



The Socio-economic Impact of Social Computing

Proceedings of a validation and policy options workshop

IPTS Exploratory Research on the
Socio-economic Impact of Social Computing

Editor: Yves Punie



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The mission of the IPTS is to provide customer-driven support to the EU policy-making process by researching science-based responses to policy challenges that have both a socio-economic and a scientific or technological dimension.

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This is a report on a workshop, hence a special acknowledgment and thanks to the workshop participants who are listed at the end of this report.

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PREFACE

The European Commission's Joint Research Centre runs an exploratory research scheme which aims to build competences in strategically relevant scientific fields. One of the chosen projects at IPTS,¹ following a call for proposals, was "Exploratory Research on Social Computing" (ERoSC). This was carried out by the Information Society Unit at IPTS during 2007 – 2008.

This project aims to explore (1) the socio-economic impact of social computing; (2) the sustainability of social computing applications (business models and viability); (3) the relative position of Europe in terms of creation, use and adoption; and (4) options for EU research and innovation policies. Such research is important and urgent because social computing is already impacting many aspects of society and the previously available evidence was largely anecdotal and not comparable. Also, the recent nature of social computing applications, their strong growth in terms of creation, use and adoption, and the continuous changes in technologies, applications and user behaviour, reinforce the need for continuous monitoring and scientific capacity building. Therefore, the ERoSC project undertook a systematic empirical assessment of the socio-economic impact of social computing applications.

The methodological framework for the assessment consisted of desk-based research using available studies, reports and statistics on social computing in general and on collaborative content and social networks in particular. In addition, interviews with experts and a validation and policy options workshop were undertaken to tackle the challenge that the domain of social computing applications is quite recent and moreover, changing rapidly.

The research was undertaken in-house by a number of key researchers, supported by a larger multidisciplinary team of people belonging to the different areas of activity of the IS Unit.

This is the second of five reports from the ERoSC project. This report presents the outcomes of an expert workshop held at IPTS in Seville, on 26-27 February 2008 which had as an objective to validate results of the ERoSC research and to identify key areas for future EU research and innovation policies. All the ERoSC reports will be available at <http://is.jrc.ec.europa.eu/>.

While completing the ERoSC project, the IS Unit at IPTS is also continuing its work on social computing, and is currently investigating the impacts of social computing on health, government, learning, inclusion, competitiveness and the ICT/media industries.

¹ IPTS (Institute for Prospective Technological Studies) is one of the seven research institutes of the European Commission's Joint Research Centre (JRC).

1 Introduction

Social computing (or web 2.0) refers to digital applications that enable interaction and collaboration in such a way that users become participants (co-creators not end-users) that are strengthened through the network (as a collective resource). Examples of such applications are, amongst others, social networking (e.g. Facebook), photo-and video-sharing (e.g. Flickr & Youtube); user-generated content (e.g. Wikipedia, blogs) and sharing of experiences, taste, or internet bookmarks (e.g. del.icio.us). There has been a strong and unexpected growth in take-up and use of these applications since 2003 (See Pascu et al, 2008).²

The strong growth of social computing applications has led many to believe that it is a sign of changing times. Users – as consumers, citizens, patients, learners, workers, etc. – are playing an increasingly important role in the way products and services are shaped and used. This may have important social and economic impacts on all aspects of society: on information and knowledge sharing, on learning, health, government, business, the media, the third sector, and others. These impacts may be disruptive as they are changing existing practices and allowing new players and markets to emerge and challenge existing players, industries (e.g. media sector) and institutions (e.g. education).

There is, however, little scientific evidence on social computing trends and impacts. Therefore, in 2007 the IPTS started an in-house exploratory research project on social computing (ERoSC). Objectives of the research are to explore:

- (1) the socio-economic impact of social computing;
- (2) the sustainability of social computing applications (business models and viability);
- (3) the position of Europe in this field; and
- (4) options for EU research and innovation policies.

Three key reports addressing these questions have been made:

- (1) A report presenting an empirical analysis of the creation, use and adoption of social computing applications, with a particular focus on blogging, podcasting, social networking, including media sharing (video and photo), social gaming and social tagging;³
- (2) A report on social computing and collaborative content. It provides an analysis of collaborative content, a key feature of open access to content that is created, reviewed, refined, enhanced and shared by interactions and contributions of a number of people;⁴
- (3) A report on social computing and social networking. It provides an analysis of digital applications that facilitate social networking and multimedia interaction amongst individuals, highlighting changes and their implications in how people network, manage and operate their social contacts and share user-produced contents on the Internet.⁵

² Pascu, C., Osimo, D., Turlea, G., Ulbrich, M., Punie, Y. & Burgelman, J-C. (2008) Social Computing - Implications for the EU Innovation Landscape, Foresight, 10(1), March 2008, pp. 37-52.

³ Pascu, C. (2008) An empirical analysis of the creation, use and adoption of social computing applications. Report from Exploratory Research on Social Computing (ERoSC), IPTS, European Commission, in press.

⁴ Ala-Mutka, K. (2008) Social computing: the case of collaborative content. Report from Exploratory Research on Social Computing (ERoSC), IPTS, European Commission, in press.

⁵ Cachia, R. (2008) Social computing: the case of online social networks. Report from Exploratory Research on Social Computing (ERoSC), IPTS, European Commission, in press.

Insights from these reports were presented and discussed at an expert workshop held at IPTS in Seville, on 26-27 February 2008. The objective of the workshop was to validate results of the research on social computing and to identify key areas for future EU research and innovation policies.

This expert workshop formed an important part of the project as social computing is still very recent and rapidly changing. Given the multi-disciplinary nature of the social computing field, it was necessary to bring experts from different backgrounds together. In the end, 25 external participants from industry, academia, consultancy and EU policy-making attended the workshop. Participants received beforehand draft results of the research, which were presented and discussed during the workshop. In addition, brainstorming and open discussion sessions were held on missing issues, on the position of Europe in social computing and on policy options for future EU research and innovation. Both the workshop agenda and the list of participants are in the annex.

This report presents the major outcomes of the workshop discussions. It does not provide a synthesis of the results of the different studies; nor does it summarise the presentations made at the workshop. Rather, it is a structured account of the debate that took place during the workshop. Therefore, it is only an intermediary step, additional to the other key deliverables of EROSC, towards addressing the four major objectives of the study mentioned above.

