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Evaluation and Promise of "E-Democracy" in Some Consensus Conferences = Ocena i obietnica "elektronicznej demokracji"

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EVALUATION AND PROMISE OF "E-DEMOCRACY" IN SOME CONSENSUS CONFERENCES

Ocena i obietnica „elektronicznej demokracji"

Słowa kluczowe: demokracja elektroniczna, technologie informacyjno-komunikacyjne (TIC), demokracja partycypatywna, konferencja obywateli, etyka technologiczna, organizmy modyfikowane genetycznie.

Key words: game theory, social choice, voting rules, the power voter.

Streszczenie

Czy rzeczywiście nowe technologie informacyjno-komunikacyjne (TIL) oraz tzw. demokracja elektroniczna mogą przyczynić się do poszerzenia zakresu władzy przysługującej obywatelom? Odpowiedzi będą wielorakie. Zaczniemy od nowych technik i procedur partycypowania zwykłych obywateli w obszarze technologiczno-partycypatywnych ocen (ETP). Przebadamy ocenę samego TIC w ramach dwóch obywatelskich konferencji w USA i Japonii. Następnie rozpatrzymy TIC jako nowy sposób partycypowania. Porównamy realne debaty z asynchronicznymi debatami TIC. W końcu zastanowimy się nad nadziejami związanymi z odnowioną demokracją w obrębie zaawansowanych technologii.

Abstract

Are Information and Communication Technologies (ICT) and the so-called E-democracy a source of citizen empowerment? To answer this question we adopt different perspectives. We begin with the new techniques or procedures of citizen participation in the field of Participatory Technological Assessment (PTA), and pursue with ICT assessed in a US and a Japanese citizen conference. In a third step ICTs are considered as a new way of participating in consensus conferences (in France and Switzerland). Thanks to them we can compare real time debate and asynchronous one supported by ICT. Finally we scrutinize the hope of democracy in the age of network technology depending on the ambivalence of any techniques (material, procedural or rational).

Could techniques like Information and Communication Technologies (ICT) empower the citizen? Without any "technophobia" or on the other hand "techlotatric" posture, we can say that these new technologies could participate in this at different levels. First, new technologies in general are addressing new questions and public controversies. To tackle this challenge, some Technological and Scientific Assessment Offices have produced innovative ways to involve citizen in hybrid forums, composed of experts and non experts. Techniques are at the origin of this new way of deliberating. Second, techniques like ICT can help in the participation and integrate more actors in the debate.

We'll consider ICT as promises for E-democracy and citizen empowerment, from these different perspectives. 1) We begin with the new techniques or procedure of citizen participation in PTA, and 2) pursue with ICT assessed in a US and a Japanese Citizen Conference. 3) ICT will be next considered as a new way of participating in two consensus conferences in France and Switzerland. 4) We will conclude with the question of the ambivalence of any techniques (material, procedural or rational), to scrutinize the hope of democracy in the age of network technology.

1. From Technological Assessment to public participation

With a short diachronic return, we could say that the first Jürgen Habermas concern in *Erkenntnis und Interesse*[1] is very far away behind us. During this time, in his analyses, the risk might have come from politics having been held hostage by science. Science would have the strength to make agreement at low cost with different collectives in opposition with different frames. But Habermas's text has some limitations.

In *Theorie des Kummunikative Handelns*[2], he proposes that the protagonists reach an agreement on the state of the world, respecting the rules of discourse ethics where everybody can account for every argument. We could speak here about neokantian procedural deontologism and a moral cognitivism, where moral norms are constraining principles making in discussion. As a good weberian, he doesn't want to trespass on the insoluble quarrels among the values and reopen the "War of the Gods".

Then, with present-day Science recognising its part of uncertainty and controversy, finally it is a common condition to address problems to be sometimes plu-

[1] French translation: J. Habermas, *La technique et la science comme idéologie* (1968), Gallimard, Paris 1973.

[2] J. Habermas, *Théorie de l'agir communicationnel*, 2 tomes, trans. J-M. Ferry and J-L. Schlegel, Fayard, Paris 1987.

ralistically treated, especially concerning scientific policies to be promoted. Before of these complex technological and political choices, opening diverse possible worlds, with proved, perceived, potential or controversial risks, economic and political institutions were the first to solicit the creation of offices of Technological Assessment.

