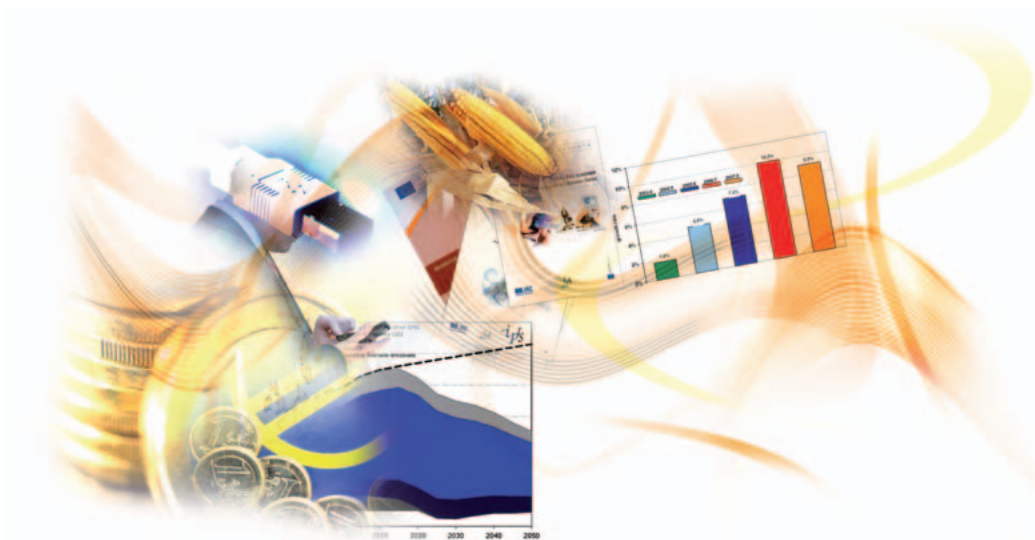# JRC Scientific and Technical Reports

# Public Services 2.0:
## The Impact of Social Computing on Public Services

**Authors: Noor Huijboom, Tijs van den Broek, Valerie Frissen, Linda Kool, Bas Kotterink, Morten Meyerhoff Nielsen and Jeremy Millard**

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JRC
EUROPEAN COMISSION

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Institute for Prospective Technological Studies

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## The Impact of Social Computing on Public Services

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**JRC**
**EUROPEAN COMISSION**

The mission of the JRC-IPTS is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/technological dimension.

*A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server http://europa.eu/*

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# ■ Preface

The social computing trend has been recognised and monitored by the Information Society Unit of the Institute for Prospective Technological Studies (IPTS)[1] since 2005. Given its importance and relevance, and in order to provide support to EU policymakers, an in-house exploratory research project was conducted by IPTS in 2007-2008. This aimed to assess systematically the socio-economic impact of social computing applications in terms of their diffusion and implications for the EU economy and society.

While completing this exploratory research, the IPTS continued to investigate the impacts of social computing on specific public services and their governance (i.e. on areas such as inclusion, health, education and learning,) and also on competitiveness and the ICT/media industries, identity management and the converging mobile ecosystem.[2] This report takes this investigation a step further. It brings together evidence of impacts, points to cross-cutting issues and identifies research challenges and policy recommendations for the future of public services in the EU.

IPTS observed a 'viral' take up of social computing applications but, at the same time, a limited provision of citizen-centred public services by governments. Based on this observation, the question was raised of what role social computing applications could play in generating public value. To achieve a more profound understanding of the impact of social computing on the future of public services, IPTS commissioned TNO[3] and DTI[4] to conduct in-depth research on this topic.

This report is the result of this investigation which was carried out during 2008 and the beginning of 2009. The findings of this research address the phenomenon of social computing and the impact it may have on future government-citizen relations, the organisational and institutional set-up of government, and the nature of the public services it provides.

With this study, IPTS aims to contribute to a greater understanding of the impact of the social computing phenomenon, the implications it may have on the public sector and the ensuing risks and opportunities. We hope that the report provides a lead for policy makers to seize the opportunities of social computing but also to mitigate any undesirable effects.

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1   IPTS is one of the seven Research Institutes of the Directorate General Joint Research Centre of the European Commission (http://ipts.jrc.ec.europa.eu).
2   IPTS published several studies outcome of the exploratory research. These include: The Socio-economic Impact of Social Computing: Proceedings of a validation and policy options workshop, http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1887; Social Computing: Study on the Use and Impacts of Collaborative Content, http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1885; Social Computing: Study on the Use and Impact of Online Social Networking, http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1884; An Empirical Analysis of the Creation, Use and Adoption of Social Computing Applications, http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1684; Web 2.0 in Government: Why and How?, http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=1565
3   Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek (*Netherlands Organization for Applied Scientific Research)*
4   Danish Technological Institute

# ■ Executive summary

Since 2003, the Internet has seen impressive growth in user-driven applications such as blogs, podcasts, wikis and social networking sites. This trend is referred to here as 'social computing' as online applications increasingly support the creation of value by social networks of people. The social computing trend has been recognised and monitored by the Institute for Prospective and Technological Studies (IPTS) over the past few years. IPTS observed a viral take up of social computing applications but – at the same time – a limited provision of citizen-centred public services by governments. Based on this observation, IPTS raised the question of what role social computing could play in generating public value. To answer this question, a more profound understanding of the impact of social computing on the public sector was required. Consequently, the key goal of the present research, commissioned by IPTS, is "to collect and analyse solid evidence, in order to qualify and quantify the significance of the social computing impact and to understand its implications."[5]

A review of the literature on social computing shows that the phenomenon continues to grow in popularity and penetration across the globe. Users all over the world blog, network, tag and review. Social networking sites have entered the mainstream and now attract users across all generations and levels of society. Most users seem to assume a relatively passive role, although recent research shows that the number of active users may be significantly larger than the 1% rule used in most studies. The immense take up of social computing applications has clearly started to impact upon the private sector. New players have entered the news and entertainment

markets, and new business models are emerging rapidly. Current research shows that, in the public sector too, considerable impacts can be found. However, these impacts seem to be broader and more diverse, in line with the multifaceted character of government. The study identifies four categories of impact: political, socio-cultural, organisational and legal.

## Impacts

– <u>Political impacts</u>. The cases studied for this research show that the empowerment and transparency characteristics of social computing initiatives seem to disrupt existing power balances. This impact may be best illustrated by the publication by citizens' watchdog Wikileaks of a confidential government report online, causing a 10% swing in the election results in Kenya. The sharing of information on governments and politics by 'the crowd' enables citizens to hold public officials and politicians to account. People seem more able to come together around a specific subject, where they can enhance their knowledge by exploiting 'the wisdom of the crowd' and thereby exercise influence on government and politics. Furthermore, the instant hype and 'long-tail' mechanisms of social computing platforms seem to support issue-based political involvement. Online, people gather around specific issues and spontaneously self-organise into advocacy groups. Here the representation of citizens may become more fragmented; citizens' participation in social computing platforms is not necessarily related to a specific party ideology. Instead, social computing offers an effective means of mobilising support, disseminating

information and providing advice on specific issues. A difference between party politics and issue-based politics is that the assessment as to whether all groups in society are equally represented in the debate does not take place automatically in the latter.

– Socio-cultural impacts. In the socio-cultural area, the inclusive and horizontal character of social computing applications seems to yield new values. The functionalities of social computing websites and also the members themselves seem to stimulate openness, informality and equality. The design of these websites aims to offer participants equal opportunities to create and share content. Participants behave informally, use informal language and the threshold to introduction is low. For example, in the educational content community Connexions and the doctor's community Doctors.net.uk, senior and junior professionals work together on equal terms, often in stark contrast with how they behave in their offline professional life. Participants are valued more for their knowledge than their seniority and position. These findings are endorsed by the survey carried out as part of this study. It shows that the communities studied share five core values, namely: openness, expertise, informality, community sense and sharing. Furthermore, long-tail and efficient allocation mechanisms in social computing applications seem to stimulate the emergence of new cohesion within communities that have grown up around very specific issues. Another socio-cultural impact is the growing threat to privacy as members publish large amounts of sensitive data online.

– Organisational impacts. In all the cases studied for this research, new players have entered the public arena and new allocations of roles between traditional and new parties are emerging. On PatientsLikeMe, members are taking over support tasks (e.g. advice, support) hitherto carried out by healthcare professionals. On Connexions, teachers

and students generate scholarly material which was previously created by publishers. The survey results indicate that services are changing. Approximately 24% of the respondents from professional communities stated that their daily practice (e.g. the products they provide) has altered as a result of their engagement with the community. 18% found that the quality of their service had improved due to their involvement in the community. Furthermore, the cases reveal that processes and business models are also beginning to change. In all cases, the content creation process is much more bottom-up and horizontal. However, the process is not necessarily more democratic; in most cases we found a strong control over content by the initiating organisation. In addition, we found that online cooperation is crossing organisational and geographical boundaries and that other boundaries, such as language and discipline boundaries, seem to become more dominant. Finally, we found that organisations can become more efficient through the use of Social Computing. In particular, the allocation mechanism of social computing platforms allows for a more efficient match of demand and supply.

– Legal impacts. In all the case studies, we found that existing legislation can come under pressure from activities undertaken within the community. The collaborative content created on Doctors.net.uk and Connexions requires a new, more inclusive type of legal protection, for example through the use of Creative Commons Licences. PatientsLikeMe has – instead of a privacy policy – an openness philosophy. The CEO of PatientsLikeMe stated in an interview that members of PatientsLikeMe simply weigh up the pros and the cons of joining the PatientsLikeMe community and often come to the conclusion that the valuable information they receive through the website outweighs any privacy implications. The information published implies a very

substantial reduction in patients' privacy, since data on their medical condition are accessible to anyone. This may run counter to privacy regimes promoted in public policy. The Wikileaks case shows that new actors are beginning to play an important role in legal procedures and court cases. In Wikileaks, the crowd play an important role in the collection of evidence and lawyers have relied on this type of evidence in a number of cases to support their legal argument.

## Future opportunities

– Transparency. Social computing applications may enhance transparency of citizen demand and government services and processes, as public-sector information is easier to collect, structure and disseminate. This process is likely to empower citizens to hold their public officials to account.
– Citizen-centred and generated services. Forms of social computing can stimulate the accessibility and personalisation of some public services because groups of users are enabled to create those public services themselves or tailor them to their preferences.
– Improvement of efficiency (cost/benefit). Social computing trends may enhance the efficiency of public value production as the knowledge needed to create public value can be built up efficiently (e.g. efficient allocation).

## Future risks

– Ensuring good governance principles. Good governance principles (such as legitimacy, accountability, transparency, integrity, audiatur et altera pars and impartiality) are not automatically ensured in the new models of citizen-generated public service.

– Privacy infringements. As more and more citizens publish highly sensitive information on social networking sites, the potential threat to privacy grows.
– Reliability of published information. Both experts and users question the reliability of the information published on social networking sites.
– Inclusion of all. Skills and resources such as time, knowledge and (in some cases) financial capital may be critical for participation in a social network. In the near future, some groups may be excluded from participation in online social networks.

## Research challenges

More research is required because literature in the area of social computing impact on the public sector is still highly tentative, exploratory and lacks consistent theory building and sound evidence. An overarching conceptual framework should be developed to stimulate a more coherent approach to research in the broad area of social computing impact. This framework could be operationalised by building on the typologies defined in the present study. In-depth research on specific social computing applications, in specific sectors or on specific impacts should be coordinated and set within the conceptual framework. Sector, application and impact-specific studies should be combined, following the general framework so that more generic conclusions on the impact of social computing in the public sector can be drawn while advancing an overall theory. Specific attention should be paid to potentially high-impact and highly disputed topics, such as the effect of citizen-generated services on inclusion of all, privacy and principles of good governance.

## Policy recommendations

– Social computing networks very effectively mobilise the energies of users (citizens) by

allowing them to pool and direct resources at a particular challenge quickly and intuitively, all via the social connection. Even the smallest groups ('niches') of scattered users may succeed in reaching critical mass and thereby thrive. By employing social computing strategies (and 'tools'), government can enlist important niche audiences and leverage their insights. Overall, this would contribute to a higher resolution of 'ground truth' to underwrite policymaking. However, in order to employ social computing strategies, civil servants would need to become intimately familiar with the tools and values of social computing communities.

– Where 'public' value and 'public' service are being generated or directed outside the usual sphere of influence of government, the role of government radically changes. To ensure that core values and rights continue to be respected, governments need to enter this new participative public realm. One way to do this is to open up traditional public service to third-party participation. This would ensure a continuing – albeit more facilitating – role for governments in the design and delivery of public service.

– The downside of citizens expressing themselves on social networking platforms is the growing number of privacy infringement cases. Any privacy infringements could be easily traced back to the perpetrator by enacting new legislation. However, this very legislation may set us on a course towards still further potential privacy infringements, accidental or intended, this time by or through government agencies and third parties operating at arm's length in sensitive public-service domains such as health and education. Any new data-gathering approach or act should therefore be preceded by a cost-benefit analysis that includes the assessment of the short-term and long-term impact on privacy. Monitoring should address in particular any cumulative effects. To create awareness of these issues, critical analysis and 'cyber behaviour' should be taught through formal, informal, life-long learning and vocational learning systems when appropriate and relevant.

– It is most likely that, within a decade, digital illiteracy will decrease as new interfaces become more embedded and intuitive to cater for an ever-wider section of the population. However, studies show that although new generations will be more experienced in using social software, they will not necessarily have the skills to understand the implications (e.g. social or legal) of their behaviour in social networks. Governments need to continuously monitor the risks and effects of high levels of participation in social network sites and to inform citizens about risks, for example through awareness, information and/or education programmes.

– There is much anecdotal evidence that social computing technologies enable (groups of) elderly people and citizens with special needs to support each other, and mobilise and organise themselves. Social computing technologies enable self-organisation and self-regulation. With fewer options for orchestrating and regulating in an increasingly connected world, governments should stimulate the emergence of these mechanisms particularly where they support key public values and goals.

# ■ 1. Introduction

## 1.1 The rise of the social web[6]

In 2004, O'Reilly Media popularised the term 'Web 2.0' – also referred to as the 'social web'- which describes a new and potentially disruptive stage in the development of the Internet. The concept has since become hugely popular - if not hyped - and has thus created as much confusion as consensus about what it really means. There is no coherent definition, rather a conceptual set of principles and practices.[7] The concept originated from the observation that the Internet was far from dead after the burst of the dot.com bubble at the turn of the 21st century. Although the Internet crisis caused a substantial shakeout of Internet firms, it also marked a turning point for the web. A whole new range of successful Internet applications burst onto a scene in which on-line social communities with a strong bottom-up character play the key role, and where the mobilisation (aggregation, syndication) of user-generated content is the main function. The nature of these applications gave rise to the qualification 'the social web'. Most remarkable and perhaps not comparable with what went before is the exponential growth of this new generation of applications, both in terms of the number of applications and the number of users. According to Gantz *et al.* (2007),[8] in 2006 the amount of content created, captured and replicated on the Internet was about 3 million times larger than the information contained in all the books ever written. Their prognosis is that this will keep on growing in the coming years. By 2010, 70% of the content on the Internet will be created by individuals (Gantz *et al.*, 2007: 2). Remarkable too is the lightning speed with which the trend spread. It took barely three years for social computing to grow from a marginal community pastime to become the dominant Internet trend it is today.

According to O'Reilly, behind the success of many Web 2.0 applications are smart ways of using the web as a platform for data management, particularly by exploiting the connectivity and collective intelligence of users. Web 2.0 services exploit connections between users, as these connections provide manifold opportunities to create added value. Not only are users actively consuming content, they are also taking on distribution roles in peer-to-peer (P2P) file sharing, and content creation roles in the case of user-generated content. Users actively rate and tag content (a phenomenon known as folksonomy), download content, comment on it, and discuss it with their peers. Furthermore, users share agendas, locations, bookmarks, documents, photos, videos and even friends, all online and on a large scale. These user roles, combined with the scope and speed of the Internet, provide many opportunities to design new and innovative services. Thus, it is fair to state that one of the crucial features of this second stage of the web is the empowerment of the user.[9]

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6　Pascu C., Osimo D., Ulbrich M., Turlea G. and Burgelman J.C. (2007) 'The potential disruptive impact of Internet 2-based technologies' First Monday, 12(3). Slot, M. & Frissen, V. 'Users in the 'golden' age of the information society", In: Sapio B., Fortunati L., Haddon L., Kommonen K.H., Mante-Meijer E. & Turk, T. (eds), Proceedings of COST 298 Conference Moscow, May 2007 The Good, The Bad and the Unexpected. The User and the Future of ICTs.

7　Madden, M. and Fox, S. (2006) 'Riding the waves of Web 2.0. More than a buzzword, but still not easily defined' *Pew Internet Project* Accessible at: http://www.pewinternet.org/pdfs/PIP_Web_2.0.pdf (retrieved April 2007).

8　Gantz, J.F. *et al.* (2007) 'The expanding digital universe. A forecast of worldwide information growth through 2010' IDC/ EMC.

9　Frissen V., 2004 *De domesticatie van de digitale wereld*. Erasmus Universiteit Rotterdam; Frissen, V. & van Lieshout, M., (2006) ICT and everyday life: the role of the user. In: Verbeek, P., & Slob, A. (eds*.) User Behaviour and Technology Development. Shaping Sustainable Relations between Consumers and Technologies*. Kluwer, Deventer.

In the Web 2.0 era, it is no longer appropriate to conceive of users as 'end-users', as they have moved into the heart of the value chain.[10] They have become important actors in virtually all aspects of online services.

The fast growth and massive uptake of Web 2.0 services are at the origin of a deeper socio-economic impact, the signs of which are only just becoming evident. However, it is still quite difficult to build an empirically sound case for specific impacts since evidence is largely anecdotal and in most cases not systematically gathered and analysed.[11] According to Pascu *et al.* (2007), citizens now have many ways of informing themselves, of expressing opinions and of organising themselves in all sorts of ways, possibly "leading to greater social engagement and providing the basis for a 'glocal' (i.e. simultaneously both global and local) civil society".[12] These authors also point to the 'trust and confidence' being developed in these mediated social networks that is likely to have an important impact on the fabric of society. In economic terms too, impacts are becoming more visible now. O'Reilly concludes about Web 2.0 services: "Network effects from user contributions are the key to market dominance in the Web 2.0 era."[13]

Pascu *et al.* distinguish the following four aspects of the potential economic relevance of social computing:

– the providers of these applications are increasingly profitable (especially the big ones);
– social computing is increasingly contributing to growth and employment;
– these applications are increasingly being adopted as a productivity tool in the private and public sector; and
– in all sectors of the economy, customers seem to be getting smarter thanks to the horizontal exchange of information with other users.

In our view, the massive take up and deployment of social computing may engender a profoundly disruptive socio-economic impact. The transformations that are already wreaking havoc in the telecommunications and content industries are destined to spread to all sectors and spheres of society. The proliferation of 'Peer-to-Peer'(P2P) content networks have put a sudden end to business as usual in the media and content industries, prompting knee-jerk reactions such as incisive amendments to delicate regulatory frameworks as in the case of intellectual property rights. The new positions that users have taken up in the value chain are forcing traditional players in this field to reconsider their business models and restructure their organisations.

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10  See also: Tuomi, I. (2002) Networks of Innovation: Change and Meaning in the Age of the Internet. Oxford: Oxford University Press.

11  Recently, Slot & Frissen (2007) began a more systematic analysis of Web 2.0 services. In March 2007, 150 Web 2.0 services were analysed. These services were selected from the Seth Godin *Web 2.0 Traffic Watch List*. Godin employs the Alexa service to construct the list. This online service measures Internet traffic by storing traffic data provided by users who have installed the Alexa toolbar. Godin uses this data to construct a Web 2.0 traffic watchlist, comprising 952 services. The first 150 services on the list were selected for an analysis of user roles in the services and the way these services generated an income.

12  Cf: Van Bavel, R., Punie, Y. & Tuomi, I. (2004) ´ICT-Enabled Changes in Social Capital´, The IPTS Report, Special issue: Building the Information Society in Europe: the contribution of socio-economic research, Issue 85, June 2004, 28-32. ; See also: Bardoel, J. & Frissen, V., (1999) Policing participation: New forms of citizenship and participation in the Information Society. In: *Communications & Strategies,* 24, second quarter, pp. 203-227. Frissen, V. & H. van Bockxmeer, (2001). The Paradox of Individual Commitment. The implications of the Internet for social participation. In: *Communications & Strategies*, nr. 42, second quarter 2001. Pp.225-258. Frissen V., 2003 *ICTs, civil society and global/local trends in civic participation.* Paper for Workshop ICTs and Social Capital in the Knowledge Society. EC IPTS/DG Employment, Seville, November 2003.
Frissen, V, (2005) The e-mancipation of the citizen and the future of e-government. Reflections on ICT and citizens' participation. In: M. Khosrow-Pour (ed.) *Practicing E-Government: A Global Perspective.* Idea Group Inc.**,** Hershey-London-Melbourne-Singapore-Beijing.

13  http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html?page=2

This shift is resulting in more open and networked business and innovation models, and new regulatory frameworks are necessary in order to be able to take a strong position in these emerging markets. According to Carlota Perez,[14] it takes several decades before the full benefits of a technological revolution can be reaped. Not only a high degree of deployment of the technology, but particularly 'societal re-engineering' and 'creative institutional destruction' constitute the necessary conditions for a real 'golden age' of technological development. The disruptive effects of social computing could be interpreted as the first signs of the phase of 'creative institutional destruction' in the information technology revolution.

It is clear that the social computing trend described here may be of crucial importance to government-citizen relationships and organisational and institutional aspects of government ('governance'). User empowerment also implies citizen empowerment. In a prior study for IPTS on future ICT-driven models for eGovernment,[15] we argued that a shift towards empowerment could be the main driver for the future of eGovernment. This shift will necessarily force governments to seriously (or to follow Perez: creatively) reassess their traditional role and functioning and explore concepts such as 'networked government' or even a 'user-generated state'.[16] There is a growing body of experience and knowledge in the field of social computing to help guide this re-assessment and to explore the opportunities and risks that could result from a shift in government-citizen relationships. One of the key objectives of this project was to systematically collect this evidence for a sound analysis of the future of public services.

## 1.2 ICT and innovation in the public sector

In European policy, high standards in public services are considered a key driver in realising inclusion, social cohesion and quality of life, all cornerstones of the Lisbon goals for the European Union. Overall, a public sector that functions well is expected to be a crucial precondition for economic growth and for making Europe one of the 'most competitive knowledge economies in the world'. ICT in this context is considered to be one of the most promising instruments for the improvement and innovation of public services and the public sector in general, and in application fields such as public administration, healthcare and education. Therefore, in the past decade, national, local and European governments have invested heavily in ICT-enabled public services. Nevertheless, until now the results of these investments have not met expectations, particularly in the public sector, where the take up of e-enabled public services has been relatively low and the anticipated transformation of the administrations not as rapid and radical as was anticipated.[17] In economic terms, the picture is only marginally better. Although we can see clear growth (ICT is making a substantial contribution to productivity gains in European economies, there is a relatively high expenditure on ICT and a renewal of a strong and dynamic ICT sector), this growth is still considerably less than in the USA and in the new emerging economies.[18]

In the public sector, there is little to show for deployment of ICT so far. More and more generic public services are moving online but their take up is still quite limited. In the Netherlands, for example, at first sight take up seems to be acceptable, but a second look shows that online tax returns account for the majority of eGovernment service take up. There is an

14  Perez C. (2002)'*Technological Revolutions and Financial Capital. The Dynamics of Bubbles and Golden Ages'.*
15  Frissen V., Huijboom N.M., Kotterink B. et al, The Future of eGovernment, Research project commissioned by the Institute for Prospective Technological Studies, 2008.
16  http://www.charlesleadbeater.net/archive/public-services-20.aspx

17  OECD, The economic impact of ICT, 2004; OESO.
18  Task-Force on ICT Sector Competitiveness and ICT Uptake.

awareness of the need for making public services more citizen-centric, but this awareness has not yet manifested itself in e-services being fully designed around user needs and preferences. This is in stark contrast to the much more significant success and wide appeal of community- and user-driven ICT applications in civil society and business in recent years.

The public sector is experiencing an endemic and systemic failure in the adoption of much-needed innovations. Applications that have proven their value on a limited scale (e.g. example in healthcare and education) are not being deployed on a wide scale. This is not due to technical limitations but rather to the way in which social services are organised. Key factors limiting the take up and spread of innovations are barriers such as organisational fragmentation, institutionalised distrust and misalignment of financial incentives.[19] Equally important factors are deep-seated cultural, political and social organisations and processes, which make it difficult to introduce new transformative measures such as ICT applications rapidly. This problem is accentuated when trying to implement e-service solutions and innovations across Europe, where the cultural, regulatory and political landscape and traditions are even more complex and fragmented. These factors are now coming to the surface, and are taken into account when developing and in particular analysing impact and trends in public-sector service development. However, despite the awareness, the results of these 'obstacles' persist in the absence of harmonisation and the use of ill-defined business models. The demand for ICT-enabled innovation is not well articulated and is poorly orchestrated at government level. The combined effect of all these barriers may explain the high failure rate of innovation in the public sector.

This points to a more fundamental problem: in order to realise high-quality public service, more profound organisational and institutional changes are urgently needed (we may label this as a need for 'public innovation').[20] Looking more closely at the deployment of ICT in the public sector, we can conclude that up until now ICT has been deployed primarily in an instrumental way and not so much as a driver of more fundamental innovations. ICT is seen as a tool for the modernisation of existing governmental functions by optimising back-office processes and procedures and by streamlining and consolidating information flows for administrative purposes (e.g. Digital IDs, electronic dossiers). This innovation has a strong technocratic character. Zuurmond *et al.* coined the term 'infocracy' to illustrate this government tendency (Zuurmond, 1994).[21] The infocracy obscures the fundamental transformations or creative destruction necessary to allow citizens (patients, students, residents, etc.) a more prominent role in the public value chain.

In the context of the trend described in chapter 2 of the report, this points to two crucial problems for the public sector. First, the paradox between the 'viral' take up of user-driven social computing applications on the one hand and, on the other hand, the slow take up of public services by citizens. ICT-enabled public services do not appeal to users in the same way that social computing applications do. Second, the public sector seems unable to apply ICT in such a way that it produces the necessary organisational and institutional innovation.

If we look at the social computing trend - as argued above - successful applications of ICT need to pair up with more fundamental innovations in business models, value-chain concepts and user/

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19  See for example, Huijboom, N.M. (forthcoming), *Factors that Determine Innovation in Government*, PhD thesis, Erasumus University Rotterdam.

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20  See: Valerie Frissen (2007): 'ICT en maatschappelijke innovatie: *Van pijplijn naar open netwerken' (ICT & Public Innovation: from stovepipe to open networks)*, essay for the Dutch Ministry of Economic Affairs (in the series '*Reflecties op elektronische communicatie*').

21  Zuurmond, A. (2007), De Infocratie: een theoretische en empirische heroriëntatie op Weber's ideaaltype in het informatietijdperk, Den Haag, Phaedrus.

producer relations to produce the leapfrog in innovation dominant in the current crop of Web 2.0 applications. Unfortunately, there are stark differences between the top-down, supply-driven and closed structure of most public services, and the open, decentralised and user-driven organisational models of social computing.

## 1.3   Objectives and methodology

The key goal of the present research is "to collect and analyse solid evidence, in order to qualify and quantify the significance of the social computing impact and to understand its implications."[22] This research goal covers four main objectives:

- To identify the key areas of potential impact of social computing in public services and describe the nature of the impact;
- To assess the weight of these impacts – their significance now and in the future;
- To understand the opportunities and risks of these impacts for future public services, in particular regarding general policy goals;
- To define the policy options and research challenges for grasping the opportunities and avoiding the risks.

The notion of social computing is defined by IPTS as "a recent development of the world wide web, and refers to a new set of ICT applications and to a specific new attitude in using them". In terms of ICT applications, it covers blogs, podcasts, wikis, social networking websites, massive online role-playing games, as well as search engines, auction websites and peer-to-peer services. In terms of attitudes, it focuses on the proactive role of users in participating in the services delivered, and refers to concepts such as user-generated content, user participation, empowerment and long-tail-

type network effects created by participative architectures harnessing collective intelligence.[23]

In order to achieve the research goals described above, the objectives have been translated into six research tasks, namely:

- Review of the relevant trends in public services in Europe,
- Review of literature on social computing uptake and impact,
- Collection of cases of applications of social computing in public services,
- Analysis of key areas of impact,
- Case studies and survey,[24]
- Foresight on prospective impact.[25]

The following figure presents an overview of the research tasks and the interrelationship between them. The research activities are not depicted in chronological order. The literature review summarises and organises documented evidence of social computing as a driver for change in civil society and business.

The review of relevant trends analyses the broader potential for 'user-generated' transformation of the public sector as evidenced in factual trends and normative visions. Case studies collected early evidence of social computing in public services. The analysis of key areas of impact combines the evidence with the potential in order to arrive at likely impact areas in public services. The foresight exercise and the final report study the most significant impact areas to assess their significance (weight) now and in the future, as well as the associated risks and

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22   Institute for Prospective Technological Studies, Technical Specifications, Call for Tenders J04/013/2007, Social Computing and its implications for future public services.

23   See also Pascu C,. Osimo D., Ulbrich M., Turlea G. and Burgelman J.C. (2007) 'The potential disruptive impact of Internet 2-based technologies' *First Monday,* volume 12, number 3.

24   Initially, a survey was not part of the research framework. However, as a survey can contribute to a more quantitative understanding of the impact of social computing trends on public-sector services, it was agreed to incorporate a survey into the research.

25   This activity included meetings with experts to discuss and validate findings and scenarios.

*Figure 1: Overview and relationship of research tasks*
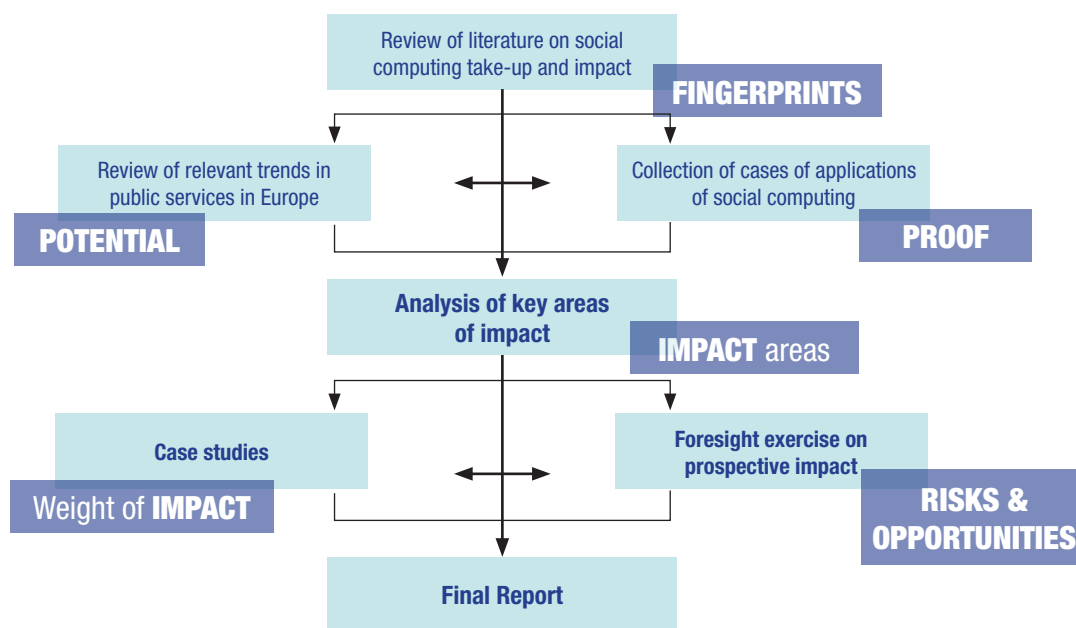
opportunities to inform policy options towards a responsible implication of social computing in transforming the public sector.

For each research task, a methodology was developed to generate solid evidence on types of impact. Different research methods such as desk research, interviews, participative observation and surveys have been applied. The survey method in particular led to a more quantitative understanding of the impact of social computing trends on public-sector services, thereby advancing existing research on social computing. The following table gives an overview of the methodologies applied for each research task.

## 1.4    Limitations of the research

During the study, the research team was confronted with several research constraints. First of all, the scope of the analysis is very broad as well as in-depth, and it proved difficult to provide a comprehensive insight into all the specific impacts within the public-service clusters under investigation (learning, health, inclusion and government). Therefore, it was decided to focus on impacts that were mentioned in literature and on

indications of impact found in case descriptions. It was not possible to validate all references e.g. by searching for and studying contra-references. Therefore, the evidence used in this research must be considered as indicative.

