The Value of the Unpopular:

Counteracting the Popularity Echo-Chamber on the Web

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***Abstract*— Theoretical proofs and empirical evidence show that diverse perspectives benefit groups, society and individuals. However, current Web applications, by artificially emphasizing popularity, discourage this diversity. This paper describes a project, "unpopular.ca", that examines the effect of the popularity echo-chamber on diversity, minority views and innovation. Applications and practices to counter this cascading trend and promote divergent thinking and minority perspectives are proposed.**

Keywords- Web 2.0; values; diversity; popularity; minority views; social networking

I. INTRODUCTION

While Web 2.0 applications have enabled bidirectional communication, the invitation to rank, rate, review and vote, as well as our unintentional participation in a ballot for the most hits, artificially promotes the value of popularity and currency. Topics with the most hits grow larger in Tag Clouds while less popular topics disappear. Social networking applications direct us to choices made by people that are like us, topics that people like us are interested in and social opportunities with people like us. Polls present a reductionist view of issues and demand a binary, polarized response. It can be argued that these applications perpetuate majority views, solidify prejudices or biases, and promote a dominant classification system. By promoting the most popular, the popularity is enhanced, which in turn amplifies the attraction of the most popular further.

The current configuration of many of these applications is not hospitable to minority views, divergent thinking, marginal needs or little known topics. Consequently they do not encourage us to stretch or challenge our views, tastes or notions. They are not supportive of diversity or individuals with minority needs or interests.

This paper will describe an initiative that explores alternative social networking applications, components and practices that: promote alternative views and novel topics, support classification or tagging that tolerates ambiguity or randomness, enable discourse on unpopular or less popular topics, invite more nuanced exploration of issues than polls and encourage interaction with people unlike us.

II. BENEFITS OF DIVERSITY

Why is diversity a quality to be preserved and promoted and what damage do we do by suppressing or discouraging diversity? The benefit of diversity in economics and markets is well documented, largely as a hedge against risks. The benefit of diversity to the ecosystem and to evolutionary progress is also broadly understood. However when discussing the Web we are talking about social networks, communication, information sources and decision making tools. Of greater relevance is an analysis of the benefit of diversity to groups, communities and individuals: both individuals who can be said to belong or prescribe to the popular or norm and those who do not.

A. Diversity and Groups, Communities or Societies

Recent work by researchers such as Scott Page shows that "diversity trumps ability" in problem solving, decision-making and prediction [1]. Including diverse perspectives is generally more important than choosing the best and the brightest when it comes to problem solving and prediction. Page provides proofs through computational experiments as well as formal theorems that the power of diversity creates better groups, firms, schools and societies. He backs up these logical theories with empirical evidence. His conclusions include that cognitive and cultural diversity result in faster growing and more productive cities and countries.

In his book Infotopia, Cass Sunstein sees the major advantage and the challenge of the Web to be the aggregation of information in order to take advantage of the widely dispersed knowledge that individuals have [2]. Like Page, he points out the benefits of diverse perspectives for decision-making, problem solving and prediction. Good decisions, predictions and creative problem solving are harmed by propagation of errors, unexpressed knowledge, opinion cascades and group polarization, all of which are also antithetical to diversity. For communities, social systems, teams or organizations, diversity leads to better decisions, more effective problem solving, greater creativity and innovation, better prediction, and in the long term resilience to external challenges and increased viability.

Wilkinson and Pickett show that the effects on society are even more dramatic [3]. They have aggregated an impressive body of evidence to show that inequality and intolerance of

diversity actually makes us ill, depressed and violent. Societies with greater inequality and marginalization or suppression of diverse groups are less healthy physically and mentally.