The first institution having equipped itself with this type of service was the US Congress, with its *US Congressional of Technology Assessment* (OTA)[3]. A lot of countries have adopted the same kind of TA offices, with different institutional designs, adapted to every cultural political and national histories relative to the relationship between the scientific, public and political spheres.

In France, the Parliamentary Office of Scientific and Technological Assessment[4] (POSTA)[5], is in charge of this mission. It's composed of 16 deputies and 16 senators, from all the political parties represented on the national level, which is a guarantee, according to its words, "of freedom of every other tutelage". The secretariat is in charge of assuming the practical functioning. It's only composed of parliamentary civil servants, depending on the office of these Assemblies. The POSTA is a pluralistic body from a political parties point of view. Meanwhile, its assessment basis is first of all constituted by experts' asynchronous hearings. We are still "entre soi" (*among peers)* from an epistemic communities point of view, mainly experts, civil servants, political decision-makers.

Some social studies have been made[6] concerning the development of such institutions, their independence, their composition and the ways to choose to address the issues depending on: the moments, their recognition, their credibility and their objectives, and finally the support they have.

1.1. Participatory Technological Assessment

In some technical and scientific controversial choices, Technological Assessment (TA) and the only exclusive advice of experts (despite they're being of different opinions) to the political and economical decision-makers, is not sufficient. And it is true as well for the resources of the scientific popularization or translation for a larger public, the communicational processes of me-

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[3] See for example F. Fischer, *Citizens, Experts and the Environment: The Politics of Local Knowledge*, Duke University Press, Durham NC 2000.

[4] See [online] <www.senat.fr/opecst/>.

[5] OPECST in France.

[6] N. Vig H. Paschen, *Parliaments and Technology. The Development of Technology Assessment in Europe*, State University of New York Press 2000; W.W. Powell, P.J. Dimaggio, *The new Institutionalism in Organisation Analysis*, University of Chicago Press 1991.

diation[7], aiming at the public acceptability concerning big technical and industrial projects.

Even though decision is in the hands of the representative political decision-makers, they have sometimes expressed their wish to broaden the spectrum of actors to be involved in the debates on controversial technical objects[8].

Now, this can be rooted in the French law (February 27, 2002), which concerns "Proximity Democracy"[9].

Some analysts have called for a "technical democracy"[10] or in other terms attempt to let the "sciences enter into democracy"[11]. On a different scale some small experiences were developed, making possible the articulation between the two worlds of the sciences and democracy, notably through the means of Participatory Technological Assessment (PTA). Within a broad spectrum of modes, they have opened up spaces where actors speak, deploying several communicational regimes, like narration, interpretation, argumentation, reconstruction, only to mention these[12].

Eleven years after the Denmark's pioneering in this domain, France knew its first citizen conference on GM Food in June 1998.

When the first analyses appeared in France about this type of devices, the first comparative European evaluations of these practices were published. It's notably the case of EUROPTA[13], TAMI[14] or "Governance of the European Research Area: The role of civil society" Projects. Some other publications have contributed to this evaluation of PTA. After having screened and made

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[7] See J-M. Dziedzicki, *La médiation environnementale: une comparaison internationale*, ESA-EDF-DER, Paris 1998, Report HN-55/98/046.

[8] See B. Reber, *Technology Assessment as Policy Analysis: From Expert Advice to Participatory Approaches*, (in:) F. Fischer, G. Miller, M. Sidney (eds.), *Handbook of Public Policy Analysis. Theory, Politics and Methods*, "Public Administration and Public Policy Series" 125, Rutgers University/CRC Press, New York 2006, pp. 493–512.

[9] Law 2002-276, 27.02.02.

[10] R. Sclove, *Democracy and Technologies*, Guilford Press, New-York 1995; Lee Kleinman (ed.), *Science, Technology & Democracy*, State University Press of New York 2000; F. Fischer, *Citizens, Experts and the Environment...*; M. Callon, P. Lascoumes, Y. Barthe, *Agir dans un monde incertain. Essai sur la démocratie technique*, Seuil, Paris 2001; S. de Cheveigné, D. Boy, J-C. Galloux, *Les Biotechnologies en débat. Pour une démocratie scientifique*, Balland, Paris 2002.

[11] Cf. B. Latour, *Les politiques de la nature. Comment faire entrer les sciences en démocratie*, La Découverte, Paris 1999.