Second, because the unit of analysis of the research is relatively new (social computing), there were some severe scientific blind spots. In some specific fields little or no research has been carried out. Examples are specific cultural impacts (e.g. change of values, beliefs, rituals) of forms of social computing on teachers, the specific organisational impacts (e.g. changing business models) of social networking sites on structures of healthcare institutions and the specific sociological impact (e.g. changing strength of ties) of social computing on minority involvement. The scientific field of social computing is so new that - with all the evidence collected - we can merely identify pointers of impact on the public-service clusters. Moreover, with the perpetual "beta-version" as a defining characteristic of social computing technologies, any research on the status quo will have a limited shelf-life. To mitigate this effect, the study continued monitoring the evidence throughout the lifetime of the project.

*Table 1: Overview of methodology applied to each research task*

| Research Task | Methodology |
| --- | --- |
| Review of relevant trends in public services in Europe to place social computing in the wider context of public-service evolution. | – Desk research[1] of existing studies and key policy documents on trends and normative visions in public services (including current trends in ICT applications). |
| Review of literature on social computing uptake (by citizens and businesses) and impact in order to find pointers for likely impact on public services. | – Definition of key research notions, e.g. social computing and public services<br>– Desk research of academic articles and studies on uptake (by citizens and businesses) and impact<br>– Translation and analysis of likely impact on public services. |
| Comprehensive gathering of cases in social computing adoption in public services (while covering Europe, United States and Asia). | – Definition of selection criteria for cases of social computing in the public sector<br>– Desk research: cases of adoption of social computing in public services<br>– Internet research: cases of adoption of social computing in public services;<br>– Incorporation of selected cases into a database. |
| Analysis of research results deriving from previous tasks in order to identify and describe a set of key areas of expected change in public services. | – Development of an analytical framework for the research findings of previous work packages<br>– Desk research on evidence of impact of social computing trends in public services (government, inclusion, health and learning);<br>– Identification of key areas of social computing impact on public services<br>– Confrontation of likely impact with public service trends and normative visions;<br>– Validation of key areas and divergence/synergy with trends and visions (online validation session in which experts identified divergences and synergies). |
| Case studies and survey | Case studies:[2]<br>– Definition of selection criteria for case studies. Criteria included: (a) indications of impact, (b) coverage of the public service domain as defined by IPTS (health, learning, government and inclusion), (c) coverage of several types of social computing websites (professional, support, crime watch and political) and (d) coverage of initiatives in Europe as well as the U.S.<br>– Selection of four case studies<br>– For each case study: desk research, interviews and participative observation<br>– For each case study: validation of the case study report by initiators of social computing site<br>– Cross-case study analysis.<br><br>Survey:[3]<br>– Definition of selection criteria for social computing websites on which survey is to be published. Criteria included: (a) indications of impact, (b) coverage of the public service domain as defined by IPTS (health, learning, government and inclusion), (c) coverage of several types of social computing websites (professional, support, crime watch and political) and (d) coverage of initiatives in European well as the U.S.<br>– Design of questionnaire;[4]<br>– Selection of social computing websites<br>– Collection of the survey results and translation into graphs;<br>– Cross-survey analysis.<br>NB: The questionnaire has been online for two weeks on 8 websites and has been filled in by 1,406 visitors. 83.5% of respondents completed the whole questionnaire. |
| Foresight exercise on prospective impact of social computing on public services (risk and opportunities). | – Collection of existing foresight research[5] on social computing impact on public services<br>– Selection of the scenario axes (uncertain developments and likely high impact)<br>– Development of 2 scenarios<br>– Analysis of key areas of impact, risks and opportunities of public service social computing<br>– Validation of impact, risks and opportunities of public-service social computing by experts. |

1  Desk research methods of this research are based upon (among others), Patton, M.Q., (2002), *Qualitative Research and Evaluation Methods*, Sage Publications.

2  The case-study methodologies applied are those of Yin R.K., (1994), *Case Study Research, Design and Methods*, Sage Publications and Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis, An Expanded Sourcebook*, Sage Publications.

3  Babbie, E. (2001), *The practice of social research*, 9th edition. Wadsworth Publishing Company.

4  For a sample questionnaire, see Annex 3.

5  The methods used for the foresight research in this study are based upon (among others) Popper, R. (2006) *Selecting foresight methods and tools*, paper prepared for 4SIGHT-GROUP.org, Ringland, G., (2002), *Scenarios in Public Policy*, John Wiley & Sons LTD and Duin, P. van der, (2006), *Qualitative futures research for innovation*, Eburon.

Third, little scientific data could be found on the case studies selected for this research because they are by definition relatively new (most of these online communities were launched only a few years ago). Although searches have been carried out in several academic databases (e.g. Picarta, ScienceOnline and SageOnline), very few scientific articles on the cases could be found. The case studies selected are thus predominantly based on data retrieved from Internet searches (e.g. journalistic articles, interviews with founders of websites), participative observation and interviews. As for the survey carried out for this research, it was outside the scope of the study to generate and study a representative sample from the hundreds of thousands of social computing communities that possibly affect the public service sector. The aim of the survey was rather to yield clues of public sector impact and provide points of departure for further research.

## 1.5   Structure of the report

In Chapter 2 of this report, the social computing trend will be placed in the wider context of an evolving public sector. This chapter will give an overview of relevant government trends and normative policy visions within and across European Union Member States on future public services. Chapter 3 will provide an overview of social computing literature. First, the scope of social computing will be explored and the uptake of social computing applications by citizens and businesses will then be assessed. The chapter will conclude with a typology of potential impacts in the public sector. In Chapter 4, the types of impact – political, socio-cultural, organisational and legal – will be studied in greater depth. For each type of impact, concrete effects of social computing in several public sectors will be explained. Representative cases of social computing impact in the public sector are described in Chapter 5. This chapter also reveals evidence of social computing impact, yielded by the eight surveys published on online social networks. Chapter 6 will depict two possible future scenarios of social computing impact and their related risks and opportunities. In Chapter 7, overall conclusions on the research questions will be drawn. It will provide an overview of the level of usage, general characteristics, impact, drivers and future risks and opportunities of social computing initiatives in the public sector. The chapter will conclude with an overview of research challenges and policy recommendations. Finally, references, a list of stakeholders involved, a sample questionnaire and detailed survey results can be found in the annexes.

# ■ 2. Trends in public services

In this chapter, the social computing trend will be placed in the wider context of an evolving public sector. Public sector trends and normative policy visions within and across European Union Member States will be reviewed. This background information is necessary not only to understand the societal and political context in which the social computing trend takes place, but also to detect divergences and synergies between the social computing trends and current developments within the public sector. The chapter is structured around the four key public-sector domains identified by IPTS: government, learning, inclusion and health. An overall analysis of the trends in government will be provided in the final paragraph of this chapter.

## 2.1 Government

Governments in Europe face an increasing number of challenges such as ageing populations, immigration, climate change and globalisation. The globalisation trend has limited the freedom of governments to manage their national economies and new challenges such as immigration and an ageing population seem to be fundamentally affecting the scope of public sector activities. At the same time, society's expectations of public service delivery have by no means diminished as citizens from the 1980s onwards have become more concerned with choice and service quality. The paradox faced is one of open-ended demand versus a capped or falling resource share for actual delivery.[26] Consequently, public administrations are under constant pressure to modernise their practices to meet new societal demands with reduced budgets. The following overview gives insight into the key factual and visionary trends in government:

– *Evidence based policy making, reorganisation and the business case*. This trend is linked to the issues of limited resources and increasing demands by citizens for more and better services. As taxpayers, citizens increasingly expect governments to justify their decisions. Consequently, the importance of evidence based policy making grows at all levels of government.

– *Goal driven policy making*. As a trend, goal-driven policymaking can be divided into two sub-trends, (1) effectiveness, efficiency and value for money, and (2) evaluation, evaluation criteria and assessment. Increased attention to the first sub-trend is driven by the pressure on governments to address issues such as demographic change, growing expectations of citizens and lack of financial resources.[27] The second sub-trend emerges as a consequence of the increased attention to performance management.[28]

– *Simplification of processes and organisation*. Simplification of processes is a key priority in most public sector reforms. Issues of importance include efficient structures and processes and administrative burden reduction for citizens and businesses.[29]

– *Privatisation, outsourcing and market mechanisms*. One of the ways in which public administrations are increasingly

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26  See for example: OECD (2005), Public Sector Modernisation: The Way Forward, OECD Publications.

27  For the importance of public sector reform, see also http://eupan.essenceserver.com/files/repository/project/ SurveyPublicSectorReform/PublicSectorReformUnit

28  See for example: OECD (2005), Public Sector Modernisation: The Way Forward, OECD Publications.

29  See, for example, the OECD paper on administrative simplification (OECD, 2003) and European Commission, 2005c and d, Communication on a strategy for the simplification of regulatory environment, European Commission, Brussels.

trying to increase value for money is through privatisation, outsourcing and letting the market provide a given service.

– *Good governance*. Good governance, as a concept, is increasingly used in the literature and may be seen as a set of interconnected issues including eight major characteristics, i.e. participation, rule of law, transparency, responsiveness, consensus orientation, equity and inclusiveness, effectiveness and efficiency, as well as accountability.[30]

– *Decentralisation, devolution and subsidiarity*. Across Europe there is a growing trend towards decentralisation, local ownership, putting more power in the hands of regions and an acknowledgement that most services are delivered by the local rather than the central authority. This trend is becoming more visible in European reforms and visions.[31]

– *Democracy, participation and inclusion*. This trend is an integral part of the founding principles of EU policies. The promotion of European diversity by fostering participation and inclusion in a democratic society based on values such as freedom, tolerance, equality, solidarity though pluralism, cultural and linguistic diversity is at the heart of many policies.[32]

In relation to the information society and the use of ICT in governments, a number of complementary but at times also unique eGovernment trends come into play:

– *Effectiveness and efficiency*. eGovernment trends in this area follow naturally from effectiveness and efficiency policy goals, as ICTs are perceived to be the means to achieving an efficient and effective government (e.g. through eServices).[33]

– *eGovernance.* eGovernance is distinct from eGovernment as it is concerned with management and organisation cultures, eSkills and eCompetences. In contrast with eGovernment, eGovernance involves the impact of ICTs on the regulatory and policymaking functions of the States.[34] The increased attention to eGovernance becomes apparent when considering the growing body of research and policy on management, organisational culture, eSkills and eCompetences.[35]

– *Interoperability, standards and architecture*. The move towards interoperability, standards and architecture is related to trends of privacy and data protection, ICT know-how, the development of technology, emerging standards and new types of service delivery channel.[36]

– *eParticipation*. This trend covers the emergence of eDemocracy and eInclusion, as well as the way in which civil society and NGOs, citizens, businesses and other stakeholders and intermediates interact.[37]

– *Empowerment*. Empowerment revolves as a trend around the citizen, freedom of information, the transparency of decision

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30 See for example: The Swedish Statskontoret's "Principles of Good Administration" (Statskontoret, 2005). Also UNDP, UNDESA and World Bank have published many reports on Good Governance, see for instance: Daniel Kaufmann and Aart Kraay (2008), Governance Indicators: Where Are We, Where Should We Be Going? World Bank, Washington.

31 See for example: Maastricht Treaty, European Commission, Brussels, Treaty of Amsterdam, European Commission, Brussels, and European Commission, Regional Cohesion policy, European Commission, Brussels.

32 See for example: European Commission (2001), eEurope 2002 - An information society for all, COM(2001)140, DG INFSO, Brussels. European Commission (2002), eEurope 2005 - An information society for all, COM(2002) 263, DG INFSO, Brussels.

33 See for example: http://ec.europa.eu/information_society/activities/egovernment/docs/e_e_2007_2010.pdf

34 See, for instance, Misuraca et al (2007, 2008).

35 See for example: European Commission (2006a), Riga Ministerial Declaration – eInclusion, European Commission, Brussels, European Commission (2006b), i2010 - An Information Society for growth and employment, COM(2002)229, DG INFSO, Brussels.

36 See for example: eEurope Advisory Group (2004), eEurope Advisory Group of leaders of national eGovernment initiatives, Working Paper on eGovernment Beyond 2005 - An overview of policy issues, European Commission DG INFSO, Brussels, European Commission (2004), Action Plan for the implementation of the legal framework for electronic public procurement, European Commission DG INFSO, Brussels.

37 See for example: http://ec.europa.eu/information_society/events/ict_riga_2006/index_en.htm

making and information, choice and access, and ability to communicate directly with other individuals, interest groups and decision makers.[38]

## 2.2 Learning

In recent years there has been considerable focus on new trends in education and training with a strong focus on harvesting and systematising innovation, digital resources and digital possibilities.[39] These trends are influenced by several societal developments, including a changed demography, increased internationalisation and globalisation which, for example, imply the participation of new stakeholders offering new types of content and services. There is a need to understand the possibilities for innovative solutions that benefit individual learners (including a digital generation demanding more sophisticated teaching methods, adult learners and early school leavers). In the area of skills, workforces need new types of skills to match trends such as internationalisation and immigration. The awareness that European countries need to develop relevant services and policies for learning and training across Europe has grown over the years. This is emphasised in the many documents from organisations such as the OECD, the CERI unit, UNESCO, Cedefop, the European Commission and IPTS. The main trends in the learning domain can be summarised as follows:

– *Changing skills and competences*. The trend towards increased specialisation raises the demands for new skills to work in collaborative working environments. In addition, the digitisation of work processes requires new IT competencies both at the user and professional level.[40]

– *Migration and offshoring*. The migration of workers from Eastern to Western European countries requires the rethinking of education policies as this group of migrants needs specific training. Another trend which may affect the education sector is the shift of specific categories of work (mostly IT support) from European towards Asian countries.[41]

– *Diversification of life and learning trajectories*. Trends, such as fast changing work processes, blurring of school and private environments and new, informal learning settings are putting pressure on the sector to absorb these changes. It raises the need for skilling in the workplace, coping with private learning demands and developing of informal learning modes.[42]

– *Lifelong learning and new competence acquisition*. Lifelong learning policies are increasingly seen as important for economic growth, competitiveness, quality of life and active participation of all.[43]

– *Evidence-based learning policy*. This trend entails the growing attention to the perceived need to develop a solid statistical and research base for the improvement of educational policy. Benchmarks are generally

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38  See for instance European Commission (2006a), Riga Ministerial Declaration – eInclusion, European Commission, Brussels.

39  See for example: the OECD's initiative New Millennium Learners.

40  See for example: European Commission (2001), 'Making a European area of lifelong learning a reality', Brussels, European Commission (2006c), 'Delivering on the modernisation agenda for universities: education, research and innovation', 10 May 2006, Brussels, European Commission (2005a), Communication to the Spring European Council – Working together for growth and jobs. A new start for the Lisbon Strategy, Brussels.

41  See for example: European Commission (2003), Expert meeting on offshore outsourcing, Brussels
OECD (2004), Potential offshoring of ICT-intensive using Occupations, Interim Report,
OECD (2006), The share of employment potentially affected by offshoring – an empirical investigation'.

42  See for example: OECD and Punie, Y. (2007), 'Learning Spaces: an ICT-enabled model of future learning in the Knowledge-based Society', European Journal of Education, 42(2), pp. 185–199.

43  See for example: European Commission (2006d), European Education and training progress on the Education and Training programme', Brussels, European Commission (2007a), Action Plan of Adult learning, European commission (2007b), Lifelong Learning Programme (2007-2013), Brussels.

seen as an essential way of monitoring the effects of policies and practice.[44]

– *Efficiency and return on investment.* The education sector is under increased pressure to organise educational processes more effectively and efficiently and to ensure a return on investments.[45]

– *Education content.* A change can be perceived in the traditional way scholarly material has been developed hitherto. More stakeholders are being involved, a trend which is likely to continue as content-creation tools will become cheaper, more widely available and easier to use.

– *Greater choice in schools.* A strong tendency has been the call for greater choice in schools for parents. Also the trend of families moving to the city where the preferred school is based is growing.[46]

In relation to the developments towards an information society, a number of complementary but at times also unique eLearning trends come into play:

– *ICT infrastructures and pervasive technology.* Networks and connectivity are seen as critical to the development of successful eLearning infrastructures. The trend towards pervasive technologies is becoming apparent in mobile learning facilities such as mobile access

for people in remote places, disadvantaged regions and developing countries.[47]

– *Learner empowerment, user-created content and the participative web.* Learners are becoming active owners of their learning processes. Online services are becoming centred on their users, or even co-built with users. In addition, learners are increasingly involved in content creation.[48]

– *Digital literacy, eSkills and competences.* As ICTs are embedded in the everyday life of citizens, ICT skills and competencies are seen as key contributors to the knowledge society. Consequently, there is increased attention to digital literacy, eSkills and competences.

– *New teaching environments.* There is an increased use of new virtual teaching environments such as games, open education environments and online learning applications.

– *ePortfolio and curricula.* A last trend is the growing attention to the use of e-portfolios. Increasingly, students and professionals are publishing their portfolio and/or curricula online (e.g. on websites such as LinkedIn).

## 2.3 Inclusion

Today, inclusion is more widely thought of as the practice of ensuring that people in a given societal or organisational setting feel that they belong, are engaged, and connected to society or organisation. In Europe, inclusion is considered an all-encompassing practice of ensuring that people with different abilities belong, are

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44  See for example: European Council (2004), Conclusions on new indicators in education and training', Brussels, European Council (2007), 'Council Conclusions on a Coherent Framework of Indicators and Benchmarks, Brussels. European Commission (2007c), 'Towards more knowledge-based policy and practice in education and training', Brussels, OECD- CERI, 2007, 'Evidence in Education, linking research and Policy'.

45  See for example: European Commission (2004b), Implementation of the education and training 2010 work programme. Mapping Analysis, Brussels, European Commission (2007d), Communication from the Commission to the Council and to the European Parliament on equity in European education and training systems, Brussels.

46  See for example: UK Department for Education and Skills (2005), Schools White Paper "Higher Standards, Better Schools for All - More Choice for Parents and Pupils".

47  See for example: European Commission (2004b), 'Implementation of Education and Training 2010 work programme', Brussels, EUN (2006), Monitoring and Benchmarking access and use of ICT in European Schools, BECTA (2005), ICT and eLearning in further education. The challenges of change.

48  See for example: European Commission (2004c), 'Facing the Challenge: The Lisbon strategy for growth and employment', Brussels, European Commission (2006a), eInclusion Riga Ministerial Declaration, Brussels, Finland ICT strategy (2006), 'A Renewing, Human-Centric, and Competitive Finland The National Knowledge Society Strategy 2007–2015', Helsinki.

engaged, and are connected to society. That being said, Europe is by no means homogeneous in relation to the degree with which inclusion as a topic or a definition is influenced by local conditions. Basically there are two overarching trends identified within the field of inclusion. First, there are various types of existing and emerging divides (e.g. eSkills) and, second, an increasing demand by citizens and businesses for high quality government services. More specifically, the following sub-trends affect inclusion policy:

– *Divides*. The divides which are recurrently addressed by European and national policies include the digital, geographical, economic, socio-cultural and the disability divides.[49]
– *Competences, skills and training*. Although skills and competences have already been mentioned in this chapter in the paragraph on learning, they should also be mentioned here because they are increasingly considered to be a cornerstone to ensure the inclusion of all.[50]
– *Democratisation and participation of all*. As a trend, active participation of all in the democratic decision-making process should be seen as part of an increasing demand on the part of citizens and businesses to have influence on government policy.[51]
– *Organisation and management of public administrations*. Emerging one-stop-shop concepts, personalised services and serving citizens with special needs require new organisational structures of governments.

In relation to the information society, a number of complementary but at times also unique eInclusion trends come into play:

– *eAccessibility, quality of life and assisted living.* eAccessibility policies aim to empower people to fully benefit from ICT in society. Quality of life and assisted living in relation to ICT are playing an increasingly important role in improving autonomy and safety (e.g. of the impaired and elderly).[52]
– *Bridging divides by means of ICT.* On the European as well as national level, policy-makers perceive ICT as an enabler to bridge existing and emerging divides. ICT may, for example, promote social and economic prosperity in rural areas, remote regions and economically disadvantaged regions. In addition, there is a growing attention to the fostering of pluralism in digital spaces and cross-national access to digital information and cultural heritage.[53]
– *Digital literacy, skills and competence.* Wide attention is being paid to the knowledge and ability of citizens to use computers and technology efficiently. However, European Member States have different views on how digital literacy relates to the competitive position of a nation in the knowledge society.[54]
– *eDemocracy and eParticipation.* ICT is often perceived by national and EU policy makers as an enabler to stimulate democratic participation of citizens. On both the European and Member State level,

49 See for example: European Commission (2005b), Report on Social Inclusion 2005 - An analysis of the National Action Plans on Social Inclusion (2004-2006) submitted by the 10 new Member States, Brussels. European Commission, Brussels European Commission, 2000, Social Inclusion Process, European Commission, Brussels European Commission, European Social Protection Social Inclusion Process, European Commission, Brussels.
50 See for example: European Commission (2000), European Social Protection Social Inclusion Process, Brussels, European Commission (2001), Mobility Action Plan, Brussels, European Commission (2001), eLearning Action Plan, Brussels.
51 See for instance European Commission (2001), eEurope 2002 - An information society for all, COM(2001)140 l, Brussels, European Commission (2002), eEurope 2005 - An information society for all, COM(2002), 263, Brussels.

52 See for example: European Commission, Inclusion, better public services and quality of life, European Commission, Brussels European Commission, 2002-2006, 6th framework programme, European Commission, Brussels European Commission, 2002-2006, 7th framework programme, European Commission, Brussels.
53 See for example: European Commission (2001), Inforegions - regional policy, Brussels, European Commission (2006), Bridging the Broadband Gap, COM(2006) 129, Brussels.
54 See for example: European Commission (2007), European i2010 initiative on e-Inclusion - To be part of the information society, COM(2007)694, Brussels.

all manner of ePetition, eDeliberation and eLegislation projects have been launched.[55]

## 2.4  Health

Several key trends are influencing the policies that are being developed, both on a European and national level. Important trends include demographic developments such as ageing, which are likely to increase the demand for healthcare services. Another emerging trend is the growing competition within the healthcare market. This development may increase the mobility of both patients and health professionals.[56] Dominant are also the growing expectations and empowerment of patients, trends which will affect the future healthcare sector in the sense that patients will ask for more personalised and high-quality services and will take over some traditional healthcare tasks. Another dominant trend that we are witnessing is the ever-growing budget constraints that healthcare organisations face. Healthcare providers are increasingly forced to focus on the cost-efficiency of treatments, thus obtaining maximum "value for money". More specifically, the following sub-trends can be discerned:

– *Reaffirming health values*. A major trend in health policies is the aim of reaffirming basic values in healthcare on a European level.[57] Four basic values have been identified by the European Council as central to health policy: universality, access to good-quality care, equity and solidarity.[58]

– *New framework for health services*. As a result of the rapid development within the area, key actors have identified the need for a new framework to provide greater legal certainty in terms of liability regarding health products and services, within the context of existing product liability legislation.[59]

– *Patient empowerment*. There has been a development towards a larger role for patients in their own treatment.[60] This has manifested itself in different ways, but in general patients have been increasingly empowered to participate in decisions concerning their own illnesses.

– *Health infrastructure*. Health infrastructure can be defined as all the parts within the health system that work to help health professionals provide essential health services. The health infrastructure in the Member States is currently undergoing changes that will direct the focus to more life-science-oriented R&D, ICT-enabled infrastructure and ICT-oriented R&D.[61]

– *Focus on health economy*. A healthy population has been repeatedly noted as a significant contributor to economic growth and prosperity.[62] This makes health policy important for the overarching goals of the Lisbon Agenda.[63]

– *Global health governance*. A number of reports highlight the challenges posed to healthcare providers by the globalisation of health issues.[64] In line with this, it has been

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55  See for example: European Commission (2006), eParticipation Initiative, Brussels, European Commission (2007), CIP ICP PSP draft, Brussels, European Commission, 2002-2006, 6th Framework Programme, European Commission, Brussels.

56  European Commission (2007g), eHealth Action Plan – Progress Report 2005, Brussels

57  See for example: WHO (2000), *The world health report 2000 - Health systems: improving performance*, NY Also, the Millennium Development Goals are in line with this: http://www.who.int/mdg/en/

58  European Council (2006) 2006/C 146/01: Council Conclusions on Common values and principles in European Union Health Systems, Brussels.

59  European Commission (2007g), eHealth Action Plan – Progress Report 2005, Brussels.

60  OECD (2005b), Transforming Disability into Ability, OECD (2005c), Long-term Care for Older People.

61  OECD (2005d), Health Technologies and Decision Making, Artmann, J. *et al.* (2007): Scenarios for ICT-Enabled New Models of Health Care, Brussels.

62  OECD (2004c), Towards High-performing Health Systems, OECD (2007b), International Migration Outlook 2007.

63  See for example Suhrcke M., McKee M, Sauto Arce R., Tsolova S., Mortensen, J. (2005): The contribution of health to the economy in the EU, Brussels or Gabriel, P. & Liimatainen, M.-R. (2000): Mental Health in the Workplace. International Labour Organisation: Geneva.

64  See for example WHO (2006a), The world health report 2007 - A safer future: global public health security in the 21st century or WHO (2006b), Health and Economic Development in South-Eastern Europe or OECD (2007b), International Migration Outlook 2007.

stated a priority for the EC and its Member States to create better health outcomes for EU citizens and for others through sustained collective leadership in global health.[65]

In relation to the information society and the use of ICT in the healthcare sector, a number of complementary but at times also unique *eInclusion* trends come into play:

– *Assisted living*. Personalised systems for monitoring and supporting patients can facilitate assisted living, a trend which is particularly relevant for elderly and/or disabled citizens.[66]
– *Community of care*. Digital platforms can enable more effective networking among clinical institutions.[67] Electronic health records enable the extraction of information for research, management, public health or other related statistics of benefit to health professionals.[68]
– *Evidence-based support to professionals and management*. There is an increased attention to eHealth applications that can securely process large amounts of integrated data are perceived as being essential for good management.[69]
– *ICT infrastructure*. With its focus on interoperability and integration as crucial concerns in eHealth, the Commission has

stressed that developing an up-to-date ICT infrastructure is a major concern.[70] Given that patients are mobile, interoperability of electronic health records will also improve conditions for treatment in other European Union countries.[71]
– *eHealth economy*. The need for cost-efficient provision of health services or "value for money" in healthcare has highlighted the benefits of using ICT applications. The eHealth economy relates to the development and use of ICTs to the improvement of the efficiency and effectiveness of the sector.[72]
– *ICTs in the healthcare sector*. Wide attention is being paid to ICT as enabler to improve care.[73] Access to information has been a crucial element, both in empowering patients and supporting professionals in their everyday practice as a professional.[74] In addition, personalised health systems will facilitate the assisted living approach and help shorten hospital stays. Finally, eHealth applications are essential in reducing costs and making health systems more productive and cost-efficient.

## 2.5 Conclusions

When cross-analysing the trends within individual sectors, it may be clear that many developments have similar characteristics across all domains. In addition, it seems that the general

65 European Commission (2007h), White Paper - Together for Health: A Strategic Approach for the EU 2008-2013, COM (2007) 630, Brussels. This also follows from Article 152 calling for cooperation with third countries and international organisations in public health and from the Commission's strategic objective of Europe as a World Partner (Annual Policy Strategy for 2008 - COM(2007) 65).
66 See for example: European Commission (2004d), e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area, COM(2004) 356, Brussels, Artmann, J. *et al.* (2007): Scenarios for ICT-Enabled New Models of Health Care.
67 European Commission (2004e), COM(2004) 301: Follow-up to the high level reflection process on patient mobility and healthcare developments in the European Union, Brussels.
68 European Commission (2004d), COM(2004) 356: e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area, Brussels.
69 http://www.epractice.eu/ehealth

70 European Commission (2007g), eHealth Action Plan – Progress Report 2005, Brussels
71 European Commission (2004d), COM(2004) 356: e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area, Brussels.
72 See for example: European Commission (2007i): Accelerating the Development of the eHealth Market in Europe, Brussels, European Commission (2004d), COM(2004) 356: e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area, Brussels.
73 This has been noted in several reports and has resulted in many initiatives (see for example http://www.oecd.org/document/16/0,3343,en_2649_37407_1895632_1_1_1_37407,00.html)
74 European Commission (2004d), COM(2004) 356: e-Health - making healthcare better for European citizens: An action plan for a European e-Health Area, Brussels.

trends within a sector do not fundamentally differ from the digital trends. For example, the changes to government are not essentially different in eGovernment. The picture that is emerging across the four domains can be captured in the following core policy trends:

- *Greater transparency and accountability of the public sector*. In all domains a demand for a more transparent and accountable government can be discerned. Many European Union Member States have put transparency and accountability policies in place.
- *Improved accessibility of public services*. An increased awareness and perception of the needs and wishes of customers is resulting in a drive towards greater choice and accessibility of public services.
- *Efficiency*. In all sectors we found increased attention to efficiency. As in many sectors, government institutions face considerable budget cuts, achieving efficiency is an urgent priority.
- *Quality and effectiveness of the public sector*. This trend is also driven by dwindling public finances. Many policies are aimed at delivering cheaper solutions while ensuring quality.
- *New models of governance and new stakeholders*. A trend that can be discerned in all domains is the emergence of new partnerships, the involvement of intermediaries and the acknowledgement of

new stakeholder roles. Citizens, civil society and advocacy groups are increasingly empowered to organise themselves and play a role in public-service delivery.
- *Stronger evidence-based policy*. A resurgence of governance models that value principles such as justification, monitoring and evaluation reaffirms the principles of evidence-based policy as a necessity for making informed decisions.
- *Citizens' empowerment, expression of diversity, choice*. The role of users is being re-evaluated in a way that acknowledges their new-found skills and growing empowerment. The principles of facilitating increased participation, user-created content, user engagement, increased independence and ownership of public services applies to all domains.
- *Improved digital competencies, bridging the digital divide*. As in all domains, technologies are playing an increasingly important role in the provision of public services, in all sectors questions are arising as to the ICT skills of citizens required to have access to those services.
- *Promotion of independent living and self-organisation*. Policymakers in all sectors acknowledge that ICTs can play an important role in the empowerment of citizens. In many countries, ICT policies aim at enhancing the independence of citizens – for example the elderly.

# ■ 3. Social computing literature

This chapter will provide an overview of the existing literature on social computing.[75] First, the scope of social computing will be explored. The history of the phenomenon will be sketched and a definition will be provided. Subsequently, uptake by users will be explored for each of the social computing roles (e.g. consuming, communicating, facilitating, sharing and creating) as well as uptake by businesses. The chapter will conclude with an elaboration on the potential impact in the public sector and a typology of public sector impacts.

## 3.1 The scope of social computing

The history of social computing and social software is deeply entangled with the evolution of the (personal) computer and the Internet. The earliest mention of something akin to collaborative computing predates the computer itself. In a visionary article on the future of computing, Vannevar Bush (1945)[76] conceives of a device he called the 'memex' that evokes the image of a personal computer. Bush may be the first to introduce the hyperlink notion when he discusses how personal data stored on the memex meshes with data on a friend's memex in a process out of which 'Wholly new forms of encyclopedias appear, ready-made with a mesh of associative

trails running through them, ready to be dropped into the memex and there amplified'.

In an authoritative blogpost,[77] Christopher Allen (2004) traces the history of social software through the rise (and fall) of notions such as Arpa's Augmented Computing (Doug Englebart, 1962[78]), Bulletin Board System front-runner 'EIES' (Turoff, 1972[79]), Groupware in the 1980s (Johnson-Lenz, 1978[80]), Computer-supported Collaborative Working (CSCW, 1984) and Groupware in the 1990s (Johansen, 1988[81]). The actual term 'social software' surfaces in the eighties (Drexler, 1987[82]) but only really takes off after 2002 when it is used to describe the new kind of social networking tools that seem to drive a new generation of web communities. Adina Levin from Social Text[83] describes the emergence of this new breed of social software:

> "Several years ago, in the depths of the tech recession, there were signs of creative life in weblog and journal communities, conversation discovery with daypop and then technorati, the growth curve of wikipedia, mobile games, photo and playlist sharing. The liveliness was about the communities, and also about the

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75   During our literature study we found that sound data on the uptake and impact of social computing applications is lacking. This conclusion has been endorsed by the OECD, which found that "*In order to make informed policy recommendations regarding user created content official data is necessary. However, there is a lack of internationally comparable data on user created content from national statistical sources, and of knowledge on changing usage habits. As a result, it is often hard to accurately assess the statistical, economic, and societal effects of user created content and to devise appropriate policies*".

76   Bush, V. (1945), *As We May Think*, , available at http://www.ps.uni-sb.de/~duchier/pub/vbush/vbush.shtml

77   Allen, C. (2004), Tracing the Evolution of Social Software, see http://www.lifewithalacrity.com/2004/10/tracing_the_evo.html

78   Englebart (1962), *Augmenting Human Intellect: A Conceptual Framework*, available at: http://www.bootstrap.org/augdocs/friedewald030402/augmentinghumanintellect/ahi62index.html.