B. Diversity and Individuals Within the "Norm"

What are the benefits of diversity for the individual? Let's first consider the individual that would feel at home and identify with the norm or the dominant, popular view. Exposure to diverse views, thinking out of the box, thinking differently, stretching our mind are all popularly seen as things to aspire to in a progressive, democratic society. This exposure to and engagement in diversity is seen to lead to greater mental agility and greater tolerance. This, in turn, leads to individuals who are more secure, less fearful and better able to deal with the unexpected. Foundational developmental psychology and educational theory points to the advantages and critical role exposure to diversity plays in our cognitive development. This exposure to diversity is most critical for individuals in the age demographic that predominates social networks. Cognitive development in the late teens, through college or university is optimized by extreme diversity or what various theorists refer to as disequilibrium, dissonance, incongruity or periods of crisis [4,5,6,7,8,9,10]. Exposure to diverse people, novel ideas, unfamiliar perspectives and unimagined experiences facilitate the development of an authentic self. Without this exposure to diversity, development of the self defaults to an automatic adoption of the perspectives, values and social roles from which the individual came.

C. Diversity and Individuals Outside the "Norm"

Of course the positive impact of a diversity-supportive environment is even more profound for individuals who for whatever reason do not feel at home or identify with the norm or the popular. Social justice research and literature abounds with arguments for diversity-tolerant societies [11, 12]. The economic, social, psychological and health impact of social exclusion are staggering for the excluded individual and ultimately for society. Even subtle discrimination can have lasting negative effects. All participants of a community wish to see their views respected, to have a voice, to avoid feeling strange, excluded or "invisible". The freedom to be different or the lack of pressure to conform has benefits for the individual and the group.

D. The Value of Popularity

There is not room in this paper to analyze the attraction of popularity. Fame, fortune and happiness are archetypal choices embedded in fairy tales and children's games. The economic value of the popularity of commodities is well argued. There is evidence to show that the popularity of people (even when not pseudo-commodities) has economic purchase [13]. The association with belonging, acceptance and "safety in numbers" make the quality even more compelling. It is not clear however that the promotion of popularity on the Web is wholly intentional and not, at least in part, a by-product of technical convenience or a consequence of mechanisms of commerce or economic reward employed on the Web, most notably by search engines.

III. TECHNOLOGIES THAT EMPHASIZE POPULARITY

The following is an incomplete and quickly outdated review of some of the popular user interfaces, applications, tools and widgets that emphasize popularity and contribute to the popularity echo-chamber. New examples appear almost weekly and new ways of combining these technologies multiply their effect.

A. Tag Clouds

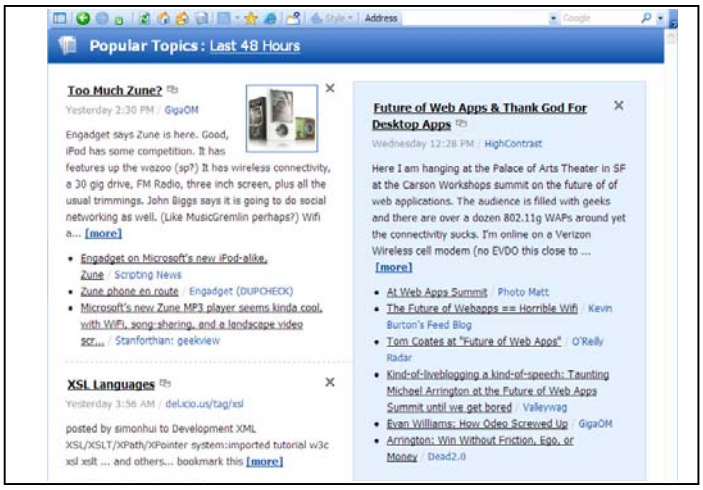
One of the most blatant or obvious reflectors and amplifiers of popularity is the Tag Cloud. The topics with the most hits or occurrences grow larger and persist while the topics with the least hits or occurrences grow smaller and disappear. As a quick visual guide to a static document or set of documents there is no damage done. As a reference for an evolving multi-party discussion it can act as an echo-chamber of dominant ideas.