[12] To take the categories proposed by J-M. Ferry, *Les puissances de l'expérience*, Cerf, 2 vol., Paris 1991.

[13] See J. Simon, S. Bellucci (eds.), *Participatory Technology Assessment. European Perspectives*, Centre for the Study of Democracy and Swiss Centre for Technology Assessment, Bern – London 2003.

[14] *Technology Assessment in Europe, between Method and Impact*, financed by the European Commission, 2002.

evaluations of technologies under divers modes, the organisers go to a second evaluation, which is more reflexive, following the comparison of their methodologies. It is the case in books or articles of F. Fischer[15], S. Joss[16], L. Hennen[17], L. Klüver[18], D.J. Fiorino[19], G. Rowe and J. L. Frewer[20], O. Renn Kastenholz H. and T. Webler[21], M. Callon, P. Lascoumes and Y. Barthe[22], or Reber[23].

PTA in diverse concrete forms in France[24], could be classified under a double tradition: one is tributary of the importation of consensus conference, when the other, more administrative and indigenous, proceeded to the creation of the National Commission for the Public Debate (NCPD)[25].

1.2. Consensus conferences, publiforums and citizen conferences

These terminologies indicate something very stabilized and perhaps less open than a debate. Eleven years after the Danish consensus conference on GM Food, France knew her first conference of this type, rebaptized "citizen conference", because of inculturation concern to import this process. More accurately, it was entitled: "The use of GM Organisms in Food and Agriculture"[26]. The

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[15] F. Fischer, *Citizens, Experts and the Environment...*; *Reframing Public Policy: Discursive Politics and Deliberative Practices*, Oxford University Press 2003.

[16] S. Joss (ed.), *Special Issue on Public Participation in Science and Technology. Science and Public Policy*, vol. 26, no. 5, Octobre 1999, pp. 290–373.

[17] L. Hennen, *Participatory Technology Assessment: a Response to Technical Modernity?*, (in:) *Special Issue on Public Participation...*, pp. 303–312.

[18] L. Klüver, *Project Management. A matter of Ethics and robust Decision*, "EUROPTA", [online] <www.tekno.dk/pdf/projekter/europta_Report.pdf.>.

[19] D.J. Fiorino, *Citizen Participation and Environmental Risk: A Survey of Institutional Mechanism*, "Science, Technology & Human Values" 1990, vol. 15, no. 2, pp. 226–243.

[20] G. Rowe, J.L. Frewer, *Public Participation Methods: A Framework for Evaluation*, "Science, Technology & Human Values" 2000, vol. 25, no. 1, pp. 3–29.

[21] O. Renn, T. Webler, H. Kastenholz, *Procedural and substantive Fairness in landfill Sitting: a Swiss Case Study*, "Risk: Health, Safety and Environment" 1996, no. 7, pp. 145–168.

[22] M. Callon, P. Lascoumes, Y. Barthe, op. cit.

[23] See B. Reber, *Technologies et débat démocratique en Europe. De la participation à l'évaluation pluraliste*, "Revue Française de Science Politique" 2005, vol. 55, no. 5–6, pp. 811–833.

[24] See B. Reber, *Les controverses scientifiques publiques au secours de la démocratie*, "République cherche démocratie et plus si aff., Cosmopolitiques. Cahiers théoriques pour l'écologie politique" 2003, no. 3, pp. 93–107.

[25] CNDP in French. See [online] <www.debatpublic.fr/>.

[26] Organised by OPECST and a steering committee (Paris, 20–21 june 1998). See D. Boy, D. Donnet-Kamel, P. Roqueplo, *Un exemple de démocratie participative: la* conférence des citoyens *sur les OGM*, "Revue Française de Sciences Politiques" 2000, vol. 50, pp. 779–809, that completes the official presentation of the Senate (www.senat.fr).

French political powers let 15 citizen, lay people in this matter, called "Candid" to give their opinion after having lengthy founded it, especially through the interaction and the confrontation among and with experts and themselves.

This can be compared with the hearings in TA where experts exchange with peers: the experts of the French conferences on GM Food or the ones in the 1999 Swiss publiforum on the same topic, are thrown into arenas, sometimes out of their field of competence, and are expected to answer questions they sometimes don't understand or try to elude. A citizen don't hesitate to say: "You speak Hebrew, you confuse us", indicating sometimes contradictions, not only among experts (which would be understandable), but in the discursive pieces of the same expert, going as far as following an expert until outside the conference hall, to get the answer to her question[27].

