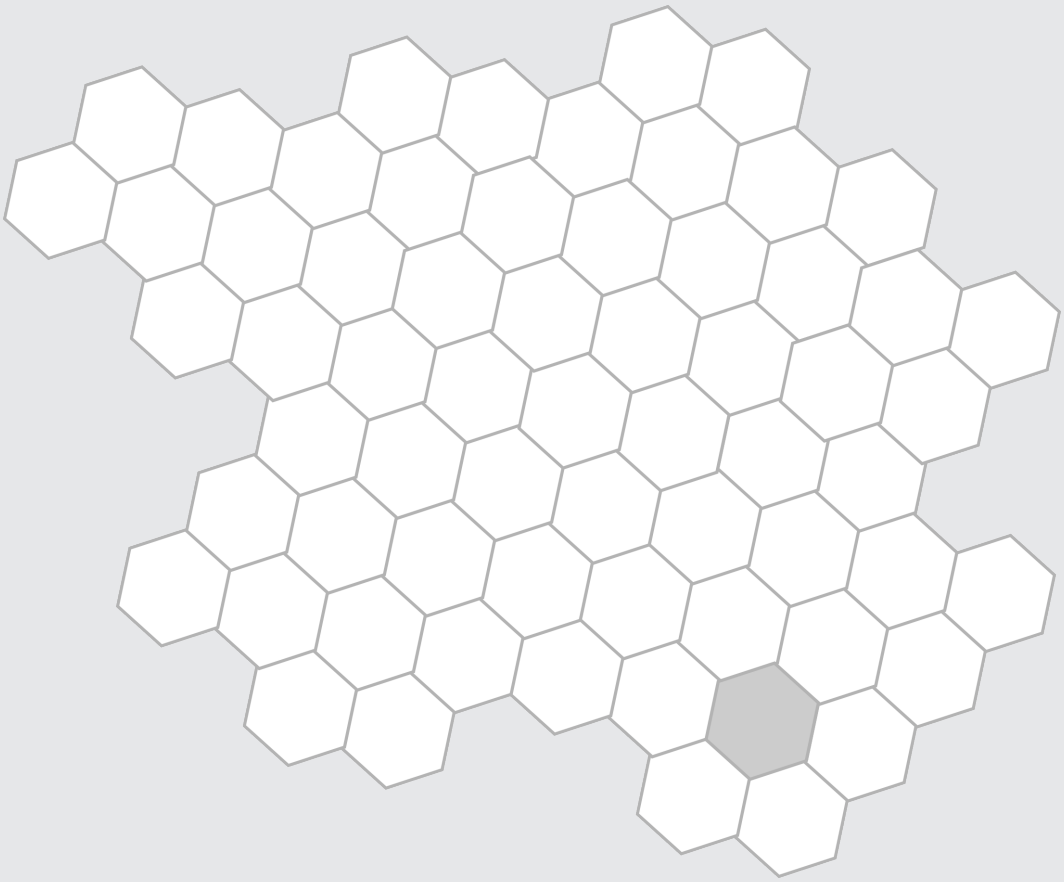

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Persuading Collaboration: Analysing Persuasion in Online Collaboration Projects

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Abstract

In this paper we propose that online collaborative production sites can be fruitfully analysed in terms of the general theoretical framework of Persuasive Design. OpenStreetMap and The Pirate Bay are used as examples of collaborative production sites. Results of a quantitative analysis of persuasion in these sites are presented and discussed. This framework may be of value to other researchers interested in design of persuasive systems.

Key words persuasion; online collaboration

Introduction

One of the most striking features about the growth of the Web over the past few years has been the remarkable success of web based services that derive their value from 'crowd sourced' production, that is sites where the majority of content is created by users themselves rather than the companies, individuals or institutions behind the site. But how do these sites convince, or persuade, their users to take part and to remain active, and thus continue contributing content? The focus of this paper is on using a persuasive framework to analyse quantitative data on user behaviour in collaborative sites.

The rise of collaboration

The growth of volunteer based web-based projects producing goods in a collaborative manner has attracted considerable interest within academia. Quantitative analyses of participation have been applied to several different projects including Wikipedia, Flickr and Usenet newsgroups (Nielsen, 2009; Ortega, 2009; Shirky, 2008). These analyses have tended to focus on system-level analyses such as the rate of participation inequality in collaborative projects. In this analysis, we try to tie quantitative data to the level of the individual participant.

Persuasive Design

Recent years have also seen the birth of the field of Persuasive Design, which is concerned with the ways in which computers and related devices can alter user

behaviour through psychological processes. B. J. Fogg (2002), the founder of the discipline, defines persuasion as *an attempt to change attitudes or behaviours or both*. The ubiquity of computing devices makes computer-based persuasion a crucial topic of study for research on digital society. In the present paper, it is argued that the perspective of Persuasive Design can be fruitfully applied to the study of online collaborative projects.