Figure 1. An example of a Tag Cloud

B. Discussion Forums

Many discussion forums similarly highlight or give weight to the most popular topics or individuals, boosting this popularity with visual prominence and consequently also privileging the topic with easier access for subsequent interaction. From a usability heuristics perspective it can be argued that this makes participation by the average user in the forum more usable and convenient. Most users are more likely to want to talk about the most popular topic and providing easier access to these topics, both for consumption and further production, supplies greater ease of use for the majority. However if you are a participant that is seeking input or wishes to express ideas about a less popular topic or idea, the technical design artificially intensifies the social inertia or social momentum in alternative directions that any novel or less popular idea would need to overcome.

Figure 2. Example of promotion of popular topics in a forum



C. *Recommendation Systems*

Recommendation systems built into everything from Amazon, iTunes Genius, YouTube, as well as movie, hotel, travel or shopping guides, cater to our comfort zone with regards to tastes and preferences. This results in what Sunstein [2] and others have referred to as the "cocooning effect." The inherent assumption is that we want to view movies that others like us view, travel to places others like us travel to, read books that others like us read, etc. We are harnessing social networks to do the hard work of checking out the often vast range of choices for us. By extrapolating our tastes and preferences from choices we have made previously and recruiting the effort of people who make similar choices (and it is assumed will therefore act as fit proxies in reviewing and rendering an opinion on a plethora of choices) we reduce the number of "bad eggs" we will need to review or experience in our search for the "good eggs" or suitable eggs. However a side effect of this convenient function is that we do not explore new ground, that our opinions and tastes become more solidified. We are shielded from serendipitous new experiences or random discoveries. The recommendation function also appears to rest on the assumption that our tastes are a personal characteristic, like the shape of our nose. Bourdieu [15] argues that good taste is not an inherent quality that we carry with us from the womb or that is crystallized at a particular age. It is largely a social construct that is open to influence and expansion [14]. Recommendation systems may expose us to minor nudges away from our familiar territory but they do not provide the opportunity for creative leaps or even moderate adjustments.

D. *Polls*

Polls have become another familiar widget in many Web applications. Their use ranges from a means of entertainment to serious survey tools to support decision-making. Standard surveys and questionnaires are frequently accused of oversimplifying issues and inadvertently influencing responses [15]. Internet polls tend to take this simplification to an extreme. Most Web polls pose either binary questions (yes/no/maybe) or small lists (which do you like best?). One of the reasons for the simplification is that they are intended for fast casual response, without technical instruction, requiring an obvious user interface. This is not harmful when determining whether chocolate, vanilla or strawberry ice cream is the most popular flavour but polls are also used to probe opinions on far less trivial topics such as choices for the next supreme court judge, opinions of Iran, and whether more defense spending is needed (admittedly even the first example is not trivial for strawberry growers). Even if we ignore the sampling problems and the inability to extrapolate any information about a population, polls also, by their technical design, encourage a reductionist representation of often nuanced and complex problems. Even if the interpretation of the results takes into account the considerable constraints on their validity or significance [16], the process of engaging the public in oversimplified discourse and displaying the consequently oversimplified results as feedback can theoretically unduly polarize a debate. It does not encourage the more nuanced and multifaceted discussion that many topics on the internet deserve. Diversity has more than two sides.