Since 1998, other French experiences were born, among others: *Debate on GMO and test in the fields*, organised by the Economic and Social Council (4.02.02)[28]; The Citizen Conference *Climate Change and Citizenship*, French commission for Sustainable Development and the Center for Science and Technology at La Villette Museum (9–10.02.02)[29]. We can note in the follow-up of the French conference in 1998, a special case: *The initiative workshops: "The ideas circulate, indifference go back"*, organised by the Autonomous State-own Company of Parisian Transport (ASCPT)[30] (2–3.12.2000). The ASCPT imported[31] the methodology of consensus conference for an application to the question of incivility in the subway and other transports in the *Ile-de-France* Region. Two other broad scale experiences, inspired by the consensus conference, but much larger, were conducted in France with a label reminiscent of the French Revolution: *Etats Généraux* of Food (2000) and *Etats Généraux* of Health (1998–1999)[32]. The last one is the *Etats Généraux de la Bioéthique* (2009)[33], which were dedicated to the revision of the French Biolaws.

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[27] Testimony from a citizen of the GM Food publiforum in Switzerland in 1998, who tried to know, without success in the conference, when the first GMO experience took place, and pursued the expert till the railway station to receive finally her answer.

[28] See [online] <www.conseil-economique-et-social.fr/ces_dat2/plan.htm>.

[29] See [online] <www.cite-des-sciences.fr>.

[30] In French: RATP.

[31] Members of the French steering committee like Philippe Roqueplo were invited by ASCPT for counselling.

[32] See B. Reber, *Public Assessment and new Rules for the "Human Park"*, (in:) B. Latour, P. Weibel, *Making Things Public. Atmospheres of Democracy*, MIT Press, Cambridge 2005, pp. 314–319.

[33] See the special issue: B. Reber (dir.), *La Bioéthique en débat*, "Archives de philosophie du droit" 2010, no. 53.

We can recognize that controversial technologies have produced innovative ways to assess them. Therefore they have produced new democratic rules making the debate more direct, interdisciplinary and pluralist[34].

2. Internet assessed

ICT can be on the both sides: as a tool in the new procedures of PTA but in the place of the controversial techniques. We will consider them in this second possibility. In 1997, the Education for Public Inquiry and International Citizenship (EPIIC) of Tufts University, the Massachusetts Foundation for the Humanities and Public Policy, the Loka Institute and some others institutions hosted a local citizen conference called "Telecommunications and the Future of Democracy"[35], the first citizens' panel in the United States which wasn't under the umbrella of a national institution. The goal was to offer the participants an opportunity to develop and publicize informed judgments on emerging telecommunications technologies and policies. A diverse range of panellists, "from a MIT scholar to a homeless woman", met and deliberated over seven days, interviewing more than twenty experts in the field.

With the same methodology, from February to September 1999, Japan's second consensus conference was held at Tokyo Denki University in Saitama Prefecture, near Tokyo. The theme of the conference was "The Information Society and Internet".

These panels produced reports containing the key questions identified by the citizens' panels, and their understandings and recommendations regarding some aspects of the information society and Internet.

The Japanese report is longer and well structured with, for each part: the questions, the common understanding of the citizens' panel, the recommendations and requests addressed sometimes not only to State, but to private companies, or to the mass media. The main recommendations are the following: both sides of Internet and its blurring of borders thanks to round-the-clock, round-the-globe access, and on the other hand the growth of non face-to-face communication, the spreading of lies; the plea for education, partly under individual responsibility and State responsibility. The Japanese panellists insist on the need for access in many ways, integrating "a real an efficient Net Day". They are in favour of international comparisons. Internet is for them "a medium of self-expression", a "powerful input method". We can notice that is exactly a part of the

[34] For a development of this idea see B. Reber, *La démocratie génétiquement modifiée. Sociologies éthiques de l'évaluation des technologies controversées*, Presses de l'Université Laval 2010.

[35] See [online] <www.loka.org/pages/worldpanels.htm>.

problem of empowerment and the beginning of inclusive deliberation. Concerning this point and addressing the mass media, the citizens' panel ask them to be careful with news stories blaming the Internet. Finally Internet nurtures judgement about how to select information.

