

## MANAGEMENT AND GOVERNANCE OF ONLINE COMMUNITIES

### B. HUBERMAN AND P.A. DAVID

#### *SEMINAR AND EXPERT WORKSHOP – 26 & 27 MAY 2010*

For the launch of a new cycle of seminars, the Chair was pleased to invite Bernardo Huberman, Director of the Social Computing Lab at Hewlett-Packard Laboratories and Consulting Professor in the Department of Applied Physics at Stanford University. The Chair took the opportunity to have, Pr. Huberman presenting his work on management and governance of on line communities, during a seminar May 26th and participating to an expert workshop on May 27<sup>th</sup>. In both events, the debates were animated by questions raised and developed by Paul A. David, Titular Professor of the Innovation and Regulation Chair, Professor of Economics (Emeritus), Stanford University & Senior Fellow, Stanford Institute for Economic Policy Research.

#### **Management and governance of social networks and digital communities, by Pr Huberman.**

In his introduction to the seminar, PJ Benghozi, who is in charge of the Innovation and Regulation Chair for the Ecole Polytechnique - first highlighted the conceptual shift, in the literature, from online communities to social networks and social media. He noted, then, that online communities provide a fractal view of society since they support social relations very similar to the one existings in the wider world. As a consequence, it can be very useful to treat them as experimental platforms (this will be the case for the research project on regulation of information exchanges and performance of collective innovation sponsored by the Chair) or as a tool to anticipate social practices and habits and to forecast and predict real-world outcomes. For both reasons, online communities raise specific questions from the perspective of governance in terms of the institutional framework, rules and incentives as well as in terms of the governance that is required for the communities to function effectively.

B. Huberman introduced his presentation by underlining some impressive data on Facebook which was created only five years ago: more than 400 million active users, 130 friends in average per user and 500 billion minutes spent every month overall. Even though it has not been around quite as long, data from Twitter provide the same impressive figures : 105 779 710 registered users, 300 000 users per day, 180 million unique visitors to the site, 55 million tweets per day.

These huge and swift developments exemplify the importance of attention economics (cf. Lanham, Franck, Klamer and van Dalen, Golhaber, Falkinger in particular). Yet, the huge flow of information and contacts face the scarcity of attention. From economic point of view, attention is a scarce, and thus valuable, resource. A reason is that almost everything else except attention can be manufactured as a commodity. As Kevin Kelly said: whenever attention flows, issues can surface ...and money will follow.

The research program of B. Huberman first aims to develop the measurement of attention, then to analyse its structure. Social attention is measured by the intensity of signals related to a particular idea, theory, product, research program, movie, book... Yet, how do competitive ideas, issues, sites, brands, attract attention? What is the role that novelty and popularity play in eliciting attention? How do we maximize value by dealing attention... Huberman illustrated that people may sacrifice money in exchange for attention of others with the outcome of an insightful experiment that he performed with colleagues where he observed the choices his experimental subjects made in lottery games in which they participated for the experiment.

In their research and successive papers Huberman and various co-authors have achieved important milestones.

Firstly, it is important to distinguish between information poor environments (cf. the useless role of stop signs in the desert) and rich environments (cf. the “million dollar homepage” which was created by selling each pixel for 1\$ resulting in an incomprehensible page overall).

Secondly, it is fruitful to analyse the information flows inside large social networks. B. Huberman gave the example of a study of 15 million recommendations from Amazon.com: it provides contrasting models of social relations and prescriptions. Medical books and Japanese graphic novel (manga) support very different structure of online communities.

One major finding of Huberman’s research is that the allocation of attention among items is universal and described by a lognormal distribution: the same structure can be found in every social network or UGC site. The distribution of Digg numbers of 29684 stories among 1 million users of [digg.com](http://digg.com) provides a very demonstrative case of this lognormal distribution.

Another important finding regards the temporal dimension of attention. We share with others what captures our attention; and when it fades, we search for novel experiences. Huberman argues that novelty decays in predictable ways: attention half-life is almost 69 minutes in the case of Digg, for example.

These findings can help to build simple models based on the rates at which information is created, diffused or consulted. For instance, one can predict the popularity of online content given the lognormal distribution of attention and the rate at which people access content. Huberman illustrates this with an analysis of Twitter chats.