Persuading Collaboration

Collaborative production sites are defined by the fact that the bulk of content is provided by users themselves in collaboration with other users. The role of site developers is therefore to create a platform that allows this creation to take place, as well as the communication and coordination that is involved in collaboration. This task clearly involves persuasive design, as the site design must encourage users to take part and to remain active. Indeed, the persuasive content of such sites may tend to be many times more complex than other examples of persuasive design, as they involve a significantly more complex array of actions including coordination with other users.

Methodology

This study applies a persuasive lens to a quantitative analysis of participation in online collaboration projects. The quantitative analysis is based on complete user histories downloaded from two such projects; Open Street Map (OSM) and The Pirate Bay (TPB). Open Street Map is a collaboratively produced map of the world. Participants contribute by adding points to the map which they may have derived from exploring an area with a GPS transmitter or simply from local knowledge. The Pirate Bay is a site which indexes torrent files which are used to download files collaboratively, from multiple computers at a time. Participants contribute by uploading torrent files and allowing other users to download files from their computer.

Data retrieval

The data for this study was retrieved by downloading histories of user activities stored publicly on the websites in question. URLs for user profiles were obtained by entering the unique subdirectories for user profiles into Yahoo! SiteExplorer (available at `http://siteexplorer.search.yahoo.com/`) and downloading the first 1,000 results, the maximum allowed by SiteExplorer. Duplicates were removed and a script was used to download the full histories associated with each user, converting pages from a html format into a tabbed text file.

Analysing persuasion

In order to analyse persuasion in our cases we need to specify some persuasive goals for such sites. For this study we have specified two goals: (1) encouraging users to participate multiple times and (2) encouraging users to remain active over time.

In order to analyse (1) we constructed frequency distributions in which users were sorted according to the number of times they had participated in; their respective project. A hierarchy was created showing the proportion of users from the sample who had contributed once, twice, three times etc. This hierarchy thus shows the proportion of users who only contribute at these small scales.

In order to analyse (2) we constructed frequency distributions based on total user lifetime, i.e. the number of days between their first and last participation event. These hierarchies thus show the projects' success at retaining users for longer periods of time.

It must be stressed that in comparing participation patterns between systems we are not necessarily comparing like with like; creating a torrent file may involve considerably more work than adding a point to a map although if data is gathered through GPS tracing, this may also involve a considerable amount of effort. For this reason it is important to use a variety of different measures in order to analyse persuasive success or failure.

Analysis and Discussion

The TPB dataset consisted of 268,141 torrents produced by 1,495 users (TPB store usernames at two different locations, which made it possible to download 2,000 urls, of which 1,495 were unique). The set had an average contribution of 179.36 torrents per user with a median of 10. The OSM dataset consisted of 1,884,104 edits contributed by 762 users. This gives an average of 2472.58 edits per user, with a median of 299.

Table 1 compares the proportion of users from each sample contributing at different scales. What is clear from this is the large difference in participation patterns between OSM users and TPB users. An extremely large proportion of TPB users only ever contribute one torrent to the project, while only a small proportion of OSM users do the same. This indicates a persuasive failure on the behalf of the Pirate Bay when it comes to encouraging repeat contributions. Of course, we must remember that contributing a torrent will frequently involve more work than adding a point to a map. For this reason it is worth looking at lifespans of users as another measure of persuasive success.

Table 1: Proportion of users contributing between 1 and 5 times

Number of contributions	OpenStreetMap	The Pirate Bay
1	1.31% (10)	17.24% (258)
2	1.31% (10)	8.35% (125)
3	0.13% (1)	6.41% (96)
4	0.52% (4)	5.08% (76)
5	0.26% (2)	3.00% (45)
≤5	3.54% (27)	40.10% (600)

The average lifetime of TPB users is 308.35 days and the median is 169 days compared to 514.88 days and 516 days for OSM users.

Table 2 shows the proportion of users from each project whose lifetimes last 1–5

Table 2: Proportion of users with lifespan of 1–5 days

Lifetime (days)	OpenStreetMap	The Pirate Bay
1	9.05% (68)	21.67% (324)
2	1.86% (14)	2.47% (37)
3	0.26% (2)	0.86% (13)
4	0.26% (2)	0.66% (10)
5	0.26% (2)	0.93% (14)
≤5	11.71%	26.62% (398)

days. As is apparent, OSM editors tend to remain involved with the project longer than TPB users. This indicates that the OSM project is better at persuading users to remain active than TPB is.

Conclusions and future work

This paper examines some ways in which quantitative data can be tied to a persuasive analysis of collaborative projects. It suggested two measures of persuasive success, user contributions and user lifetime. Many other analyses are possible and ideally these should be tied to a heuristic analysis of site features.

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Call for Papers

Papers to be included in the next issue should be preferably focused on topics related to social-networks in one or more of the following subjects (the list is indicative rather than exhaustive):

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Submitted papers should not have been previously published nor be currently under consideration for publication elsewhere. Each of the submitted research papers should not exceed 26 pages. All papers are refereed through a peer review process.

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