The US report insists on the process "government of the people, by the people and for the people". For these reasons, citizen panel seems to be opposed the business forces whish often to dictate public policy. They insist on free speech, allowing anonymously maintained websites in conjunction with "seals of approval" for accurate and trustworthy websites, timely correction, a right to individual privacy, the monitoring of government for certain types of data, but only after due legal process under the Fourth Amendment and limited access to the children.

They propose for matters of censorship a kind of procedure similar to the citizens' conference, and make the plea that each State or community reaches its own solution about placement and means of funding additional equipment. In the same way they underscore the need for multicultural and multi-ethnic curricula.

We have retained two last remarks helping us to understand the issue of citizen empowerment. Panellists write after evoking democratic deliberation: "The Internet may hold more potential for this kind of participation than other forms of debate. But it also has more potential for polarizing in like-minded chat rooms". We will come back to this point on the occasion of a concrete French debate chosen as case study.

In their conclusion they write: "Technology gives us tools; we must decide how to use them. Technology itself does not develop socially responsible citizens of democracy, people and society do". We see here a common kind of reduction of technology to tools. We recognize here the weakness of ethics or politics of technologies[36].

3. Virtual Forum *versus* real Forum: two case studies in Switzerland and France

We propose here to change our posture to consider ICT as a new access, a new tool, for Participatory Technological Assessment (PTA). In November of 2001, the Centre for Technology Assessment at the Swiss Science and Tech-

[36] See B. Reber, *La Nouveauté éthique des "nouvelles technologies". Les techniques confrontées à l'exigence apocalytpique.* [*The ethical novelty of "New technologies". Techniques confronted the Apocaliptic*], PhD Thesis, Centre Raymond Aron, Ecole des Hautes Etudes en Sciences Sociales, 1999.

nology Council organized a publiforum on "Medical Transplants". The people in charge opened an "agora" to a public as large as possible, with the resources of ICT. They proposed a free on-line forum. The French Parliamentary Scientific and Technological Evaluation Office did the same in 1998, around the citizen conference "GMOs in Food and Agriculture", mentioned above. We will analyse the result of the French experience, and complete this with the Swiss one despite the answers were less abundant in this second case.

Some pieces of evidences or figures to begin with, concerning the type of actors involved and their questions. Out of the eighty-four mails, eleven are from Mr X[37], a professor of mathematics, three from Mr Y an ecological activist. Afterward, you find seven different people with only two mails, mainly people involved in academic professions, often in biological or agricultural fields. The other forty-eight people sent a single message.

If we follow the chronological progression of this "literature", we see a lot of people disappearing. On the gender perspective side, we have only six women for fifty-seven mail senders, as far as it's possible to deduce this from the name address or in the texts.

Another gender-related remarks shows that most of the time women ask questions and they stay polite and respectful, which is not always the case with the men, who are sometimes not gentlemanly or respectful of Netiquette.

In a more detailed examination of the texts, we can distinguish between:

- questions (29),
- service-questions like "where it's possible to have information on the GMOs, because I am doing research on this?" or "Can you give me information on this citizens' conference?" (5),
- answers (26),
- affirmation, assertions or claims (96),

More interestingly for our research on empowerment and deliberation, which is closer to interpersonal interaction than in the real forum, the number of times people answer or react to other mails: fifteen are simple sent and only five with multiple responses.

Five main issues are crystallising interactions. The more discussed is: "What's new with the gene technology compared with the agricultural selection, or natural evolution?". Secondly people discuss the amalgam or the analogies with other scientific controversies like made cow disease or cloning. Another point is whether they have the choice as a consumer to eat GM Food or not. A convergence took place on the question: which is better, to frighten people or on the contrary to reassure them? The last point is connected here with the application of the precautionary principle.

[37] Despite the emails were nominative we think we have to make a distinction between public character and unknown people. For this reason we let them anonymous.

A special mail which "organised" the discussion, was the one from Jean-Yves Le Déaut, the President of the "life" citizens' conference, and the deputy appointed to submit a report on the topics of GMOs for the Parliament, and, to be complete, the former President of the Parliamentary Office for Technological and Scientific Assessment (OPECST/POSTA). He sent a long email where he pretended to answer most of the questions and to map the issue. His strongest position was to say that the most important concern is the necessity to give scientific evidence to prove in international summits that GMOs are dangerous. He retained for his mapping, issues like the importance of legislation to determine the responsibilities, the traceability, the reactions against a static reaction of government in the face of multinational firms.