The study of 10 million videos submitted by 0,5 million users to YouTube contributes to the analysis of the supply side of information and content providers. In particular, productivity exhibits strong positive dependence on attention. The structure of YouTube demonstrates that producers compare themselves to others when having low productivity... and don’t compare with others when they have achieved a certain threshold of activity.

Results also establish that the persistence of content production increases quality attributed to the content but not the likelihood of success. On the contrary, content that receives an extreme amount of attention does typically not stem from persistent producers. That is, we observe a “winner –takes-all” scenario.

In summary, Huberman argues that governance in networks is about something determined by the public's agenda. Yet, in society there are many agendas in social network competing for the attention of the network.

He claimed, then, that in an information rich environment, attention – the scarce and valuable resource- is allocated to a few issues in a predictable fashion. Most issues get some attention, but few get it all, and even then their prominence is likely soon to fade. Those few are the ones that will rise to the top, demanding a new, revised agenda.

More information and papers are available at : <http://www.hpl.hp.com/research/scl>

## Discussion

In the discussion period following this lecture Paul David raised several important issues that were provoked by Pr. Huberman's general subject and some particular points in the exposition.

David questioned whether the focusing of popular attention on topics that Pr. Huberman's research had shown to command at best very short-lived salience (e.g., the 69 minute "half-life" of top news items on the website DIGG.com) really had the power to shape more persisting public agendas affecting legislative and administrative policy-making. An alternative view, David suggested, was that pre-existing and enduring interest groups and political actors with their own agendas, might opportunistically seek to connect the latter to, and thereby leverage transient popular attention to serve their own purposes. Consequently, far from having the "democratizing" effect upon public policy processes that Pr. Huberman envisaged, the transfer of day-to-day "agenda-setting" from the traditional media to the self-referential mechanisms of the Web, actually might be enhancing the power of essentially *demagogic* political tactics.

A second theme, on which Paul David elaborated in a brief commentary following the general question-period devoted expressly to Pr. Huberman's lecture, concerned the implications of the difference between computer-mediated "trading networks" or dedicated, special-purpose "exchange networks", and actual "communities" whose members communicate "on line." Unlike narrowly purposed exchange networks, "communities" possess developed structures of governance based upon social as well as technical mechanisms. The complementary components of the latter structures, when properly designed, could enhance the discretionary intelligence and moderate of the dynamic interactions among their constituent entities of the socio-technical system that the underlying communication networks supporting. But for the system to function in a self-sustaining way, due attention must be paid to "proper design" of those governance mechanisms.

Digital technologies and the architecture of the Internet have greatly expanded possibilities of readily affording "connections" for message generation and transmission between "machines", and among peoples via machines, but the Web and its connected sub-networks do not automatically create functional human-machine organizations that have the properties of "communities." The latter require some minimal degree of mutual recognition of a common interest, and so give rise to reflexive identification of individual actors with the group, which in turn encourages sufficient

compliance with norms and mechanisms of social control to stabilize interactions among the ensemble of individuals – keeping them within functional bounds.

Modern society's augmented facilities for achieving technical connectivity, David observed, have tended to outrun its capabilities for creating networked *communities*, in the particular sense of the term that he had indicated. This was the case in good part because established governance procedures and regulatory structures historically have tended to be specified with reference to particular, widely-deployed technical means of communication, rather to achieving and maintaining some minimum standards to assure continuity of the socio-technical systems that come into existence on the network. Rapid technological innovation, however, by creating novel and more effective means of connectivity, thus can have surprising disruptive effects (whether intended or not ) by permitting the formation of incompletely regulated new systems of "networked exchange"; or by fragmenting previously integrated communities within which functional interactions were sustainable. This might be seen as part of the process of "creative destruction" that Joseph Schumpeter viewed an inherent feature of the growth dynamics of capitalist economies driven by innovations, but the question David posed was whether the risks of serious "destruction" really are a necessary price that must be paid, and whether societies in the 21<sup>st</sup> century can afford to pay for sustained technological and organizational creativity.

David's remarks concluded by pointing to several different manifestation of the problematic tendency for the modern pursuit of "hyper-connectivity" to outrun the creation of "networked communities." One among these, which warranted notice for the emblematic nature of the underlying processes that could be seen to be at work more generally, was the seemingly inexplicable "free-fall" of stock prices that occurred on May 6<sup>th</sup>. The significance of that episode, according to David, lay in its having been the resultant of the recent proliferation of asymmetrically regulated electronic stock exchanges in the U.S., which had "fragmented" and so undermined the formerly integrated operations of the country's national stock market.