79   Turoff, M. (1972), Delphi conferencing: Computer-based Conferencing with Anonymity, available at: http://web.njit.edu/~turoff/Papers/DelphiConference.pdf

80   Johnson-Lenz, P. and Johnson-Lenz, T. (1978), *Humanising Hyperspace.*

81   Johansen, R. (1988), Groupware: Computer Support for Business Team.

82   Drexler, E. (1987), *Hypertext Publishing and the Evolution of Knowledge.*

83   Levin, A., http://alevin.com/weblog/

■ *Figure 2: Popularity of the terms 'social software',' social computing' and 'Web 2.0' according to Google Trends*
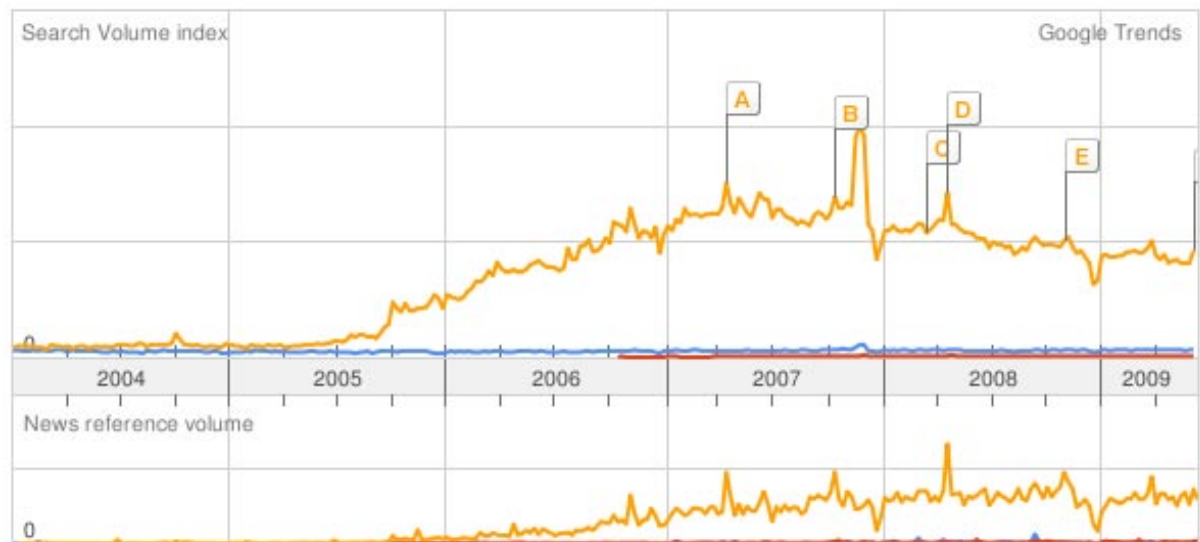


culture of tool mix'n'match bricolage. Many of the attributes of social software –– hyperlinks for naming and reference, weblog conversation discovery, standards-based aggregation –– build on older forms. But the difference in scale, standardisation, simplicity, and social incentives provided by web access turn a difference in degree to a difference in kind."

She makes a key point when she attributes the rise of this new kind of social software or social computing to the critical mass and scale afforded by mass deployment on a ubiquitous web. Cheap broadband access to the Internet turned the personal computer (and subsequently the telephone, the PDA, the mp3) into an ultimate collaborative device. The outburst of web technologies and web services that ensued, marks the beginning of an era in which harnessing the collaborative potential of mass numbers of users accessing the web is likely to be a prime driver of growth. The phenomenal interest in the community-centric Web 2.0 platform (see Figure 1 below) reflects a realisation that this new era is all about connecting people not computers. This new web is a social and participative one.

According to Forrester Research (2006):[84] 'a new social structure is emerging in which technology puts power in communities, not institutions'. Forrester calls this evolution Social Computing. 'Sounds like Web 2.0, right? We think not. And here's why: Web 2.0 is about specific technologies (blogs, podcasts, wikis, etc) that are relatively easy to adopt and master. Social Computing is about the new relationships and power structures that will result. Think of it another way: Web 2.0 is the building of the Interstate Highway System in the 1950s; Social Computing is everything that resulted next (for better or worse): suburban sprawl, energy dependency, efficient commerce, Americans' lust for cheap and easy travel'.

Here Forrester depicts Web2.0 as the service platform on top of which new relationships and new power structures will emerge. From Dion Hinchcliffe's blog on Enterprise 2.0:[85]

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84 Charron C., Favier J., and Li C.(2006), Social Computing How Networks Erode Institutional Power, And What to Do About It, Forrester, http://blogs.forrester.com/charleneli/2006/02/forrsters_socia.html

85 http://blogs.zdnet.com/Hinchcliffe/index.php?p=21

*Figure 3: Social Computing user roles, Slot (2009)*



"Consequently, it appears that the two-way Web is increasingly moving the power out of the hands of trusted institutions and into the hands of everyday users, who decide for themselves what products they should buy, whose information they should consume, what marketing they want. Thus, online communities are increasingly driving the vision of institutions because these technologies put the majority of power into the hands of communities, essentially take it away from existing formal social structures and organisations…Forrester in particular recently told me their customers are increasingly tracking this and they believe this shift is affecting all major industries, not just media, which up to know has borne the brunt of the disruptive changes driven by the increasingly pervasive and immersive Web".

While Web2.0 tools and technologies facilitate a mass deployment and uptake of new, community-centric web-based services, the real story is that through social computing these communities are beginning to disrupt existing power structures and driving new institutional arrangements. The present study therefore focuses on the dynamic of user creativity and

social networking unleashed with the emergence of the Web as the key platform for social computing (somewhere around 2003[86]). Based on the considerations in the sections above and the definitions put forward in literature, we propose to define Social Computing as the systems concerned with creating value through the aggregation of large numbers of individual contributions generated in computer-mediated social networks and platforms.[87]

### The importance of user roles

A key way in which to establish the disruptive effects of new user-driven services (value creation) in social computing is to analyse the shift in the roles that users take on in the value chain. Slot (2009)[88] introduced a classification of user roles for assessing social computing services in the

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86    The emergence of the web as a platform for computing is more specifically thought of as the result of high levels of PC and broadband penetration, the democratisation of content production tools and the availability of platform glue in the form of service and data interoperability standards and protocols such as XML, SOAP and AJAX. The details of the Web2.0 story have been described in many places and we will not repeat it here. For a first reading see: http://en.wikipedia.org/wiki/Web_2.0

87    With reference to prevailing concepts and definitions as in wikipedia:social_computing

88    Slot, M. (2009), 'Exploring user-producer interaction in an online community: the case of Habbo Hotel', *Int. J. Web Based Communities*, Vol. 5, No. 1, pp.33–48.

media and entertainment domain, depicted in Figure 3.

The scheme can be used to categorise types of user role in social computing applications and will be used in the following paragraph to gain insight into the uptake for each type of social computing application.

## 3.2 Take up by users

### Social computing usage

When surveying the literature, it becomes apparent that social computing systems are continuing to grow in popularity and penetration across the globe.[89] According to Technorati (2007), there are now approximately 1.1 billion Internet users. An estimated 60% of European Internet users are involved in some form of social computing. The uptake by users differs for each type of social computing application. Whereas the number of visitors of social networking websites (such as Facebook) is still growing significantly, the number of weblogs currently appears to be levelling off.[90]

This paragraph provides an overview of user uptake for each role (consume, communicate, facilitate, share and create) in the Slot classification introduced in the previous paragraph.[91]

### User demographics

It seems that social networking sites are becoming mainstream and gaining popularity across all generations and levels of society. Although a study by Kemp (2007)[92] among US social network users indicates that young adults (16-26) are the most avid users and that adults seem to be lagging behind, other studies show that adults are catching up with significant speed. Already at the end of 2006, according to comScore Media Metrix's analysis of US Internet traffic, half of the MySpace US users were 35 or older. The 35–54 age group at MySpace grew to 41% in August 2006, from 32% a year earlier.

As regards teens, the Pew Internet & American Life Project (2007) found that in the US, 64% of online teens aged 12-17 participate in one or more from a wide range of content-creating activities on the Internet (including uploading self-made video/audio), up from 57% of online teens in a similar survey at the end of 2004.[93] Under the European Sixth Framework Programme, the CitzenMedia project[94] came to the conclusion that: "For the first time ever, 16-24 year olds across Europe are now accessing the internet more frequently than they are watching TV - 82% of this younger demographic use the internet between 5 and 7 days each week while only 77% watch TV as regularly (a decrease of 5% since last year)."[95]

According to a Forrester study (2008),[96] nearly two-thirds of US online teens – those

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89    See for example: Pascu, C. (2008), An Empirical Analysis of the Creation, Use and Adoption of Social Computing Applications, IPTS Exploratory Research on the Socio-economic Impact of Social Computing, Seville and Cachia, R., (2008), Social Computing: Study on the Use and Impact of Online Social Networking, IPTS Exploratory Research on the Socio-economic Impact of Social Computing, Seville. Note that nearly 100 sources have been examined and analysed.

90    It is important to stress that the distinctions used in the Slot-Frissen framework – commenting, creating, communicating – are blurring fast because applications are converging.

91    As we were not able to find sound quantitative data on all activities of a specific role (e.g. the activities "read" and "search" of the consumer role) some activities (for which we could not find sound data) are not covered in the tables.

92    Kemp, M. B. (2007b), Social Computing Comes of Age, Forrester.

93    Lenhart, A. et al (2007), Teens and Social Media. PEW, available at: http://www.pewinternet.org/PPF/r/230/report_display.asp

94    Limonard, S. & Esmeijer, J. (2007), Citizen media and societal change, Business requirements and potential bottlenecks for successful new CITIZEN MEDIA applications (Deliverable 6.1.1), TNO, commissioned by European Commission DG Information Society & Media.

95    EIAA (2007), Mediascope Europe 2007, Executive summary, http://www.eiaa.net/Ftp/casestudiesppt/EIAA%5FMediascope%5FEurope%5F2007%5FPan%5FEuropean%5FExecutive%5FSummary%2Epdf

96    Li, C. (2008) Youth and Social Networks. Forrester.

■ *Table 2: Take up by role*

| CONSUME | |
|---|---|
| Listen | According to a 2008 survey by Arbitron-Edison Research, 9% of Americans downloaded and listened to a podcast in March 2007 with overall podcast awareness (having listened to a podcast at least once), compared to 13 to 18% in 2008.[1] Overall, online music consumption is dominated by streaming audio. Fast-growing social streaming sites such as Imeem.com are riding and propelling this wave. |
| Play | In 2008 there were 170 million registered users of Massive Multiplayers Online Roleplaying games (MMO).[2] The number of active users is less than 20 million, or around 10%.[3] Other sources report 30-50 million active users.[4] Based on total numbers of active users, the most popular virtual world is World of Warcraft with over 8 million active subscribers. 42% of Americans play games online (NPD, 2008[5]). The MMO market is likely to expand.[6] |

| COMMUNICATE | |
|---|---|
| Comment | **Blogging.** It seems that the growth of the blogosphere has levelled off recently. Although there are over 100 million blogs and over 100,000 new blogs are still created each day, many people seem to be moving on to micro-blogging.[7] <br> **Micro-blogging.** Between April and May 2007, Twitter – one of the most popular microblogging services – had grown rapidly from 300,000 to over 600,000 users. By March 2008, the number of users had exceeded 900,000. |
| Messaging | In the USA, 34% of adults were using instant messaging (IM) in 2007.[8] In Europe, IM is the most popular online activity, and was performed by 37% of European consumers in 2007. An ITU report[9] estimates that the corporate IM market will grow globally at an annual rate of around 20%, at least until 2009. Research by In-Stat found that in 2005 there were around 2.5 million wireless IM users worldwide, generating revenue of USD 54.5 million, and In-Stat forecast that revenues would reach USD 3.6 billion by 2009. |
| Networking | In early 2008, MySpace and Facebook remained the largest social network sites with a predominant North American user base, each with over 100 million unique visitors.[10] The number of visitors to social network sites worldwide is estimated at about 500 million. The fastest growth, however, is coming from other regions (e.g. Latin-America: Orkut and Asia: Friendster) and niche sites such as the Social Music streaming site Imeem and the professional network LinkedIn.[11] These thematic social networks are part of the long tail of social network sites. A Forrester study[12] mentions that 17% of European online consumers have signed up for at least one networking site, such as LinkedIn, peuplade.fr, or Windows Live Spaces (MSN Spaces). Yet, only 40% of the members frequently visit the sites they have joined. |
| Rate | According to a study conducted by Synovate, 27% of users in selected European countries are involved in rating and reviewing content.[13] A popular and growing category is sites for reviewing and comparing customer products and prices. More generally, Forrester reports[14] that 18% of European Internet users post comments online. Commenting includes writing customer reviews about a product or service at sites such as reviewcentre.com, becoming involved in a forum or chat room at sites such as Lycos, or responding to a blog post. |

1   *Arbitron-Edison Research (2008), The Podcast Consumer Revealed 2008, available at http://www.edisonresearch.com/home/ archives/2008/04/the_podcast_con_1.php http://www.edisonresearch.com/home/archives/2008/04/the_podcast_con_1.php*

2   *See http://www.kzero.co.uk/blog/?p=1832*

3   *http://www.mmogchart.com/Chart4.html*

4   *http://gigaom.com/2007/06/13/top-ten-most-popular-mmos/*

5   *Online gaming 2008, NPD. See http://www.webpronews.com/topnews/2008/04/02/42-of-americans-play-games-online and NPD.com*

6   *http://forge.ironrealms.com/2008/04/28/mmosvirtual-worlds-among-most-valuable-private-web-companies/*

7   *Ars Technica, 2007 and See also http://www.caslon.com.au/weblogprofile1.htm*

8   *Golvin, C.S. (2007) The State of Consumers And Technology: Benchmark 2007. Forrester.*

9   *ITU (2006) Digital Life. Available at: http://www.itu.int/osg/spu/publications/digitalife/*

10  *Comscore (2008), see http://www.techcrunch.com/2008/02/27/the-global-race-among-social-networks-heats-up-keep-an-eye-on-hi5-friendster-and-imeem/*

11  *See   http://www.techcrunch.com/2008/02/27/the-global-race-among-social-networks-heats-up-keep-an-eye-on-hi5-friendster-and-imeem/*

12  *Kemp, M.B. (2007a) Europeans Have Adopted Social Computing Differently. Forrester*

13  *EIAA (2007), Mediascope Europe 2007, Executive summary, http://www.eiaa.net/Ftp/casestudiesppt/EIAA%5FMediascope%5 FEurope%5F2007%5FPan%5FEuropean%5FExecutive%5FSummary%2Epdf*

14  *Kemp, M.B. (2007) Europeans Have Adopted Social Computing Differently. Forrester*

Table 2: Take up by role (cont.)

| FACILITATE | |
|---|---|
| Tag | The December 2006 survey by Pew[20] found that 28% of US Internet users tagged or categorised content online such as photos, news stories or blog posts. On a typical day online, 7% of US Internet users say they tag or categorise online content. 10% of US online consumers identify themselves as 'Taggers'. The act of tagging is likely to be embraced by a more mainstream population in the future because many organisations are making it ever-easier to tag Internet content. New forms of tagging will emerge. According to Weinberger (2007):[21] "*We'll also undoubtedly figure out how to intersect tags with social networks, so that the tags created by people we know and respect have more "weight" when we search for tagged items. In fact, by analysing how various social groups use tags, we can do better at understanding how seemingly different worldviews map to one another.*" |
| Book-marking | In contrast, the social bookmarking based sites appear to be levelling off. The number of unique visitors to Delicious, for example, dropped from around 2,000 in September 2007 to approximately 1,000 in January 2008. One explanation for the falling numbers is the use of *browser extensions*, which use is not measured in terms of unique visitors. However, there may also be other reasons for the fall in popularity. Statistics from Addthis show that bookmarking activity in social networking sites such as Facebook may take over from dedicated services.[22] |

| SHARE/CREATE | |
|---|---|
| Upload | The popularity of online video streaming also continues to soar. Between 150,000 and 200,000 videos are uploaded daily to YouTube, growing the total to over 80 million videos.[23] February 2008 saw 80 million unique YouTube visitors in the US alone, viewing nearly 2 hours of online videos each,[24] a 66% increase from February 2007. |
| Publish | Wikipedia has grown by 8000% (sic!) in the last five years (as of 2008).[25] After peaks in 2005 and 2005, growth is now levelling off to 22% year on year. The number of unique users in the US stands at 55 million in 2008 (Nielsen online, 2008). In 2006 Wikipedia counted 60 million users (Comscore 2006). If Europe mirrored the growth in the US, the numbers of users would exceed 100 million. Some 2,000 articles per day are submitted to the English Wikipedia. Articles in English represent around one-quarter of total Wikipedia articles. |
| Produce | This study found no relevant data on the proportion of user-produced goods. What could be found were many anecdotal examples, such as the frequently cited community-created Lego (Lugnet), user-produced films (e.g. Elephant Dream) and user-designed car (Open Source Car Oscar), but also in the academic field, such as the sharing of scientific problems and solutions in the InnoCentive community.[26] |

20  Rainie, L. (2007), Tagging, Pew Internet and American Life Project, available at: http://www.pewinternet.org/pdfs/PIP_Tagging.pdf
21  Weinberger, D. (2007) Everything Is Miscellaneous: The Power of the New Digital Disorder, Times Books.
22  Social bookmarking, the rise of SNS based bookmarking. Source: Addthis (2007). http://blog.addthis.com/?p=35
23  See http://mediatedcultures.net/ksudigg/?p=163
24  Comscore (2008). http://www.comscore.com/press/release.asp?press=2190
25  Nielsen Netratings (2008), See http://www.nielsen-netratings.com/pr/pr_080514.pdf
26  See for example: http://blog.futurelab.net/2006/09/crowdsourcing_and_financing_mu.html and http://www.innocentive.com/

ages 15-17 – visit social networking sites at least monthly. Including early teens (12-17), half of US youth visits social networking sites at least monthly. More than two-thirds of US online teens who use social networking sites update their profile at least weekly, as opposed to 55% of US adult (18+) users of social networking sites. The use of social media – from blogging to online social networking to creating all kinds of digital material – is central to many teenagers' lives.

The CitizenMedia research team, referred to above, concluded with regard to social networking websites that both young men and women engage in social networking, but that young women are most active. Topic-related social networks seem to attract older users with more equal gender distribution. Furthermore, audio/video websites, such as YouTube and Flickr are visited by both men and women, but mainly men seem to upload content. These websites are visited by young people in particular. Wikipedia is visited by both men and women of all age groups, and older men seem to be the most active editors. This research endorses the conclusion of other studies (see for instance Pascu et al, 2008) that social computing platforms are becoming part of everyday life and gaining popularity across all generations and levels of society.[97]

97  See for example: Pascu, C. (2008), An Empirical Analysis of the Creation, Use and Adoption of Social Computing Applications, IPTS Exploratory Research on the Socio-economic Impact of Social Computing, Seville.

Furthermore, there seem to be cultural differences in the use of social computing applications.[98] The Germans and the Dutch are not very active in commenting on forums. The Dutch also tend to shy away from writing customer reviews, as do Swedish consumers, with only 3% actively doing so in each country. The masters of commenting and giving their opinions are the Spanish and the French. Of US online consumers between 12 and 18 years old, 35% comment on blogs and 20% post ratings or reviews at least monthly. In Korea, one of the most advanced social computing countries, official statistics[99] indicate that 46.1% of Internet users engage in posting comments on news articles and postings by others more than once a month; 29.3% post to the Internet bulletin board of social networking sites i.e., clubs, communities, and blogs/minihompys,[100] and 20.1% engage in asking questions online or providing answers to others.[101]

### Type of usage

According to Technorati: "all large-scale, multi-user communities and online social networks that rely on users to contribute content or build services share one property: most users don't participate very much. Often, they simply lurk in the background. In contrast, a tiny minority of users usually accounts for a disproportionately large amount of the content and other system activity. This phenomenon of participation

inequality was first studied in depth by Will Hill in the early '90s."[102]

According to Nielsen, user participation tends to follow a 90-9-1 rule:[103]

– 90% of users are 'lurkers' (i.e. they read or observe, but do not contribute),
– 9% of users contribute from time to time, but other priorities dominate their time (the contributors),
– 1% of users account for the majority of contributions (the creators and, in the case of social networking, the communicators).

Nielsen furthermore contends that blogs are even worse in terms of participation inequality; the rule here is more like 95-5-0.1. Other inequalities are found by Nielsen on Wikipedia, where more than 99% of users are lurkers (consumers). At the time of this research, Wikipedia's 'about' page listed only 68,000 active contributors, which is 0.2% of the 32 million unique visitors it had in the US alone. Wikipedia's most active 1,000 people - 0.003% of its users - contributed about two-thirds of the site's edits. Wikipedia is thus even more skewed than blogs, following a 99.8-0.2-0.003 rule.

Participation inequality seems to exist in many places on the web.[104] Amazon.com sells thousands of copies of books with around 10 reviews. Nielsen (2006) calculates that fewer than 1% of customers contribute reviews. In addition, over 150,000 of the reviews were contributed by a few "top-100" reviewers, with the top reviewer submitting a staggering – and unlikely – 12,000 reviews. In most online communities, 90% of users are lurkers (consumers) who never

98   Limonard, S. & Esmeijer, J. (2007), Citizen media and societal change, Business requirements and potential bottlenecks for successful new CITIZEN MEDIA applications (Deliverable 6.1.1), TNO, commissioned by European Commission DG Information Society & Media.
99   Shim, J.M. *et al.* (2007), Survey on the Computer and Internet Usage, Korean Ministry of Information and Communication (MIC), National Internet Development Agency of Korea (NIDA), Survey on the Computer and Internet Usage, October 2007, http://isis.nida.or.kr/board/service/bbsView.jsp?bbs_id=10&item_id=300&curPage=1&dummy=20080123234224
100  The name of a mini-homepage on Cyworld, a very popular South Korean virtual space and web community site.
101  Shim, J.M. et al (2007), Survey on the Computer and Internet Usage, Korean Ministry of Information and Communication (MIC), National Internet Development Agency of Korea (NIDA), Survey on the Computer and Internet Usage, October 2007.

102  Nielsen, J. (2006). Participation Inequality: Encouraging More Users to Contribute. Jakob Nielsen's Alertbox, 9 October 2006, available at: www.useit.com/alertbox/participation_inequality.html
103  Ibid.
104  Nielsen, J. (2006). Participation Inequality: Encouraging More Users to Contribute. Jakob Nielsen's Alertbox, 9 October 2006, available at: www.useit.com/alertbox/participation_inequality.html

*Figure 4: Economic value of Social Computing by sector, according to Forrester (2007)*

| Sources of economic value | Firms that *do not* adopt Social Computing | Firms that *do* adopt Social Computing | Industries most affected |
|---|---|---|---|
| Community | No user content or interaction | User content, forums, add value to brand | Media, retail, telecom |
| Customer service | No follow-up to user suggestions | Community self-help reduces service costs | High-tech, automotive |
| Sales | Lower loyalty erodes prices | Community loyalty reduces commissions | CPG, finance, telecom, travel |
| Marketing | Bad targeting and no use of WOM | WOM and better targeting raise ROI | CPG, automotive |
| Production | Products don't meet user demand | Co-design reduces waste | CPG, media, high-tech |
| R&D | No use of user intelligence | Community input raises success rate | Healthcare, high-tech |

contribute, 9% of users contribute a little (the contributors), and 1% of users account for almost all the activity (the creators).

An initial critique of the 90-9-1 rule is, however, provided by Slot (2009),[105] who states that, although more passive activities such as consuming are very popular online, Internet users also engage in a large variety of more active roles. The survey conducted by Slot among Internet users yields indications that a far larger percentage than 1% may be creating content online.[106] Almost 38% of the respondents stated that they have a website, over 27% reported writing a weblog, over 15% stated that they were engaged in writing news messages, and 3.5% record and upload a podcast at least once a year. Slot's research findings thus raise some important questions regarding Nielsen's widely adopted 90-9-1.

In conclusion:

- The percentage of creators on new social computing services seems to depend on the aim of the community, skills level and required skills;
- The percentage of creators multiplied by the massive number of users means a huge addition of user-created value;
- Even consumers represent value by leaving traces that are valuable to the Amazons of this world.

## 3.3  Take up by businesses

According to Forrester, social computing is starting to move past early adopter firms and on to the early majority. Recent Forrester surveys find that, while large-scale investments are still rare, more than one in four large US firms has made some investment in blogs, wikis, and RSS each, and a minority of firms today report no intentions whatsoever to adopt the technologies.[107]

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105  Slot, M. (forthcoming), Web Roles Re-examined: Exploring User Roles in the Online Media Entertainment Domain, Proceedings of the COST Conference "The Good, the Bad and the Challenging", Copenhagen.
106  Slot conducted a user survey among approximately 600 Internet users. There may be a bias in the research of Slot as most of the respondents have a relatively high level of education and have Dutch nationality.

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107  Enterprise Web2.0 Q&A: Northwestern Mutual, Forrester, 2007.

In a survey of 119 chief intelligence officers, Forrester (2007) found that "fully 89% of the CIOs said they had adopted at least one of six prominent social computing tools - blogs, wikis, podcasts, RSS, social networking, and content tagging - and a remarkable 35% said they were already using all six of the tools. Although Forrester did not break down adoption rates by tool, it did state that CIOs saw relatively high business value in RSS, wikis, and tagging and relatively low value in social networking and blogging.[108]

In a broader study tracking the use of the same technologies (replacing mashups for tagging) among 2800 executives around the world, McKinsey (2007)[109] found a more modest uptake and a different distribution across tools: "Social networking was actually the most popular tool, with 19% of companies having invested in it, followed by podcasts (17%), blogs (16%), RSS (14%), wikis (13%), and mashups (4%). When you add in companies planning to invest in the tools, the percentages are as follows: social networking (37%), RSS (35%), podcasts (35%), wikis (33%), blogs (32%), and mashups (21%)". The survey also found that "Leading the way are Indian firms, 80% of which plan to increase their investments in social computing over the next three years, compared with 69% of Asia-Pacific firms, 65% of European firms, 64% of Chinese firms, 64% of North American firms, and 62% of Latin American firms."

More specifically, some research shows it will become more and more common for highly placed corporate executives and public officials to act as bloggers themselves.[110,111] Furthermore, virtual worlds and (serious) games are considered promising in a company environment, in particular for simulation and education. They reduce costs and improve the work experience.[112] Companies have been slower to pick up on the new phenomenon of tagging. Honeywell, an industrial conglomerate, is among the first to introduce a tagging capability behind its firewall. The aim, says Rich Hoeg, a senior Honeywell manager and blogger, is to allow engineers "to perform knowledge discovery research, and sharing across the miles, even if they don't know each other."[113]

Research of McKinsey (2008, 2009) shows that companies continued to invest in web 2.0 in 2007 and 2008.[114] Companies that are deriving business value from web 2.0 tools appeared to shift from using them experimentally to adopting them as part of a broader business practice.

## 3.4 The impact of social computing

### Private sector

In 2007, in the report "Participative Web and User-Created Content", the OECD[115] described two types of impact that social computing trends are currently having on the private sector, namely economic and social impact. As regards social impact, the OECD states that the way in which users produce, distribute, access and re-use information, knowledge and entertainment is potentially giving rise to increased user autonomy,

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108  As quoted in "Social media slowly scaling the walls of corporate halls", Globe and Mail update, (2007).
109  http://www.mckinseyquarterly.com/links/26068,
110  http://www.mckinseyquarterly.com/Building_the_ Web_20_Enterprise_McKinsey_Global_Survey_2174 http://www.mckinseyquarterly.com/Six_ways_to_make_ Web_20_work_2294
111  Wyld, D,C. (2008), The Blogging Revolution, Government in the Age of Web 2.0, IBM Centre for The Business of Government, available at: http://www. businessofgovernment.org/pdfs/WyldReportBlog.pdf

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112  McKinsey (2007), How businesses are using Web 2.0: A McKinsey Global Survey, *McKinsey Quarterly,* March 2007, Available at: http://www.mckinseyquarterly.com/ links/26068
113  KPMG (2007), 'Enterprise 2.0: Fad or Future? The Business Role for Social Software Platforms'
114  http://www.mckinseyquarterly.com/Six_ways_to_make_ Web_20_work_2294,    http://www.mckinseyquarterly. com/Building_the_Web_20_Enterprise_McKinsey_ Global_Survey_2174
115  Wunsch-Vincent, S. and Vickery, G. (2007). Participative Web: User-Created Content. OECD, Directorate for Science, Technology and Industry, Working Party on the Information Economy, April 2007, available at: http:// www.oecd.org/dataoecd/57/14/38393115.pdf

participation and diversity. Discussion forums and product reviews can lead to more informed user and consumer decisions. Participative web technologies may improve the quality and extend the reach of content (e.g. educational content). And the long-tail mechanism of social computing applications, which are used on a massive scale, allows a substantial increase in, and a more diverse array of, cultural content to find niche users.

Other studies identify other social impacts, such as the strengthening of existing social ties or the support of making new social contacts. The Oxford Internet Survey 2007, for example, found that social networking sites and instant messaging enhance social capital. One-third (35%) of student users in Britain have met someone online, and 13% have met a person offline who they first met online.[116] Other studies (see for instance IPTS, 2007), however, stress that engagement on social network sites or instant messaging particularly strengthens existing relationships.[117] This trend may have positive impacts (having fun together and providing mutual support) but also negative impacts. The Stony Brook University, for example, found that intensive communication between teens about their problems on social network sites made them more depressed.[118]

Another social impact frequently referred to in the literature is the increased possibility of privacy infringements. In their article on Social Network sites, Boyd & Ellison (2007)[119] claim that "SNSs are challenging legal conceptions of privacy". Hodge (2006) argued that the Fourth Amendment to the United States Constitution and legal decisions concerning privacy are not equipped to address social network sites. For example, do police officers have the right to access content posted to Facebook without a warrant? The legality of this hinges on users' expectations of privacy and whether or not Facebook profiles are considered public or private."

The economic impacts described by the OECD (2007)[120] relate mostly to business models of traditional companies. According to the OECD, new forms of content provision are more based on decentralised creativity, organisational innovation and new value-added models, which favour new entrants, and less on traditional scale advantages and large start-up investments. Search engines, portals and aggregators are also experimenting with business models that are often based on online advertisement and marketing. The shift to Internet-based media is only just beginning to affect content publishers and broadcasters. At the outset, user-created content may have been seen as competition. However, some traditional media organisations have shifted from creating online content to creating the facilities and frameworks for user-created content creators to publish.

Forrester[121] writes the following on economic impacts: "…To sum up, we can identify four aspects of economic relevance of social computing. The providers of these applications are increasingly profitable and contribute to growth and employment. At the same time, they already constitute an important threat to the telecommunication and content industries. They are increasingly being adopted as a productivity tool in the private and public sector. And in all sectors of the economy, customers are becoming

116 Dutton, W. & Helsper, E. (2007), Oxford Internet Survey (OxIS): The Internet in Britain 2007, Oxford Internet Institute, available at: http://www.oii.ox.ac.uk/research/oxis/OxIS2007_Report.pdf

117 Cachia, R., (2008), Social Computing: Study on the Use and Impact of Online Social Networking, IPTS (2007), Exploratory Research on the Socio-economic Impact of Social Computing, Seville Dutton, W. & Helsper, E. (2007), Oxford Internet Survey (OxIS): The Internet in Britain 2007, Oxford Internet Institute, available at: http://www.oii.ox.ac.uk/research/oxis/OxIS2007_Report.pdf

118 http://www.dailymail.co.uk/health/article-1132788/Why-chatting-long-Facebook-girl-down.html

119 Boyd, D.M. and Ellison, N.B., Social Network Sites: Definition, History, and Scholarship, available at: http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html.

120 Wunsch-Vincent, S. and Vickery, G. (2007). Participative Web: User-Created Content. OECD, Directorate for Science, Technology and Industry, Working Party on the Information Economy, April 2007, available at: http://www.oecd.org/dataoecd/57/14/38393115.pdf

121 Li, C. (2007) How Consumers Use Social Networks. Forrester.

smarter thanks to horizontal exchange of information with other users."

## 3.5    Conclusions

When surveying the literature on social computing, it becomes apparent that these systems are continuing to grow in popularity and penetration across the globe. Social computing can be understood as the systems concerned with creating value through the aggregation of large numbers of individual contributors generated in computer-mediated social networks and platforms. Users from all over the world blog, network, tag and review. Social networking sites are becoming mainstream and attract users across all generations and levels of society. The large majority of users seem to have a passive role. However, new research shows that the number of active users may be significantly larger than the 1% rule used in most studies. The immense uptake of social computing applications is clearly having an impact in the private sector. New players have entered the market (such as the news and entertainment industries) and new business models are emerging rapidly. Cases collected for this research reveal that impact can also be found in the public sector. These impacts, however, seem to be broader and more versatile. Scrutiny of the cases indicates that four types of impact can be distinguished: political, socio-cultural, organisational and legal. These types of impact will be discussed further in the next chapter.