The most significant differences between this virtual forum and the classical/real hybrid forum concern a) style, b) moderation and c) time perspectives:

a) Concerning the style: in the web forum, there exists a risk of lack of civility. You say things that are not acceptable in a face-to-face interaction in a real hybrid forum. For example this sentence: "He's such a stupid[38] human being! If you have a panoramic view and more than two brain cells, you can tell immediately that....", or "if you are a biologist and you say that, you are a liar", or other frontal attacks against the government or the big farmer unions, who are suppose to be in favour of genetic engineering.

b) The moderator in the forum was quite open, while, on the contrary, the visitors on the real citizen' panel have another status, which gives them less opportunity for self-expression. On the website, people can take positions on their own. In a sense this is more in the logic of the French citizens' conference, as it is called, which lets citizens free to express their positions, in contrast with the efforts to reach consensus. On the other hand, in the website, the president has a much more powerful position because he implicitly maps out the debate and decides to privilege one question as essential or not.

c) If we have lost in term of civility on Internet, we have gained time duration to express individual voice. You find people who come to the agora, write their sentence and disappear. They have the time to develop real argumentation and sometime texts not far from essays. When you have an answer to a specific question, you can compare more objectively the way it is responding to. It is true that sometimes people "cut and paste" log part of texts and we cannot be sure they read them.

What is more important is that you find hyperlinks to other website and often to protagonist' website. With the online forum, you have new information, like very relevant websites on GMOs. Mister X, who attends the real conference asks for social mobilisation and invites people to his website. Even though

[38] "Con" in French.

this experience took place more than ten years ago, we can see the embryo of what we know now on the terminology of social networks and the sort of events they can mobilize.

We have no space to debate on whether questions treated in both agoras are identical. In short, we can say that they often overlap. But one issue, which was not specifically mentioned in the real hybrid forum appears there: the necessity of speaking on the ethical aspects of the question[39]. It's not by chance, because the steering committee avoided this question[40].

In the Swiss website dedicated to the Publiforum on Medical Transplants, the mails are less numerous than in France. We have only twenty-two mails but the country is around ten times smaller. A special thematic classification helps the visitors. We have noticed that quite all the mails explicitly mention or quote the others. Aside from the last one, which was provocative, all the other mails were very respectful.

Conclusion

As we have seen there is a big gap between "technophobic" or "technolatric" approaches of Internet. In matters of deliberation and PTA, Internet reveals hidden or implicit questions. That was partly the case in the Japanese report or in the French forums producing variations compared with real social interactions.

The last *motto* on the use of technology, in the very instrumentalist US report, is partly the opposite because it says that the *use* qualifies it. "Technology give us tools; we must decide how to use them". Is this compatible with the users of the website analysed here? Have they this kind of calculation in their mind? Or, do we have a good way to show through Internet that something happens before we decide to use it in a way or another? Technological objects are more than instruments. Thanks from all the old objects to Internet, the newness by excellence, for having revealed this. We recognize there the technology as a revelation of what we are, as old as *Prometheus* or Heidegger.

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[39] For more details, see B. Reber, *Ethics in Participatory Technology Assessment*, "Technikfolgenabschätzung, Theorie und Praxis" 2006, no. 2 (15), pp. 73–81. See [online]<www.itas.fzk.de/tatup/062/rebe06a.htm>.

[40] Concerning the underdevelopment of moral philosophy and moral sociology in France, see M. Canto-Sperber, *L'inquiétude morale*, Presses Universitaires de France, Paris 2001; P. Pharo, *Morale et sociologie*, Gallimard, Paris 2004. This point is a good one to enter in a transnational comparison with the Swiss website. In another publiforum on GM Food (1998), ethics was treated as a specific topic. See B. Reber, *La démocratie génétiquement modifiée...*

ICT could empower citizen participation, but not in a deterministic way. They can enforce their participation and deliberation in the field of PTA and ordinary democratic process. Technical objects not only cause risk and provoke discussion, but they could help to make the discussion public, based on innovative procedures. But as we have tried to show, the way to combine ends and means is not so easy as Weber or Habermas implicitly pretend, exactly because of their reductionist way to treat the technical objects[41].

[41] To deepen these questions see B. Reber, C. Brossaud, *Digital Cognitive Technologies. Epistemology and Knowledge Economy*, ISTE/John Wiley and Sons Inc. 2010.