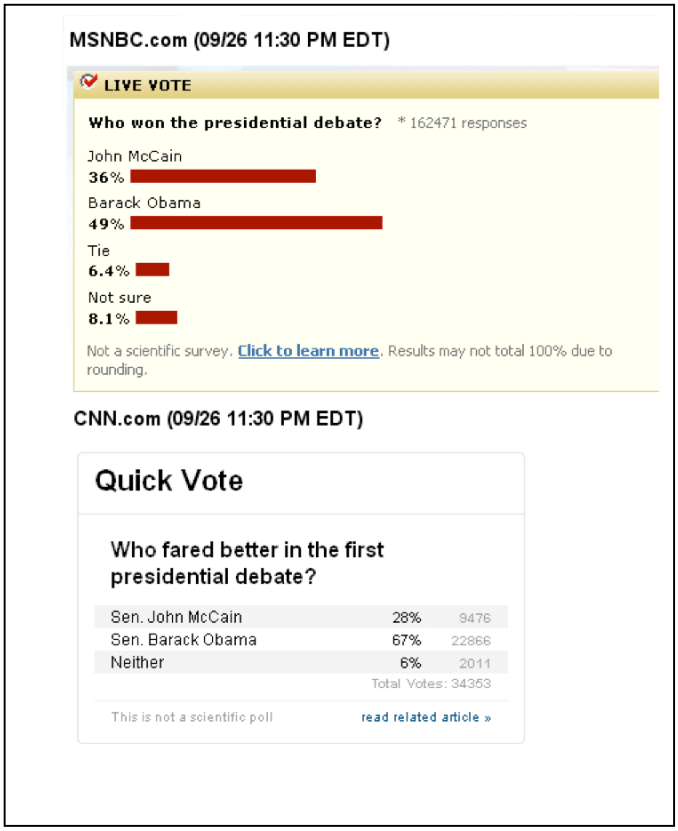


Figure 3. Example of a typical online Poll

E. *Keywords and Metadata*

It would appear from promotional email spam promising to "boost your hits by 400%" and Web production firm advertising that the universal goal of public sites on the Web is to gain attention. One of the primary strategies to achieve this attention is to include keywords that are most commonly entered into search engines [17]. This leads to a winnowing down of categorical descriptors in favour of the most popular. In the race for attention the categories become fewer and the content thus categorized greater. It can be argued that this has an effect counter to the intent of metadata which is to

accurately describe resources and distinguish resources one from the other.

F. Folksonomies and Social Bookmarking

In aid of sorting through the plethora of information of indeterminate quality and relevance we have also extended the formal labeling, achieved by metadata, with informal tagging through mechanisms such as social bookmarking and folksonomies. Given the less formal structure and the diversity of people tagging the resources, one would imagine that there would be an ever-growing variety of descriptive terms used. However even this populist practice has been effected by the pressure toward the norm. Applications such as Delicious (http://delicious.com) highlight and encourage the use of the most popular tags. Declaring that the "best bookmarks bubble up, see the most popular bookmarks for any tag" and then also listing the most popular tags in rank order unequivocally equates popular with good. Tonkin and Guy see the winnowing of terms as a positive trend and an indicator of the utility of the tags [18]. In fact folksonomies are criticized for their lack of precision or vagueness. This criticism does not acknowledge that what is tagged may be imprecise, random or vague.

G. Authority Ranking

Even our attempts to address the problem of judging authority, quality and trustworthiness promote the value of popularity. Applications such as twitority (http://twitority.com) and slash dot karma (http://slashdot.org/faq/com-mod.shtml) rank the authority of authors based on their popularity, thereby concatenating the value of popularity with other desirable values such as trustworthiness and authority [19]. Thus the most popular authors are also deemed the authors with the most authority thereby amplifying their popularity and further fueling the cascade away from diversity.

H. Search Engines

The most powerful players in this popularity echo-chamber and information cocoon are search engines. Using ever more powerful profiling tools, search engines attempt to get us to where we wish to go and find us what we wish to find as efficiently as possible. Because these profiling tools extrapolate based on where we have been before, where people who make similar choices have been before and the probability of making particular choices based on the popular choices made, the most popular becomes more popular and the range of choices we explore becomes more constricted [20].

I. New and Interacting Tools

The number of convenient tools that amplify this effect continues to increase. A new tool supported by most browsers is a drop down menu that predicts the terms you may wish to type based on previous entries. Thereby suggesting not just popular results but also popular search terms.

If the amplification of popularity in single tools is not enough, with the linking and embedding of one tool within another, the tsunami not only crosses the application boundary, it is multiplied with each linked tool. Thus, what is popular in twitter finds its way and is multiplied in Facebook and vice versa.