2 Measuring and analysing social computing

2.1 Methodological challenges and the governance of data

The recent nature of social computing applications, their strong growth in terms of diffusion and use, and the continuous changes in technologies, applications and user behaviour, are amongst the main reasons for the need to be cautious with data on the availability, diffusion and use of social computing applications. Especially when only secondary data are used for the analysis, it is advisable to develop taxonomy of the data used and to critically assess them and their sources. The advantages and limitations of available data sets should also be made explicit.

While it is relevant and even necessary to analyse the best publicly available data on social computing ("numbers are important"), as IPTS has attempted, it should also be recognized that there are clear limits to such data. Such limits include, for instance, lack of transparency on data collection (e.g. representative samples) and measurement issues (e.g. unique visitors), and a bias of certain companies towards presenting positive data. A critical stance is necessary to avoid giving too much credit to data of which the origins and orientations are unclear or opaque.

In addition, it is likely that private companies are quite well informed on social computing through their own surveys and studies and these are not always shared publicly. Such information would, of course, be useful to construct a more complete picture. At the European level, questions related to social computing (blogs, user-generated content) are included in the current EU household survey, the results of which will be available at the end of 2008.⁶

More data is needed to develop a more comprehensive picture on social computing. Such data would include frequencies of use, types of activities for which social computing applications are used, as well as age and gender differences. There is also a need for more qualitative and in-depth studies that look at how and why social computing applications are used, in order to understand, for instance, the real motivations people have for contributing and sharing information. It would be good to complement existing data on individual user behaviour with data on organisational use (by companies, institutions and the third sector or civil society) of social computing. When looking at these levels, it is also important to differentiate between economic sectors, small and big companies and between institutions (e.g. health and learning). Use of social computing by the public sector and by intermediaries could also be taken into account.

Measuring only the stereotype major social computing applications is not sufficient as user behaviour is changing and users are taking up other, sometimes smaller niche applications restricted to closely-knit communities. Users can also use different applications at the same time or engage themselves differently (social innovation) according to the social computing applications they are using. This may lead to the need for different measurement criteria where the unit of analysis is the person, and not the content, the blog post, review, comment or the picture. However, such a person-centred approach would need to be embedded in a mutual shaping approach that takes into account the broader interactions between technology and society.

⁶ See <http://epp.eurostat.ec.europa.eu>

2.2 The creation of value

Traditional approaches to studying media measure the interaction between supply and demand; between what is offered by suppliers and what is consumed by end-users. A rigid distinction between supply and demand of digital media and especially of social computing applications no longer seems valid in a networked information society where users become co-producers of content, taste, profiles, services, etc. It is conceptually and empirically inaccurate as it is a key constituent of industrial societies where production and consumption are completely separate. It would therefore be preferable to look at the creation of value and how users add value to digital content by creating, sharing and networking content, people, information, resources, etc.

This may include however, also the study of the diffusion, adoption and use of social computing applications by looking, for instance, at the number of users, usage frequencies, functionalities of use, user demographics, and user activities.

2.3 The bigger picture: What is really new with social computing?

Focus is important for studying social computing in detail but questions related to the broader context within which the phenomenon is emerging need also to be addressed. Relevant questions from this angle are:

- Is social computing the driver of change or rather a part of a broader wave of socio-economic and technological changes towards a fully digitalized, knowledge-based and networked society?
- How does social computing relate to other trends and drivers in society such as globalization and localization; ageing societies, competitiveness, inclusion, individualization, fragmentation of lifestyles and even environmental issues?
- How does social computing relate to existing information society theories and concepts such as Communities of Practice (e.g. Duguid, Wenger); digital identities (e.g. S. Turkle); networked society (e.g. Castells), innovation (e.g. Tuomi), etc?

Addressing the bigger picture of changes related to social computing would mean looking not only at micro level changes in individual behaviour but also at meso-level (e.g. organizational) and macro level changes (e.g. social cohesion, cultural diversity, civil society).

An important question is: what is fundamentally new about social computing? Workshop participants believe that though there is little really new, many issues that have been emerging during the last decade "now become really possible". Some believe that the major difference lies in the scale and the speed of what is happening, and in the opportunities for user creativity, do-it-yourself and value creation (as a result of low entry levels in terms of cost and user-friendliness) which may give rise to significant changes in content creation and use (bypassing existing/established solutions, providers, companies, etc.). Others see a significant shift from a market-based industrial economy to a meaning-based digital economy, where value creation is central.

Understanding social computing also requires taking into account the broader media ecology, in which other media companies and entertainment opportunities play a role. For instance, dissatisfaction with traditional media could drive people towards the Internet and towards blogs to get access to more diverse, pluralistic and reliable information.

2.4 Towards a more diversified social computing landscape

The IPTS study⁷ observes that the strong and fast growth in terms of diffusion and use of social computing applications since 2003 seems to have been levelling off since 2007. Is this part of a normal S-shaped growth curve that is slowing down or rather, is it an indication of other changes?

Given the lack of data and the recent nature of these changes, one can only speculate on the answers. For some experts, it is an indication that social computing is no longer just hype and that it is moving into a maturity phase with wide user acceptance. It is becoming a social and economic reality involving many users, companies and other actors. The levelling off of the growth in diffusion and use might also be related to the fact that early adopters, as the fascination for the new (the “try me” virus) wears off, move on to newer applications. Others may have tried social computing applications and are now dropping out for a variety of reasons such as little added value, not user-friendly, problems with spam, privacy, technical limitations such as broadband availability, etc. A relevant question to the issue of drop-outs is that if the reported problems were addressed, would this drive a new wave of social computing application take up?

One should also look at what is happening behind the archetypical applications such as Myspace, Youtube and others. This would reveal a host of new, smaller, local and niche-based social computing applications such as Twitter that are being taking up by users at the expense of the quintessential applications. Twitter is a service for friends, family, and co-workers to communicate and stay connected through the exchange of quick, frequent messages on what they are doing at that particular moment.⁸ This shift towards more intimate and affective social networks would thus indicate a shift in social computing usage, rather than saturation. This highlights the need to also conduct qualitative studies that look at how different users make different use of social computing applications.

