ON-LINE DISCUSSION AND PUBLIC DELIBERATION

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Abstract: This paper surveys how the principles of the development of collective intelligence in on-line discussion and the consequences of the open source movement can influence the shape and recommended format of public deliberation processes. It raises the question of the conditions and factors which explain the difference in the quality of discussion results when technological issues are discussed and when values are discussed. It also raises the question of the importance of formats and types of facilitation which allow for deliberation to be structured towards achieving better productivity and the more effective participation of discussion participants.

Keywords: collective intelligence; deliberation; public discourses.

In this paper we explore the way in which the principles for developing collective intelligence in on-line discussions and the consequences of the open source movement may be reflected in the structure and recommended formats of public deliberation processes.

New technological developments in the field of electronic media have produced a different level in the quality of social networking, which has brought significant changes to our traditional understanding of public communication, deliberation and public decision-making. The mass scope of global networking does not only allow for the accelerated transmission of information, the opportunity for the public to participate more but also for the simplification of communication. It also enables a different, and perhaps slightly unexpected, modification of the forms and quality of public discourse.

Conditions for the Effective Functioning of Large Groups

Collective intelligence[1] is understood to be a phenomenon where large groups of heterogeneous individuals, independent of each other and acting in coordination and openness, collectively reach better decisions than individuals would. A larger number of participants in a discussion does not, however, guarantee the better quality of the product, and, vice versa, a more significant educational impact of a public discussion is not necessarily the result of higher levels of participation.

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[1] Other terms used along with the term "collective intelligence" include mass intelligence, collaborative intelligence, symbiotic intelligence, crowdsourcing, swarm intelligence, co-intelligence, smart mobs, noosphere, wisdom of crowds, global brain, wikinomics... and others.

A number of authors (such as Surowiecki 2005; Olson 1965; Axelrod 1984; Barret 2008; Fisher 2008) have set out several important conditions that ensure that the results of group discussions are of better quality than those reached by the participants individually. The conditions listed most frequently in the authors' research regarding the effectiveness of group discussions include the following:

- *Diversity of opinion (non-homogeneity).* Each individual should take viewpoints based on his/her own information. If all their opinions stem from the same limited or filtered sources of information, the likelihood of them reaching better conclusions is minimised.
- *Independence.* People's opinions are not determined by the opinions of those around them. Imitation and information cascades do not provide answers. New solutions can only be found where there is freedom of expression of any opinion. Good solutions will never be created in an atmosphere of censorship or self-censorship.
- *Decentralization.* People are able to draw on their local and specific knowledge. Discussion projects which are not centrally planned and controlled are not likely to develop along predictable lines, but it is exactly the digression from a pre-planned stream of ideas that may cause unanticipated interactions with bizarre, but also very useful and creative solutions, which do not normally occur in centrally planned discussions.
- *Aggregation. Accumulation of opinions/knowledge.* New solutions are created when information can be openly shared. Where sharing is not inhibited by laws of confidentiality, where there are no physical or institutional barriers, where enormously difficult tasks are dealt with by letting each individual or group focus on one part of the problem in discussion and then by enabling them to complement and put the various findings together. A good example of this was the cooperation of laboratories all over the world in conducting virus isolation for SARS; or the campaigns which monitored and eventually set up the global vaccination schemes that resulted in the eradication of new cases of chicken pox (Barrett 2008).

Collective Intelligence Inspired by the Open Source Movement

The OPEN SOURCE movement, introduced by software fans, is a phenomenon that may in the future be considered a breakthrough of significance comparable to that of the Sputnik back in the 1960s.

Since the 1970s devotees of the open source software movement have influenced not only the way in which software development procedures are viewed, but also traditional procedures in science, education, management, media and public governance. It appears that the revolutionary change brought about by the open source movement has had dramatic consequences in intellectual property licensing litigation, in understanding public participation in decision-making, and in distributing cultural messages. It is not only concerned with just those fields where information is dealt with directly; the changes also concern social development and global relations. Below we list examples of research on the conditions under which the open source approach and the impact of peer inventors' activities may be more effective than traditional procedures and also summarize the risks involved.