J. Artificial versus Natural Phenomenon

One could ask: is the phenomenon of promoting popularity on the Web not just a reflection of what would happen in any democratic forum? Is the emphasis placed on popularity not simply a naturally occurring phenomenon that reflects the nature of society and not this particular environment or system? In fact the move to the participatory Web has corrected the imbalance between consumption and production of information [21]. No longer is publishing, broadcasting and information distribution only the domain of a few. The Web makes broadcasting accessible to the populace and undeniably has led to a proliferation of perspectives. It is only natural that this explosion of information must evolve some form of organization, prioritization, filtering, review and ranking. Could it be, however, that the technical simplicity of counting hits or frequency of occurrence, the use of this count in economic rewards (e.g., Google Ads), the easy availability of popularity metrics for mashups of new applications has meant that popularity has been artificially over-applied? It would appear that these tools and technologies have amplified a naturally occurring phenomenon.

Sunstein argues that there are occasions when the popularity cascade is desirable, namely when it is going in the right direction (e.g., toward democracy) [2]. I would argue that even in these situations the amplification of popularity, and the unavoidable antagonism toward diversity, typically results in an extreme pendular swing in one direction that will inevitably prompt an equally extreme reaction. Diversity allows a more nuanced, less crude response that will ultimately lead to a more moderate and consequently more stable outcome.

IV. UNPOPULAR.CA

The project unpopular.ca is beginning to explore means of supporting diversity on the Web. The project team is designing experimental applications and interface components to promote a variety of views and novel topics, support classification or tagging that tolerates ambiguity or randomness, enable discourse on unpopular or less popular topics, invite more nuanced exploration of issues than polls and encourage interaction with people "unlike us". The challenge is that: while popularity is supported by simple metrics, diversity cannot be engineered, and it is hard to socially or technically construct creativity. However, it should be possible to skew the pendulum so the swing becomes less extreme, inject disruptive notions, promote serendipity and invite novel thinking without "smelling" too contrived.

Early designs include:

- A "serendipity" button or "feeling adventurous?" link to be embedded in recommendation systems. This would be linked to novel products or experiences. The user could indicate restricted areas or the "degree of courage",
- A "want a different opinion?" link in forums with algorithms to find alternative views or invitations to

provide different perspectives from people the most "unlike" the user,

- A customizable Tag Cloud that uses criteria other than frequency of occurrence to determine the size and positioning of topics,
- In place of polls, an applet that states the two opposing views and asks "what is wrong with both these statements" in and attempt to decrease the polarization,
- In place of "the most popular" listings, provide "the most innovative" listings based in part on algorithms that identify unique pairings of words.

The project has also explored techniques to skew popularity weightings in favour of desired topics or search across forums and applications to find where a topic is popular in an attempt to address the dilemma of attempting to voice and receive input on minority topics.

These designs are in early stages of development and, if successful, will only partially address the centrifugal force of popularity-based applications. In addition to applets and Web components the project will also attempt to use social networking tools themselves by raising the challenge in the most popular forums to engage online communities in reflecting on ways to address the skewed dominance of popularity.

V. Conclusion

Diversity promotes innovation and creativity and results in better problem solving. Mathematical modeling shows that this phenomenon is partly due to the increased coverage of possible options that a diversity of perspectives and therefore diversity of paths enables [1]. The unprecedented amplification of popularity on the present Web means that we wear deep ruts into the creative terrain, ruts that become harder and harder to escape. Like cow paths, we perpetually follow in the footsteps of others, leaving much of the intellectual landscape unexplored. It is widely agreed that diverse thinking, an open mind, novel concepts and exposure to variety is good for a thinking being, yet popular applications aid and abet us in creating a protective cocoon [2]. An inclusive community is safer, more stable and healthier [3], however, in many online networks individuals or groups who are marginalized are pushed further from the focal centre by the popularity echo-chamber. Unpopular.ca hopes to invite discourse on and address these apparent contradictions.

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