Finally, when discussing the diffusion and use of social computing, it should be placed in a more global context and it should be remembered that there is still much potential for growth in diffusion and use outside the developed countries. Not only global digital divides should be looked at, but also the potential of social computing for social and economic development in developing countries.

⁷ Pascu, C. (2008) Ibid.

⁸ <http://twitter.com>

3 Discussing the impact of social computing applications

3.1 Disruptive and sustaining impacts

Discussing the socio-economic impact of social computing is a way to understand the changes that are emerging with its rise. These changes do not, however, necessarily lead to significant new practices replacing existing ones or to new actors (e.g. companies) replacing existing ones. And a threat to existing practices is not necessarily a disruption of existing practices. To account for these differences, it is therefore important to distinguish between disruptive or sustaining impacts.

Much of the evidence on social computing presented at the workshop points to small-scale, down-to-earth changes and it is not (yet) clear if the impacts of these changes are disruptive or sustaining. It would be useful to look as much as possible at the disruptive potential of social computing at different levels - i.e. political, entrepreneurial, consumers - and also at specific sectors such as the media. It is expected that the public sector and public services might be strongly affected by social computing.

Also organizational change could be at the forefront, especially as social computing could affect the transaction and operational costs of organizations. For instance, top law firms are currently duplicating the production costs of knowledge creation because they are afraid to lose competitive advantage, even though more openness and sharing of knowledge could also have huge cost-saving potential for them.

The disruption could also be in the timing and the scale. Many of the ideas and concepts that are now seen as being at the centre of social computing have already been around for a long time, but now the tools are available to make them possible on a scale never imagined before. Experts see a potential for significant change over the next 5-10 years. Therefore, research and evidence is needed to get a better idea of how these ideas and concepts are being taken up. Although most of the ideas are not really new (Cf. the new economy debate in the late 90s), the scale (critical mass of connections) might lead to significant impacts (see also the work of John Zysman on technological revolutions).

Timing is also important as potentially disruptive impacts could be turned into sustaining impacts by vested interests. It is often the case that a consolidation amongst new players emerges, and that existing players try to take-over promising initiatives and turn them into 'business as usual'. This means that the impact could be only temporary. When for instance, the use of social computing for politics becomes widespread and mainstream, it may turn into a zero-sum game. This may also happen with the so-called 'empowerment of customers' when companies have better control over consumer feedback via social computing applications.

A challenge when studying impacts is that it might be necessary to look beyond the beaten path to find new things. For instance, though it is increasingly difficult to imagine any business being done without ICT, its contribution to productivity remains a problematic issue (productivity paradox). This may also be true of social computing in the future.

Lastly, impact can also be situated in the old economy. Digital social computing applications could also impact how activities are undertaken in the physical world.

3.2 User motivations for participating / contributing

The workshop confirmed that there is a gradation in user activity and only a small portion of social computing users actively contribute to content. The group of users tends to get bigger as user activity diminishes. This means that not everybody will become a content producer and not everyone has the necessary skills and competencies to participate. Motivation to participate often has to do with wanting to share experiences, knowledge, preferences, etc. But it also depends on age, as participation rises when people are younger, except for certain applications such as Wikipedia where old people contribute proportionally more. Contributions to Wikipedia are also different from those, for example, to blogs. People only sporadically post to Wikipedia while contributions to blogs may be more continuous and permanent.

3.3 Economic impacts

It is difficult to assess the economic impacts of social computing in broad terms, as you would when measuring the impact of something like electricity. There are many specific impacts to be identified, for instance, on how companies can save money without losing value. However, one should look at social computing not only as a tool but also at the impacts social computing communities generate. Therefore, it could also be useful to distinguish between different social computing applications (e.g. Wikipedia, wiki communities, social networking communities, etc.). Another factor to be taken into account could be time, as impacts may become more significant in a couple of years.

Impacts on the industry itself (ICT, social computing, media, publishers), on products or services that are being substituted by social computing, and on other industries using social computing tools, should also be identified. Entrepreneurial use of social computing can be done to improve existing practices, products and services or to develop new practices, products and services. In addition, users are also shaping these developments by using certain applications (e.g. Wikipedia) and services that are becoming competitors of existing products and services (e.g. printed encyclopaedias).

3.4 Social impact

There are many social impacts to be considered. A useful distinction could be to discuss social impacts at the individual level, the meso-level and the broader macro-level. For individuals, it is often mentioned that the loss of social contact and the risks of addiction must be considered. But for many young people, virtual social contacts are not different from real social contacts, leading to the disappearance of boundaries between the physical and the online world. Also addiction could be the result of not only the attractiveness of the online world but also of social pressure being exercised within the online world, as is evidenced by games such as the World of Warcraft or virtual worlds such as Second Life.

At the meso-level, impacts are related to social capital, to the creation and maintenance of communities (bonding and bridging); to civil society and to the empowerment of social movements. There is a potential for social computing networks to overcome real-world obstacles and to maintain geographically dispersed communities (e.g. diasporas; refugees). Social computing could provide new opportunities for engagement and for involving new groups of people that have not traditionally been involved in civil society activities. This could be done at the level of local communities and neighbourhoods. There is a risk, however, that only those who are skilled social computing users, or those who have the time and money, participate.

Communities also impact on the functioning of organisations. The example was given of the knowledge worker (a term coined by Peter Drucker in 1959). Knowledge workers are now more connected to each other via knowledge communities to which they are loyal. This may lead to a declining loyalty to the companies they work for, especially when they are compared to other employees.

At the broader macro-level, issues related to social structure, social cohesion, digital divides and the delivery of public services are also important. Social structures shape the processes of identity formation, and social computing is particularly interesting because of its impact on privacy and celebrity, as expressed by Andy Warhol's 15 minutes of fame for everyone. Privacy concerns may also differ according to the type of media used. There is a difference between personal information that is written down in a blog, personal pictures on, for instance, Flickr and personal videos on Youtube. Now that social computing is becoming increasingly based on rich multimedia formats, this may be changing our notion of privacy.

It should also be noted that networks are gendered, and that gender differences emerge in the way social computing tools are used, reflecting broader social structures and power relations.