# ■ 4. Key areas of impact

In this chapter four categories of impact – political, socio-cultural, organisational and legal will be described. For each type of impact, a literature review will be presented on the specific effects of social computing in the public-service clusters (as defined by IPTS: health, learning, government and inclusion). Subsequently, the policy visions of European Union Member States as set out in Chapter 2 (an overview is provided in paragraph 2.5) and the likely impact identified in this chapter will be dealt with, identifying key risks and opportunities linked to social computing. The chapter will conclude with a summary of key impacts and the divergences and synergies with existing government policies.

In general terms, it can be observed that the impacts found in the private sector as described in the previous chapter, may be translated to the public sector. In particular, the social impacts mentioned by the OECD (2007[122]) have a significant potential to affect governments. The growing possibilities of privacy infringements, for example, has put increased pressure on governments to create new regulatory frameworks to protect users' privacy. Yet the impacts of the social computing trend on governments seem to be broader and more versatile than the economic and social impacts described by the OECD. A screening and investigation of the cases collected for this research shows that some other types of social computing impact in the public sector can be discerned, namely political, socio-cultural, organisational and legal impacts.[123]

One of the political impacts may, for example, be the emergence of volatile cause-oriented forms of civic involvement in politics. Many of the cases found for this research concerned online mobilisations of citizens around a specific subject. Another political impact may be that political practice is becoming more transparent. We have found dozens of websites on which political information is structured and published. One of the many examples is the website www.opensecrets.org in the US, a user-generated database for the campaign finance data of all federally elected politicians since 1989. An example of the socio-cultural impacts is the inclusion of particular groups of citizens in the public sphere. We found many communities initiated by or for minority groups such as the elderly (silver surfers, e.g. www.seniorweb.nl) and immigrants (e.g. www.maroc.nl). Several cases from the database also point to improved quality of life because citizens (e.g. patients or the disabled) feel more empowered to gain control over their illness or disability (e.g. www. PatientsLikeMe.com).

Organisational impacts in the public sector could be found in the several examples in our database of user-generated public-sector content. It seems that new networked forms of organisation may be emerging. We found multiple examples of cross-agency cooperation through the use of social computing platforms. An example is Doctors.net. uk, an online community for doctors and medical students who jointly build medical knowledge. In addition, several cases indicate that some online communities are taking over tasks hitherto carried out by government institutions. An example is www.mylanguageexchange.com, a website on which users teach each other languages. A last type of social computing impact in the public sector may be legal impact. Several cases from

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122  Wunsch-Vincent, S. and Vickery, G. (2007). Participative Web: User-created Content. OECD, Directorate for Science, Technology and Industry, Working Party on the Information Economy, April 2007, available at: http://www.oecd.org/dataoecd/57/14/38393115.pdf

123  As set out in paragraph 1.2 of this report, we have collected many cases of social computing adoption in public services. These have been included in a database of social computing cases.

our databases indicate that social computing trends require a new regulatory framework. In the learning domain, this need is clearly evident as joint creators of educational content urge the governments to provide legal possibilities for the safe dissemination of content.

In the following paragraph we will elaborate on these four types of impact.

## 4.1 Political impacts

One of the crucial political impacts of social computing is the emergence of volatile, cause-oriented forms of civic involvement in politics. Through social computing websites (e.g. Facebook, MySpace), people can instantly be mobilised around specific political issues. Within online communities all kinds of advocacy and issue groups instantly emerge and disappear. Because the social computing phenomenon enables people to create critical mass around very specific subjects, "niche politics" becomes relevant. Furthermore, the social computing trend seems to stimulate the creation of political hypes. Videos of politicians, polemic blogs and political rumours disseminate with unprecedented speed and can generate great and acute attention to a political subject or event. Political incidents can be viewed by millions of citizens, turning the incident into a considerable phenomenon that impacts the image of politicians or their party. In addition, certain types of social computing seem to be eroding traditional political structures. New forms of party financing are emerging and the political process seems increasingly to be organised as a grid rather than by committee 'spokes' around a hub. Finally, social computing seems to open up politics. Mashups and crowdsourcing websites enforce the cognitive surplus; the political knowledge of citizens. As a result, citizens are increasingly empowered to hold politicians accountable for their promises, statements and actions.

– Several recent elections in western democratic countries demonstrate the emergence of new forms of fundraising, candidate exposure and mobilisation, based on social computing trends.[124] In the 2004 US presidential elections, supporters of Howard Dean used networking websites to contact each other, plan gatherings and customise phrases, all of which helped to grow support for their candidate. Dean created a groundswell of more than 700,000 core supporters through decentralised online campaigning, and raised over $50m – mostly through online donations of $100 or less.[125] Moreover, in 2008 Obama attracted some three million donors through his website, who together donated a total of $650 million. It seems that the trend towards democratised fundraising will continue to soar in the coming decades. The Pew Internet Center found that, in June 2008, 8% of Internet users (representing 6% of all adults) had donated money online to one of the candidates of the 2008 election,[126] whereas in 2006 only 3% of Internet users (representing 2% of all adults) did so. The community-based model for raising money is quick, cheap, easy and increases the pool of small donors.[127] In addition, Scientist who studied the impact of social computing trend on the 2008 election found that support by members social network sites, such as Facebook, appeared to be an important additional indicator of electoral success that is independent of traditional measures like expenditures, media coverage

124 Simon, R. (2005), *The mobilisation of democracy*, RSA Journal, October 2005.
125 Trippi, J. (2004), The Revolution Will Not Be Televised: Democracy, the Internet and the Overthrow of Everything, Harpin-Collins Publishers, 2004.
126 Rainie, L. (2008), The Internet and the 2008 election, Pew Internet and American Life Project, June, 2008.
127 See for example: Institute for Politics, Democracy and the Internet, George Washington University, The Political Consultants' Online Fundraising Primer, 2004.

and organising activities as represented by campaign events.[128]

– Another political impact that is clearly noticeable is the effect of social computing activities (e.g. posting of videos on YouTube) on the image of politicians.[129] Videos posted by users affect the perception of and support for election candidates. One of the many examples is the John Edwards's "John Edwards Feeling Pretty" video on YouTube, which had over 1,142,00 views and showed Edwards and an assistant fixing his hair with a great deal of hairspray and much fussing over his image in a small mirror.[130] Whereas incidents like these previously went unnoticed, YouTube allows them to be analysed by millions of citizens and turns them into a phenomenon that impacts the image of and/or support for a candidate. A survey research by the Pew Research Centre shows that the proportion of Americans who rely on traditional news sources for information about a campaign (such as television) has declined significantly since the last presidential campaign.[131] By contrast, the proportion of Americans who say they regularly learn about campaigns from the Internet has more than doubled since 2000 – from 9% to 24%. Substantial numbers of young people (over 25%) say they received information on the campaign or the candidates through social networking sites such as MySpace and Facebook.[132] Roughly 41% of people under the age of 30 have watched at least one form of campaign video online, compared with 20% of those aged 30 and older.

– A third impact may be on the way public opinions are shaped. Several scholars argue that there is strong anecdotal evidence of an ever-expanding number of situations in which the blogosphere exercises influence over traditional media, the formation of political opinions and, eventually, politics.[133] Wright (2003) and Bloom (2005), for example, found that blogs played a major role in the fall of Senator Trent Lott in 2002 in the US.[134] Whereas the traditional press ignored a politically sensitive comment by Senator Trent Lott, weblogs turned Lott's comment into a major story and even caused his resignation. Schiffer (2005), however, demonstrated that not all weblogs have the same impact. The left-leaning blogosphere in the UK, for example, failed to stir up interest in a memo - now infamous and published in the Times of London - which suggested that facts and intelligence leading up to Iraq II were being manipulated by the Bush administration. Unlike the Trent Lott case, bloggers were unable to reopen the discussion on the start of the Iraq war using the new information. Sroka (2006) concludes that the question of whether a story discussed in the blogosphere

128  Christine B. Williams and Girish J. "Jeff" Gulati (2008), What is a Social Network Worth? Facebook and Vote Share in the 2008 Presidential Primaries, Department of International Studies and Government Bentley College, Boston, http://blogsandwikis.bentley.edu/politechmedia/wp-content/uploads/2008/10/apr-sept-1.pdf

129  www.thestar.com, A lesson for today's politician: Get yourself on YouTube, June 2008, In August of 2006, YouTube had roughly 500,000 registered users and was hosting more than 6 million videos. At the beginning of 2008, almost 79 million users watched more than 3 billion videos in the month of January alone.

130  Other examples are the "I Got a Crush…On Obama" video, which has been watched around 7.5 million times, the video "CBS Exposes Hillary Clinton Bosnia Trip" has almost 2 million views.

131  Kohut, A. (2008), The Internet Gains in Politics, Pew Internet and American Life Project, January 2008, available at: http://pewInternet.org/PPF/r/234/report_display.asp,

132  This practice is almost exclusively limited to young people; just 4% of Americans in their 30s, and 1% of those ages 40 and older, have obtained news about the campaign in this way.

133  Sroka, T.N. (2006), Understanding the Political Influence of Blogs, A Study of the Growing Importance of the Blogosphere in the U.S. Congress, George Washington University.

134  In December 2002, Republican Senate leader Trent Lott said that if Strom Thurmond had been elected president in 1948 on a segregationist platform, "we wouldn't have had all these problems over all these years". For four days, the press all but ignored his comments. The New York Times, for example, failed to mention them. The story looked ready to disappear into the ether. Then, all at once, the remarks were front-page news. Even President Bush scolded Lott, saying that his words did not reflect the spirit of our country. Weblogs made Lotts comments into a major story.

merits attention depends on the perceived newsworthiness of the story by journalists and other influential decision-makers.[135] Cornfield, Carson *et al.* (2005) also show that, in order to influence decision-makers, the blogosphere typically needs the assistance of a contingent of the mainstream media that is willing to listen to its claims and arguments. Nevertheless, the vast majority of scientists have stressed the blogosphere's potential for influencing, guiding, and generally shaping how the media perceives and frames political events.[136]

– Another political impact that can be discerned is the emergence of online community activism - the use of social networking websites to advocate a specific interest. The Pew Internet Center states that online activism using social media has grown substantially since the first time they probed this issue during the 2006 midterm elections. Among the findings in their survey:[137]

• 11% of Americans have contributed to the political conversation by forwarding or posting someone else's commentary about the race.

• 5% have posted their own original commentary or analysis.

• 8% have gone online to donate money to a candidate or campaign.

• Young voters are helping to define the online political debate—12% of online 18-29 year olds have posted their own political commentary or writing to an online newsgroup, website or blog.

The burgeoning of activist communities on the Internet also indicates increased online activism. A quick search on the Internet provides thousands of links to activist communities.[138] Several scholars argue that politicians are more than ever obliged to take serious note of grassroots activism and the increased ease with which popular movements and thinking can now spread. Norris (2004), for example, studied the impact of online social movements on the existing political establishment and found that "the primary impact will be upon facilitating cause-oriented and civic forms of political activism, thereby strengthening social movements, voluntary associations, and interest groups."[139]

– The last political impact that is increasingly becoming apparent is the growing transparency of the political practice. There are numerous online communities and mashup websites on which information on politicians, policy and the political process is collected and made accessible in a structured way. For example, www. Opencongress.org offers RSS feeds to follow the latest news and blog mentions relating to a bill, a vote or a member of Congress. www.Opensecrets.org provides a searchable database for the campaign finance data of all federally elected politicians in the US since 1989. www.votesmart.org offers detailed information – biographical information, campaign finances, interest groups' ratings, issue positions, and public statements – on elected officials including the President, members of Congress, state officials and leadership in state legislatures. These are just three examples of the hundreds of online communities and mashups that seek to make

135  Sroka, T.N. (2006), Understanding the Political Influence of Blogs, A Study of the Growing Importance of the Blogosphere in the U.S. Congress, George Washington University.

136  See for example: Wallsten, K. (2005), Political Blogs and the Bloggers Who Blog Them: Is the Political Blogosphere an Echo Chamber? Paper presented at the annual convention of the American Political Science Association, Washington D.C.

137  http://media.mcclatchydc.com/smedia/2008/06/13/16/ Pew-Internet-2008press-release.source.prod_ affiliate.91.pdf

138  In one search we found approximately 1,500 online activist communities.

139  Norris, P. and J. Curtice, (2004), If you build a political website, will they come? The supply and demand model of new technology, social capital, and civic engagement in Britain, Harvard University, John F. Kennedy School of Government, September 2004.

politics more transparent.[140] Several scientists argue that mashups and crowdsourcing websites have a considerable potential to make politics more transparent and that increased transparency may in turn stimulate citizens to hold politicians accountable for their promises, statements, earnings and activities.[141] Yet others argue that online communities need basic government data in order to be able to make politics more transparent. According to these researchers, government should provide the necessary informational building blocks which can be used by communities to collect, structure and disseminate information. Most of these building blocks however, are still lacking in many western democratic states.[142]

## 4.2 Socio-cultural impacts

When considering the socio-cultural impact of social computing, the literature and anecdotal evidence show that social computing (and other technological trends) particularly enhances existing offline social behaviour and dynamics. Social networking websites support sociality among users; maintaining contacts with friends, lurking profiles of others and polishing of their own profile. Because this social activity takes place in what Boyd (2007) coined as "networked publics" (relationships in the network are publicly articulated, profiles are publicly viewed and comments are publicly visible), new privacy questions are arising. However, it appears that social computing platforms (particularly blogs and support groups) stretch the perception of which information can be

shared openly and hence the privacy paradigm seems to be shifting. Particularly in blogs and specific support groups, more and more people openly share personal information such as name, address and specific information about illnesses or treatments. Individuals increasingly find like-minded people or people with whom they share a passion or interest through social networking websites. Relationships are maintained on social networking websites and new relationships are created. Both social segregation and integration take place on social networking websites.

– One of the sociological impacts that social computing technologies are having is what Boyd *et al.* (2007) have coined as online identity production.[143] Profiles on social computing websites such as MySpace, Friendster and Facebook have become a common mechanism for presenting one's identity online. Boyd *et al.* argue that "Profiles are digital bodies, public displays of identity where people can explore impression management. Because the digital world requires people to write themselves into being, profiles provide an opportunity to craft the intended expression through language, imagery and media." Teens in particular tend to mould their online identity in an effort to impress their peers. Among teens, the peer pressure to "be cool" is high and stimulates the creation of a profile that is deemed socially appropriate (Boyd, 2006:10). The dominant reason for teens to participate in an online social network is to maintain contact with their friends. The answer to the question of why teens join MySpace is simple: "Cuz that's where my friends are" (Boyd, 2006:9). Adults have more diverse reasons for joining social networks. They are less present on platforms that support social processes and

140 For a catalogue of the many mashups available on the Internet, see ProgrammableWeb – Mashups, APIs, and the Web as Platform, http://www.programmableweb.com

141 Sturges, P. (2004), Corruption, Transparency and a Role for ICT, in: International Journal of Information Ethics Vol. 2 (11/2004), pp. 1614-1687.

142 Brito, J. (2008), Hack, Mash & Peer, Crowdsourcing Government Transparency, The Columbia Science and Technology Law Review, page 119-157.

143 Boyd, D. and Heer, J. (2007), Profiles as Conversation: Networked Identity Performance on Friendster, University of California, In: Proceedings of the Hawai'i International Conference on System Science (HICSS-39), Persistent Conversation Track, Kauai, HI: IEEE Computer Society.

more present on platforms that support business-oriented activities. Whereas 26% of Facebook users are between the age of 26 and 45, the percentage of users in this age group on LinkedIn is 73%.[144] Furthermore, it seems that transparency is the norm among adults who create social networking profiles. In a Pew survey, 82% of adult respondents said that their profile is currently visible compared with 77% of online teens who report this (Pew, 2007).[145] Among adults who say they have a visible profile, 60% say that their profile can be seen by anyone who happens to stumble upon it, while 40% of the teens say their profile is visible to anyone.

– Because people create online profiles, publish personal information and communicate on social computing websites, a second profound impact of the social computing trend is on the attitudes towards and the way users manage their personal privacy. However, research results in this field are ambiguous. Whereas some scientists argue that the privacy of individuals is increasingly threatened as they openly display their life and thoughts on social computing sites (see for example Westwin, 2008), other research shows that people actively manage and protect their personal information on social networks (see for example Pew survey, 2007).[146] The difference in findings may be explained by the type of social computing medium used. The Pew Internet Survey shows that users of social network *sites* are able to perform a precarious balancing act between keeping information confined to their network of trusted friends and disclosing some of their

personal information in order to make new friends. However, Huffaker (2005) found that users of blogs reveal a considerable amount of personal data, including real name, age and location, as well as a variety of ways of contacting them. It thus seems that the goal of the publishing of information and platform used may affect the extent to which private information is exposed. A study of IPTS (2009) shows that most young people are sceptical of the internet as an environment for the exchange of personal data and have major doubts about personal data protection. They perceive high risks in giving personal data and fear that these will be misused in specific eService settings.[147]

– Another socio-cultural impact is that personal behaviours, attitudes, values and lifestyles are being influenced by participation in social networks. As the uptake of social computing is considerable, the opportunities for mutual online influencing are growing.[148] For example, people influence each other's political opinions (e.g. through political blogs), recommend books and music (e.g. preferences on sites such as Facebook and MySpace) and persuade each other to join online mobs (e.g. MSN, SMS and social networking websites). Less peaceful and harmless are the examples of organised riots and criminal networks.[149] Benschop (2007), for example, demonstrated the crucial role that social computing technologies played in the radicalisation of the Hofstad Group in the Netherlands.[150] The downside of the social computing trend is also illustrated in the literature on the effect of social communities on suicide. According

144  http://blog.rapleaf.com/2007/11/13/statistics-on-googles-opensocial-platform-end-users-and-facebook-users/

145  Madden, M., Fox, S., Smith, A. and Vitak, J. (2007) "Digital footprints: online identity management and search in the age of transparency," Pew Internet & American Life Project, Washington, DC.

146  Madden, M., Fox, S., Smith, A. and Vitak, J. (2007), "Digital footprints: online identity management and search in the age of transparency," Pew Internet & American Life Project, Washington, DC

147  IPTS, (2009), Young People and Emerging Digital Services, An Explanatory Survey on Motivations, Perceptions and Acceptance of Risks, Seville.

148  Each month 6.5 million teens are on Habbo hotel, a social networking website for teenagers. For more data about uptake (e.g. MySpace, Bebo, etc.), see section 3.1.

149  See for example: Frissen, V. (2008), *De Digitale Diaspora, De Virtuele realiteit van de multiculturele samenleving*, describing the digital networks as a driving force behind the radicalised Hofstadgroep.

150  http://www.sociosite.org/jihad_nl.php

to Becker (2004), for example, online suicide communities can herald a trend in suicide pacts. Becker describes how a 17-year-old youngster actively seeks help to commit suicide. Another example of the negative impact is the presence of online pro-anorexia/bulimia communities. Bardone-Cone *et al.* (2007) show that online social communities can have a profoundly negative effect on social self-esteem and self-efficacy of participants.[151]

– Literature reports contrasting findings on the impact of social computing on social relationships. According to Pew (2007), 91% of social network teens have used social network sites to meet their regular friends, and 28% meet friends they would rarely see in person. Apart from existing relationships, 49% of the social network users make new friends online and 32% of the users were contacted online by strangers. Meeting new people online is especially popular with students: one-third of student users have met someone online (Oxford survey 2007).[152] The survey also shows that making new friends is more popular among retired and unemployed people. There is contradiction as regards the extent to which social computing positively affects relationships. According to Pew (2001),[153] 48% of the teenagers state that social computing enhances their social life. By contrast, 64% of the teens admit that social computing diminishes the time they spend with their family. Cummings (2000)[154] points out that the impact of social computing

on social relationships depends on the degree of interaction in the communication, e.g. synchrony. Chan (2004)[155] confirms this premise and states that the differences in quality between online and offline friendships diminish over time. In the health sector, online support groups are an example of how social computing contributes to social cohesion. Here in particular, new relationships are being built around specific diseases. About 28% of Internet users visited an online support group in 2001 (Pew, 2001).[156]

– Social computing has the potential to contribute to both social inclusion and social exclusion (e.g. Zajicek, 2007).[157] This dichotomy is a result of a long-standing debate on the effect of ICT on social inclusion (see e.g. Ferlander, 2003).[158] Social computing applications give users the opportunity to strengthen existing ties and develop new ties, but until now only a few can profit from these new technologies (IPTS, 2007).[159] However, there are some signs of effect: the number of silver surfers that use social computing to communicate with family and friends increased by 115% in 2005 (EIAA, 2007)[160] to 18%. In addition, there is much anecdotal evidence of inclusion initiatives. Examples are social websites for immigrants, such as Mahgreb.nl and Marokko.nl for Moroccan immigrants in the Netherlands. Frissen (2008)[161] elaborates on social inclusion, but

151 Bardone-Cone, A.M., Cass, K.M. (2007), What Does Viewing a Pro-Anorexia Website Do? An Experimental Examination of Website Exposure and Moderating Effects, Int. Journal Eat Disorder 2007; 40:537–548.

152 Dutton, W. & Helsper, E. (2007), Oxford Internet Survey (OxIS): The Internet in Britain 2007, Oxford Internet Institute, available at: http://www.oii.ox.ac.uk/research/oxis/OxIS2007_Report.pdf

153 Lenhart, A., Rainie, L., & Lewis, O. (2001), Teenage life online: The rise of the instant message generation and the internet's impact on friendships and family relationships. Washington D.C.: Pew Internet & American Life Project.

154 Cummings, J., Butler, B., & Kraut, R. (2002), The quality of online social relationships. Communications of the ACM, 45(7), 103-108.

155 Chan, D. K.-S., & Cheng, G. H.-L., (2004), A comparison of offline and online friendship qualities at different stages of relationship development. Journal of Social and Personal Relationships, 21(3), 305-320.

156 Horrigan, J. (2001), Online communities: Networks that nurture long-distance relationships and local ties., Pew Internet & American Life Project, Washington DC.

157 Zajicek, M., (2007), Web 2.0: Hype or Happiness? Presented at the 16th ACM International World Wide Web Conference.

158 Ferlander, S. (2003), The Internet, Social Capital and Local Community, Doctoral dissertation, University of Stirling.

159 IPTS, Zinnbauer, D., (2007), What can Social Capital and ICT do for Inclusion? Technical Report, EUR 22673, Seville.

160 EIAA (2007), Silver surfers report, Executive summary.

161 Frissen, V. (2004), De digitale diaspora: de virtuele realiteit van de multiculturele samenleving, Forum jaarlezing, Utrecht.

concludes that social computing can cause both social segregation and integration.

– Social computing can possibly have an impact on the perceived quality of life, both in positive and negative terms. An increasing number of people are seeking online emotional support on social networks sites, such as the aforementioned support groups and communities (Potts, 2005). Most people (44%) seek information on health issues, 9% seek emotional support and the remaining 34% seek a combination of the two (Stromberg, 2007).[162] Apart from uptake, the effect of social computing on quality of life in terms of health shows some conflicting results in academic literature. Pioneering research by Gustafson (1999)[163] demonstrates that a computer-based personal health support system can improve a patient's quality of life and promote more efficient use of healthcare. However, research thereafter draws two important conclusions. First of all, online support groups drastically increase the accessibility and participation rate due to factors such as anonymity (Iafusco, 2000)[164] and the omission of distance barriers (Lieberman, 2003).[165] As regards the subsequent effectiveness of these online support groups, a positive effect was found (Alemi et al, 1996; Houston, 2002),[166, 167] but this effect did not significantly differ from offline measures (Alemi, 1996; Eysenbach,

2004).[168] Apart from the health aspect of quality of life, Rideout *et al.* (2005)[169] report a negative correlation between the happiness of children and longer daily exposure to new media: the least contented children spent about 1:30 hours more on media than the cohort of most contented children. This difference in happiness can be explained by a smaller proportion of time spent with friends and the struggle with (e.g. game) addiction.

## 4.3 Organisational impacts

Private-sector literature shows that social computing technologies have the potential to disrupt existing organisations. Although government institutions have not yet changed significantly as a result of the social computing trend, there seems to be a considerable potential for disruption. Anecdotal evidence shows that new online communities are emerging, generating public value previously provided through government agencies.[170] Examples are peer counselling (replacing professional counselling) and educational communities (replacing traditional learning environments). The values, processes and structure of the online communities which provide public value are fundamentally different from the traditional government bureaucracy. The communities are open instead of closed, horizontal instead of hierarchical, and informal instead of formal. If the trend towards networked provision of public services continues, it is likely that the character of government bureaucracies will change

162 Stromberg, C. (2007), Health Marketeers: Create A Social Computing Game Plan. Forrester.

163 Gustafson D.H., Hawkins R., Boberg E., Pingree S., Serling R.E., Graziano F., et al (1999), Impact of a patient-centred, computer-based health information/ support system, American Journal Prev Med, 1999; 16:1-9.

164 Iafusco, D., Ingenito, N. and Prisco, F. (2000), The chatline as a communication and educational tool in adolescents with insulin-dependent diabetes: preliminary observations, Diabetes Care; 23:1853.

165 Lieberman, M.A., Golant, M., Giese-Davis, J. (2003), Winzlenberg, A. *et al.*, Electronic support groups for breast carcinoma, Cancer, 97:920-5.

166 Alemi F., Mosavel M., Stephens R.C., Ghadiri A., aswamy J., Thakkar H., (1996) Electronic self-help and support groups, Med Care, 34: OS32-OS44.

167 Houston T.K., Cooper L.A., Ford D.E. (2002), Internet support groups for depression: a 1-year prospective cohort study, Am Journal for Psychiatry, 159:2062-8.

168 Eysenbach G., Powell J., Englesakis M., Rizo C., Stern A. (2004), Health-related virtual communities and electronic support groups: systematic review of the effects of online peer-to-peer interactions, BMJ, 328:1166 (15 May), doi:10.1136/bmj.328.7449.1166 http://bmj. bmjjournals.com/cgi/content/full/328/7449/1166

169 Rideout V., Roberts D. F., & Foehr U. G. (2005), Generation m: Media in the lives of 8-18 year-olds. Washington D.C.: Kaiser Family Foundation.

170 Osimo, D. (2008). Web 2.0 in government: why and how? Technical Report. JRC, EUR 23358, EC JRC.

substantially and that 'creative destruction' – a term coined by Perez (2002) – will take place.

– Studies and cases in the private sector illustrate that social computing has a considerable potential impact in terms of new, networked forms of organisation (e.g. Siemens, 2005, McKinsey, 2007).[171] Social software is increasingly being used for developing and sharing knowledge and for cultural interchange and networking between professionals of different organisations and users. In the private sector, professionals and users are increasingly attempting to jointly create meaning and value through engagement in networks (Siemens, 2005). Despite this connectivity trend in the private sector, several scholars contend that institutions in the public sector remain rigidly tied to existing – rather isolated - processes and procedures. Guy (2006), for example, studied the uptake of collaborative working in the public sector through the use of wikis and found that public-sector organisations still make little use of wikis.[172] One of the main barriers to the cross-border creation of wikis in public sectors is the government culture in which values such as formality, hierarchy and legitimacy prevail. In educational terms too, scholars are reaching the conclusion that a centre-staged model of teaching prevails today.[173] Herrington *et al.* (2005) show that, in most universities, the dominant teaching model is one in which experts transmit theoretical knowledge that passive learners receive and consume. According to Herrington *et al.*, a model of

this type discourages collaboration. Yet many researchers, be it in the educational, health or government domain, argue that social computing technologies provide huge opportunities for future services. Guy, for example, comes to the conclusion that wikis hold great potential for enhancing the efficiency, effectiveness and quality of public services. In the areas of education and health there are several examples of joint creation, sharing and preservation of information by, respectively, teachers and students and doctors and patients. Examples in the education sector are the MIT Opencourseware, the Webcast.Berkeley initiative and the OpenLearn project in the UK.[174] A well-known example of knowledge-building and sharing in the healthcare domain is GANFYD, an online community in which physicians share information about diseases, drugs and treatments. However, scientists who studied open knowledge creation and sharing in the healthcare, education and government sectors also point to some important complications (e.g. reliability of information, lack of understanding of learning modes, plagiarism).[175]

– Another impact of social computing on existing organisations is the replacement of government tasks, in the sense that public value was previously created in public institutions and is now generated by users. Although there is not much quantitative data on this phenomenon of user-generated public services, there is substantial anecdotal evidence that the provision of public services by citizens is taking place in various public service sectors. In the learning domain for example, there are many learning communities in which users meet each other in student and

171  Siemens, G. (2004), A Learning Theory for the Digital Age http://www.elearnspace.org/Articles/connectivism.htm, and McKinsey (2007), How Business are using Web 2.0, A McKinsey Global Survey http://www.ectolearning.com/Ecto2/File.aspx?f=11b9e0ed-18d2-4d2e-aaef-73000fd5b460

172  Guy M., (2006) Wiki or Won't He? A Tale of Public Sector Wikis, October 2006, http://www.ariadne.ac.uk/issue49/guy/

173  Herrington, A. et al, (2005), Authentic learning environments in higher education, Hershey, PA: Information Science Publishing.

174  http://ocw.mit.edu/OcwWeb/web/home/home/index.htm, http://webcast.berkeley.edu/, http://openlearn.open.ac.uk/

175  See for example: Mike Cannon-Brookes, Using Wiki in Education, http://www.wikiineducation.com/display/ikiw/Home, http://askdrwiki.com/mediawiki/index.php?title=Physician_Medical_Wiki

teacher roles. Within the online community "My language exchange" for example, over 1 million members from 133 countries teach languages to each other.[176] In the healthcare sector there are thousands of self-support communities where patients conduct peer counselling. A survey by the Pew Internet Center found that 28% of Internet users had contacted an online support group, a figure that has increased since.[177] Online support groups seem to exist for any disorder from alcoholism to Zollinger-Ellison syndrome, and cover a wide range of issues beyond medical conditions (e.g. parenting, bereavement, victims of professional misconduct). In other government sectors too, online communities can be found that create services traditionally provided by government agencies. An example in the social security sector is Zopa, a social lending and borrowing marketplace, which enables people to lend to and borrow directly from each other. The main goal of the community is to give people around the world the power to help themselves financially and help others at the same time.[178]

– A third impact on traditional organisations that can be observed is a change in the way in which government practitioners form and disseminate their professional opinion. This trend is clearly evident in the science sector, for example. Although evidence is only anecdotal, blogging seems to be becoming more popular with researchers of all disciplines in order to engage in peer debate, share early results or seek help on experimental issues (Anderson, 2006,

Skipper, 2006).[179] Butler (2005) contends that blogging occurs mostly among younger researchers and that many of them make use of anonymous names to avoid being traced to their institutions.[180] In their study "The Blogging Revolution: Government in the Age of Web 2.0", IBM found many examples of government practitioners (e.g. city mangers, policemen, university presidents) who write blogs.[181] Yet IBM also argues that blogging is still in its infancy in taking hold amongst bureaucrats. Government practitioners' use of blogs appears to be twofold: on the one hand they use blogs to spread their views and, on the other hand, their opinions are affected by influential blogs.[182] The principal impact of blogs lies in the fact that they have the potential to disseminate very quickly through the social network and instantly become known and influential on a global scale. The blog of a bureaucrat may be picked up by several individuals and – via their networks – receive widespread attention, thereby impacting on public opinion and – more indirectly - his profession and his organisation. An example of a blog that became known worldwide was that of Jan Pronk, U.N. representative in Sudan, on the Dafur crisis.[183] Because of its outspokenness, Pronk's blog drew global attention which eventually led to his resignation.

176  http://www.mylanguageexchange.com/Default.asp

177  Potts, H.W.W. (2005), Online support groups: An overlooked resource for patients, Centre for Health Informatics and Multiprofessional Education (CHIME), University College London http://eprints.ucl.ac.uk/1406/1/Online_support_groups.pdf, DR. PLATO: The emergence of online community. 1994. http://thinkofit.com/plato/dwplato.htm and Fox S, Fallows D. (2003) Internet health resources. Washington DC, Pew Internet & American Life Project, www.pewinternet.org/PPF/r/95/report_display.asp

178  http://uk.zopa.com/ZopaWeb/

179  Anderson, P. (2007) What is web 2.0? Ideas, technologies and implications for education. JISC Technologies and Standards watch, available at: http://www.jisc.ac.uk/media/documents/techwatch/tsw0701b.pdf, Skipper, M., (2006), *Would Mendel have been a blogger?* Nature Reviews Genetics. 7, 664 (September 2006). Available online at: http://www.nature.com/nrg/journal/v7/n9/full/nrg1957.html

180  Butler, D. (2005), *Science in the web age: Joint efforts*. Nature. Nature 438 (1 December 2005), pp. 548-549.

181  Wyld, D,C. (2008), The Blogging Revolution, Government in the Age of Web 2.0, IBM Centre for The Business of Government, available at: http://www.businessofgovernment.org/pdfs/WyldReportBlog.pdf

182  See for example: the Trent Lott case, described in paragraph 5.4.4

183  Steele, J. (2006), Sudan expels UN official for blog revealing Darfur military defeats: Report details loss of hundreds of soldiers' lives, move likely to sour relations further. *Guardian*, October 23, 2006. http://www.guardian.co.uk/sudan/story/0,,1929019,00.html.