### Expert workshop – 27 May

The seminar of B. Huberman was followed by an academic expert workshop devoted to models of organisation, operation and regulation of communities. A limited number of participants from various academic fields and perspectives were invited to attend the workshop and present papers based upon their research for collective discussion in the presence of Profs. David and Huberman.

#### ***The Four Attention Economies***

**Kevin Mellet (Sense - Orange Labs)**

It is possible to identify four alternative models of production, allocation and regulation of attention, each forming what we could call "a pure attention economy": the amplifier, the filter, reciprocity and style. We present these models and the way they are equipped on the web (by focusing on measurement instruments). Then, we show tensions and possible compromises at the border of these worlds.

***Cognitive science informing the design of attention aware social systems***

**Thierry Nabeth (Insead) and Claudia Roda (American University Paris)**

In the future people in this *new new Web* (i.e. the blended online / offline social world) will be constantly (or potentially) engaged in social interaction, monitoring or emitting social signals (e.g. activity streams), communicating and/or cooperating with others (e.g. work, family, play, learn, shop). This new state of things raises issues related to the ability of people to deal with the explosion of connectivity, and to the sustainability of this situation. The overall objective of this presentation is to provide some answers to these questions by analysing how to design social systems for the *new new Web* that are more social attention effective, and therefore support users in allocating their cognitive resources in this online social context. The concept of *attention* indeed appears to represent a conceptual instrument capable of covering the different elements at the root of the problematic of the *new new Web* and cognitive science can help in informing the design of such systems.

***Quartier Numérique (Digital Neighborhood) – A living lab experiment in Paris***

**Meryem Marzouki (Université Jussieu - Lip6)**

The presentation will report the result of a study on the project "Quartier Numérique" (Digital Neighborhood, [www.quartiernumerique.org](http://www.quartiernumerique.org)). The project's objective was to provide the neighborhood with on the one hand free wireless communication means and on the other hand innovative mobile services accessible through the Internet or mobile phone. Our main research questions were to understand under which conditions and to which extent the availability of innovative infrastructure, products and services could allow to reinforce or create new forms of social relationships in the local urban context, as expected by the project partners and sponsors (local authorities).

***The Spatial and Structural Development of FidoNet: a Proto-Internet Community***

**Griffith Rees (Research Student – Oxford Internet Institute)**

FidoNet was a network of Bulletin Board Systems--modem-based message boards--that grew rapidly in the mid 1980s and 1990s in parallel to USENET. This presentation will include initial descriptive results on FidoNet's development and two novel methodological approaches to modelling its growth.

***Management through annotation in Wikipedia***

**Matthijs den Besten (Ecole polytechnique – Innovation & Regulation Chair)**

Wikipedia is a free online encyclopedia that everyone can edit. Over time several mechanisms have been introduced in order to facilitate coordination among the volunteer editors who contribute to this vast collection of articles. In this presentation on the role and effectiveness of annotation in Wikipedia as a method to attract efforts to address defaults in articles.

***Projects management in the Wikipedia Community***

**Hang Ung (Research Student - Ecole polytechnique ; HP Labs)**

A feature of online communities and notably Wikipedia is the increasing use of managerial techniques to coordinate the efforts of volunteers. We will present our recent work on exploring the influence of the organization of Wikipedia in so-called projects. We examine the project-based coordination activity and find bursts of activity, which appear to be related to individual leadership. Using time series, we show that coordination activity is positively correlated with contributions on articles. Finally, we bring evidence that this positive correlation is relying on two types of coordination: group coordination, with project leadership and articles editors strongly coinciding, and directed coordination, with differentiated online roles.

***Distribution of property rights and governance in F/OSS***

**Inna Lyubareva (Université Nanterre, Ecole polytechnique, Innovation & Regulation Chair)**

To create collectively a product goes far beyond the sharing of distinct ideas, but necessitates complex processes of individual and collective learning to ensure the compatibility of emergent rules, norms and routines. Development and expansion of the Commons-based peer production in different spheres is of special attention for economists. One of the central questions which occupy researchers is how individuals dispersed across space, time, and organizational boundaries co-ordinate their efforts to achieve coherent and synergic innovation processes? Using the example of Free and Open Source development, this paper substantiates a link between the emergent characteristics and formal institutional arrangements in the projects. It demonstrates that institutions matter in setting some ex ante limits to the varieties of emergent relational structures and patterns of governance.