4 Sustainability – business models

Following the strong growth in take-up of social computing applications, a major issue for the future is the sustainability of social computing – of both the phenomenon itself and specific social computing applications. The question is if, and how, social computing will be sustained for a longer period of time. This is related to establishing a business model that is able to generate revenues.

Like other online revenue models, social computing revenues often rely on advertising, subscriptions, paying for specific services and donations. Also basic services may be for free, while additional services are set-up to generate revenues. Another strategy for social computing entrepreneurs may be to get acquired by bigger players.

It should also be noted that many social computing applications do not require high investments because of the low costs of setting up and maintaining new services. Applications are often run by volunteers and maintained by voluntary contributions. The Wikipedia Foundation and Wikipedia are examples of this. People are sometimes prepared to make voluntary contributions and donations because they would like the service to be maintained, because it is useful to them or because of its social value. Social computing should focus on providing added value that is available for free, such as personalisation, immediacy, authenticity.⁹ Sustainability remains a concern when applications are run only on the basis of donations.

It may be useful to differentiate between internal and external sustainability, and to take into account direct and indirect revenues. Indirect revenues occurs for instance when blogs and other social computing applications are used to attract attention, create awareness and build a reputation, all of which can be used to derive revenues from other sources, such as consultancy, books, other paying websites and services. In some cases, running social computing applications without direct revenues or other returns has become part of the work of particular professions. Researchers, professors, teachers and other knowledge-intensive professions are examples of this.

Some experts suggested that we should not focus only on exogenous sources of revenues for social computing applications, as they often have an internal energy (fire) to feed them.

For the creative industries and the media, the links with social computing are often more direct, and related to branding, maintaining their audiences, or to tapping into new audiences such as young people who seem to use less traditional media. Media companies are thus directly impacted by social computing applications as these applications fit within cross-media strategies. Therefore, the sustainability of social computing should also be seen within the context of larger media networks or media ecology.

There is a potential for social computing applications to reduce the operational and transaction costs of companies. If this potential is realised, then the sustainability is, of course, assured. The problem is that today, little is known about how to ensure that the potential is effectively realised. This will probably change as the younger generations growing up with these tools, will be able to better grasp the opportunities offered by social computing - for them, it will be the natural way of organizing things.

⁹ See for instance Kevin Kelly's "Better than free" article:
http://www.kk.org/thetechnium/archives/2008/01/better_than_fre.php

Some companies are already making use of social computing applications to outsource intelligence (crowd-sourcing) and to get feedback from users on the design of their products and services. Thus, user feedback and user-led innovation via social computing tools is also an important element to take into account when discussing sustainability and business models.

5 Other challenges

5.1 Quality, reliability and accountability of user-produced content

Content produced by professionals goes through a number of quality and reliability checks before being published. This is not the case for user-produced content. This poses a number of challenges, such as the need for people to have the education and skills to be able to assess the reliability of available content for themselves. Another challenge is accountability when certain information leads to undesired outcomes. These challenges need to be tackled for the further development of social computing.

There are, however, examples of networked control mechanism and peer reviewing that are bottom up and that seem to work as well. The case of Wikimedia versus Encyclopaedia Britannica has shown an interesting controversy whereby the latter was not necessarily more reliable as both contained errors, according to a test by Nature.¹⁰

The challenges are related to differences between professionals and amateurs, between what is regarded as reliable and accredited content and any personal opinion. The tensions raised by these differences may lead in the longer run to fundamental changes in terms of claims on truth and in terms of how scientific knowledge and the work of researchers, professors, journalists and others are evaluated.

5.2 Blurring boundaries between the real and the virtual

Many instances of blurring boundaries between the real and the virtual are occurring as life becomes more digital. This is also the case for social computing applications, as social networks, friendships and personal/social identities are increasingly established and maintained via online social networks. These are all extensions of both the real and the virtual. Meeting other people online in the club ‘Second Life’ is as real and meaningful as meeting people in real life, as is ‘twittering’ about what you are doing at a particular moment. It is about augmenting and enriching existing experiences.

This is consistent with a shift from place to people as life becomes more networked and digital (Cf. the shift in telecommunications from fixed phones to mobile phones). It gives rise to notions such as networked individualism.¹¹

Merging the real and the virtual has both advantages and shortcomings. On the plus side, physical differences, disabilities and psychological barriers can easily be overcome in virtual life. However, on the down side, the digital leaves traces, and it becomes more difficult to keep one’s life private, for instance, from possible employers.

5.3 User-driven innovation / open innovation

Social computing is accelerating the ongoing process whereby innovation is being opened up and users are playing a key role in shaping innovations. This is also important for companies as they have to plan for innovation. This has to be done in an open way, enabling team-building, communities, and the exchange of ideas across company boundaries. Some years

¹⁰ See http://www.nature.com/press_releases/Britannica_response.pdf

¹¹ See Berry Wellman on networked individualism:
<http://www.chass.utoronto.ca/~wellman/publications/index.html>

ago, Von Hippel pointed to the role of expert users who become innovators.¹² Social computing is now offering more possibilities for users to innovate. It seems, however, that only a small group of young but highly experienced users are able to participate. It needs to be raised that these are a sub-elite as well and therefore, that innovation might not be so bottom up as is often assumed.

5.4 A sceptical view of social computing: the identification of risks

Discussions on the impact of social computing run the risk of presenting an analysis based on hype, because of the absence of solid scientific evidence, and the subsequent reliance on anecdotes. In order to avoid overrating its potential impact, negative and critical scenarios can be elaborated to identify the potential risks and to understand their importance and implications.

A post-it exercise was therefore carried out at the workshop, and the experts were asked to imagine the three main reasons why social computing might not fully grasp the opportunities outlined. In particular, the questions proposed were:

- (1) Why might social computing NOT have a significant impact?
- (2) What major negative impacts might hinder the realization of the full potential of social computing?

These two questions are obviously closely related, as a negative impact would discourage take-up and lead to reduced impact.