– Another impact of social computing in the public sector is the increased transparency of government institutions, their services and their employees. In the health and learning domain we found numerous examples of websites (mostly privately initiated) which aim to make the healthcare, education and law enforcement sector more transparent. Frequently visited are websites such as www.ratemyteachers.com, www.ratemyprofessors.com, www.ratemycop.com and www.ratemydoctor.net, where students, citizens and patients can give their opinion on the performance of teachers, professors, the police and doctors.[184] Nearly one million teachers at 7,500 schools are listed on the www.ratemyteachers.com website. In 2006, the website www.ratemyprofessors.com had almost 6 million ratings from some 6,000 colleges and universities, and nearly 800,000 instructors are listed across nine countries.[185] With over 8 million student members, daily traffic averages more than 200,000 unique visitors per day. The uptake of rating websites seems substantial. The Pew Internet Center reports that 33 million Internet users in America have reviewed or rated something as part of an online rating system.[186] Of users who have participated online for more than six years, 32% have rated something online, compared to 14% of those with either two or three years of access and just 12% of those with up to one year of access. Literature on the precise impact of rating websites is hard to find. Anecdotal evidence demonstrates various types of impact of rating websites. On the one hand, some cases show that the feedback generated

improves the performance of professionals. On the other hand, many researchers question the validity of the evaluations by users. Several studies show a strong correlation between the communication skills of healthcare professionals (and not necessarily their medical skills) and patient satisfaction with healthcare services.[187] Davidson *et al.* (2006) found that students in their ratings on www.ratemyprofessors.com focus more on how easy, nice, hot, helpful and entertaining professors are, and less on their teaching skills, knowledge and the teaching programme.[188]

– There are some anecdotal indications that the social computing trend is beginning to affect personnel management and job seeking. Users of social networking websites such as LinkedIn and MySpace and Facebook – be it employers or job-seekers – are starting (albeit slowly) to use these websites for recruiting and job-seeking purposes. Igoe (2008) found that employers seem to be in the early stages of recognising the importance and usefulness of social networking sites, but use social networking sites primarily to gather information on prospective employees.[189] CNN conducted a study reporting that roughly 43% of employers run Internet background searches on prospective employees using Internet sites, including

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184  www.ratemyteachers.com,         www.ratemycop.com and www.ratemydoctor.org, other examples are www.pickaprof.com, www.campusdirt.com, www.myprofessorsucks.com, www.ratemyprofessors.com and www.rateyourprof.com

185  Davison, E., and J. Price (2006), How Do We Rate, An Evaluation of Online Student Evaluations, Department of Sociology and Social Work, Appalachian State University.

186  www.pewinternet.org/pdfs/PIP_Content_Creation_Report.pdf

187  See for example: Lewin, S., Skea, Z., (2002), Interventions for providers to promote a patient-centred approach to clinical consultations, The Cochrane Library, 2002;2, Wong, S.Y.S and Lee, A. (2006), Communication Skills and Doctor Patient Relationships, Medical Bulletin, 3(11), pp. 7-9, March 2006, CME programme of the Medical Council of Hong Kong, Jackson, J.L., Chamberlin J., Kroenke K. (2001)Predictors of patient satisfaction, Social Science and Medicine, 52, pp. 609-620. See also Hickson, G.B., Clayton, E.W. (1992), Factors that prompted families to file malpractice claims following perinatal injuries, JAMA, 268(11), pp.1413-1414. and Hickson, G.B., Clayton, E.W. (1994), Obstetricians' prior malpractice experience and patients' satisfaction with care, JAMA, 272, 1583-1587.

188  Davison, E., and Price, J. (2006), How Do We Rate, An Evaluation of Online Student Evaluations, Department of Sociology and Social Work, Appalachian

189  Igoe, J.M. (2008), Social Networking Sites as Employment Tools, George Mason University, http://u2.gmu.edu:8080/dspace/bitstream/1920/3147/1/Igoe_Jennifer.pdf

online social networking sites such as MySpace and Facebook.[190] However, other studies illustrate a much smaller percentage. A study on the website CareerBuilder found that 12% of hiring managers have used social networking sites when screening candidates, and a NACE study found that 11.1% of the employers review profiles of candidates on social networking sites.[191] Statistical data on the use of social networking sites by job-seekers seems to be lacking. Yet Igoe (2008) concluded, after a survey among members of LinkedIn and Facebook, that job-seekers – compared to employers – are less aware of the usability of social network sites as employment tools. Nevertheless, Igloe argues that the current generation entering the workforce – with 10 years of experience with social networking sites and an awareness of the importance of professional networking – could boost uptake. It seems that further research is needed on the current impact of the use of social networking websites on job-seeking and recruitment processes. Nevertheless, some scientists contend that, as transaction costs continue to decrease, it is likely that in the future work will be increasingly allocated among freelancers in an online labour market and that organisations (in their current form of static firms) may eventually disappear.[192]

## 4.4 Legal impacts

The social computing trend raises all manner of regulatory and legal questions, since much legislation of western countries is based on an offline world.[193] Many laws appear to be *obsolete – and* intellectual property legislation may be the best-known example of this.[194] There seems to be a tension between the "all-sharing and co-creation" character of social computing technologies and traditional rules of ownership of information, ideas and creations. In the learning domain, this tension is evident when it comes to online libraries and open access to educational resources. Although seamless access to knowledge has been recognised as a key driver of educational development, copyright prevents learning environments from openly sharing didactic content.[195] Copyright law, which derives from international conventions and is similar in most countries, stipulates that one cannot reproduce, copy, communicate and/or transmit to the copyright material without the permission of the owner.[196] Court rulings regarding copyright infringements in peer-to-peer communities are burgeoning.[197]

– Yet, in response to copyright constraints, several initiatives have emerged that attempt to provide alternative regulations. One of these initiatives is the Creative Commons, an organisation that developed a software application for the Internet that allows copyright holders who do not want to exercise all of the restrictions of copyright

190 McIntosh, S., (2006) Facebook and Myspace Used by Employers as Screening Device, The Pacer, http://pacer.utm.edu/3296.htm

191 Gardner, D. (2006), Survey: Employers Checking Job Hunters by Scouring Social Networks, Techweb, www.techweb.com/wire/ebiz/193402565 and Koncz, A. (2006), One in 10 Employees Will Use Social Networking Sites to Review Job Candidate Information, NACEWeb

192 See e.g. Benkler, Y. (2002), Coase's Penguin, or Linux and the Nature of the Firm, The Yale Law Journal, vol 112.

193 See for example: Latham, R.P., Brown, J.T. and C.C. Butzer (2008), Legal Implications of User Generated Content: Youtube, Myspace, Facebook. available at: http://www.lexbe.com/hp/Art.aspx?art=http://images.jw.com/com/publications/892.pdf

194 Lessig, L., (2004), Free Culture, The Nature and Future of Creativity, Creative Commons.

195 Fitzgerald, B., (2007) Open Content Licensing (OCL) for Open Educational Resources, paper commissioned by the OECD's Centre for Educational Research and Innovation (CERI) for the project on Open Educational Resources. http://www.oecd.org/dataoecd/33/10/38645489.pdf

196 See, Berne Convention for the Protection of Literary and Artistic Works, 1886 (Berne Convention), Agreement on Trade-Related Aspects of Intellectual Property Right 1994 (TRIPS Agreement) and bilateral free trade agreements (FTAs) such as the Australia-US Free Trade Agreement 2004 (AUSFTA).

197 Latham, R.P., Brown, J.T. and C.C. Butzer (2008), Legal Implications of User Generated Content: YouTube, MySpace, Facebook. available at: http://www.lexbe.com/hp/Art.aspx?art=http://images.jw.com/com/publications/892.pdf

law to dedicate their work to the public domain or license it on conditions that allow copying and creative reuse.[198] The Creative Commons framework enables teachers and students, for example, to reuse and alter documents, photographs or videos, with the authorisation of the initial creator. In a digital world, where educational users will increasingly engage with a culture of cut and paste, remix, collaboration and instant Internet access, open content licensing will play an increasingly vital role in the sharing and reshaping of knowledge. Consequently, there are more and more examples of open content licensing. In Australia, for example, AEShareNet has developed a Free for Education License (FfE) which can be used by government or any other person or entity to label content that can be utilised for educational activities. In addition, more and more educational resources are being published under Open Content Licences. The Public Library of Science and BioMed Central, for example, license their publications under the Creative Commons licenses.[199] Another example is the BBC, which has adapted the Creative Commons Licensing model for use by the BBC Creative Archive to allow people to download clips of BBC programmes for non-commercial use.[200] The content published on these websites is open to educational use.

–  In the healthcare sector, too, the tension between property-rights legislation and the open sharing of information is evident (OEC, 2008).[201] In the 1990s for example, researchers in the field of medicine feared that patents on large amounts of DNA sequence

data would hinder a culture of open science (Tapscott and Williams, 2006:164).[202] Some 20% of the human genome was already under private ownership, including the genes for hepatitis C and diabetes. The owners of these patents influenced the level of participation of scientists and the costs of research, and thus played a disproportionate role in determining the overall rate and direction of the research in these areas. Both academe and commercial businesses (such as the pharmaceutical firms) warned that lack of access to biological information was raising costs and lowering the efficiency of drugs discovery. As patents proliferated, R&D budgets were rising to inefficient levels, and biotechnology companies, pharmaceutical firms, universities, government agencies, purchasers of healthcare and the legal system were becoming entangled in expensive and damaging struggles for associated economic benefits (Tapscott and Williams, 2006:165). Yet the majority of actors involved recognised that unrestricted access to gene information would boost scientific discovery and ultimately lead to new therapeutics for a wide range of diseases. Consequently, Merck Pharmaceuticals and the Gene Sequencing Center at the Washington University School of Medicine started the Merck Gene Index project – an initiative to create a public database of gene sequences.[203] Other pharmaceutical firms started similar activities and today the Merck Gene Index contains millions of gene sequences.

–  In addition to alternative legislation (e.g. open content licensing replacing copyright and patent right), there is an increasing need for new regulations because new forms of

198  See www.creativecommons.org and Boynton, R.S., The Tyranny of Copyright? The New York Times, January 25, 2004, http://www-personal.si.umich.edu/~rfrost/courses/SI110/readings/IntellecProp/Copyright_Tyranny.pdf

199  See www.plos.org, www.biomedcentral.com/home

200  See www.creativearchive.bbc.co.uk

201  OEC (2008), Harnessing Openness to Transform American Health Care, A Report by the Digital Connections Council of the Committee for Economic Development.    http://www.ced.org/images/library/reports/health_care/report_healthcare07dcc.pdf

202  Tapscott, D. and Williams, A.D. (2008), Wikinomics: How Mass Communication Changes Everything, Penguin Group.

203  Eckman, B.A., Aaronson, J.S., et al. (1998) The Merck Gene Index browser: an extensible data integration system for gene finding, gene characterization and EST data mining, Bioinformatics, Vol 14, 2-13, Oxford University Press http://bioinformatics.oxfordjournals.org/cgi/content/abstract/14/1/2http://bioinformatics.oxfordjournals.org/cgi/content/abstract/14/1/2

crime and violation may emerge from social computing and other technological trends. An example is cyberbullying, the use of social computing sites (and other technologies) to deliberately violate an individual.[204] In the UK for example, cyberbullying is a key issue for young people, with 35% of Year 6 (aged 12) pupils reporting bullying as a main concern. This percentage decreases with age, with 25% of Year 8s reporting bullying as a main concern, and only 15% of Year 10 pupils.[205] In the UK, evidence shows that 22% of young people have been victims of cyberbullying at least once, reporting that they have received hurtful comments via text message or experienced abuse on forums and social networking sites. In recent years, cyberbullying has become a key public concern, especially in the case of pupils using their digital technologies (particularly video captured on mobile phones and publishing on platforms) to bully their teachers.[206] This is just one of the many new online violations that require new legislation.

– Another legal impact of social computing technologies that is becoming increasingly apparent (although anecdotally) is the opening-up of the law making process. The OpenLaw project of the Berkman Center for Internet and Society of Harvard Law School is an example of an open platform on which existing legislation is discussed and modifications are proposed.[207] In addition, users, together with the initiators of the platform, work together to develop arguments and draft pleadings. Another example of

collaborative law-making is the LexiPation project of the European Commission.[208] This project involves the development of an integrated ICT platform for conducting moderated online discourses on legislative proposals, involving policymakers, citizens and other socio-economic groups. Furthermore, the "We the People" project of the Dutch newspaper NRC aimed to provide citizens with a platform to collaboratively create an alternative European constitution by using a wiki (see also the case description in paragraph 5.3.4).[209] However, evaluations of some of these projects show that, although the projects intended to involve large numbers of citizens with all manner of backgrounds, participation is low and the profile of the participants is homogeneous (mostly professionals who have an interest in the subject such as lawyers, politicians and researchers). In addition, the legal world is also opening up in the sense that legal practices are becoming more transparent. There is much anecdotal evidence, for example, on the emergence of legal communities in which legal knowledge is shared. Examples are Jurispedia and WikiLawGuru; wikis on which users collaboratively create large repositories of legal terms, definitions and information.[210]

## 4.5 Confrontation between trends and impacts

An important research question in this study is the extent to which the impacts set out in the previous paragraphs match the current normative visions and trends in the policy domain described in Chapter 2 of this report. The outline

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204  Withers, K. and R. Sheldon (2008), Behind the Screen, The hidden life of youth online, Institute for Public Policy Research, http://www.ippr.org/members/download.asp?f=%2Fecomm%2Ffiles%2Fbehind%5Fthe%5Fscreen%5F20%2Epdf

205  Department for Children, Schools and Families (2007a), Every Child Matters, London: HMSO and Department for Children, Schools and Families (2007b), The Children's Plan: Building Brighter Futures, London: HMSO.

206  Harrison, A., (2007), When online friends spell danger, online news story, 22 October, available at: http://news.bbc.co.uk/1/hi/education/7046986.stm

207  http://cyber.law.harvard.edu/openlaw/

208  http://www.lexipation.eu/

209  Huynink, S., Roodenburg, H., Schnakers (2006), M., Hoe verder met de Europese Grondwet? "We the People": een lappendeken van creatieve voorstellen, correcties en commentaren., in NRC Handelsblad, 19 June 2006.

210  http://en.jurispedia.org/index.php/Main_Page and http://wiki.lawguru.com/index.php/Main_Page

below provides a summary of the confrontation between visions/policies and the impact of social computing. For each vision/policy, conclusions are drawn as to whether the social computing trend strengthens or undermines the vision/policy. The confrontation has been validated by experts by means of an online validation session (see also the methodology paragraph 1.3 of this report). The confrontations between the visions/policies and social computing impacts have been translated into hypotheses that have been rejected, supported and/or commented upon by experts through an online survey. The results of the online validation session have been incorporated in the synopsis below (the vision/policy is given in italics).

| | |
|---|---|
| *Greater transparency / accountability of public sector* | **+** Social computing applications may enhance transparency of citizens' demand and government products and processes. Crowd sourcing mechanisms mean that public sector information can easily be collected, structured and disseminated and thus provide the potential to make government more transparent and empower citizens to hold public officials accountable.[1] |
| | **-** However, several experts question the quality of the information published within social network sites. Statements within communities often lack authoritative sources and a small group of users may dominate the discussions within the network. The latter in particular may cause a bias in the information provided through social networks. In addition, advanced technologies enable people to easily manipulate content |
| *Improved accessibility of public services* | **+** Forms of social computing (e.g. online communities) can stimulate the accessibility and personalisation of some public services because groups of users are enabled to create those public services themselves and tailor them to their preferences. |
| | **-** However, it may be the case that not all people have equal access to these services. Skills and resources such as time, knowledge and (in some cases) financial capital may be critical in terms of being able to participate in a social network. In the future, specific groups may be excluded to a greater or lesser extent from participation in social computing communities |
| *Improvement of efficiency in public sector* | **+** Social computing trends may enhance the *efficiency* of the production of public value (e.g. public services or legislation). By using social computing technologies, knowledge to create public value can be built in an efficient way. Furthermore, resources to produce public value (e.g. human resources) can be allocated in an efficient way. |
| *Improvement of quality and effectiveness public sector* | **-** Although the use of social networks may enhance the effectiveness of policy instruments (e.g. greater ability of governments to monitor citizen demand) the social computing trend may also threaten existing principles of good governance. When citizens or new players take over tasks hitherto carried out by public sector parties, the question arises as to whether good governance principles are sufficiently ensured. The exercise of government power has been legally restricted and regulated by principles such as legitimacy, accountability, transparency, integrity, *audiatur et altera pars* and impartiality. These principles are not legally embedded in cases of citizen-generated public tasks. |
| *New ways of organising, new models of governance, new stakeholders* | **+** Literature and cases show that social computing techniques enable groups and individuals to participate more actively in the public domain. There are many examples of groups of citizens creating their own public services (e.g. education, healthcare, peer support). The way in which these groups are organised differs from the traditional models of governance in the sense that these groups act in a more horizontal and informal way and are more open to newcomers. |
| *Stronger evidence-based policy* | **+** Crowd sourcing techniques and online communities can enhance the knowledge of government practitioners as they are enabled to make use of the wisdom of the crowds, and use this wisdom to substantiate specific strategies or policies. However, as previously stated, several experts are questioning the quality of the information published within social network sites. |
| *Citizen empowerment and expression of diversity* | **+** Social computing technologies empower citizens to express themselves and to mobilise. |
| | **-** However, citizens also become more vulnerable to new forms of digital violation. |
| *Improved digital competencies/bridging the digital divide* | As stated previously, not all people may have equal access to public services provided through social computing techniques. Skills and resources such as time, knowledge and (in some cases) financial capital may be critical in terms of being able to participate in a social network. In the future, specific groups may be excluded to a greater or lesser extent from participation in social computing communities. |
| *Enhancement of independent living, self organisation and autonomy* | **+** Social computing technologies stimulate self-organisation and self-regulation in all kind of groups within society. |
| | **-** However, just as governments are becoming more transparent, more information on individual citizens can be found through social computing applications. It is therefore very likely that there will be more potential threats to privacy in the future and an increased demand for privacy protection. |

1   *Precondition: mashups and crowd sourcing can only be effective if the building blocks of public sector information are provided by government agencies. Research shows that in many western countries only a limited number of public sector documents are accessible online.*

## 4.6   Conclusions

Four key areas of social computing impact can be discerned, namely political, socio-cultural, organisational and legal. Examples of political impact are the emergence of volatile, cause-oriented forms of civic involvement in politics, niche politics becoming relevant (citizens being able to generate mass around a very specific subject), growing number of political hypes and new forms of party financing. The socio-cultural impacts we found include changing values (e.g. from formal to informal, hierarchic to horizontal and closed to open), increased social cohesion around specific subjects and increased empowerment of citizens in their relation to governments (e.g. patient-doctor relationship). The organisational impacts which yield from our literature research included the trend towards networked forms of organisation, government tasks being taken over by citizens, and increased transparency of the public sector. Examples of legal impacts are existing regulatory frameworks (e.g. intellectual property) becoming obsolete, the emergence of alternative regulations (e.g. Creative Commons) and the law-making process becoming more transparent.

When analysing these impacts against the government policies of European Union Member States, it becomes apparent that some of these impacts strengthen government policies, while others undermine them. Some future opportunities may be that the social computing trend enhances the transparency of citizen demand and of government services and processes. In addition, public sector services may become more accessible and personalised as users are more involved in service provision. In addition, the efficiency of governments may increase. Social computing platforms enable groups of government practitioners to allocate resources in an efficient way. A future risk may be that principles of good governance (e.g. legitimacy, integrity, inclusion of all) are not automatically embedded in forms of user-generated public services. Furthermore, it is likely that the potential threat to privacy will grow due to the sensitive information that citizens publish on social networking sites. The quality of the information generated within communities is questioned by experts but also by users themselves. Lastly, it may be the case that not all groups will have equal access to user-generated public services.

# ■ 5. Evidence of social computing impact

This chapter reveals evidence of social computing impact yielding from case studies and a survey (for an explanation of the methodologies used, see paragraph 1.3 of this report). Four cases which cover the four public-service clusters (health, learning, government and inclusion) have been studied, namely the educational content community *Connexions*, the doctors' network *Doctors.net.uk*, the patients' support site *PatientsLikeMe* and the citizens' watchdog *Wikileaks*.[211] The survey was published on eight sites: the professional communities *Flu Wiki, ECGpedia*, *ePractice* and *Doctors.net.uk*, the patient support community *Endometriosis.uk.org*, the political community *Petities.nl* and the crime-watch communities *Patewire* and *WikiCrimes*.[212] In this chapter, the impacts found in the cases and survey will be set out. In the last paragraph of the chapter, conclusions are drawn as to the weight of the impact.

## 5.1   Connexions case

### Introduction

The Connexions project began in the autumn of 1999 as an idea, building into a vision, for moving teaching and learning from a static, linear progression through a set of topics to a dynamic "ecosystem" of shared knowledge.[213] The goal of Connexions is to provide and maintain a commons where individuals and communities worldwide can create and freely share scholarly materials.[214] According to the founder, Richard Baraniuk, Connexions is an online community which provides "the conditions for the widespread re-use of educational or scholarly materials by communities of educators and learners."[215] Today, Connexions offers a platform to instructors, authors and learners who share knowledge, continually updating it and weaving together a variety of concepts.

The Connexions website has five key applications:

- *Course roadmap:* a guide for instructors and learners. Learners can add their own annotations to the materials, which are kept private to them.
- *Authoring Interface:* support to authors in creating modules to contribute to the repository. Authors can work in their individual workspace and in workgroups with colleagues to jointly develop modules.
- *Course Composer/Instructor Interface:* allows instructors to work individually as well as collaboratively to create courses using modules in the repository.
- *Repository:* supports searching and management of the content.
- *Endorsement system:* a window into the Content Commons of material that has been endorsed by professional authorities.

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211  www.cnx.org, www.Doctors.net.uk, www.PatientsLikeMe.com and www.wikileaks.org

212  www.cnx.org, www, http://www.Doctors.net.uk, www.patientslikeme.com, www.wikileaks.org, www.fluwikie.com, http://www.en.ecgpedia.org, www.epractice.eu, http://www.endometriosis-uk.org, http://www.petities.nl, http://www.platewire.com, http://wikicrimes.org, ,

213  Henry, G. (2004), New Models and Tool – Connexions: an Alternative Approach to Publishing, in: Heery, R. et al: ECDL, 2004, LNCS 3232, pp. 421-431.

214  Baraniuk, R.G. et al, (2002), Connexions,: Education for a Networked World, IEEE International Conference on Acoustics, Speech, and Signal Processing – ICASSP'20, Orlando and Baraniuk, et al (2006), Connexions – Sharing Knowledge and Building Communities in Signal Processing, IEEE Signal Processing Magazine, 21(5), 10-16.

215  Dholakia U.M., King W.J. and R. Baraniuk, (2006), What Makes an Open Education Program Sustainable, The Case of Connexions, Connexions, www.cnx.org.

### Level of usage

Connexions has four distinct user groups:[216] (1) authors, who create original educational content and make it available in the Content Commons, (2) instructors, who can select the available content and compile or otherwise manipulate it, to create customised instructional materials such as a course or a curriculum for use in their classes and teaching activities (3) students (e.g. of primary, secondary schools and universities), who consume the educational materials and (4) reviewers, who review and can endorse content published on Connexions. In the past few months, the average number of visits per day was around 32,000, the number of pages viewed was around 70,000 and the number of files accessed approximately 1,200,000.[217]

More user statistics are provided by Petrides *et al.* (2008), who focused on the size of the group of co-creators; the "author users" who actively create, modify, upload and discuss content.[218] Her research shows that the vast majority of users read, download and use the online material for their courses and that only a small minority of users are the creators of content. However, by examining log files, Petrides *et al.* (2008) also found that the number of new author users joining each year increased at an average rate of 93% - from seven new author users in 2000 to 83 in 2004.

In an interview with TNO and DTI, Joel Thierstein (CEO of Connexions) estimated the current number author users at 1,000. Of these 1,000 author users, approximately 500 remix and edit modules and 500 create content.[219] When

relating these new figures to the calculations of Pertrides *et al.* (2008) it becomes clear that between 2005 and 2008 the number of author users continued to grow steadily. As the total number of author users in 2005 was 247 (see Table 1), until 2008 the number of author users has grown by an average of 100% each year.

### Impact

The impact of the Connexions community seems diverse; existing products, processes, organisation structures and legislation are changing. First, products: the Connexions community generates open and freely available scholarly material. Whereas traditional publishers hitherto had the exclusive rights to publish and sell textbooks, the educational content created on the Connexions website can be created, published and disseminated by anyone. In terms of product change, the creation of the product has become more open (several authors co-creating the product), the status quo of the product has altered (the textbooks are in a perpetual beta version; there are many final versions of a Connexions textbook), the number of versions of the product increases (hyper-customisation; books are tailored to the needs of each individual) and the availability of the product has changed (freely available to anyone). The fact that text books are available to students for free has, in turn, an effect on the learning opportunities for students all over the world. In the interview with TNO, Joel Thierstein told TNO that the Maxfield Foundation had bought the rights to the book "Collaborative Statistics" and made the content available free through Connexions under the Creative Commons Attribution License. The online version of the book has already been chosen as the primary text for autumn classes enrolling more than 1,000 students. The release of the book in Connexions makes it possible for students all over the world to study this subject at no cost. In the US alone, almost 100,000 students take a statistics course at a community college each year and many pay $100 or more for a traditional statistics textbook.

216 Dholakia, U.M., King, W.J. and R. Baraniuk, (2006), What Makes an Open Education Program Sustainable, The Case of Connexions, Connexions, www.cnx.org. The Connexions Project http://cnx.rice.edu

217 http://cnx.org/stats, website accessed December 2008.

218 Petrides, L., Nguyen, L., Jimes, C. and A. Karaglani (2008), *Open educational resources, inquiring into author use and reuse*, Int. J. Technology Enhanced Learning, Vol. 1. Nos. 1/2.

219 Joel Thierstein was interviewed by TNO and DTI on 2 December 2008, for the "Impact of Social Computing" project.

"Collaborative Statistics" is not only used by Connexions members in the traditional way (downloading and reading); several members have already customised the book by re-mixing or adding other scholarly material.[220]

Furthermore, the professional processes for creating educational content are changing, as well as the preparation of courses. Market research (Dholakia *et al.*, 2005) on the Connexions community reveals that instructors who participate in the Connexions community realise time savings in their everyday profession as a teacher.[221] Many of the instructors who use Connexions have intensive teaching schedules during the working week and therefore appreciate being able to have a repository of educational materials organised in a modular format to make their course preparation more efficient. Online activities in the Connexions community also seem to stimulate a further specialisation of professions. As Joel Thierstein argues: "Connexions teachers are able to find other teachers who are experts in very specific field, which contacts stimulate a further development of the expertise. Moreover, highly specialised knowledge - which normally would disappear – is preserved and further developed because experts are able to find the few other experts in other parts of the world who have the same highly specialised knowledge." In addition, the individual impact of professionals seems to be increasing. Dholakia *et al.* (2005) show that Connexions' authors experience having a greater impact on scholars, practitioners, and students within their disciplines through the widespread dissemination and use of their educational and scholarly materials.[222] The vast majority of traditional text-books are small-run, selling from a few dozen to a few thousand copies. The retail price of textbooks is high and the revenues for the author relatively low. Academic recognition rather than revenue is the main driver for authors to publish. Publishing works on Connexions substantially increases the reach of the work.

Open education communities seem to stimulate inclusion of all. Anecdotal evidence shows that modularity and open-content development lowers the barrier to entry into the author community.[223] A member of the Electrical Engineering faculty at the University of Illinois said the following about his participation in Connexions: "For years I have wanted to write a textbook, because I love to write about Fast Fourier Transforms (FFTs). However, any complete text in my field also has to cover z-transforms, on which I have no interest in writing." Connexions allows this faculty member to contribute his FFT material and then weave a custom text for this course using contributions from other authors who are passionate about FFTs. In addition, Dholakia *et al.* (2005) show that, while many authors and instructors are professors, others are "shut outs" like Kitty Jones, a private music teacher from Champaign, IL, who is writing on music theory.[224] Interestingly, Kitty's materials are among the most popular in Connexions at present. Her materials had over 600,000 page views in January 2006 alone.

Furthermore, organisational structures and business models are shifting. Processes of content creation, professional feedback and course preparation, for example, are starting to cross organisational boundaries. Teachers at individual separate schools and colleges, who were not in contact before they joined the Connexions community and now collaborate on the creation

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220  For textbook see http://cnx.org/content/col10522. See also http://www.media.rice.edu/media/NewsBot. asp?MODE=VIEW&ID=11300.

221  Dholakia, Utpal M., Stacy Roll and John McKeever (2005), Building Community inConnexions. Market Research report for the Connexions project.

222  Dholakia, U.M., Stacy Roll and John McKeever (2005), Building Community inConnexions. Market Research report for the Connexions project

223  Dholakia U.M., King W.J. and R. Baraniuk, (2006), What Makes an Open Education Program Sustainable, The Case of Connexions, Connexions, www.cnx.org

224  Dholakia U.M., Stacy Roll and John McKeever (2005), Building Community in Connexions. Market Research report for the Connexions project.

of educational content, provide each other with feedback, discuss learning methods and help each other with course preparation. Furthermore, in contrast to the hierarchic structure of a school, the social structure of the Connexions community is horizontal. Professors, instructors, students and textbook authors all have the same position within the community. Status within the community is based on knowledgeability: the higher the quality of the content produced by a member, the more he/she is appreciated by peers. In addition, it appears that traditional organisations, such as the publishers, are under competitive pressure from open education communities. The business model of traditional publishers is based on conventional production and distribution processes and channels. However, it seems that publishers in the United States are not currently in the position to put a new business model into place.[225]

Another impact which can be discerned is the amendment of policy and legislation. In the United States, several states are reconsidering their policy on the dissemination of scholarly material as a result of content creation within open education communities such as Connexions. States have the task of monitoring the quality of educational content and are currently discussing the acceptance of open materials. Several states, such as Texas, are starting to accept open created educational content. Furthermore, various government institutions are themselves beginning to openly share the content they create. An example is the National Institute of Health in the United States, which adopted a "public access policy" in April 2008.

### Drivers and barriers

There are several drivers for users to participate in the Connexions community. The most important driver may be possibility to

contribute to a greater knowledge base. As Joel Thierstein argues: "One of the main purposes of the academy is for its faculty to contribute to the knowledge base of their respective disciplines." Academic recognition may be a second driver for users to contribute to the creation of educational content. Contributors of the Connexions website are seeking a broader exposure of their work. Citations, re-use of and elaborations upon their publications strengthen the academic position of authors. In addition, they are more able to advance their work with the feedback they receive from other Connexions members.

Evaluations of co-creation processes in Connexions also show that the most vibrant communities within Connexions are those which already have a content base (a basis of scholarly material). "No-one likes to start with a blank page" explains Joel Thierstein. "it is easier to continue with something that has already started. Blocks of knowledge attract authors and facilitate the building of an online community. These blocks can really accelerate the growth and liveliness of the community." Most Authors will not write a whole book online. "We learned from Wikipedia that people are willing to contribute freely, but only small blocks of their time."[226] Another driver for users to participate is the online presence of a critical mass. The greater the number of professionals and students online, the more appealing the community is to other professionals and students. It seems that the Connexions website has currently reached a tipping point; the membership to Connexions is becoming rapidly more common. Joel Thierstein states "this is the network effect; people joining up because their peers have joined up."

A barrier for teachers, authors and students to use Connexions could be the limited quality of

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225  Joel Thierstein states the following about the traditional publishers: "*As the American stakeholder model stresses short term profit, publishers do not have the incentive to fundamentally change traditional processes.*"

226  Joel Thierstein: "*a group of very active author users had created a solid basis of content which attracted many other users to the website. From that moment (the presence of a solid basis of content) the average number of users started to grow rapidly.*"

the content. According to Joel Thierstein, quality is not an issue because Connexions has put in place a quality control system. Connexions works with "lenses" - selections of content in the Connexions repository which enable both organisations and individuals to give their seal of approval to content in the Connexions repository, allowing for user-driven quality control of Connexions modules and collections.[227] Through these lenses, Connexions users can provide their own endorsements for items in the repository. Lenses can also be used as "bookmarks" within the repository to keep track of related or otherwise interesting content. A search will yield a ranking of the most popular and user-approved content. In addition, organisations, such as professional societies, can create endorsement lenses containing content they have carefully reviewed and deem to be of high quality. Organisations use their own criteria for endorsement and are encouraged to describe their selection process on the lens home page.[228]

Another challenge (and not unique) for Connexions is planning for and ensuring the sustainability of the community (long-term viability and stability). The complication is that the traditional revenue models employed as a matter of course in other educational settings (earning revenue from knowledge creation and dissemination such as enrolment fees, tuition, book sales, subscriptions, etc.) do not directly apply to open education communities, since their materials – and often their software platforms – are freely available on the web.[229] The Connexions community does not have permanent funding, which makes the future and the possibilities for growth unsure. However, Connexions have been in existence for 10 years. A last challenge for Connexions may be to achieve full exploitation of the potential of interdisciplinary knowledge-building. Intellectual ties are often much stronger between colleagues and peers in the same

discipline. Discipline-based repositories lead to fragmentation based upon knowledge domain, which hinders interdisciplinary knowledge exchange.