In his book, *The Cathedral and the Bazaar*, Erik Raymond (1999) presents his observations on two differing approaches to creating and developing a new intellectual product. He uses the Cathedral/Bazaar metaphor: The Cathedral model is a situation in which the source code is available with each software release, but the code developed between releases is restricted to an exclusive group of software developers. In the *Bazaar* model, the code is developed over the Internet in view of the public. Raymond credits Linus Torvalds, a Finnish student who was the leader of the Linux Kernel project, as the inventor of this process. This approach is a loose continuation of the free software movement that started in the 1970s. The central thesis of Raymond's book is what he terms "Linus's law" : "*given enough eyeballs, all* bugs *are shallow*": the more widely available the source code is for public testing, scrutiny, and experimentation, the more rapidly all forms of bugs will be discovered and they will not be too serious. In contrast, Raymond claims that an inordinate amount of time and energy must be spent hunting for bugs in the Cathedral model, since the working version of the code is available only to a few developers. Raymond's metaphor reignited the debate about the effective work of large groups without clearly defined "in-group" and "out-group" limits. His examples of free software development point to principles of a much greater relevance. They apply to almost any creative activity in which more contributors may be engaged. The open source principle also has its critics.

Some authors throw doubt on the proposition that the increasing number of contributors reduces costs and saves time. They refer to *Brooks' Law* (sometimes also known as the MMM, Mythical Man-Month rule). According to its author Fred Brooks (1995), an expert in the management of systems development, adding manpower to a late software project does not speed it up nor does it increase the quality; on the contrary, it delays it further. Brooks gives reasons why he thinks that a "man month" is not a useful measure of productivity. We begin to assume that work that could be done by one programmer in ten months (that is a volume of ten man months) could be finished by ten programmers in one month. According to Brooks, this logic may be true of picking cotton, but it is certainly not true of intellectual operations where all partners must communicate, with the number of possible pairwise communications paths in a team of n people being $n\,(n-1)/2$. There are also great differences between partners. Brooks believes that particularly good programmers may outperform average ones by a ratio of between 5 and 10:1. A demanding level of coordination and the required adherence to task sequence (some actions may only be started once other tasks are finished) slows the work down. Brooks' point was that the increasing number of team members makes the cost of communication amongst the members quadruple, while total productivity only increases linearly, which is much slower.

However, practice has proved Brooks wrong. The cost of communication is not as high as anticipated by the Brooks model. Cooperating partners are effective simply because not everybody communicates with everybody else. Sometimes pairs of partners are formed, whether intentionally or not, and they provide feedback and multiply control mechanisms, but not everybody reads everything. Brooks' law was only anecdotal and not based on a verifiable model. After 25 years of undisputed existence, the law was subjected by Ira Glickstein (2000) to verification using the information and hierarchy theory and it came to light that a major factor is the duration of the project with regard to the number of team members and various forms of organisational hierarchy. Brooks' law is to some

extent valid in absolutely horizontal structures or, on the contrary, in very hierarchical multi-level types of management, but it does not apply in organizations with a smaller number of management levels which utilize the advantages of both horizontal and vertical communication. Glickstein (2000) has also shown that coordination and communication cost is highest in the initial phases of a project and that there is an optimal time-span, when the profit derived from adding manpower to a project exceeds the necessary cost of communication and coordination.

Moreover, energizing factors of open source philosophy, which must be mentioned are the hacker ethos, the positive motivation of colleagues, the enthusiasm of hundreds and thousands of people working on improvements to the final product, not because they have to, but because they serve themselves and they are proud to participate. Almost 40 years ago, in his frequently cited book *Psychology of Computer Programming* (1998) the eminent psychologist Gerald M. Weinberg characterized the spirit of software developers as being not focused on themselves. He stated that even prior to the Internet era there were communities of programmers cooperating on software development projects and sharing information within an unlimited community (he referred to this style of work as "*egoless programming*"). Weinberg noticed that those communities were able to achieve progress much faster than any other community. Independent contributors to open sources projects were highly competitive and driven to overtaking software companies and to achieving professional prestige. A survey on the motivation of participants from the open source movement (Bonaccorsi, Rossi 2002; Bonaccorsi, Rossi 2006) showed that change was usually triggered by a small initiatory group, which very quickly reached critical mass and was able, thanks to its diversity and spectrum of expertise, to outdo the elitist groups of professionals in software firms. Crossing the threshold from the initiatory group to a critical mass always occurred at the point where the expanding initiatory group had the impression that achieving the final product was feasible.

Also, according to the Boston Consulting Group 2002 survey (Wheeler, 2007) of users and contributors to the SourceForge open source application, their most frequent motivation was that participation was intellectually stimulating (44.9%), it improved their skills (41.3%) and it was functional to their work (33.8%). Users' motivation was divided into four segments: 1) believers (19%)—they do it because they believe in the final product created by their efforts, 2) fun seekers (29%)—they enjoy the intellectual stimulation and do not care about how the product is utilised, 3) skill enhancers (27%)—do it as a way of passing their free time, and finally, 4) professionals (25%), who do it for professional status and for their work needs (Wheeler 2007).