The proposals were then aggregated by the research team around key issues.¹³ The first group of issues relates to the overrated importance of social computing (Cf. question 1):

- In particular, 3 experts pointed out that social computing is **not a radical innovation**, but just part of normal Internet evolution. Social computing is only a minor manifestation of a wider trend towards increased importance of communication in everyday life. Along the same lines, one of the possible reasons for its perceived lack of impact is that social computing applications could disappear as their features become embedded in every ICT applications.
- There were doubts about the **long-term sustainability** of providers of social computing applications, which mostly rely on advertising as their only revenue. 3 experts warned that an advertising recession could cause a new bubble to burst. Social computing could soon be replaced by a new hype before achieving significant impact.
- A major cause of concern was that **take-up of social computing will remain limited** (pointed out by 12 experts). Social computing, especially with regard to the active involvement of users, is still used only by a minority and too little attention is paid to involving second wave adopters. It is therefore unlikely to reach the majority of Internet users. Furthermore, the motivation of the few proactive users could easily fade away because of disappointment with quantity and quality of content. Additionally, collaboration efforts launched top-down could fail and generate a backlash. For example, one expert speculated that "The EU will launch a huge collaborative site - and no-one will come and play".
- Related to this, **user participation has high costs in terms of time** (pointed out by 6 experts). Users are unlikely to continue contributing without compensation, but this

¹² Von Hippel, 2005, Democratizing innovation. <http://web.mit.edu/evhippel/www/democ.htm>

¹³ The complete results are published as a mindmap at http://www.mindmeister.com/maps/show_public/4965172?password=erosc

compensation might not be compatible with the existing success factors such as trust. There is also an initial perception of "technofatigue" among users, and user attention is at a premium with the increasing amounts of information available. Also, altruism is not a sufficient driver of participation, less virtuous motivations (greed, vanity, personal desire) are more effective.

- Last but not least, barriers related to **Intellectual Property Rights** and possible future restrictive developments could hinder the re-use and sharing of content by users. This issue, highlighted by 3 experts, generated, as expected, discussion and controversy.

The second group of issues highlights potential negative impacts, which could discourage further engagement with social computing applications (mainly in relation with question 2).

- The major cause for concern was the possible **disruption of existing trust mechanisms** on social computing applications. If social computing becomes mainstream, it is very likely that **vested interests** will try to influence and steer it, as was pointed out by 9 experts. Large companies, institutions, and political parties have only temporarily been displaced by the emergence of social computing. However, they are learning fast and will try to get back in control. Trust is delicate and difficult to ensure, manipulation risks are high. One participant said: "if it made a real difference, it would be suppressed".
- Trust is also likely to be harmed by the **behaviour of individual participants**: 4 experts pointed out that users often lie and misrepresent themselves, and the more important social computing becomes, the greater the potential gains (and temptations) of mis-representation of self will be.
- **Privacy infringements** remain one of the biggest threats (8 experts). There is consensus that current users are not fully aware of the risks, are not taking adequate precautions, and that this may lead towards some kind of dramatic event(s) likely to generate a backlash against openness and information disclosure. This relates also, according to 5 experts, to IT security problems on an unprecedented scale, in terms of viruses, identity theft, spam, and content manipulation.
- **Low quality** of content produced by users is seen as a major issue (12 experts). A lot of user-generated content is low quality or trivial, and the skills necessary to critically assess the quality of content are not widespread among the majority of people. People who do have adequate critical skills will not have the time available to go through user-generated content. Furthermore, social networks are likely to encourage conformity, rather than innovation.
- Social computing could enhance **social and digital divides**, according to 6 experts: "It will empower those already most empowered" and will increase social fragmentation and closed-mindedness. It will encourage social networks that are well connected (bonding social capital) rather than bridge between different networks (bridging social capital).
- There was also the perception that these risks are often exaggerated by traditional media, and that **misrepresentation** of social computing is, in itself, a risk. For example, poster child applications, such as Facebook, are considered to be the only instances of social computing, and a future fall of such high-profile applications is likely to hinder the overall social computing movement.

The brainstorming exercise reported here provided valuable insight and new perspectives to offset the hype around social computing. While the emphasis on privacy and low quality was somehow expected, the degree of consensus on counter-intuitive issues such as "limited take-up" and the importance of "vested interests" were remarkable. Also, the highlighted risk of a

backlash against huge collaborative projects launched top-down is a useful cautionary message for government action in this field. It was supported by several other remarks in favour of a "hands-off" and light approach.

But, of course, this is only an initial insight. Further research is necessary to validate each of the risks described above. Their relative importance must be assessed and their implications analyzed, so that proposals can be made as to how they can be prevented or faced up to.

6 Policy options for Europe

6.1 Room for policies

A number of issues related to the position of Europe in terms of the development and use of social computing applications were discussed. Is Europe an important player in this field or not? Are European companies or European technologies playing a key role or not? Are other actors such as government and civil society playing a key role? How significant is the use of social computing in Europe? What is specific to social computing in Europe compared to other regions?

Experts do not believe there is room for direct policy interventions on social computing. Some even argued that there is a risk that policies of this kind would be counter productive and go against the interests of those involved with social computing. At the moment, the environment around social computing is rich and innovative, and suffocating it should be avoided.

But that does not mean there is no room for policy actions. The implications of social computing for other policy areas, like education, health, and inclusion, and for the policy-making process itself, should certainly be considered. Governments can, for instance, be lead users of social computing applications and use the tools in modernising and reforming the public sector; and in experimenting with new governance models, including crowd-sourcing certain governmental tasks. In other fields, such as education, governments can stimulate and promote the development and use of open educational resources and free learning materials in schools. Even alternative financing mechanisms could be considered whereby credits would be given to learners who learn via social computing tools rather than attending educational institutions. This would provide a strong case for giving priority to bottom-up processes and to the user-side.

However, experts also pointed to a possible downside to more user-driven innovation. Although innovation processes are no longer restricted to a number of key players and companies, and are thus becoming more democratic, it is still only a small group of elite users that is involved. Not everyone is, or can be involved in innovation, and therefore, outcomes of such innovative processes are not necessarily a result of full sufficient representation.