## 5.2 Doctors.net.uk case

Doctors.net.uk describes itself as a peer-led service, set up by 'doctors for doctors'.[230] The website contains both traditional web services (e.g. gateway to online literature searching) as well as social computing functionalities (e.g. a medipaedia). The website was founded in 1998 by Dr Neil Bacon, a nephrologist at the Oxford renal unit. The initial goal of Doctors.net.uk was to stimulate Internet use among doctors and thereby realise the potential of the Internet to improve healthcare services. The website started as a gateway to medical information while offering members free e-mail addresses. Over time, Doctors.net.uk steadily evolved from a service-oriented, static website into a lively community in which doctors jointly build knowledge. The website contains the following social computing functionalities which are accessible only to registered doctors and medical students:[231, 232]

- *Forum for discussion groups:* where doctors debate complex medical questions. Automated e-mails alert doctors to new posts made in their favourite forum or messages containing their chosen keywords of interest.
- *Medical Image Library:* contains over 1,400 images to search and is used by doctors and students for learning, training and presentations. Doctors and students can upload their own images, download others, and discuss images.

227  http://cnx.org/help/lens_what
228  http://cnx.org/endorsements
229  See also Geneva, H. (2005), Managing "Open": An Oxymoron or Formula for Success? Rice University.

230  http://www.Doctors.net.uk/
231  http://www.sovereign-publications.com/Doctors.net.uk.htm
232  http://www.Doctors.net.uk/

- *Medipaedi:* an online textbook written and edited by members. Members can edit and update another member's article.
- *eCases:* a collection of medical cases submitted by members of the Doctors.net.uk community. Doctors can create, share and rate eCases.
- *Medical Education Modules:* this database contains 160 free, accredited eCME modules which are revised annually. Doctors can create and publish modules.

### Level of usage

In November 2008, 161,327 doctors were member of Doctors.net.uk, which is more than 90% of the doctors in the UK. The average number of doctors online on a daily basis was around 13,000 at that time, and the average number of doctors online on a weekly basis was approximately 50,000. The number of participating doctors has grown rapidly over the years (approximately 10,000 members in 1999, 40,000 in 2001, 80,000 in 2003, 100,000 in 2005, 138,000 in 2007).[233] The average yearly growth of Doctors.net.uk is around 85%. In its early years the website grew by around 150% each year and in the past few years growth has levelled off to around 15% each year. This growth is expected to decline further, since almost all UK doctors have joined Doctors.net.uk. The users include general practitioners, physicians and medical students, representing over 50 medical specialisations. Of the 161,327 doctors, 47,246 are general practitioners and 114,081 are specialists (some of whom are in training).[234] In 2007 the website saw 250,000 new postings every month.[235]

The most popular social computing applications seem to be the image library and the forum.[236] Over 2,000 images have currently been published and discussed in the medical image library. Tim Ringrose, CEO of Doctors.net. uk stated about the medical image library: "The content of the medical images library seems to be most compelling; the pictures provide concrete medical content to be discussed by doctors. The user statistics show that the usage of the medical images library climbs steadily". Medipaedia and eCases are only used by groups of early adopters. The Medipedia was launched in 2006. Four months after its launch, around 35,000 members had used it and 1,000 articles had been submitted. According to Tim Ringrose a growth in the use of the Medipaedia and eCases has yet to happen. Popular among users is the Medical eModules application; almost two-thirds of Doctors.net. uk members use the eModules. Interestingly, the number of user-generated modules seems to be increasing. Today, between 40 and 50 of the 219 modules have been created by users. Other modules are provided commercially or by the Department of Health.

### Impact

Although the impact reported by respondents of a survey conducted by TNO and DTI[237] seems to be substantial (varying from increased quality of treatments to a more efficient use of their network), no less than 47% of respondents of the survey state that they wish Doctors.net.uk to have even more impact. This survey outcome could point to a social computing potential that is yet to be exploited. Desk research and the survey results show that the current Doctors.net.uk community is already affecting existing healthcare services, processes, organisational structures and legislation. Most significant may be the impact of Doctors.net.uk on the everyday practice of

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233  http://www.stlcomms.com/index.php?section=179, http://findarticles.com/p/articles/mi_m0ECZ/is_/ai_62060639, http://www.nma.co.uk/Articles/31558/Profile+-+Dr+Neil+Bacon.html, http://www.bmj.com/cgi/eletters/326/7382/176
234  Reference date November 2008.
235  http://www.nma.co.uk/Articles/31558/Profile+-+Dr+Neil+Bacon.html,

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236  Interview with Tim Ringrose, CEO of Doctors.net.uk, 5 December 2008, TNO AND DTI "Impact of Social Computing" Project.
237  See also paragraph 5.4 of this report.

doctors. In the TNO and DTI survey, around 63% of the respondents stated that their service to patients has improved due to their involvement in Doctors.net.uk.[238] Tim Ringrose explains the impact of social computing applications of Doctors.net.uk with some examples: "One of the Doctors.net.uk members had uploaded a picture of a pacemaker complication of one of his patients. This image was examined by several other doctors and one of them found that there was a second complication which the doctor in attendance had missed. Another example is of a child who had a gunshot injury in his head. The doctor who treated the child uploaded pictures of the injury including an X-ray. He wrote on the image page that he intended not to perform any surgery because of considerable medical risks. A plastic surgeon however reacted to this while saying that new methods where being developed which made surgery possible. The doctor of the child with the injury subsequently invited the plastic surgeon to further collaborate on this medical case."

Another impact of Doctors.net.uk experienced by members of Doctors.net.uk relates to improvements in their efficiency. 54% of the respondents of the TNO and DTI survey stated that they save time by accessing information and communicating with peers through the Doctors.net.uk website.[239] For example, doctors are more efficient in finding and disseminating information. As one of the survey respondents stated: "I am more efficient in obtaining and updating my knowledge". Knowledge is acquired through static applications (such as the eJournals) and social computing applications (e.g. the forum and the medical image library). Time savings also seem to be realised through the efficient allocation of human resources. Specialists on Doctors.net.uk

can find each other more easily. Only 3% of the respondents consider the time spent on Doctors. net as one of the drawbacks of the website. One of the respondents states, for example: "it is easy to waste a lot of time on Doctors.net.uk."

Furthermore, Doctors.net.uk seems to stimulate community building. Many respondents of the TNO and DTI survey referred to social networking activities they undertake on Doctors. net.uk. As one of the respondents stated "one of the most important impacts of Doctors.net.uk on my professional life is the sense of 'community' with other medics". Others said that they expanded their network of medical friends and that they were more informed about what peers are doing. Another respondent reported that he/she had "several times started at new hospitals in strange parts of the country, and found someone there who I knew on Doctors.net.uk". And a member writes that he/she is "less isolated when working in remote locations". In addition, 34% of the respondents state that they make better use of their network. Overall it seems that ties between professionals are becoming more horizontal and crossing organisational boundaries. The values shared within the Doctors.net.uk community endorse this horizontalisation trend, as the top 5 values shared within the community are: professionalism, community sense, openness, informality and equality.

Doctors.net.uk also seems to generate a long-tail effect - because a large number of UK doctors are connected, doctors with a very specific medical profession are able to locate each other. This long-tail effect could increase if doctors from other countries could also join Doctors.net.uk. Furthermore, interaction on Doctors.net.uk seems to stimulate interdisciplinary cooperation and knowledge exchange. Respondents to the TNO and DTI survey comment: "an important impact of Doctors.net.uk is the increased awareness of concerns from other specialities", and "I am more able to test skills knowledge in other areas of medicine (not just my own specialty)", and "I am more knowledgeable of

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238 Of this 63%, 43% found "improved quality of services" to be the most important impact of Doctors.net.uk on their everyday practice as a doctor.
239 Of this 54%, 49% found "time savings" to be the most important impact of Doctors.net.uk on their everyday practice as a doctor.

issues affecting other disciplines within medicine." However, most interaction is between peers who report that "Doctors.net.uk provides me with the opportunity to exchange my opinion with others", and "I am enabled to seek peer views on complex issues", and "I use Doctors.net.uk to discuss contract issues with peers."

The fact that individual contributions to the Doctors.net.uk community may generate substantial impact can be demonstrated by the "Dr Scot Junior case". A trainee surgeon at the Raigmore Hospital insulted a professor of medicine on the forum of Doctors.net.uk.[240] The trainee expressed his anger about the role of the professor at the head of what has been called 'the UK government's Modernising Medical Careers (MMC) fiasco'.[241] Another member of Doctors.net. uk saw the trainee's comment and reported him to the authorities in Scotland which immediately suspended him. Through the Doctors.net.uk community, a group of supporters of the trainee mobilised, arguing that the suspension would appear on the trainee's permanent record and damage his future employment or promotion prospects. Several members of the Doctors.net. uk community report that Doctors.net.uk enabled supporters of the trainee to mobilise. Some, for example, state that: "Doctors.net.uk has been instrumental during the MMC fiasco" and "Ability for Drs to 'stick together' over issues - e.g. when Dr Scot was suspended after the MTAS fiasco".[242]

Finally, it seems that the content generated at Doctors.net.uk raises new legal issues, for example on intellectual property. Doctors assign to Doctors.net.uk the copyright of all the material they post, except for content posted in

the Medical Image Library, Medipaedia, eCases or Photography Forum; the latter is subject to a Creative Commons Attribution 3.0 Licence.[243]

### Drivers and barriers

Besides obtaining a free e-mail address, access to Doctors.net.uk in hospitals is an important driver for doctors to join up. According to Tim Ringrose, UK hospitals block access to Google and Yahoo on their computers, but do provide access to Doctors. net.uk.[244] Other reasons for participating are revealed by the TNO and DTI survey, which shows the following top 5 drivers: (1) having an e-mail account, (2) acquiring knowledge, (3) access to specialist knowledge, (4) acquiring skills and (5) professional advice. The generation of knowledge is thus – apart from having an e-mail account – the key driver for doctors to join Doctors.net. uk. The knowledge-generation is very versatile and may concern information about medical politics, general medical information, conference reports, specific medical case information, and concrete medical advice. Tim Ringrose refers in this respect to the "wisdom of the professionals", which enhances the knowledge of doctors and the effectiveness of treatments.

Another driver to participate the Doctors.net. uk (and not another professional community) in particular may be the Doctors.net.uk brand, which represents four core values: trust, transparency, independence and collaboration. Doctors.net.uk has published a clear mission statement on the home page of the website, namely to provide doctors with the largest independent network for collaboration and improvement in healthcare. The TNO and DTI survey reveals that community members seem to identify with the Doctors.net.uk values and mission because their core values are professionalism, community sense, openness, informality and equality. Furthermore, the fact that the majority of

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240  http://www.theregister.co.uk/2008/09/09/inverness_doctor_suspension/

241  The MMC regime has been applied to postgraduate medical training with "the aim of bringing more structure into the career path for doctors and better training towards the very best care for patients". In 2007, this resulted in the inability of thousands of newly-qualified junior doctors to find work, and hospitals has problems with recruiting the staff they needed.

242  See also http://www.remedyuk.org/

243  http://about.doctors.net.uk/Terms-And-Conditions

244  Interview with Tim Ringrose, CEO of Doctors.net.uk, 5 December 2008, TNO AND DTI "Impact of Social Computing" Project.

peers are connected may be a driver for others to connect to Doctors.net.uk. As Tim Ringrose explains: "it seems that at a certain moment in time there has been a tipping point in usage; the Doctors.net.uk website gained a critical mass which attracted even more doctors to the site."

However, the Doctors.net.uk community is also facing some challenges. 53% of the respondents to the TNO and DTI survey, for example, find that their or their patients' privacy is at risk. One of the respondents states, for example: "I fear for lurking deans and therefore feel that I cannot chat freely." To address the privacy issue, Doctors.net.uk has developed a comprehensive privacy policy.[245] In principle, Doctors.net.uk does not disclose members' personal data, but will occasionally ask members whether their personal data may be passed on to third parties. Doctors are always able to refuse permission, except where the information is included in the Doctors.net.uk bulletin. Doctors. net.uk uses personal data to provide services, to carry out membership administration and - if allowed by the member - for direct marketing purposes. Members are reminded by Doctors. net.uk of the GMC and BMA (Britisch Medical Association) guidance that they should not send any patient-identifiable data across the Internet, and that they should not post such information in the Forum area. Forum comments are annotated with the user name of the member commenting, and cannot be posted anonymously. Unless specifically indicated, the forum is only provided for GMC-registered doctors.

Another challenge – and not unique to the Doctors.net.uk community[246] – may be to ensure

the liability and accuracy of co-created content. The TNO and DTI survey shows that around 37% of Doctors.net.uk members question the quality of the information generated by peers. In order to ensure the quality of the content as much as possible, Doctors.net.uk gives access to the co-creation applications only to registered doctors and students.[247] Furthermore, as Tim Ringrose states "A great advantage of the doctors.net.uk social computing applications in comparison with other – general accessible - social computing applications (such as wikipedia) is that the profile and seniority of the contributor is traceable. Readers can look into the profiles of the contributors and find out the track record of the doctors, which results in a greater level of confidence in the quality of the information". Members of Doctors.net.uk are responsible for use or misuse by any person accessing the website through their password or ID. Doctors are invited to report inaccuracies and incomplete information they find on the website.

A third drawback of Doctors.net.uk perceived by users is the domination of the discussions and content by a few peers. As many as 56% of the respondents to the TNO and DTI survey found this to be a shortcoming of the community. Some of the respondents report that they find the advertisements (with which Doctors.net.uk is partly financed) annoying.

## 5.3    PatientsLikeMe case

PatientsLikeMe was founded in 2004 by three MIT engineers, Jamie Heywood, Benjamin Heywood and Jeff Cole. Their personal experiences with Amyotrophic lateral sclerosis (ALS) motivated them to create a community of patients, doctors and organisations that

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245  http://www.doctors.net.uk/targetting/article. aspx?areaid=2&articleid=4619

246  See for example: Gustini, D. and Barsky, E. (2007), Introducing Web 2.0: wikis for health librarians, JCHLA/ JABSC, 28, 147-150, Guistini, D. (2006), How web 2.0 is changing medicine [editorial], BMJ, 333, 1283-1284, see also, McLean, R., Richards, B.H. and Wardman, J. (2007), The effect of Web 2.0 on the future of medical practice and education: Dwarikinian evolution or folksonomic revolution?, MJA, 187, 3, 174-177.

247  Doctors.net.uk holds individual members responsible for keeping their password and ID secret and not allowing anyone else to use them.

inspires, informs and empowers individuals.[248] The founders started with their own case and developed a website where ALS patients could share experiences, support each other and enter data on their medical condition and treatment, such as symptoms, drug prescription, dosages, and effectiveness of treatments. In March 2006, PatientsLikeMe opened for business. Within a year, the company added communities for patients with Multiple Sclerosis (MS) and Parkinson's disease. The number of users grew rapidly and in the autumn of 2007, the company opened a community for people with HIV. Today, PatientsLikeMe also has communities for Mood disorders, Fibromyalgia and orphan diseases like PSP, MSA and Devic's.[249] PatientsLikeMe has online communities for 16 different conditions, with each community having the following functionalities:

- *Community search:* a search application with which patients can find peer patients.
- *Personal page:* each member can create his/her own page by filling out their profile (details registered include personal information, diagnosis summary, information on medical condition, treatments and symptoms).
- *Forum:* online platform on which patients can discuss treatments, symptoms and exchange personal experiences.
- *Treatment statistics:* aggregated data on the treatments of members.
- *Symptom statistics:* aggregated data on the symptoms of members.
- *Research page:* page with community reports, staff presentations and information about partner programmes.
- *Private Message:* members have their own inbox to exchange messages privately.

An important element of the website is the data-gathering to enhance knowledge about the diseases. The website collects patient information on two levels. First, a quantitative breakdown of symptoms and dosages is provided through data entry by patients. In their profiles, patients fill out data on their medical conditions and treatments which is then translated by software into charts and graphs. Second, the forum generates more qualitative information in the sense that members share general advice and provide feedback on certain drug or treatment issues.[250]

### *Usage*

The number of members of PatientsLimeMe has grown rapidly since its launch in 2006. In only four years, the website has attracted a total of 38,904 members.[251] The size of the communities varies, from the Moods Community with 6,653 to the Neuroendocrine Conditions community with 633 members. Differences between the sizes of the communities may be due to the prevalence or rareness of a particular disease. In 2008, the website reached approximately 150,000 unique visitors by month. PatientsLikeMe has members from all over the world. However, the largest number of members live in the United States, United Kingdom, Australia, Germany, the Netherlands and New Zealand.[252]

Ben Heywood, one of the founders of PatientsLikeMe, stated the following in an interview about the type of usage of the PatientsLikeMe website: "Our patients are really engaged. Their time on the site is very long. They do a number of things. They view other patient profiles, so they can learn from them. They find a 'patient like me,' and there are some really interesting stories about that. They learn from the

248  www.PatientsLikeMe.com, accessed on 9 December 2008

249  www.PatientsLikeMe.com, accessed on 12 December 2008.

250  New York Times Magazine, Practicing Patients, 23 March 2008, available at: http://www.nytimes.com/2008/03/23/magazine/23patients-t.html

251  Website accessed on 26-03-2009.

252  New York Times Magazine, Practicing Patients, 23 March 2008, available at: http://www.nytimes.com/2008/03/23/magazine/23patients-t.html

collected treatment reports and symptom reports that we have, which is the aggregated data of all of our patients within the community, and then they share and answer questions in the forum. So, there is an emotional support as well as helping with standards of care and how patients do the little things that help them with their disease."[253] And in the interview with TNO and DTI, Ben Heywood states: "About 60% is actively engaged in the sense that they are more than just watching profiles, for example communicating on the forum. 10 to 20% of the patients really uses PatientsLikeMe to manage their disease, providing all health information. This proportion is consistent over the years."[254]

### Impact

It seems that the PatientsLikeMe community generates substantial organisational, social and legal impacts. The most important impact may be that the knowledge of diseases increases as members' data on their medical condition, symptoms and treatments is collected, translated into graphs and analysed. PatientsLikeMe claims that the effectiveness of treatments and drugs is also increasing. James Heywood explains this impact by using an example in which a drug evaluation on PatientsLikeMe was negative and affected the drug prescription. "We have data in our system on over 100 patients who have been on a drug long enough to demonstrate the hope of that drug was not what was originally assumed – and that means thousands of patients won't take it."[255] In addition to the aggregated data, which is automatically generated from the patient-reported data on individual profiles and reported in Treatment and Symptom reports, members themselves collect data. One of the users, for example, sent

the following message to all other patients who received a specific treatment: "I see you are using Glyconutrients. What are the exact ones that you're using, how long have you been using them for, and what benefits if any have you seen. I have heard a lot of encouraging things about them, but I have yet to hear anything about their use by ALS patients. Are they helping with a particular symptom? Please let me know what you have learned by taking these supplements. Blessings to you and your family."[256] The knowledge built by the patients can be used by patients as a basis for medical decisions. James Heywood, one of the founders, stated in an interview with Newsweek that the site is all about gathering the collective wisdom and making it available to patients and professionals. "In the end, it's the same as open-source software. If you can see all the information, you can correct errors."[257]

Aggregated data yielding from the PatientsLikeMe community is also impacting on existing research programmes and methods. James Heywood gives the following example in an interview with Frontline:[258] "One of our researchers, Dr. Paul Wicks, recently read a published clinical observation report on two ALS patients experiencing excessive yawning. Several patients were already tracking excessive yawning as a symptom on PatientsLikeMe, through our user-added symptom tracker. Using a system-wide invitation, patients were asked to endorse whether they experienced no, mild, moderate or severe excessive yawning, described as "attacks of uncontrollable yawning, sometimes when they are not even tired". The results were impressive. Excessive yawning was reported to be absent in 30% of responders, mild in 30%, moderate in 32%, and severe in 9%. Dr. Wicks also identified an unexpected association between yawning

253 See: http://www.mylot.com/nr/viewframe.aspx?id=61 4543&url=http%3a%2f%2fwww.healthbusinessblog. com%2f%3fp%3d1612&type=Blog
254 Interview with TNO and DTI, 13 January 2009.
255 The Boston Globe, Through website, patients creating own drug studies, November 16 2008, available at: http:// www.boston.com/news/health/articles/2008/11/16/ through_website_patients_creating_own_drug_studies/

256 www.PatientsLikeMe.com, accessed on 12 December 2008.
257 Newsweek, Power to the bottom, September 15, 2008, available at: http://www.newsweek.com/id/157540/
258 Frontline, Ben Heywood's new website, http:// www.pbs.org/wgbh/pages/frontline/somuchsofast/ heywoods/ben.html

severity and site of ALS symptom onset. Patients with a bulbar onset of disease (57%) were more likely to have moderate or severe yawning than patients with arm onset (42%) or leg onset (31%). Dr. Wicks was able to respond to the case report within two weeks of its publishing with a sample population of 254 and taking only about 10 hours. These results are being published as a letter in response to the original article." It thus seems that research projects from traditional research institutes may become more intertwined with research conducted on PatientsLikeMe.[259]

An important social impact may be generated by the personal support and advice that members of PatientsLikeMe give each other. Many of the posts on patients' pages contain encouraging messages from other patients. The level of social networking in most PatientsLikeMe communities is very high. Patients search for peer patients, often become friends and sometimes also meet in real life. The location filter of the search engine can be used by members to see if there are any peer patients living in their neighbourhood. When feeling depressed, members of PatientsLikeMe receive support from other members.[260] An HIV patient, for example, posted a message in which he said that he was feeling very down. He received many encouraging messages from other patients, including the following. "…Hang in there. Your babies and the rest of us need you. We are all here to support you. What is going on regarding your depression. I recently checked out of an inpatient facility so I somewhat understand where you are coming from."

Furthermore, it seems that patients with very specific or rare symptoms are able to find other patients who have the same symptoms - which points to a long-tail impact of the PatientsLikeMe community. Peer patients who did not previously have contact are now able to find each other. One of the many examples is provided by Mary Sontz in an interview with the Boston Globe.[261] Mary, who suffers from the Parkinson's disease, recalls complaining to her doctor that the medication she took for young onset Parkinson's disease was causing her rapidly to lose weight. Because she tracked her weight and medication on PatientsLikeMe, she was able to find a dozen other women of her age who had experienced the same side effect.

PatientsLikeMe also seems to affect traditional healthcare organisations. Patients appear more empowered to have their say in the healthcare dialogue. Ben Heywood explains in an interview on the World Health Care Congress:[262] "That is part of what is so exciting about PatientsLikeMe – patients now have the ability to drive change, make their issues central to the dialogue." In the interview with TNO and DTI, Ben states: "The usual format is around the loudest voices convincing others on an anecdotal basis. The PatientsLikeMe format is different: it is really based on quantitative data from all patients: not anecdotal data. Therefore it has a largely positive impact on the doctor–patient relation. It opens up the dialogue. Patients ask: What treatments are most effective? Besides, PatientsLikeMe increases the personalisation of treatments; patients are not the same and will ask what works for a patient like them."[263] It thus seems that the bilateral relationship between doctors and patients is changing as information asymmetry decreases

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259  Also: the biggest set of data available on lithium use by ALS patients comes from the reports on PatientsLikeMe. So far, the data –which are still being gathered – indicate that the drug is considerably less effective than indicated by the Italian study, published in the Proceedings of the National Academy of Sciences. While that discovery has been disappointing, the online reporting is still useful (The Boston Globe, November 2008).

260  www.PatientsLikeMe.com, forum, accessed on 12, 16 and 18 December 2008, PatientsLikeMe permitted TNO and DTI to publish this statement.

261  The Boston Globe (2008), Through websites, patients creating own drug studies, by Carolyn Y. Johnson, 16 November 2008.

262  The World Healthcare Congress, Speaker Live Chat Series, Ben Heywood, co-founder, president and director of PatientsLikeMe, http://www.worldcongress.com/transcripts/Ben_Heywood_Transcript.pdf

263  Interview with TNO and DTI, 13 January 2009.

because patients are well-informed about their medical condition, symptoms and treatments. A concrete example is provided by Todd Small, a Multiple Sclerosis patient, who became a member of PatientsLikeMe in June 2007.[264] He learned from PatientsLikeMe that he was taking the wrong dose of drugs. Contrary to what his neurologist told him, the PatientsLikeMe website showed that other patients took a higher dose of the drug which worked well with them. He started taking a higher dosage and his treatment improved.

The last impact seems to be on the legal rights of patients to privacy protection. Members of PatientsLikeMe can choose to make their data viewable by all PatientsLikeMe members or to anyone on the Internet.[265] As anyone can become a member of PatientsLikeMe, anyone with a computer and Internet connection can access the patient data on PatientsLikeMe. Data access is not protected by authentication processes or technologies. This seems to have a substantial impact on the patients' privacy protection. PatientsLikeMe states the following about their privacy policy in an interview on the World Health Care Congress: "We have a unique take on privacy, well outlined in our Openness Philosophy (a link is on our home page). We talk openly with our patients about the risks of sharing information – but we (as do our members) feel the benefits outweigh the risks." On the website, PatientsLikeMe states in their Openness Philosophy: "Currently, most healthcare data is inaccessible due to privacy regulations or proprietary tactics. As a result, research is slowed, and the development of breakthrough treatments takes decades. Patients also can't get the information they need to make important treatment decisions. But it doesn't have to be that way. When you and thousands like you share your data, you open up the healthcare

system. You learn what's working for others. You improve your dialogue with your doctors. Best of all, you help bring better treatments to market in record time." In the interview with Ben Heywood, TNO and DTI asked why PatientsLikeMe does not use more privacy-enhancing technologies (e.g., not sharing profiles, or only between friends), to which Heywood responded: "We chose to apply a fully open model because of two reasons. Firstly, it gives a validation: everything can be drilled down, verified and validated at the individual level by others. It allows some kind of self-police, much like the open-source model. Secondly, it is difficult to capture individual patient experiences in more closed models. An open model ensures transparency which is required to have an impact at the individual level." And: "PatientsLikeMe is not for everybody. Also it is too hard to work with this open model in the formal public sector because of public policy limitations."[266]

### Drivers and barriers

There are several drivers that attract patients to the website. The most important driver may be the support and information they can find on PatientsLikeMe. The following statement by a PatientsLikeMe member illustrates the social motivation for patients to join up: "I also appreciate this site, there are so many different personalities that make this site so fun. I really love the things that I have been reading and learning and I like being able to express what I feel about what we live with and talking about it to people that understand."[267] Another driver of patients may be the fact that PatientsLikeMe provides them with a personal medical record. Patients continually enter data about their medical condition, drug usage and treatments, resulting in a comprehensive status report with graphs and charts of their medical situation.

264 New York Times Magazine, Practicing Patients, 23 March 2008, available at: http://www.nytimes.com/2008/03/23/magazine/23patients-t.html
265 www.PatientsLikeMe.com, accessed on 12 December 2008.

266 Interview with TNO and DTI, 13 January 2009.
267 www.PatientsLikeMe.com, forum, accessed on 12, 16, and 18 December 2008, PatientsLikeMe permitted TNO and DTI to publish this statement

Furthermore, several patients state that a reason for joining the PatientsLikeMe community is that they can contribute to the improvement of treatments and drugs by sharing their data and experiences. As one PatientsLikeMe member stated in an interview with The Boston Globe: "If my information benefits scientists in finding a treatment or a cure, even after I die, then it was worth the sharing of personal information."[268] The large number of other patient members also attracts people to the website. The fact that other patients join up is a reason for patients to become involved. And, as Ben Heywood states in an interview with Frontline: "The bigger our communities get, the more information there is for everyone to learn from."[269]

However, being a member of PatientsLikeMe also has some important disadvantages for users. The most important downside of the community is the threat to privacy. Although not required to do so, patients can choose to enter comprehensive data into the site, such as residence, age, symptoms and medications. They post not only their own photos but often pictures of their children and spouses too.[270] They add brief autobiographies and describe their conditions in precise detail – including potentially embarrassing details.[271] PatientsLikeMe allows researchers and healthcare product and service companies to buy and access de-identified patient data, both individual and aggregated, for advancing medication and other health products or services. There are several risks to sharing one's health information: most insurers exclude pre-existing conditions from their coverage, giving people an incentive to hide early warning signs of disease. Employers might discriminate against potential employees if they are aware of a serious medical condition, and it may leave a social stigma attached to illnesses.[272] When signing up, patients must agree to the use and selling of their data. PatientsLikeMe acknowledges that the sharing of personal information that patients may choose to engage in on the site can carry risks.[273] According to Alan Westwin, a political scientist and expert in privacy issues, the members of PatientsLikeMe fit the profile of pragmatists.[274] They weigh up the pros and cons of PatientsLikeMe and then decide whether to join.

Another important perceived drawback of the PatientsLikeMe community is the limited accuracy of the information generated. William Stamney, neurologist of one of the patients on PatientsLikeMe sees - besides advantages such as mutual support – some disadvantages of PatientsLikeMe such as the risk of patients taking the wrong medical decisions based upon incomplete or inaccurate information.[275] "There are downsides to trying unproven treatments and looking to individual experiences for medical advice. The course of a disease can vary widely between individuals, making it difficult to disentangle the many factors – including a new drug – that might influence its progression. There are also risks to taking drugs when they have not been fully vetted by clinical studies." Some other doctors endorse this statement by Stamney and argue that the patient-led research lacks rigor and may lead to unreliable results, false hopes and harm to patients.[276] In an interview with Frontline, Ben Heywood acknowledges the possible bias of their patient-reported data and states that PatientsLikeMe tries to reduce this bias.[277]

268   The Boston Globe, Through website, patients creating own drug studies, November 16 2008, available at: http://www.boston.com/news/health/articles/2008/11/16/through_website_patients_creating_own_drug_studies/

269   http://www.pbs.org/wgbh/pages/frontline/somuchsofast/heywoods/ben.html

270   New York Times Magazine, Practicing Patients, 23 March 2008, available at: http://www.nytimes.com/2008/03/23/magazine/23patients-t.html

271   Dimick, C. (2008), Openness, Not Privacy, Web Site Promotes Sharing Disease Successes, Hardships, Journal of AHIMA, 79(6), pp. 30.

272   Newsweek, December 2008.

273   http://www.PatientsLikeMe.com/help/faq/Read%20This!#a_safe

274   New York Times Magazine, Practicing Patients, 23 March 2008, available at: http://www.nytimes.com/2008/03/23/magazine/23patients-t.html

275   The Boston Globe, Through website, patients creating own drug studies, 16 November 2008, available at: http://www.boston.com/news/health/articles/2008/11/16/through_website_patients_creating_own_drug_studies/

276   Psychorg.com, Patient-led drug trials defy medical establishment, 2008.

277   http://www.pbs.org/wgbh/pages/frontline/somuchsofast/heywoods/ben.html

A last drawback of the PatientsLikeMe website may be the peer pressure to provide certain (intimate) information and the domination of a few patients' opinions on the forum. When registered as a member, users can be approached by others and encouraged to fill out their profile. Also, the PatientsLikeMe staff frequently tell users about the benefits of entering their data, which may pressure members to enter intimate information. Administrators of the website remind users to fill out their profile and PatientsLikeMe also develops other incentives for users to enter their personal data. In an interview with Frontline, Ben Heywood states, for example: "we just implemented data quality grading of patients where users earn stars for filling out their profile, keeping their information current and tracking periodically over the course of their illness."[278] Furthermore, it seems that there is a small number of users who are very active on the forums, leaving other voices unheard and possibly resulting in a bias in the qualitative information provided. Yet the data used by PatientsLikeMe for research purposes is based on the user profiles (not on the forum) and are therefore more sound.

## 5.4 Wikileaks case

Wikileaks is designed to allow anyone to post documents which contain evidence of government corruption or other wrongdoings on the web without the possibility of being traced. The goal of Wikileaks is to enable whistleblowers and journalists to disclose sensitive information without being arrested.[279] Wikileaks phrase their mission thus: to provide an uncensorable Wikipedia for untraceable mass document leaking and analysis.[280] Wikileaks has an idealistic motive: "transparency in government activities leads to reduced corruption, better government

and stronger democracies." The Wikileaks website was launched in December 2006, a few months earlier than planned.[281] Among the founders of Wikileaks are Chinese dissidents, mathematicians and start-up company technologies, from the US, Taiwan, Europe, Australia and South Africa. As one of the initiators stated: "We are serious people working on a serious project, three advisors have been detained by Asian government, one of us for over six years".

The website has the following key functionalities which support the leaking and further dissemination of sensitive information:

- *Wikileaks search*. Search engine for finding documents on a specific subject on the Wikileaks website.
- *Country index*. An overview of leaks and analysis for each country. On the country page, documents can be accessed, discussed and uploaded.
- *Media kit*. An overview of how the data on the website is generated and can be used by journalists.
- *Writers' kit*. Introduction to posting, discussing and analysing leaked documents and the nature of these documents.
- *Donations page*. Online payment module for donating money to the Wikileaks community.
- *Chat*. Secure chat for whistleblowers and journalists to discuss specific cases or seek advice.