Reflection of Open Source Principles in Public Deliberation Processes

Our view of the possibilities and new areas and techniques in the use of collective intelligence in public discussions is changing significantly. In this context Don Tapscott and Anthony Williams (2008) have created the Ideagoras model. This model searches for ways of harmonizing the ingenious ancient heritage of the direct democracy of elites and the "agora" tradition of citizen debates in publicly accessible spaces with the technological and territorial limitations of discussions involving a large number of people. In the days

when there were no technological possibilities, the limiting capacity was clearly defined: the upper limit for a public discussion was the size of an amphitheatre or a stadium and the number of people who could hold discussion at the same time and be able to hear and not disturb one another. Technological progress enables on-line discussions to be held regardless of distance, allows for the democratisation of discussion, the recording and replaying of almost any communication (the only problem is organising information archiving and searches to make information easily retrievable). Language and status barriers are considerably lower. It has become much harder than in the past to determine who can participate in discussion and thanks to alternative discussion channels, ways of censoring information and direct discussion have been reduced.

The benefit of the ideagora model can be seen in its use in mass brainstorming. Some large firms (such as Dow, Boeing, P&G) as well as academic institutions found that by being open to the ideas of an unlimited community of contributors they not only acquire original and feasible solutions but also the loyalty and involvement of the users or citizens, who appreciate the opportunity to participate, express their ideas and be heard. The InnoCentive website (www.innocentive.com) received over 160,000 registrations from people offering their technological and economic solutions to the challenging problems posted by big firms on this website. Winning solutions are awarded from between $5,000 and $1,000,000 for patents and solutions which research and development departments would not be able to find so quickly and cheaply. In his 2008 presidential campaign, Barack Obama called on his supporters to create and post on Youtube clips for his pre-election campaign. Several thousands of people sent in their videos and the winning clips also helped with the campaign, perhaps even more so than the clips created by professional advertising agencies. In the first week of it being posted on Youtube, the hip-hop style clip "Yes we can" had been viewed by more than 20 million young viewers and it is possible that this clip also helped increase young voter participation in the US 2008 presidential election (Faris, Etling 2008). In their project "We are smarter than me", initiators Barry Libert and Jon Spector (2008) put together a book about the most effective marketing strategies in business explored by means of establishing a website supported additionally supported by radio broadcasts and social events. In the year-long project the authors first invited alumni of management studies from various universities, as leaders in the world of business, to sum up their most significant experience in marketing and then posted them on the project's website. From the 4,200 top articles the readers then chose the texts they considered the best and these were published in the bestseller compilation book "We are smarter than me". The project was a success and is considered to be a quality and inspirational product which did not end with the book but lives on and continues to develop on the website.

Does Structured On-Line Discussion Provide Real Deliberation?

Supporters of technological advancements of online communication are confident that expanding the possibilities for critical discussion which are enabled by technological advancements (large never-ending virtual discussions of an almost unlimited number of participants, the sharing of information though the creation, adjustment and exchange of video, film and text regardless of physical distance or state borders) will certainly

lead to higher participation of people in public life, and to an increase in their informed participation in discussions which concern us all. Thomas L. Friedman (2007) thinks the world of the 21st century is becoming flat. By "flat" he means the breaking-down of the barriers (borders, walls, closed strategic information owned exclusively by limited groups and inaccessible to others) which disconnect communication and the spread of goods and ideas. Not everybody shares Friedmann's optimism, though. Bill Gates points out that actually "only half the world is flat and it will always be so" (according to Friedmann 2007, 432). Nevertheless, the dramatic improvement in access to and the direct sharing of information is a commonly accepted fact.

It is assumed that technology-enabled open, moderated discussion of large groups will afford the opportunity for a deeper understanding of an issue subject to discussion, for real deliberation which, according to the supporters of discursive democracy, is of key significance for optimal social development (Dryzek1990; Dutwin 2003). It is also an environment in which new contradictory information is provided, which brings new perspectives to the discussion participants by stimulating deliberation and eventually leads to more competent decisions. Solutions based on a large amount of or referring to diverse information allow for a more accurate consideration of the pros and cons of each solution proposed.

Initial euphoria followed by doubt is typical of internet discussions that enable simultaneous discussion for hundreds of participants without any physical barriers or distance. On-line discussion also has a strong democratizing effect on participation in discussion, eliminating the automatic distinguishing of participants based on their visible age or status.