In terms of development of new technologies, it was mentioned that many are initially developed in Europe but then move to the US, to Silicon Valley and other sites. Examples given are instant messaging, Linux, Skype, and many computer games. There is also the case of a well-known French blogger who went to the US to develop a specific social computing application. There are many reasons for such moves. The lack of venture capital is one, although it was acknowledged that, increasingly, social computing venture capital is becoming available in Europe. Another reason is the attractiveness of the market in terms of scale and use and there the US is ahead. The US is also ahead in terms of access to the necessary people and social networks (including skills and competences) which characterise innovation clusters such as Silicon Valley. It is, however, not an issue of entry costs, which are low and enable anyone to innovate.

6.2 Opportunities for Europe

Experts do not expect EU policies to be able to directly redress this situation but, rather, to provide the necessary framework conditions that would favour people and companies (start-ups) to stay in Europe. Focussing on the framework conditions enables us to circumvent the

possibility that, by the time specific policy measures are taken, it is often already too late to redress the issue. It is also important to tackle IPR and copyright issues that might prevent the further development of social computing.

In addition to supporting entrepreneurship at individual levels, there is also room for policy activities to encourage social cohesion and limit the exclusion of groups of people such as the elderly and migrants, and to support democratisation and eParticipation processes. The strength of Europe often lies in services of public and social value, rather than those that have purely commercial value. Empowering people from different cultural backgrounds to benefit from public services enabled by social computing is important. It would be good to keep on developing a strong position on such social services and on services that empower people. This would include paying attention to the necessary soft skills and competences to use social computing tools for empowerment.

Europe has an important capacity for understanding and promoting diversity, in terms of values, culture, language, etc. This is an advantage that should also be further exploited through the use of social computing so that products and services are not developed only with a typical, uniform person in mind. A good example is the language diversity of Wikipedia, now available in more than 250 languages. This does not mean, however, that a "critical mass" of users and user contributions is necessary to make the content attractive to other users.

Another European strength lies in mobile technologies and mobile connectivity, together with a marked lead in mobile devices. Hence, Europe has the chance to further develop relevant services, applications and platforms for mobile 2.0.

Another opportunity for Europe would be to provide better access to public data as such data are typically used in social computing applications (e.g. mash-ups) to provide added value. Opening public data sets to allow citizens to create their own services could provide a boost to the use of social computing. The case of "patientopinion.org", which collects and publishes patients' feedback and rating on the service received at hospitals, was mentioned. The data is used to improve the quality of public health and to better understand user needs. However, experts also pointed to the possible risks to data ownership, privacy and security, which could lead to a surveillance society. But there might be a need to reconsider our current notions of privacy, of what is public and what is private, as social norms and values on these notions are changing through the use of social computing applications. The model to deal with these issues seems to be moving towards more bottom-up and opening-up, rather than top-down and controlling.

The latter trend of more user-led, bottom-up and open processes typifies the real added value that social computing has to offer. This implies that not only the public sector is affected by these changes. Industry, companies (including SME's), other organizations and civil society are also becoming users of social computing applications and hence encounter opportunities for improving existing practices and for experimenting with new ways of doing things to provide added value.

6.3 Research needs

There is a lot of ongoing ICT research (e.g. FP7; the CIP programme; large scale testing and validation environments; Living Labs, etc.), at European, national and regional levels, involving many different actors. Social computing is now beginning to be included in this research.

Research is needed to determine whether social computing is the driver of change or rather part of a more global wave of socio-economic and technological changes towards a fully digitalized, knowledge-based and networked society. If the latter is the case, would this transform society? And if so, in what way? Through connectivity, mobility, or user empowerment?

Though it is not easy to answer these fundamental questions, we can envisage to understand them better. Ongoing practices should be observed and empirical evidence on the use of social computing by different actors and organizations gathered. It is important to go bottom-up and study the concrete changes in everyday life, in organizations and elsewhere, in order to see how, for instance, new professional networks are created via social computing applications. How is knowledge created and exchanged? How do social computing entrepreneurs work? How are business models established? How are new skills and competences developed? How are social computing innovations being shaped and how are users playing a role? How can more users be consulted (mass consultation and crowd-sourcing)? How are the boundaries between the real and the virtual disappearing (virtual reality and real virtuality)? How is value created with social computing? Other relevant issues are related to the use of social computing for linking and bridging communities, for instance in the research field, so that there is more interconnection between different research communities and research projects.

Research is also needed to better understand the epistemology of knowledge transformation through social computing. What is the impact of free and user-generated online content, such as Wikipedia, on the study of knowledge or on knowledge theories? This would certainly not exclude discussions on reliability and would also have to take into account different kinds and categories of knowledge, how they are acquired, validated, and used, amongst others.

7 The future of social computing

What is the future of social computing? How is it expected to evolve? What will the next stage of social computing be?

The next step would logically consist of web 3.0 but experts agree that there are many different and many possible versions of web 3.0. It will depend on how current and future social and technological trends both converge and diverge: the semantic web, the Internet of things; next generation Internet architectures and infrastructures; next generation computer interfaces, mobile and wireless networks.

Discussion also focussed on the difference between earlier (year 2000) predictions for the future information society labelled as Ambient Intelligence (AmI),¹⁴ and the future of social computing. With AmI, it was predicted that the environment would become intelligent and AmI services would be smart and pro-active, and able to learn user requirements and preferences and act on them. The difference with social computing is that the intelligence is not in the machine but with the humans, through interconnecting, sharing, and networking. A vision of the future internet could thus be the convergence between smart machines (AmI) and smart people (social computing).

But there can be many different versions of this, and many intermediate versions as some applications disappear, others emerge, coincidences take place, and new players come to the fore, some of which will consolidate and others disappear; leading to a reality that might be very different from the one we envisage now. For instance, although the web is becoming ubiquitous and manageable, it is unclear what the defining applications for the next wave will be, as was the case with browsers and web 1.0.

Fragmentation and separation were also mentioned as important trends, at the level of the Internet as a network (different smaller, local networks that are not necessarily interconnected) and at the level of usage. Behind the major applications such as Myspace, Facebook, Youtube and others, there is whole range of new, smaller, local and niche-based social computing applications that are being taken up by users. This fragmentation and localization could also shape how social computing might evolve in the future.