In an interview with a former Advisory Board member (who wishes to remain anonymous for reasons of personal security), TNO and DTI asked if Wikileaks could provide some more information about the founders. Wikileaks stated in this interview that "Wikileaks cannot provide more information about the founders." However, Wikileaks could reveal that: "The founders have

278  http://www.pbs.org/wgbh/pages/frontline/somuchsofast/heywoods/ben.html
279  New Scientist, 'How the MySpace mindset can boost medical science', 15 May 2008.
280  Wikileaks website, accessed on 24-11-2008.
281  Wikileaks website, accessed on 2-12-2008.

*Table 3: Top 20 most popular countries on which leaked documents are provided, Wikileaks*

| # | Top 20 most popular countries on which leaked documents are provided | | |
|---|---|---|---|
| 1. | United States | 11. | China |
| 2. | United Kingdom | 12. | India |
| 3. | Bermuda | 13. | Poland |
| 4. | Kenya | 14. | Israel |
| 5. | Canada | 15. | Russia |
| 6. | Germany | 16. | Israel and Occupied Territories |
| 7. | Iraq | 17. | Norway |
| 8. | Australia | 18. | Denmark |
| 9. | Afghanistan | 19. | Netherlands |
| 10. | Iran | 20. | Thailand |

*Source: Alexa, accessed on 27-11-2008*

*Table 4: Percentage of visitors per country, Wikileaks*

| # | Country | % of visitors | # | Country | % of visitors |
|---|---|---|---|---|---|
| 1. | United States | 28.3% | 12. | Italy | 0.9% |
| 2. | Germany | 24.5% | 13. | Ireland | 0.9% |
| 3. | United Kingdom | 22.3% | 14. | Greece | 0.7% |
| 4. | India | 4.3% | 15. | Netherlands | 0.6% |
| 5. | Austria | 2.8% | 16. | Switzerland | 0.5% |
| 6. | France | 1.8% | 17. | Spain | 0.5% |
| 7. | Canada | 1.4% | 18. | Brazil | 0.5% |
| 8. | South African | 1.3% | 19. | Mexico | 0.3% |
| 9. | China | 1.2% | 20. | Thailand | 0.3% |
| 10. | Sweden | 1.0% | 21. | Other countries | 4.9% |
| 11. | Australia | 0.9% | | | |

*Source: Alexa, accessed on 27-11-2008*

the rare combination of very high consciousness and vision on government issues and specialist technological knowledge. This is the basis of the Wikileaks' uniqueness."[282]

***Level of usage***

The Wikileaks website claims to have received 1.2 million documents.[283] There are leaked documents from 128 countries available on Wikileaks.[284] The following table gives an overview of the top 20 countries from which leaked documents are published on Wikileaks (see Table 3).

Wikileaks is available in 30 languages and its visitors originate from the following countries[285] (see Table 4).

In the interview with TNO and DTI, Wikileaks explain the high involvement of visitors from the United States, Germany and

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282 Interview by TNO and DTI with former Advisory Board member, 15 January 2009.
283 Wikileaks website, accessed on 27-11-2008.
284 Wikileaks website, accessed on 27-11-2008.

285 Source: Alexa, accessed on 27-11-2008.

United Kingdom as follows:[286] "There are several reasons why Wikileaks is most popular in these countries. Firstly in these countries there are many non-government organisations and media that are very interested in Wikileaks. So there is a relatively established community scrutinising government compared to many developing countries. Secondly, these are all countries with a high level of freedom of speech compared to many other countries – there is some censorship but in general they are characterised by high freedom and a lot of transparency. So there is a comfort level with and expectation of freely available information. Thirdly, particularly in the United States, citizens have a high sense of accountability. They often ask, 'What are politicians doing with my taxes?' So there is a culture of demanding accountability."

### Impact

Activities within the Wikileaks community seem to yield organisational, political and legal impacts, including increased transparency of government practice, political pressure to fight government corruption or misconduct, and the generation of legal evidence used in court cases. To start with, the increased openness of governments; many of the documents published on Wikileaks concern internal government files. These files can contain government documents such as (including military) strategies, policies, annual accounts, duplicate bookkeeping, budgets, formal letters, bulletins, e-mails, presentations, Excel sheets, pictures, manuals, handbooks and procedures. The documents published do not necessarily reveal a government's misbehaviour. Various documents merely provide more insight into internal standards, agreements and proceedings, which are not published by governments but may be of interest to citizens or journalists. An example is an FBI document which reveals the secret symbols that organised paedophiles use

to recognise each other, and is likely to be of broad interest to parents.[287] Another example is a PowerPoint presentation by the American Center for Disease Control and Prevention. The presentation gives insight into the collaboration between the United States and China as regards global disease detection.[288] Wikileaks states about this document "The material is of a type that is often made public, however we have so far been unable to find reference to the report on cdc.gov or elsewhere on the internet or in the press." These documents published on Wikileaks contribute to the opening-up of governments. Wikileaks organisers hold the view that, since government paid for these types of report to be created (and taxes paid for government to do this), the information should be freely available to citizens, as when the US government decided to require the open publication of research funded by the National Institute of Health, rather than selling publications to publishers.[289]

However, the majority of documents published on Wikileaks do reveal – some documents to a greater extent than others – governments' deviations from determined and communicated policies, the breaking of rules or agreements, and violations of national and international law. Several disclosed documents have had a substantial political impact. An example is the confidential investigation report by Kroll (a private investigation and security firm). This report on government corruption in Kenya was published on Wikileaks.[290] The investigation was assigned by the Kibaki administration in order to fight corruption in the former Moi administration. The Kroll report was issued in 2004 and uncovered a bribery scandal involving

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286  Interview by TNO and DTI with former Advisory Board member, 15 January 2009.

287  https://secure.wikileaks.org/wiki/FBI_pedophile_symbols

288  See: https://secure.wikileaks.org/wiki/US_Centers_for_Disease_Control_Collaborations_with_China:_rabies_explosion%2C_10_Dec_2008

289  http://arstechnica.com/science/news/2009/02/congress-may-slam-door-on-nih-research-open-access-policy.ars

290  https://secure.wikileaks.org/wiki/The_looting_of_Kenya_under_President_Moi

billions of US dollars.[291] President Kibaki decided not to use the evidence against Moi, since he entered an alliance with him for the elections in 2007. However, the report was published on Wikileaks in 2006 by a public official of the Kenyan government and was picked up globally by journalists from traditional media, including the Guardian, Sunday Times, Daily Telegraph and Kenyan broadcasters and newspapers (The Daily Nation and The Standard).[292] Wikileaks claim that the revelation of the report changed the result of the Kenyan presidential election of 2007, swinging the vote by 10% towards the opposition, which won the election by 1%-3% of the vote.[293]

Documents published on Wikileaks have been used by lawyers and interest groups to hold governments accountable and/or strengthen evidence in a court case against a government agency or official. An example is a military manual published on Wikileaks detailing the day-to-day operations of the US military's Guantanamo Bay detention facility.[294] The document "Camp Delta Standard Operating Procedures" is dated 28 March 2003 and was leaked in 2007.[295] Since 2003, the Pentagon has resisted a request by the American Civil Liberties Union to access this document under the Freedom of Information Act. Since its disclosure in 2007 on Wikileaks, the document has been used by several lawyers

and human-rights groups. For example, Jamil Dakwar, advocacy director of the ACLU's Human Rights programme, found hints in the report of the violation of international law. In a section of the report, guards are instructed to use dogs to intimidate prisoners. He also raises concerns about a section on the International Committee of the Red Cross (ICRC), which indicates that some prisoners were hidden from Red Cross representatives. In addition, four attorneys from the Center for Constitutional Rights (CCR) used the document analysis with Wikileaks in their legal battle over Guantánamo.[296] CCR has been responsible for coordinating a coalition of pro-bono lawyers in order to defend the detainees at Guantánamo, ensuring that nearly all have been represented

Any person can contribute to the site anonymously and become a watchdog of good government. This is empowering for the individual citizen. The fact that users of the Wikileaks website are taking on the role of watchdog is illustrated by the many documents uploaded which provide evidence of countries violating international conventions, agreements and treaties. One of the Wikileaks users, for example, published documents which reveal that the United States government is violating the international Convention on Chemical Weapons (1997)[297] by employing in Iraq some of the weapons listed in the convention.[298] As stated on the Wikileaks website: "The following information suggests that the United States has breached the Chemical Weapons Convention by employing riot control agents not only for non-domestic riot control, but as a method of warfare. In particular, the M33A1, pictured at the start of

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291  https://secure.wikileaks.org/wiki/KTM_report, Wikileaks: "The leaked report is 106 pages long and contains several sections: executive summary (1-10), source enquiries (11-54), business associates and front men (55-76), and appendix (77-106).[8] The executive summary outlines the most suspicious financial transactions, properties and business links discovered in its investigation. A series of additional enquiries is proposed. The following sections proceed in intricate detail, investigating the background, 'modus operandi', business links, financial transactions, business associates, and property holdings, all around the world, of several powerful members of Kenyan society linked to Daniel arap Moi."

292  https://secure.wikileaks.org/wiki/The_looting_of_ Kenya_under_President_Moi

293  http://www.wired.com/politics/onlinerights/ news/2008/07/wikileaks and http://wikileaks.org/wiki/ Wikileaks.org_under_injunction

294  http://www.wired.com/politics/onlinerights/ news/2007/11/gitmo

295  http://wikileaks.org/wiki/Camp_Delta_Standard_ Operating_Procedure_%282004%29

296  http://wikileaks.org/wiki/Guantanamo_manual_shows_ continued_abuses

297  http://www.opcw.org/chemical-weapons-convention, The CWC aims to eliminate an entire category of weapons of mass destruction by prohibiting the development, production, acquisition, stockpiling, retention, transfer or use of chemical weapons by States Parties.

298  http://wikileaks.org/wiki/US_violates_chemical_ weapons_convention

this article, is ideally suited to offensive urban "flush out" operations but with its full body suit has limited defensive application."

In conclusion, the disclosure of sensitive information on Wikileaks by the crowds has an impact on the transparency of government in the sense that particularly confidential government information is made available to the general public. This in turn impacts governments because government agencies and officials are being held accountable and may have to change their policy and practice. The disclosure of the information also has a legal impact in the sense that it provides evidence for and thus influences the outcome of court cases. In addition, existing watchdogs are affected as – in some cases - citizens are taking over some of their roles.[299]

### Drivers and barriers

There are several motives for users to publish sensitive information on the Wikileaks website. According to Wikileaks activists, the most important of these is the desire to see an injustice corrected.[300] Individuals may turn to Wikileaks because they believe that the current correction mechanisms of a government have failed, and public disclosure will therefore right a wrong.

The site users' sense of justice is a key driver for them to leak information. In the interview with TNO and DTI, Wikileaks state that:[301] "The number one motive for users to upload information is altruistic. They believe that transparency leads to good government and better

organisations. Analyses of the posted documents show that well more than 90% of the leaks clearly have an altruistic motive. If any don't, it would be only a very small proportion of the users who upload a document who might have another agenda. If so, it is a very small price to pay for the enormous benefit of honest government and other institutions such as corporations."

The most important enabler for this activity is the anonymity with which they can disclose information.[302] With regard to the leaking of information in particular, anonymity is of interest to the user. Wikileaks states the following about anonymous leaking on the Wikileaks website: "To date, as far as we can ascertain, none of the thousands of Wikileaks sources have been exposed, via Wikileaks or any other method. (…) Wikileaks applauds the courage of those who blow the whistle on injustice, and seeks to reduce the risks they face. Our servers are distributed over multiple international jurisdictions and do not keep logs. Hence these logs cannot be seized. Anonymisation occurs early in the Wikileaks network, long before information passes to our webservers. Without specialised global internet traffic analysis, multiple parts of our organisation and volunteers must conspire with each other to strip submitters of their anonymity. However, we also provide instructions on how to submit material to us, by post and from netcafés and wireless hotspots, so even if Wikileaks is infiltrated by government intelligence agency submitters cannot be traced."

Despite their altruistic character, the Wikileaks community receives some severe critique. The most frequently cited drawback of the website is the infringement of individuals' privacy. In this respect, the publishing of the e-mails of vice-presidential candidate Sarah Palin may be of interest. In September 2008, some of Sarah Palin's personal e-mail messages (which included posted copies of two e-mails, a contact

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299 In some cases the disclosure of sensitive information had a significant financial impact. In January 2008, for example, Wikileaks published secret banking documents from the Cayman Islands branch of the Swiss private bank Julius Baer, despite not being certain of their veracity. The documents show that the bank knew about, and even aided, money laundering. Wikileaks notes on its site that Bank Julius Baer's stock has dropped 20% since January (Informationweek, March 2008).

300 Based on written correspondence by a former Advisory Board member, 9 April 2009.

301 Interview by TNO and DTI with former Advisory Board member, 15 January 2009.

302 Wikileaks website, accessed 2-12-2008.

list and family photos) were published on the Wikileaks website. The reason for the leaker (a member of Anonymous, an online group known for its attacks against the Church of Scientology) to publish the emails was that he/she found it inappropriate for Sarah to use a personal e-mail address for business purposes. According to the campaign management of Sarah Palin this was: "a shocking invasion of the Governor's privacy and a violation of law."[303] The FBI and Secret service launched a joint investigation into the hacking.[304]

Another criticism that Wikileaks has received is that the published information could endanger public security. Many of the documents published on Wikileaks have a military character (e.g. military plans, strategies, equipment overviews). According to some of the critics of Wikileaks, this military information can be used by criminal and terrorist networks.[305] Military agencies from countries all around the world have made many efforts to have sensitive information removed from the Wikileaks website.

Several organisations have tried to prevent Wikileaks from publishing documents on their websites. For example, in February 2008 the Zurich-based bank Julius Baer filed suit in the United-States, claiming that an ex-employee had passed stolen internal documents to Wikileaks.[306] The leaked information pointed to money laundering, asset-hiding and illegal tax evasion. Judge Jeffrey White issued an injunction sealing the US IP address of Wikileaks. A hailstorm of criticism followed from public interest and media organisations, who denounced the order as an unconstitutional prior restraint on free speech.

A media coalition, comprising all the major US newspaper publishers and press organisations, filed a friend-of-the-court brief on behalf of Wikileaks and called attention to relevant points of law that the court had apparently overlooked.[307] The broad dissatisfaction with the judge's decision to try to block all of Wikileaks in order to limit access to a few documents played an important role in helping the judge to re-evaluate the breadth of his decision.[308] The judge dissolved the injunction, effectively rebooting the site. Despite the injunction, Wikileaks had been readily available at several mirror locations around the world, including domains registered in Belgium, the Christmas Islands and Germany, and at its numerical IP address.

Furthermore, since January 2007, the Chinese government has attempted to censor every website with Wikileaks in the URL, including the primary.org site and the regional variations .cn and .uk. However, the site is still accessible from behind the Chinese firewall via one of the many alternative names used by the project, such as secure.lsjsf.org and secure.sunshinepress.org. The alternative sites change frequently and Wikileaks encourages users to search Wikileaks cover names outside mainland China for the latest alternative names. Baidu and Yahoo China censor references to Wikileaks.[309]

A last, and perhaps most important, drawback of the Wikileaks community is that there is no control of the Wikileaks community itself in the sense that their processes are clear and they can be held accountable. Since Wikileaks sees itself as augmenting the existing "ombudsman" function, greater transparency of organisation, processes and decisions is needed to be able to hold them accountable

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303  Washington Post, Hackers Access Palin's Personal E-Mail, Post Some Online, September 2008.

304  Foxnews, FBI, Secret Service Investigate Hacking of Palin's E-mail, September 2008.

305  Foreign service journal, march 2007, Available at: http://mirror.wikileaks.morphium.info/wikileaks-crs-reports/RL33721.pdf

306  Reuters, Guantanamo operating manual posted on Internet". 15 November 2007, available at: http://www.reuters.com/article/newsOne/idUSN1424207020071114?pageNumber=1

307  The Inquirer, Judge reverses Wikileaks injunction, Feb 2008, available at: http://www.theinquirer.net/inquirer/news/527/1039527/judge-rethinks-wikileaks

308  Information week, Swiss Bank Abandons Lawsuit against Wikileaks, 6 March 2008.

309  Wikileaks website, accessed on 24-11-2008.

and ensure good governance principles (such as integrity, *audiatur et altera pars*, impartiality). The Wikileaks representatives counter this view with the argument that all the information leaked to the site has already been published.[310] Any delays are only caused by the limited resources of the non-profit organisation. They hold the view that, since the leaked information submitted is completely uncensored, it does not matter who operates Wikileaks. They view the site as a vehicle for releasing the information submitted without fear or favour, and as a venue for those interested in the information to discuss ideas. In this way, they do not see themselves as a screening or vetting service, but rather almost as a semi-automated machine following a clearly stated process of uncensored publication. Therefore they view their own identities as unimportant.

## 5.5 Survey

The community surveys have been published on eight sites: the professional communities *Flu Wiki, ECGpedia, ePractice* and *Doctors.net.uk*, the patient support community *Endometriosis. uk.org*, the political community *Petities.nl* and the crime-watch communities *Patewire* and *WikiCrimes*.[311] The survey was published for two weeks on the websites and filled out by 1,406 visitors. 83.5% of the respondents completed the whole questionnaire. For a further explanation of the methodology used, see paragraph 1.2 of this report. This paragraph presents a summary of the survey results.

310  Based on written correspondence by a former Advisory Board member, 9 April 2009.
311  www.cnx.org, www, http://www.Doctors.net.uk, www. patientslikeme.com, www.wikileaks.org, www.fluwikie. com, http://www.en.ecgpedia.org, www.epractice.eu, http://www.endometriosis-uk.org, http://www.petities. nl, http://www.platewire.com, http://wikicrimes.org,

*Age*

The age of the population involved in the community seems to depend strongly upon the activity supported and the content provided by the community. The peer support offered within the Endometriosis community is between (female) patients with a medical condition which mostly concerns diagnosed women of around 25-35 years of age. Consequently, the majority (52.4%) of women involved in the Endometriosis community are between 25 and 40. In the professional communities, most visitors are aged between 25 and 40 (e.g. 58.5% at ePractice and 42% at Doctors.net.uk) or 40 and 55 (e.g. 24.6% at ePractice and 32.3% at Doctors.net.uk), numbers that reflect the age of the working population. The average age of visitors to the ECGpedia website is somewhat lower (42.9% are aged between 18-25 and 42.9% between 25 and 40) most likely due to a substantial involvement of students (35%). A considerable part of the content created on ECGpedia concerns educational material (more than Doctors.net.uk and ePractice), e.g. a course, textbook, cases and examples. By contrast, the average age of the Flu Wiki community is significantly higher (53.5% aged 25-40 and 32.3% > 55), which may be explained by a relatively high participation of silver surfers (16.1% of visitors are retired), a target audience in the preparation for and response to pandemic flu. On Petities, a political community, participation of silver surfers is equally significant as 41.6% of the visitors are aged 55 or older. Here, as many as 23% of visitors are retired. The visitors to the crime-watch communities are evenly distributed over the age groups, although the population of Platewire seems somewhat older than the population of WikiCrimes (11.4% are 55 or older compared to 1.9% age 55 or older).

*Gender*

The gender of visitors is partly determined by the subject of the content created. The high percentage of female members (97.6%) of the

Endometriosis community is of course due to the fact that endometriosis is a disease found only among women. On websites which enable peer support for women as well as men, the involvement of both sexes is more equal. For example, the percentage of female and male members of PatientsLikeMe – a community for life-threatening diseases – is respectively 57% and 43% (see paragraph 2.3 on PatientsLikeMe). More research is needed to address the question of whether some activities on support communities (e.g. seeking and providing encouragement) particularly attract women (a conclusion which cannot be drawn from the data collected in this study, but which is frequently suggested). The slightly higher participation of men in professional communities such as Doctors.net.uk (53.7%) and ePractice (67.2%) is likely to be in line with the percentages of men and women involved in particular professions (respectively healthcare and government/consultancy). The involvement of men in crime-watch communities is significant higher (89% of visitors to WikiCrimes are male and 76.3% of Platewire visitors are male) than the involvement of women. Male visitors are also more present in the political community – Petities – that we studied (65.4% are male). On the other hand, women seem to be more interested than men in content on preparing for and responding to pandemic flu: 64.4% of the visitors to Flu Wiki are female.

### Education

It appears that the education levels of visitors to professional communities corresponds to the typical education levels of associated professions. Whereas the level of education in the professional communities and political community is rather high (high percentages of Bachelor's and Master's degrees), the membership bases of the support and crime-watch communities represent several levels of education. The level of education is highest on Doctors.net.uk (76.1% Master's or higher) and ePractice (64.2% Master's or higher), where the majority of visitors are, respectively,

doctors and policymakers or researchers/consultants. The educational level on ECGpedia is somewhat lower due to participation of students and nurses. On Flu Wiki, levels of education are more diverse than on Doctors.net.uk and ePractice. The particular communities chosen for this research (e.g. healthcare professionals' and policymakers' communities), may account for the high level of education within the "professional" type of community. Other professional communities (e.g. plumbing community) will show lower average levels of education. On Endometriosis, WikiCrimes and Platewire, the diverse educational groups (Master, Bachelor, vocational/technical, high, grammar school) are more equally represented (patient support and crime-watch may be subjects that cut across educational levels).

### Employment

The occupation of visitors to professional communities correlates closely with the purpose of the community. While visitors to support, crime-watch and political communities, are from all professional backgrounds, visitors to the professional communities work in specific sectors for which the community has been initiated. Overall, retired users account for a significant part (e.g. Platewire 20% and Petities 23%).

### Benefits

The survey results show that the benefits perceived are strongly related to specific purposes of the website. Whereas, in support communities, both knowledge acquisition (around 33%) and mutual support among patients (around 31%) are important benefits, in the professional community the dominant advantages perceived by users are inspiration and the acquisition of knowledge and skills. In some cases, advantages perceived by users can be very practical and ordinary, as shown by the survey of Doctors.net.uk where the number-one benefit perceived by users is to have an e-mail account. On WikiCrimes, the most

important advantage perceived by users seems to be the access to detailed information about one's neighbourhood. Interestingly, on Platewire some 12.3% of the users find the content created entertaining.

### Drawbacks

Limited reliability of the published information is seen as an important disadvantage on seven of the eight websites. Only on Doctors.net.uk this disadvantage is not mentioned, which may be due to the fact that co-created content is only a small part of content offered on the website (which gives access to many academic articles). On Endometriosis, ePractice, WikiCrimes and Platewire, the percentage of users who are concerned about the reliability of the information published is between 17 and 22%. Furthermore, users of seven of the eight sites report that they find the impact of the website on their medical condition, work, politics or law enforcement quite limited. Whereas the percentage of users who report this on Endometriosis, Doctors.net.uk and Flu Wiki is between 8 and 14%, on the websites ECGpedia, Petities, WikiCrimes and Platewire this percentage is between 17 and 26%. When considering the comments made in the survey, it seems that users would like these websites to have more impact. Several users of Petities and Platewire, for example, state that they would like to see, respectively, politicians and police officers make more active use of the content for policy and enforcement purposes.

On six of the eight websites, privacy infringements are perceived as an important potential risk of participating on the website. 20.5% of the members of Endometriosis find this the most important drawback to joining the community. This relatively high percentage is probably due to the fact that, on the Endometriosis website, patients share personal medical and thus highly sensitive information. Some 16.6% of the doctors on Doctors.net.uk find privacy infringements an important potential risk. This

privacy risk may concern not only doctors but also their patients, since doctors share patient information (e.g. medical images, medical cases) within the community. The percentage of 16.6 is noticeable as Doctors.net.uk is only accessible for registered doctors (and not, as with the other website, to anyone with Internet access). The dominance of a small number of users is also mentioned as an important drawback on six of the eight websites. In four of these six communities (Endometriosis, Doctors.net.uk, Flu Wiki and Platewire) the percentage of users who perceive this as a disadvantage is between 17 and 21%. Dominance by a small number of users seems to occur in all types of social computing communities (support, professional, crime-watch and political) and may be related to the tendency that a few people generate most of the content (see also the case analysis and section above on activities).

Other drawbacks of the websites mentioned by users are spam/inappropriate comments (five of the eight cases) and the limited quality of online services (three of the eight cases). Drawbacks mentioned by users of single websites are intimidation and harassment (ECGpedia), peer pressure (Petities) and limited access to the Internet and thus the website (WikiCrimes, mostly Brazilian users).

### Impacts

There are two significant outcomes of the survey question on impacts: (a) in each survey the answers were more diverse than the answers to other questions, and (b) the types of impact mentioned are closely related to the specific type of social computing community (e.g. support, professional, political or crime-watch). The outcomes point to the conclusion that the impacts that social computing communities may have are versatile and many concern personal relationships, products, processes, services, methods, legislation and politics.

The survey published on the support website Endometriosis shows that the impacts concern social aspects (e.g. making new friends, improved life circumstances) as well as organisational aspects (e.g. changing relationship between professional and patient, change of treatments, medications, doctors, treatment becoming more effective). The central impact seems to be the empowerment of patients in their relation ship with professionals; they have changed their views on their medical condition and have come to rely more on self-treatment and self-diagnosis.

The most important impact perceived by users of the professional communities studied (Doctors.net.uk, ECG-Pedia, ePractice and Flu Wiki) is that – based on the knowledge they acquire through their participation – professionals and organisations have changed products, methods, processes policies and strategies. On average, 24% of the respondents answered that one of these organisational aspect has altered as a result of their engagement in the community. Around 18% of the respondents find that the quality of the service they provide has improved due to their involvement in the community. Here too, the empowerment impact is evident since around 15% of the respondents state that they are more capable of solving professional problems. Some 12% answered they save time by applying the knowledge generated within the community. The users of Doctors.net.uk and ePractice in particular feel that they make better use of their professional network and/or that cooperation with peers has improved. The impact perceived by the users of these websites predominantly concerns the organisational dimension.

Unsurprisingly, within the political community Petities, the political impact is dominant. No less than 50% of the respondents state that they experience some kind of impact on local or national political levels. 27.2% state that a petition has put an issue on the local or national agenda. 12.7% reports that local or national politicians have acted upon petitions.

Around 7% of the respondents say that policies have changed as a result of the petition and some 3% state that local or national politicians have responded to the petitions. It thus seems that the impact is primarily on agenda–setting, with less effect in terms of changes to policy. Some 26% of the respondents feel that they or other participants have become more politically engaged.

The most dominant impact of the crime-watch communities (WikiCrimes and Platewire) seems to be the political and media attention to crime. Around 23% of the respondents see this as an important impact. Some 13% of the respondents report that they think the information generated by the website is used by the police to detect or arrest offenders. Around 9% state that the information on the website has resulted in actual regulatory amendments.

### Values

The survey results show that, although the communities share core values, each type (e.g. support, professional, political and crime-watch) has its own specific values. In all four types of community, respondents have mentioned openness, expertise and informality as core values (on average 9.6%, 9% and 6% respectively). In three of the four types of community, respondents have stated that they highly value community sense and sharing (11.3% and 7% respectively). In addition, the four types of communities all seem to have their own core values. Empathy is an important value in the support community, professionalism in the professional communities (16.8%) respect for norms and values in the crime-watch communities (11.5%) and engagement in the political communities (7.8%).

## 5.6 Conclusions

The impacts we have found in the four cases and survey can be summarised as follows:

– *Political*. The cases studied show that the empowerment and transparency characteristics of the social computing initiatives seem to disrupt the existing power balances. This impact may be most clearly illustrated by the Wikileaks case, in which the publication of a report by a Wikileaks user resulted in a 10% swing in the outcome of the elections in Kenya. The sharing of information about governments and politics by the crowds enables them to hold public officials and politicians accountable. People seem to be more able to mobilise around a specific subject, to enhance their knowledge by exploiting the wisdom of the crowds, thereby exercising influence on government and politics. Furthermore, the instant hype and long-tail mechanisms of the social computing platforms seem to particularly support issue-based political involvement. People are able to find each other around very specific subjects and spontaneously organise an advocacy group. Here the representation of citizens may become more fragmented; citizens are not ideologically attracted to a specific party but feel represented by a different party for each issue. A difference between party politics and issue-based politics is that the assessment as to whether every group in society is equally represented in the debate does not take place automatically in issue-based politics. Whereas in a party system, participants deliberately strive to cover all societal groups for all subjects, in topic-based politics the assessment as to whether all groups are heard has to be made for each issue raised.

– *Socio-cultural*. In the socio-cultural area, the inclusive and horizontal character of social computing applications seems to be yielding new values. The functionalities of the websites but also members themselves seem to stimulate openness, informality and equality. The designs of the websites aim at the equal creation and sharing of content.

Participants behave informally, use informal language, and the threshold to introduction is low. Both on Connexions and Doctors. net.uk, senior and junior professionals work together more equally than in their offline professional life. Values such as seniority and position have been replaced by values such as knowledgeability. These findings are endorsed by the survey, which shows that the communities studied share five core values: openness, expertise, informality, community sense and sharing. Furthermore, long-tail and efficient allocation mechanisms of social computing applications seem to stimulate the emergence of new cohesion within the communities based on specific merits. On Connexions, teachers and students gather around educational content, on Doctors. net.uk doctors find new colleagues with the same specialisation, and on PatientsLikeMe members make contact with peer patients. Another socio-cultural impact is the growing threat to privacy as members publish large amounts of sensitive data online.

– *Organisational*. In all cases studied, new players had entered the public arena and new allocations of roles between traditional and new parties were emerging. On PatientsLikeMe, members are taking over support tasks (e.g. advice, support) hitherto carried out by healthcare professionals. They are also taking over some of the research tasks traditionally carried out by the pharmaceutical industry (e.g. generation of statistical data on side effects of drugs). On Connexions, teachers and students generate scholarly material which was previously created by publishers. The survey results show the same kinds of impact. Around 24% of the respondents from professional communities stated that their daily practice (e.g. the products they provide) has altered as a result of their engagement in the community. 18% found that – due to their involvement in the community – the quality of their service had improved. Furthermore,

the cases reveal that processes and business models are also starting to change; in all cases, creation takes place in a horizontal way, for example. The creation process is not necessarily more democratic; in most cases we found that the initiating organisation exercised strong control over the content. In addition we found that online cooperation is crossing organisational and geographical boundaries. Patients, teachers and doctors from all kinds of organisations and countries work together. Other boundaries, such as language and discipline boundaries, seem to become more dominant. A last organisational impact we found is increased efficiency. In particular, the allocation mechanism of social computing platforms stimulates a more efficient match of demand and supply. The survey results support this finding as around 12% of the respondents from professional communities stated that they save time through efficient knowledge allocation.

– *Legislation.* In all case studies we found that existing legislation is coming under pressure from activities undertaken within the community. The collaborative content created on Doctors.net.uk and Connexions requires new legal protection, for example by the use of Creative Commons Licences. PatientsLikeMe has – instead of a privacy policy – an openness philosophy. The CEO of PatientsLikeMe stated in an interview that members of PatientsLikeMe simply weigh up the pros and the cons of joining the PatientsLikeMe

community and often come to the conclusion that the information they receive through the website is more important for them than the privacy risks. Yet the information published still implies a substantial reduction in patients' privacy because data on their medial condition are accessible to anyone. The Wikileaks case shows that new parties are starting to play an important role in legal procedures and court cases. The crowds play a role in evidence-gathering through Wikileaks; this evidence has been used several times by lawyers to strengthen their case.

Concluding on the weight of the impact, one could argue that we might be in the first stage of what Carlota Perez has labelled a "disruptive transformation" of traditional paradigms fuelled by technology. This phase involves creative destruction from which new inputs, products, stakeholders, power balances and/or industries emerge. The impacts described above could be interpreted as the first signs of creative destruction as we witness new engagement, services, players and interdependencies. It appears that a more fundamental disruption is likely to occur as the social computing trend reaches its full potential. Although the large majority of European citizens have Internet access and social software is cheaply available, social computing platforms could evolve to become much more embedded in the everyday activities of groups of users. Then, if indeed the social computing trend deepens, the weight of its impact will loom much larger in the future.

# ■ 6. Future opportunities and risks

This chapter will explore two - relatively extreme - future scenarios of social computing impact. The exploration of social computing trends in two scenarios serves as a thought experiment of how social computing could potentially impact the public sector. In the "Yes we can" scenario, citizens are actively engaged in the public domain and social computing technologies have empowered all groups within society. Citizens use social network sites to mobilise, creating a continuous stream of political hypes. Public services are delivered by decentralised public organisations in close cooperation with private actors and citizens. By contrast, in the "Wall-E" scenario, citizens are indifferent and governments have delegated power to an involved technological system. Both users and government are left with a rather passive role; technology has become the fabric of society.