Several researchers have explored the question of whether the on-line environment of virtual discussions strengthens or weakens the elements of deliberation. Interesting research results have been presented by Francesca Polletta, Christopher Anderson and Pang Ching Chen (2007), and Laura W. Black (2008). In their studies they observed the discussion in the on-line forum "Listening to the City Online", in which participants discussed plans for the redevelopment of the World Trade Center site in New York. Polletta, Anderson and Chen analysed the discussion of 826 registered regular users. The participants shared ideas in 26 semi-closed online groups. The discussion participants were not selected or selectively invited to join the discussion; they had open access but could not participate in the discussion anonymously, registration was required. Group discussion was semi-closed. Discussion in one half of the groups was facilitated by a professional facilitator, the other half discussed spontaneously, without facilitation.

What the researchers focused on were links to other sources—whether they be arguments or messages in on-line discussions. They analysed messages in which the author posted a link to another source, recommended another proposition, plan, citation, or statistical data located elsewhere, called for the reader to follow the link and accept the argument stated therein, or the other way round—express doubt about or reject a viewpoint, mostly by presenting their own counter-argument and referring to some other arguments unmentioned in previous discussion. These are examples of deliberation—reasoning and considering the power of arguments, which are desired moments of critical reasoning discussion. Formally, the posting of links (i.e. potential moments for deliberation) occurred quite often. Of the

10,264 contributions 2.9% contained at least one link, and 18% of discussion participants posted at least one link. Most groups had only a few active participants posting url-links supporting their argumentation, links were much more frequent in facilitated groups than in non-facilitated ones. Of the messages containing links 41% were responded to, although only a few of the links elicited much discussion; in general, people in facilitated groups were more likely to respond to messages with links than people in non-facilitated ones (Polletta, Anderson, Chen 2007, 5-6).

The qualitative analysis of discussion and the deliberative potential of the use of the links yield more sceptical results. Most links are not intended to be argumentative, there is almost no confronting of the contradictory arguments or solutions, no competition of ideas. As many as 42% of the links were presented in a collaborative context, i.e. in order to answer a question posed by another participant, to introduce possibilities in support of what had been said. About 5% of the links had a mobilizing purpose (inviting deliberators to participate in collective supportive or critical action outside the forum, to sign an on-line petition, etc.)

Even though the deliberative potential provided by on-line discussion with its almost endless supply of accessible source information available directly on the net seems to be limitless, authors point to three assumptions which are not necessarily always met. For the new communication technologies to accelerate deliberation and democratize public discourse, it would have to be the case that: 1) discussion participants not only have access to rich information sources on the web, but they also actively seek them out and use them as an argumentative tool; 2) more informed discussion using large capacity databases does not occur at the expense of other important values such as equality or politeness; and finally, that 3) information from the Internet used as resources for argumentation is objective, not biased in any way. In practice, though, it becomes clear that none of these assumptions is particularly valid, which brings on-line discussion to the same level as vis-à-vis discussion: participants do not take full advantage of the web's information capacities for argumentation, discussion frequently includes personal attacks and derogatory remarks about fellow participants, and the content of arguments is far from being the only factor that determines the decision about a possible solution. Moreover, a large number of cited sources do not represent objective data but an interpreted or selectively distorted reality. The analyses of "Listening to the City Online" discussion forum bring Polletta, Anderson and Chen (2007) to the conclusion that on-line discussion participants use the discussion much more to diverge from alternatives for decision-making, enrich the participants' discussion horizons and emotionally engage more participants in the discussion than to evaluate the menu of possible solutions. Critical evaluation of the solutions offered, comparison and the giving of reasons for advantages and disadvantages and consideration of the quality of solutions are all very rare in on-line discussion.

Similarly, Harry Weger, Jr. and Mark Aakhus (2003) believe that even though Internet-based communication makes it easier for deliberators to join discussion, the quality of discussion in large-scale non-facilitated chat rooms with anonymous participants is low. Participants' argumentation skills appear to deteriorate in on-line discussion and their participation motives also very often seem dubious—for example in political discussion on the Internet. Research has shown that discussion in chat rooms departs from the ideal of

critical discussion as formulated in 10 pragma-dialectical rules for critical argumentation (van Eemeren, Houtlosser 2006).

Weger and Aakhus (2003) came up with three specific phenomena which pose the greatest barrier to real deliberation in on-line discussion: the lack of conversational coherence, under-developed arguments and flaming. Internet discussion in political discussion forums lacks conversational coherence (participants jump from one topic to another, it is not clear which argument is being followed up or responded to, participants freely join and leave discussions without knowing which arguments have been presented, discussion frequently just goes around the same point). Another hindering factor is the use of under-developed arguments. In written on-line discussion the participants are limited to the use of only a restricted number of characters per single speaker turn. The immediate display of messages sent in makes it easier to interrupt another arguer, which in consequence breaks the coherence of a standpoint in the discussion. If participants are forced to begin to deal with objections raised immediately after presenting a standpoint, they often lose their intended line of argument. Flaming, the practice of issuing personal attacks instead of reasoning, is also part of on-line forums because communication that is exclusively written with no visible expressions other than words is harder to read than normal face-to-face communication. Light irony, joking or metaphoric speech can be impossible to understand in writing or is interpreted as nonsense, aggressive attacks or ridicule. Such written communication tends to be perceived as carrying negative connotations and as such elicits counter-attacks as response.