Another term is the implicit web. Social computing relies on attention data of users, on their preferences, reviews, etc. All this data which users create is extracted and used for other purposes, for developing new services and also for marketing, advertising, etc. When this is combined with the Internet of things, the implicit Internet of things would then collect and reuse all digital information of people and exploit it for other purposes which lie outside the computer interface and outside recording interactions. This could be a disruptive potential.

Another question is what will happen with social computing and the Internet if illegal copying of content becomes more and more difficult as DRM systems improve. Illegal p2p content exchange is currently one of the major drivers of Internet traffic. The Internet and also social computing could be very different, if it were to disappear.

There might not even be a next wave of social computing as major changes do not emerge automatically or at frequent intervals. Some experts argue that there is nothing radically new with social computing. Certain things can be done better, faster and on a bigger scale, but many of the processes that are enabled by social computing are not necessarily new.

¹⁴ 'Scenarios for Ambient Intelligence in 2010', Edited by Ducatel K., Bogdanowicz M., Scapolo F., Leijten J. & Burgelman J.-C., 2001, IPTS-ISTAG, EC: Luxembourg. www.cordis.lu/ist/istag

Examples of such processes are identity formation and elaboration, also described as identity computing rather than social computing; augmentation of people's presence and awareness (augmentation computing); lower transaction costs (distributed collaboration); and social networking (social identities). Some of these are quantitative changes that may shift towards qualitative changes as people start to make more innovative use of existing technologies.

Experts argue that the success of social computing is the proof that the semantic web has failed, the former being bottom-up and user-centric and the latter being top-down and technology-centric. It remains difficult to predict however, as we know from the past that the most advanced technologies are not always the ones that survive. In addition, there are different layers of technological development (e.g. infrastructure, applications, interfaces, networks, devices) and different communities of developers with different interests according to their layers. The evolution of technologies will also impact on how social computing evolves.

Mobility and presence are also important trends. Although mobile2.0 has not yet been able to demonstrate its potential, visions of what it will be like already exist, and some are linked to remote presence applications such as Twitter. Micro-blogging was also mentioned, where users contribute with short texts or images, via SMS or MMS for instance.

8 Final remarks

This report presents the major outcomes of an expert workshop on exploring the socio-economic impact of social computing applications in Europe. It does not provide a synthesis of the results of the different IPTS studies that were presented at the workshop but rather offers a structured account of the debate that took place. Therefore, it is only an intermediary step, additional to the key deliverables that are being prepared for this project.

A special challenge for studying social computing is the limited availability and comparability of short and longer term data on the take-up and use of social computing. The recent nature of social computing applications, their strong growth in terms of diffusion and use, as well as continuous changes in technologies, applications and user behaviour are amongst the main reasons for being cautious with secondary data. Although there are clear limits to such an analysis, it was acknowledged by experts that analyzing the best publicly available data on social computing is certainly worthwhile and relevant ("numbers are important"). In addition, the need to have more and better data (including qualitative studies; a value creation approach and looking beyond the stereotypical social computing applications), in order to develop a more comprehensive picture on social computing, was highlighted.

In addition to methodological concerns, there is the substantial issue of how unique and new social computing really is. Though the workshop participants believe there is little radically new with social computing, many issues that have emerged during the last decade "now become entirely possible". Some believe that the major difference lies in the scale and the speed of what is happening, and in the opportunities for user creativity, do-it-yourself and value creation which may give rise to significant changes in content creation and use. Others see a significant shift from a market-based industrial economy to a meaning-based digital economy where value creation is central.

Understanding social computing also requires that we take into account the media ecology, in which other media companies and entertainment opportunities play a role. And there is an even broader context ("the wider picture") that is important: the shift towards a fully digitalized, knowledge-based and networked society. The question was raised as to whether social computing would be the major driver for these changes or just one of many other digital and non-digital trends (e.g. globalization, mobility).

Discussing the socio-economic impact of social computing is a way of understanding the changes that are emerging with its rise. These changes do not, however, necessarily lead to significant new practices replacing existing ones, or to new actors (e.g. companies) replacing existing ones. And a threat to existing practices is not necessarily a disruption of existing practices. To account for these differences, it is therefore important to distinguish between disruptive or sustaining impacts. It is not (yet) clear from the current evidence on social computing, much of which indicates small-scale, down-to-earth changes, whether the impacts are disruptive or rather sustaining. The disruption could also be in the timing and the scale, as mentioned above.

Following the strong growth in take-up of social computing applications, a major issue for the future is the sustainability of both the social computing phenomenon itself and specific SC applications. This is related to establishing a business model that can generate revenues. Similar to other online revenue models, social computing revenues often rely on advertising, subscriptions, paying for specific services and donations. Also, basic services may be for free while additional services are set up to generate revenues. Another strategy for social computing entrepreneurs may be to get acquired by bigger players. It may be useful to

differentiate between internal and external sustainability, and to take into account direct and indirect revenues. Workshop participants confirmed the importance of finding revenues and highlighted that a lot depends on the kind of applications and services being offered. However, if social computing applications can realise their potential to reduce operational and transaction costs of companies, then the sustainability of social computing will be assured. The problem is that today, little is known about how to ensure that this potential is effectively realised.

A number of other important challenges were discussed at the workshop:

- the fact that social computing relies on user contributions does not mean that everybody will become a content producer and that everyone will have the necessary skills and competencies to participate;
- quality, reliability and accountability of user-produced content are important issues that must be tackled;
- the boundaries between the real and the virtual are blurring as life becomes more digital. This has both advantages and shortcomings;
- user-driven innovation and open innovation are strongly enabled by social computing. However, those who participate are usually expert and elite users, so innovation may not be as bottom-up as is often assumed.

This gives us a more critical and sceptical view on social computing which is important to counterbalance naive optimism and to identify risks before they occur. Experts were asked to imagine (1) why social computing would not have a significant impact and (2) what major negative impacts could hinder the realization of the full potential of social computing?

A first group of issues to arise were related to the overrated importance of social computing: it is not a radical innovation; it will not survive in the longer-term; take-up will remain limited; user participation has high costs in terms of time to arrange for it; "technofatigue" by users, and last but not least, barriers related to Intellectual Property Rights and copyrights.

A second group of issues highlighted potential negative impacts, which will discourage further engagement with social computing applications: existing players and vested interests will make sure disruptive impacts are neutralised by taking over the phenomenon; trust will be harmed, misrepresentations of self and manipulations will dominate; privacy infringements will continue to be one of the biggest threats; low quality of content and conformism will prevail since there is no time and/or skills for critical content assessments; social and digital divides will deepen; social computing itself will be misrepresented. This risk assessment exercise provides a first, interesting list of issues which would be useful to research further.

As regards policy options, experts do not believe there is room for direct policy interventions on social computing. Some even argued that there is a risk that policies could be counter-productive and go against the interests of those involved. Suffocating the current rich and innovative scene around SC should be avoided. However, this does not mean there is no room for policy action. The implications of social computing for other policies should certainly be considered, such as for education, health, inclusion and for the policy making process itself. Governments can, for instance, be lead users of social computing applications and use the tools to modernise and reform the public sector. In other fields, such as education, governments can stimulate and promote the development and use of open educational resources and free learning materials in schools.

In addition, policies could be developed to provide the necessary framework conditions that would encourage people and companies (start-ups) to stay in Europe. These policies could

include promoting entrepreneurship and dealing with IPR and copyright issues that might prevent the further development of social computing. There is also room for policy activities that improve social cohesion and limit the exclusion of groups of people such as the elderly and migrants; to support democratisation and eParticipation processes. It could be seen as one of Europe's strengths that it offers services of public and social value that, in this case, would empower people from different cultural backgrounds to benefit from public services enabled by social computing.

An opportunity for Europe would also be to provide better access to public data as such data are typically used in social computing applications (e.g. mash-ups) to provide added value. Opening public data sets to allow citizens to create their own services could provide a boost to the use of social computing, providing adequate privacy and security measures are put in place.

The trend towards more user-led, bottom-up and open processes typifies the real added value that social computing has to offer. This implies that not only the public sector is affected by these changes. Industry, companies (including SME's), other organizations and civil society are also becoming users of social computing applications and hence encounter opportunities for improving existing practices and for experimenting with new ways of doing things to provide added value.

Finally, the future of social computing was discussed. Terms that were mentioned are web 3.0; the semantic web, the Internet of things; a possible convergence between smart machines (Aml) and smart people (social computing); implicit web; mobile 2.0; identity computing; augmentation computing; etc. Relevant trends that were identified are fragmentation, separation, localization, mobility, presence and the evolution of Digital Rights Management and copyrights.

It is clear that this is a fast changing environment and that there could be many different versions of the next wave of social computing, and many intermediate versions. Some applications will disappear, others will emerge, and coincidences will take place. New players will come to the fore, some of which will consolidate and others disappear; leading to a reality that might be very different to the one we envisage now. It will depend on how current and future social and technological trends converge and also on how they diverge. Therefore, it remains important to monitor and study the further evolution and development of social computing in society.

9 Annex

9.1 Agenda

The Socio-economic Impact of Social Computing (SC): validation and policy options workshop

DAY 1 - TUESDAY, 26 FEBRUARY 2008 (IPTS ROOM 116)

09:15 Arrival at IPTS

Session 1: Opening

09:30 Welcome and introduction (M. Cabrera, IPTS) (10')

09:40 Objectives of workshop (Y. Punie, IPTS) (20')

10:00 Presentation of participants (30')

Session 2: Growth in supply and demand of Social Computing (SC) applications: a monitoring and trend analysis

10:30 Presentation of IPTS results (C. Pascu, IPTS) (20')

10:50 Discussion (20')

11:10 Coffee Break (30')

Session 3a: A closer look at SC: The case of collaborative content

11:40 Presentation of IPTS results (K. Ala-Mutka, IPTS) (20')

12:00 Discussion (30')

Session 3b: A closer look at SC: The case of social networking applications

12:30 Presentation of IPTS results (R. Cachia, IPTS) (20')

12:50 Discussion (30')

13:20 Lunch

Session 4a: Economic impacts of social computing

14:30 Introduction (K. Ala-Mutka, IPTS) (15')

14:45 Discussion (50')

Session 4b: Social impacts of social computing

15:35 Introduction ((R. Cachia, IPTS) (15')

15:50 Open discussion (50')

16:40 Coffee Break

Session 4c: What's missing?

17:10 Introduction (D. Osimo, IPTS) (15')

17:25 Post-it session on missing issues (50')

18:15 Close of First Day

21:00 Dinner

DAY 2 – WEDNESDAY 27 FEBRUARY 2008 (IPTS ROOM 116)

Session 5: Key challenges for social computing

09:15 Summary first day discussions (Y. Punie, IPTS) (15')

09:30 Discussion (45')

Session 6: Opportunities for Europe

10:15 Where does Europe stand? Open discussion (30')

10:45 Coffee Break

11:15 What can Europe do? Open discussion on policy options and research challenges (45')

Session 7: The future of social computing

12:00 Open discussion on the future of social computing (45')

12:45 Workshop Conclusions (Y. Punie, IPTS) (15')

13:00 End of Workshop

9.2 List of participants

Caroline Bassett, University of Sussex, United Kingdom

Ronald Beelaard, Board Wikimedia Netherlands

Marco Bettiol, Ca' Foscari University, Italy

Lee Bryant, Headshift, United Kingdom

Claudio Dondi, ScienTer, Italy

Andreas Ebert, Microsoft Corp., EMEA, Belgium

Valerie Frissen, TNO, The Netherlands,

Antonio Fumero, Universidad Politecnica de Madrid, Spain

Ajit Jaokar, Futuretext, United Kingdom

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Nick Kings, British Telecom, United Kingdom

Isidro Maya Jariego, Universidad de Sevilla, Spain

Paul Miller, Schoolofeverything, United Kingdom

James Munro, Patient opinion, Sheffield, United Kingdom

Jaume Nualart, FLOSS, Spain

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Abstract

This report presents the major outcomes of a validation and policy options workshop on social computing, held at IPTS in Seville, on 26-27 February 2008. It points to a number of relevant issues (including methodological and conceptual ones) that need to be taken into account in a study of the socio-economic impacts of social computing. It argues that there is little room for direct policy interventions in social computing but that framework conditions and impacts at sector-level (e.g. education, government) need to be considered. The report also discusses the future of social computing and the opportunities it offers Europe.

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