Despite the rightful criticism on-line discussion on public issues does have deliberative potential. In contrast to mass media, which mostly distribute information from one point to many addressees/consumers of information, on-line discussion activates a large number of computer-literate citizens. When plasticity of participation in on-line discussion grows with new Web 2.0 technology and tools (universal Internet literacy, discussion via videoconferences that does not limit the capacity for delivered messages, reduction of the language barrier by automatic translation), it may be anticipated that discussion will increasingly have more characteristics typical of face-to-face discussion. And at the same time it will also include the advantages of the virtual world (knowledge management, access to any data and statistics, meeting others without regard to time and place). It may be expected though that despite technological progress, on-line discussion will never fully substitute the added quality of direct interpersonal contact present only in vis-à-vis discussion.

Testing of Principles of Collective Intelligence in Public Deliberation Projects

Current experience with the application of collective intelligence principles in public deliberation processes is not extensive enough to enable us to arrive at clearly positive conclusions and recommendations. Projects that experiment with new mechanisms for public deliberation processes include Open Space, World Café, Citizen Juries, Deliberative Forums, Bar Camp, etc. It appears that similar processes can be very effective if adequately facilitated, and if the design of such processes is both thought-out ahead and flexible, they provide new, exciting challenges.

A positive example of experimenting with collective intelligence formats in public deliberation is Fishkin's (2006) concept of Deliberative Days. In recent years, James S. Fishkin, Professor at the Department of Communication at Stanford University, has been developing improved practices of citizen public decision-making within election systems. In order to minimise the risk of an incompetent uninformed choice, which may even be manipulated by massive propaganda, Fishkin seeks a model enabling informed and rational voting in parliamentary democracy. According to Fishkin (2006), there are eight methods of consulting the public based on the method of selection and how informed public opinion is.

The range of possibilities for the selection runs from self-selection to an overall participation of all citizens in a referendum or plebiscite. When considering the form of public opinion Fishkin refers to "raw" public opinion which is more or less uninformed, not the product of deliberation, while "refined" public opinion is the product of deliberation with other citizens and experts. The following table shows the eight forms of public consultation.

Eight forms of public consultation (James S. Fishkin 2006)

	Self-selection	Non-random sample	Random sample	Everybody
Raw public opinion	SLOP ("self-selected listener opinion poll")	Non-systematic public opinion poll	Systematic public opinion polling	referendum/ plebiscite
Refined public opinion	Discussion groups	Citizens' juries	Deliberative Polls	Deliberative day

Fishkin's (2006) experiment includes combining elections with pre-voting deliberative discussions of voters as preparation for the local/regional voting process (elections or referendums on public issues). His dream is to have what he calls "Deliberation Day" across all of the USA. On one day all citizens would gather for discussions in small groups and to arrive at informed judgements. Only after such deliberation would voting take place. A similar approach to public consultations with citizens is a central experiment in several other projects such as those implemented by the Belgian foundation KBF (www.european-citizens-consultations.eu). The "European Citizens Consultations" project is aimed at creating a model of European citizen participation in future large-scale dialogues (Miková, Ondrušek 2008).

The use of collective intelligence in processes of public deliberation will spread so quickly that we may not even be able to analyse it. Practice overtakes theory and we urgently need to find the answers to some questions: What are the factors that would explain the different quality of results of on-line discussion on issues of a measurable, technological or more concrete character as opposed to public issues concerning social or moral issues or values, or questions of politics or identity? (How is it that involving thousands of people

in crowdsourcing usually generates a technological solution of better quality, but involving thousands of people in a political discussion or discussion on a regulative solution to an issue concerning identity very often ends in the polarization of the opinions of the participants but also very often fails to provide better quality solutions?)

What format and what type of facilitation enables deliberation to be structured in such a way so as to ensure productivity and the more effective involvement of participants? (In most cases previous research focused little attention on the formats of on-line discussion facilitation and structures of such deliberative processes. Perhaps that is one of the major factors why the evaluation of the results of public deliberation processes is so ambiguous.)

Further research into seeking and developing collective intelligence in public deliberation processes should without doubt concentrate on finding answers to these issues.

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