## 6.1 The "Yes, we can!" scenario

It is 8 o'clock on Monday when Astrid wakes up in a small town near Stockholm. She suffers from Multiple Sclerosis (MS), and the disease has reached the stage where she is immobile and dependent on others.[312] The doorbell rings. It's her brother Lars - she can see this on the little display next to her bed. With a 'Yes, come in', the door opens for him. Every morning, Lars helps her to get out of bed and get ready for work.

Although Astrid's condition is progressing fast, it is an exciting day for both her and Lars. Both work for the MS community and this afternoon

they have an important meeting at the office in Stockholm, where representatives of the MS community from all over Europe will participate in a video conference. They will discuss new scientific research regarding the possibilities for preventing MS. Medical specialists will present the results from their latest trials, in which Astrid participated as an experimental test subject. She was given the opportunity to participate by the community due to her active involvement within the community.

But first, Astrid has a video consultation with her medical specialist Stina in Oslo – the hospital in Oslo has the most prominent MS specialists in Europe. Stina will be there this afternoon as well. Astrid's condition requires that her medication is adjusted weekly. Stina reads the results from the monitoring devices that Astrid uses herself at home. She combines the results with data from the global online MS community that links her with other MS patients and healthcare professionals. The system provides Stina with a recommendation for adjusting Astrid's medication based on an algorithm that carefully balances patients' experiences, professional knowledge and the ecological footprint. Astrid may choose a different medication from the recommendation, but her insurance company may charge her extra for not choosing the recommended treatment path.

### Society

In 2025, Europe can be characterised as a diverse and innovative society. Citizens are optimistic about the future and believe that they actively contribute to it. "We can do it together" is an important slogan endorsed by citizens, government and businesses. All groups in society have full access to the web and have now acquired sufficient ICT skills. Citizens make

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312 Multiple Sclerosis (MS) also known as *disseminated sclerosis* or *encephalomyelitis disseminata*) is an autoimmune condition in which the immune system attacks the central nervous system.

extensive use of social computing technologies for all kinds of purposes in their daily lives. As a result, citizens are empowered, well-informed, and eager to employ new, innovative initiatives in networked cooperation with government, businesses and non-profit organisations. Citizens play important roles in the development of new services (both public and private) as co-creators and initiators. Senior citizens participate actively in society, and are able to maintain extensive social contacts through their networks. Citizens are highly engaged in the political decision-making process and make optimum use of social computing technologies to exert political influence. A new political participative model has emerged in which feedback loops and co-creation are fully integrated into the policy and decision-making cycle of the European Union and the Member States.

Sustainability was taken as the key organising principle for both private and public service delivery, out of sheer necessity when faced with depleting fossil-fuel resources, and because of the growing social awareness and mobilisation of citizens on this matter. After years of economic depression following the collapse of the financial system in 2008, Europe makes a remarkable recovery in the period 2015-2025 and experiences a period of sustainable economic prosperity and fast technological development, driven by user involvement. The ambitious goals set by citizens in cooperation with government with regard to sustainability spurred innovative developments in all sectors of the economy and created a front-runner position for Europe. The concern for sustainability has resulted in advanced systems that recommend products and services on the basis of their ecological footprint.

### Politics

This scenario represents a shift that has taken place over the years. Citizens were increasingly using the possibilities of social computing technologies to exert their influence

on the political decision-making process. They succeeded in determining the main political agendas, which are led more and more by the issues of the day, possibly undermining the representative political system. Citizens have become extremely well-organised and mobilise their networks to bring volatile, niche communities into being, creating a continuous stream of political hypes. The extreme number of issues demanding government attention are overloading the system, further eroding citizens' trust in governments and eventually leading to the abandonment of the traditional representative democratic model in most European member states by 2020. Over time, however, an increasing number of the communities, at first so volatile, begin to stabilise. Citizens align themselves with one particular community that best represent their interests, lifestyle and philosophies. Citizens put their trust in the community and start to delegate several tasks to it, creating a strong civil society that replaces the representative model. Governments have decentralised most tasks and activities to this 'third sector'. The communities represent new alliances between citizens, private companies and government, leading to networked governments that continuously cooperate with the third sector for optimum service delivery. The representative model is only used at the European level for long-term policy issues.

### Public services

Public services are delivered by decentralised public organisations, in close cooperation with private actors and involving civil society, businesses, non-profit organisations and citizens. Through self-organised collectives, citizens have been able to organise themselves and claim a role in several public domains such as healthcare, education and law enforcement, giving rise to effective public-private partnerships for the provisioning of public services. These platforms and communities have led to the further empowerment of users, providing them with a strong voice towards professionals and

government. Their knowledge is recognised by professionals and fully integrated into the services provided. This has resulted in decentralised public services as users themselves take on certain tasks that used to be the sole domain of government institutions. In healthcare, for example, patients can perform a number of tasks themselves through self-monitoring and self-diagnosis and by exchanging experience and knowledge with both patient and professional communities. Lifelong learning is made possible by strong cooperation between citizens, academics and businesses. Students of any age have their own education 'portfolio' and receive advice from peers and professionals concerning modules that fit their learning needs and educational level. Textbooks have been abolished; learning materials are created online by students and professionals themselves.

### Technology

In 2025, innovation is fast-paced. The open environment in which universities, private companies and prosumers work together has created an open approach to R&D in which users participate and contribute actively to research and development. All actors are 'linked in', creating instant feedback on new ideas, products and services. Ethical principles are incorporated into new technologies, products and services by means of value-sensitive designs. This has resulted, for example, in decentralised databases, distributed control and privacy-enhancing technologies that provide users with powerful tools to control access to vital personal data used for personalised services.

## 6.2 The "Wall-E" scenario

It is 11.02 am in Maribor, Slovenia. In their spacious flat on the outskirts of Maribor, Anja and Tomaz are in a state of bliss: Anja has just given birth to a healthy girl. Friends and family followed every detail of the birth on the Europe-

wide social health network Wall-E. Suddenly, their euphoria is interrupted by a beeping sound from Tomaz's personal mobile device. It is a message from SocialAdmin, the moderation system of 'the Web'. "SocialAdmin congratulates you on your first child, born at 11.06 on Monday 6-3-2025. Based on a poll among your peers we recommend the following names. Please pick one of the names and press OK. A personal profile will be generated after your choice. Have a nice day!" Fortunately the list includes one of their favourite names, so they quickly choose 'Danica'. Then another message arrives. It is "HealthyLife", a health provider and insurance company, the on Vall-E.. They require a saliva sample to run a full gene scan. "The necessary equipment for collecting and sending the saliva will arrive in 25 minutes. The full gene scan will take one day, after which Danica's profile will be ready to receive continuous health data ranging from simple characteristics such as eye colour and blood type, to advanced details such as life expectancy, probability profiles for diseases, and the monthly health-insurance premium that will be charged. Anja and Tomaz are happy to comply: Danica deserves the healthy and prosperous life they are now able to afford for her.

### Society

In 2025, European society can be characterised by indifference among citizens, the diminished role of government, and strong reliance on intelligent technological solutions. Citizens generally live their life in economic prosperity and harmony. A high degree of incremental innovation makes life comfortable, predictable and transparent. Ambient intelligence and biometric technology is mature and optimises daily life. The evolution of Web 2.0 into a system of autonomous web services is accompanied by fine-grained data collection on the daily living environment, resulting in high citizen transparency and enabling the provision of fully customised private and public services. Privacy – as a downside of transparency – is no longer

considered a delicate issue, provided citizens can pursue their lives of luxury. The European Union and national governments exert only limited power over the oligarchic consortium of multinationals that are feeding new technologies and data to perfect the service-centred architecture at the core of this semi-autonomous web.

This scenario represents a shift that has taken place over the years. During the economic depression at the end of the first decade of the 21st century, European governments focused solely on repairing the economy. In most EU Member States, reduction of the administrative burden during the crisis led to 'lean governments' with a key responsibility to boost technological innovation and economic growth. An additional factor for the diminished role of government was the paralysis of the public system. Between 2010 and 2015, the exponential growth in citizen initiatives using social computing caused an information overload for citizens and government agencies. The public system was paralysed, as few could cope with this complexity. Citizens in particular grew weary of the muddle of initiatives and decided to focus on regaining the wealth they experienced at the end of the 20th century. They felt rather indifferent about most other public issues. After the economic crisis and the freezing of the public system, large private firms sensed the gap left by citizens and governments and started to provide their own 'public services': education, health, security, transport services, etc. An innovation race for the best and most optimised public services begun, and the government lost its grip on innovation. The market-dominated delivery of public services focused on optimisation, productivity and efficiency. The increased absence of concern for societal issues among government, citizens and private companies caused societal problems, such as environmental devastation and obesity. Technology helped citizens to make decisions in favour of the environment and physical condition. For example, personal healthcare monitoring systems forced citizens to take more exercise if their BMI is above the critical level.

### Politics

The strong focus of governments and private companies on restoring economic growth by implementing large and intelligent autonomous systems meant that private companies determined the direction of economic and technological development, leaving little room for citizen involvement. Over the years, idealism was slowly replaced by pragmatism due to the focus on economic and scientific values. So long as the services provided bring economic and technological prosperity, citizens do not feel the need to be involved, and accept the course of development. Their motto is: "They probably know what they are doing". Between 2015-2020, European and national politics gave up on attempts to regain citizens' interest and decided to focus on minimising administrative responsibilities. The political system can be described as an evidence-based democratic technocracy: decisions are based on scientific facts and the most recent technological developments. All decisions are fully transparent and can be monitored in real-time. Due to the lack of engagement, the political party structure in most European Member States evolved into a homogenous two-party system. Power is out of balance: the private sector outweighs the public sector and there are few countervailing powers to compensate.

### Public services

Public services, mostly offered by large companies, are centrally organised in a few optimum public systems. They are of very high quality: intelligent technologies enable mass customisation, efficiency and virtualisation. For example: almost all physical government offices have been replaced by virtual offices, as most services are web-based. They imply the use of large electronic databases with extensive and detailed profiles of citizens. Intelligent technology is implemented to monitor and track the activities of citizens, and the information is used in all public domains, including healthcare, security and education. In healthcare, new technologies

are able to screen the body and the brain for both mental and physical shortcomings (in some cases even before birth or at the time of conception). Healthcare providers and insurance companies use the information to personalise their services. Instead of the annual and monthly check-ups, bodily functions are monitored constantly from home. In the security domain, 'preventive tracing' has become the norm. Databases are coupled to an extensive network of sensors and the Internet in order to analyse risk profiles and track potential suspicious behaviour. The same kind of system is used to monitor the safety and well-being of children and young adults; extensive profiles concerning the behaviour of children alert public servants in the event of abnormalities and existing risk factors. Learning is virtualised and optimised: citizens can plug in to online modules developed by the private sector. Intelligent systems, connected to databases, monitor learning performance and determine the educational path by recommending new modules.

***Technology***

In 2025, growth and the pace of technological innovation are very high. Private universities and research institutes play an important role in society. They are the source of the profound scientific knowledge that led to the rapid pace of incremental innovation. The Internet and social computing technologies evolved over the years into an autonomic system that connects everything in the virtual and physical realm. This process further accelerated the degree of innovation. Advancements in ambient intelligence technologies increased the Internet's intelligence: it anticipates citizens' needs in real-time. All data that are generated make our lives transparent and personalised. Ethics on technology is best described as blind technology optimism. Some rebellious intellectuals argue that personal autonomy is being surrendered to technology, but who cares?

## 6.3   Conclusions

Both scenarios build on the evolution of current Web 2.0 developments. The scenarios are governed either by the social forces unleashed by social computing or by an autonomous, connected technological regime that has evolved from social computing technologies and other ICT innovations. Both factors are unlikely to decline in importance. Gradually, but inevitably, they will lead to a changing - facilitating - role for governments that are facing two important challenges: (a) avoiding the pitfalls of an anarchic society ruled by the issues of the day, and (b) avoiding delegating too much decision-making power and autonomy to semi-autonomous technological systems. An important question for the future is whether governments will be able to safeguard core public values and functions in such an environment.

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# ■ 7. Overall conclusions

In this final chapter of the report, overall conclusions will be provided as to the level of usage of social computing, the general characteristics of the cases studied, the impact of social computing on the public sector, social computing drivers, and the future risks and opportunities. The chapter will conclude with an overview of research challenges and policy recommendations.

## 7.1   Level of usage

### *Social computing take up*

The review of the literature on social computing shows that these systems continue to grow in popularity and penetration across the globe.[313] According to Technorati (2007), an estimated 60% of Internet users in Europe are involved in some form of social computing. A study conducted by Synovate[314] reveals that, in 2007, 27% of European consumers were involved in rating and reviewing content. Golvin (2007) found that, in 2007, 37% used instant messaging[315] and Forrester (2007) calculated that, in the same year, 17% had signed up for at least one networking site.[316] The growth in take up by users seems to differ for each type of social computing application. Whereas the number of visitors to social networking websites (such as Facebook) is still growing significantly, the number of weblogs currently seems to be levelling off.[317] The growth of Wikipedia also seems to be

slowing; after peaking in 2005 and 2006, growth has declined to 22% in recent years.

Take up studies also indicate that the percentage of users engaged in social computing activities in the government realm has increased in the past few years. A study by the Pew Internet Center, for example, found that, in 2008, around 25% of American citizens received information on political campaigns or electoral candidates through social networking sites,[318] while in 2000 the percentage of citizens who regularly learned about the campaign from the Internet was only around 9%. In 2008, roughly 41% of people under the age of 30 watched at least one form of campaign video online, compared with 20% of those aged 30 and older. Pew also found that social media may support political activities. In 2008, 11% of Americans contributed to the political conversation by forwarding or posting someone else's commentary about the presidential election. 5% posted their own original commentary or analysis, and 12% of online 18-29 year-olds posted their own political commentary or writing to an online newsgroup, website or blog. Social computing applications are not just used for political purposes. Several studies show that the number of patient-support communities (social networks for patients) has grown steadily in the past decade. For example, Eysenbach *et al.* (2004) found that, as of April 2004, Yahoo!Groups listed almost 25,000 electronic support groups in the health and wellness section.[319] In 2008, this number

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313   Nearly 100 sources have been examined and analysed.
314   EIAA, 2007.
315   Golvin, C.S. (2007).
316   Kemp, M.B. (2007) Europeans Have Adopted Social Computing Differently. Forrester.
317   It is important to stress that the distinctions used in the Slot-Frissen framework – commenting, creating, communicating – are blurring fast because applications are converging.

318   Kohut, A., The Internet Gains in Politics, Pew Internet and American Life Project, http://pewInternet.org/PPF/r/234/report_display.asp, January 2008.
319   Gunther Eysenbach, John Powell, Marina Englesakis, Carlos Rizo, Anita Stern, Health related virtual communities and electronic support groups: systematic review of the effects of online peer to peer interactions, BMJ   2004;328:1166   (15   May),   doi:10.1136/bmj.328.7449.1166

increased to approximately 200,000.[320] Similarly, the Pew Internet Center found that in 2001 around 28% of Internet users had visited an online support group.[321] In December 2005, Pew found that 36% of e-caregivers (people who care for a loved one during a health crisis and find that the Internet plays a crucial role in their support – or 12% of American adults) said that the Internet helped them find advice or support from other people.[322]

In other sectors too, the take up of social computing applications seems to be growing. Although hard data is scarce, searches on the Internet reveal more and more examples of people collaborating online to create educational content. Well-known examples are MIT Opencourseware, the OpenLearn project in the UK and Connexions.[323] Yahoo! Groups listed over 30,000 "craft groups", online networks where people share knowledge on a specific craft.[324] The case studies conducted for this research confirms that take up of social computing applications in the public sphere is increasing. All the cases studied (the educational content community Connexions, the doctors' community Doctors. net.uk, the patient community PatientsLikeMe and the whistleblowers' community Wikileaks) have expanded significantly over the past few years. The Connexions community, for example, has grown annually by approximately 100% since its launch. The PatientsLikeMe community has grown by almost 200% over the past two years.

### User demographics

It seems that social networking sites are becoming mainstream and gaining popularity across all generations and levels of society. Although a study by Kemp (2007)[325] among US social network users indicates that young adults (16-26) are the most avid users and that adults seem to be lagging behind, other studies show that adults are catching up with significant speed. At the end of 2006, according to comScore Media Metrix's analysis of US Internet traffic, half the users of MySpace US were 35 or older. The 35–54 age group at MySpace grew to 41% in August 2006, from 32% a year earlier.

In the present research, the results of the survey, which focuses mainly on social computing initiatives in the public sector, seem to support these findings. The demographic data from the survey indicate that, in western countries with a high level of broadband penetration, all age groups are involved in public-sector social computing networks. We found that the age of the population involved in a specific community seems to depend strongly the activity supported and content provided by the community. Whereas the professional communities we studied reflected the age of the working population (around 50% of visitors are aged between 25- 40 and around 30% are between 40-50), in the learning environments we studied, the average age is lower because more students are involved (around 40% are aged between 18-25). The participation of silver surfers in particular communities was also significant. No less than 41.6% of the visitors to the Dutch petition website www.petities.nl are aged 55 or older.

Furthermore, the survey reveals that the gender of visitors is partly determined by the subject of the content created. The high percentage of female members (97.6%) of the Endometriosis community is simply due to the fact that Endometriosis is a

320   See: http://health.dir.groups.yahoo.com/dir/Health___Wellness?ch=web&pub=groups&sec=bestOfGroups&t=bestofyahoogroups, website accessed in December 2008.

321   Horrigan, J. Online communities: Networks that nurture long-distance relationships and local ties. Washington DC, Pew Internet & American Life Project, 2001.

322   Pew Internet & American Life Project Report, Finding Answers Online in Sickness and in Health By Mary Madden and Susannah Fox, 2 May 2006, http://www.pewinternet.org/pdfs/PIP_Health_Decisions_2006.pdf

323   http://ocw.mit.edu/OcwWeb/web/home/home/index.htm, http://webcast.berkeley.edu/, http://openlearn.open.ac.uk/, www.cnx.org

324   http://dir.groups.yahoo.com/dir/1600062985, website accessed in December 2008.

325   Kemp, M. B. (2007) Social Computing Comes of Age. Forrester.

disease that is found only among women. On websites which enable peer support for women as well as men, the involvement of both sexes is more equal. For example, the percentage of female and male members of PatientsLikeMe – a community for life-threatening diseases – is 57% and 43% respectively. The involvement of men in crime-watch communities is significantly higher (89% of visitors to WikiCrimes are male and 76.3% of Platewire visitors are male) than the involvement of women. Male visitors are also more present in the political community – Petities – that we studied (65.4% are male). On the other hand, women seem to be more interested than men in content relating to preparing for and responding to a flu pandemic: 64.4% of visitors to Flu Wiki are female. Therefore the phenomenon of social computing itself does not seem to have a gender bias per se.

As regards the educational level of visitors to public-sector social computing networks, it appears that this corresponds to the educational level of the community's target audience. Whereas the level of education in professional communities and the political community is rather high (high percentages of Bachelor's and Master's degrees), several levels of education are evident in the support and crime-watch communities. Again, for these niche communities, social computing applications do not seem to preselect on the basis of educational attainment.

### Type of usage

Research on social networks in the private sphere stresses that only a small number of users participate actively. The Nielsen rule is well known: 90% of users are lurkers, 9% of users contribute from time to time, and 1% of users make the majority of contributions. However, Slot (2009) criticised these percentages, stating that her research indicates that far more than 1% of users may be creating content online. Almost 38% of the respondents in her research on Dutch Internet users stated that they have a website, over 27% reported that they write a weblog, and over 15% stated that they write news messages.

The case studies in the present research show that the percentage of active users may depend on the type of community. Although only a small number of users of the Connexions, Wikileaks and Doctors.net.uk communities create content, the PatientsLikeMe community seems to have a significantly larger active user base. In an interview with TNO and DTI, one of the website's founders, Ben Heywood, stated that no less than 60% of all users are actively contributing, e.g. through debate on the forum or in other ways. This high percentage of active users may be related to the type of social network, in this case a peer-support community where patients share medical information and where users greatly value a sense of community. This finding is endorsed by the survey results of the present research, which showed a particularly high level of user activity in the support community studied. Over 30% of the respondents stated that they use the website to ask for advice, chat with other members or debate at the forum.

## 7.2 General characteristics of social computing

A cross-analysis of the four social-computing cases demonstrates that they share general characteristics and mechanisms as well as a potential for deep impact, partly as a result of rapid, massive take up. The following shared characteristics and mechanisms were identified:

– The first is the empowerment of networked individuals. The social computing platform enables the individual to acquire and accumulate information, news, knowledge and – perhaps most importantly – social status by exchanging content in networks with a predominantly social character. Well-informed users exert greater influence on society or government. Members of PatientsLikeMe, for example, state that they experience an improvement in their position as regards information, as a result of the

peer-reviewed content on PatientsLikeMe. Likewise, doctors on Doctors.net.uk feel that their professionalism is enhanced by having access to peer-reviewed medical images and up-to-date eModules on medical procedures. The users who disseminate content through Connexions find they have a greater impact on scholars, practitioners and students through the widespread dissemination and use of their educational and scholarly material. The empowerment of the individual may be most apparent in the Wikileaks case, where individuals can post incriminating evidence against governments. Contributors to Wikileaks have had considerable impact, a key example being the swing of 10% in national election results after a resident published a confidential investigation report on government corruption in Kenya.

–  Second, all four cases demonstrate a substantial increase in the transparency of users, subjects and organisations. Patients on PatientsLikeMe fill out a comprehensive medical profile that is visible to everyone on the Internet. By automatically aggregating the information of individual patients, the PatientsLikeMe websites provide better insight into drug usage, side effects of drugs, and the effectiveness of drugs and treatments. Profiles of members on Doctors.net.uk and Connexions also contribute to a greater transparency among professionals, but these websites emphasise the transparency of professional practice and improving expertise. Doctors.net.uk members share information on medical conditions, and Connexions members share educational content, but in both cases the free content-sharing stimulates open access to domain expertise. Wikileaks is an example of a social computing platform that stimulates transparency of organisations (typically governments) as users expose information on government practices.

–  A third characteristic which can be found in all cases is the occurrence of instant hype waves. The cases show that massive participation and connectedness stimulate the rapid emergence and subsidence of community events. Small incidents can rapidly develop into major themes within a social network community. An example is the "Dr Scot Junior case" on Doctors.net.uk: an offensive post by a trainee surgeon on the medical forum was disseminated through the network and read by hundreds of doctors within a short space of time. A spontaneous online campaign emerged to safeguard doctors' freedom of speech. Then the hectic debate about the incident seemed to vanish overnight. Just as hypes can emerge around a single forum post, they can also be triggered by a textbook on Connexions or a drug or treatment on PatientsLikeMe. A statistics textbook published on Connexions became a major hit through the wide dissemination both within and outside the Connexions network. Wikileaks also provides several examples, notably the leaked Sarah Palin e-mails. E-mails from Sarah Palin published on Wikileaks were forwarded through multiple social computing platforms (e.g. Facebook, MySpace) and were viewed by thousands of people.

–  Fourth, it seems that in all four cases the threshold to joining an online community is lower than in comparable groups in real life, and in this sense online communities seem to be more inclusive. A clear example is provided by the Connexions case in which "shut out teachers" are accepted as peer members. Also on Doctors.net.uk users experience that within the online Doctors.net.uk community they are more easily accepted by peer doctors. It seems that some dominant values associated with group boundaries in the offline world (e.g. seniority) are less important in the online communities we studied. For example, professors and students and doctors and assistants feel more equal on Connexions and Doctors.net.uk than in their offline professional life. However, it is not

clear from the four cases if there are specific online values that may stimulate exclusion. There are some indications that these exist; patients in the PatientsLikeMe community are not accepted by peers if they do not fill out their profile. Further research on this subject may be needed. Furthermore, online communities also appear to be all-inclusive in the sense that anyone with a computer, Internet access and basic Internet skills has access to the community's knowledge. On Connexions, scholarly material is published by anyone, for anyone. People unable to pay $100 for a statistics text book are able to download it for free.

– All cases, perhaps understandably, exhibit a strong community sense. As the social computing initiatives studied in this research are merit-based - people join the community to generate a certain community value (be it support, medical knowledge, scholarly material or court evidence) - people feel bonded around their interest in and expertise on the subject. Unlike more general communities oriented towards social networking (such as MySpace, Facebook and Bebo), users of professional, support, crime-watch and political communities frequently acquire and maintain new contacts. Whereas communities such as MySpace are mainly used by members to strengthen existing ties, on the social computing websites studied for this research new (patient, professional and political) communities emerged. Participants of these topic-based social computing platforms report that they feel more connected to people who share the same passion or interest. In other words, in merit-based networks, social cohesiveness seems to emerge around specific values or interests.

– A sixth characteristic found in all cases is that the user-created content is subject to infinite refinement, it is in perpetual beta; there is no final version. On PatientsLikeMe, the user statistics are continuously enriched

and improved; the Medipaedia articles on Doctors.net.uk are always under discussion; the educational content on Connexions is always being elaborated upon and users of Wikileaks are endlessly trying to strengthen their case against a government. Large numbers of users seem to deliver bits and pieces of content (snippets of information, advice, opinions), which together drive value higher and higher. The Connexions case, for example, shows that users are only willing to spend 15 minutes on contributing to the educational content base. As the CEO of Connexions stated "no one is willing to write his PhD on Connexions, but merely to make a small contribution to a shared textbook".

– All four cases show an efficient allocation of resources. As profiles of users are transparent and content is tagged, specific people and information are more easily traceable. On Connexions, teachers with an interest in a specific subject can easily find each other; on PatientsLikeMe users can trace others based on medical condition, drug use, nationality or place of residence; doctors on Doctors.net.uk report that they benefit from finding colleagues who work in the same area or are dealing with specific medical questions. In other words, the registering, structuring and tagging of data on people and subjects enables an effective match of demand and supply.

– The eighth and perhaps ultimate characteristic demonstrated by all four social computing case studies is the long-tail effect. On PatientsLikeMe, patients with the rarest of symptoms are able to find each other and start exchanging experiences, supporting each other and building knowledge. The Doctors.net.uk case shows that doctors from separate healthcare providers who share a very specific medical interest find one another. Physicians who are treating a patient with a very rare disorder are also able to find one another. People from all over the world contribute on Wikileaks to provide evidence

in very specific legal cases. Connexions users report that they are able to preserve and further develop highly specialised knowledge which under normal circumstances would disappear. In all cases, it appears that the larger the number of people involved, the greater the long-tail effect. If Doctors.net.uk, for example would allow doctors from other countries to participate in their medical community, the long-tail effect would be much stronger. The long tail seems to result in hyper specialisation; highly specialised knowledge that is allocated very efficiently, and is combined and further developed.

## 7.3 Social-computing impact on the public sector

The impacts we have found in the four cases and the survey can be distributed among the categories distinguished in this report (see paragraph 3.4 for an explanation of the typology used), namely: political, socio-cultural, organisational and legal impacts.

### Political

The cases studied for this research show that the empowerment and transparency characteristics of social computing initiatives (see also section above on general patterns) seem to disrupt existing power balances. This impact can be most clearly illustrated by the Wikileaks case, when the publication of a report by a Wikileaks user resulted in a 10% swing in the outcome of the elections in Kenya. The sharing of information about governments and politics by the crowd enables citizens to make public officials and politicians accountable. People seem to be more easily mobilised around a specific subject, to enhance their knowledge by exploiting the wisdom of the crowd, thereby exercising influence on government and politics. Although mobilisation around a political interest is not the initial purpose of the PatientsLikeMe, Doctors.net.uk

and Connexions communities (as it is the goal of Wikileaks community), some examples show that these platforms can – and probably will – be used for political mobilisation purposes if the necessary conditions occur. For example, in the Doctors.net.uk case, doctors were mobilised around the right of UK doctors to freedom of speech. The political mobilisation features of social computing websites could be exploited much further in the future. This finding seems to be endorsed by the fact that over 20% of the respondents to this study's survey on Petities.nl – a Dutch petition platform – stated that they would like the platform to have more political impact in the future.

The instant hype and long-tail mechanisms of social computing platforms seem to particularly support issue-based political involvement. People are able to find each other around very specific subjects and spontaneously organise advocacy groups. The representation of citizens may hence become more fragmented. Citizens may not be ideologically attracted to a specific party but may feel represented by a different party for each issue. A difference between party politics and issue-based politics is that, in issue-based politics, the assessment as to whether every group in society is equally represented in the debate does not take place automatically. In a party system, participants deliberately strive for inclusion of all societal groups for all subjects, whereas in topic-based politics the assessment of whether all groups are heard has to be made for each issue raised.

### Socio-cultural

In the socio-cultural area, the inclusive and horizontal character of social computing applications seems to be yielding new values. The architecture and functionalities of the websites studied seem to stimulate openness, informality and equality, as do the community members themselves. The design of the websites aims to increase openness, an equal sharing of information, and all users have the same rights to create and use information. The communities often

adopt the Creative Commons Licence and some of them use open source software. Participants behave informally, use informal language and the threshold for the introduction of new members is low. Both on Connexions and Doctors.net.uk, senior and junior professionals work together more equally than in their offline professional lives. Values such as seniority and position-based status seem to be less relevant in the online communities. Here, members who are knowledgeable and have valuable expertise receive the most respect. These findings are endorsed by the survey conducted for this research, which shows that the communities studied share five core values, namely: openness, expertise, informality, community sense and sharing.

Furthermore, the long-tail and efficient allocation mechanisms of social computing applications seem to stimulate the emergence of new cohesion within the communities around specific merits. On Connexions, teachers and students gather around educational content, on Doctors.net.uk doctors find new colleagues with the same medical specialisations, and on PatientsLikeMe members make new contacts with peer patients. Another socio-cultural impact perceived is the threat to the personal privacy of community members. The transparency mechanism in particular makes members more vulnerable to privacy infringements. This threat may be most visible on PatientsLikeMe, where members' personal medical information can be accessed by employers and insurance companies.

### Organisational

In all the cases studied in this research, we found that new players had entered the public arena and that new allocations of roles between traditional and new parties were emerging. On PatientsLikeMe, members seem to take over support tasks hitherto predominantly carried out by healthcare professionals. They advise and encourage each other, a type of support that until now has mainly been provided by patient-

care organisations. Furthermore, it seems that the members of PatientsLikeMe are taking over some of the research tasks traditionally carried out by the pharmaceutical industry. They collect information on the effectiveness of drugs, analyse the results and – moreover – base medical decisions upon research outcomes. On Connexions, teachers and students generate scholarly material hitherto created by publishers. Textbooks are published which would otherwise not have been considered by high-street publishers. The survey results also show these kinds of impact. Around 24% of the respondents from professional communities stated that their daily practice has altered as a result of their engagement in the community (e.g. their products had changed). Approximately 18% of the respondents from these communities found that – due to their involvement in the community – the quality of their service had improved.

Not only are the players and the products changing, but also the process whereby the products are created and the business models behind their creation. In all cases, the creation process is horizontal, all members can contribute bits and pieces to the whole. However, the creation is not necessarily more democratic; in most cases we found that the initiating organisation exercises strong control of the content. Wikileaks has a team which verifies and decides upon the publication of the uploaded information; Doctors.net.uk has a group of knowledge architects who are able to remove content, and on PatientsLikeMe there is also strong supervision of the content published on the website. Furthermore, cooperation on social computing platforms seems to cross organisational and geographical boundaries. Patients, teachers and doctors from all manner of organisations and countries are working together. Other boundaries, such as language and discipline boundaries, seem to be becoming more dominant. Two of the cases studied – PatientsLikeMe and Doctors.net.uk – have put a more scalable business model in place whereby commercial parties pay for advertising space and/ or community-generated data. Further research

would be needed to identify the opportunities and risks of such models. Wikileaks and Connexions are donation-based (donations from individuals as well as foundations and governments).

Finally, it was found in several cases that social computing can make organisations more efficient. In particular, the network-based allocation mechanism of social computing platforms stimulates a more efficient match of demand and supply. The survey results support this finding: around 12% of the respondents from professional communities stated that they save time by finding and applying knowledge generated within the community. The users of Doctors.net.uk and ePractice in particular find that they are making better use of their professional network and/or experiencing improved cooperation with peers.

### Legislation

In the case studies, we found that existing legislation (be it copyright, patent rights or privacy) is coming under pressure from activities undertaken within the community. The collaborative content created on Doctors.net.uk and Connexions requires a new, more inclusive type of legal protection, for example through the use of Creative Commons Licences. PatientsLikeMe has – instead of a privacy policy – an openness philosophy in which they state: "Currently, most healthcare data is inaccessible due to privacy regulations or proprietary tactics. As a result, research is slowed, and the development of breakthrough treatments takes decades. Patients also can't get the information they need to make important treatment decisions. But it doesn't have to be that way. When you and thousands like you share your data, you open up the healthcare system. You learn what's working for others. You improve your dialogue with your doctors. Best of all, you help bring better treatments to market in record time." The CEO of PatientsLikeMe stated in an interview that PatientsLikeMe members simply weigh up the pros and the cons of joining the PatientsLikeMe

community and often come to the conclusion that the information they receive through the website is more important for them than the risk to their privacy. Yet the information published still implies a substantial reduction in patient privacy because data on their medial conditions are accessible to anyone. The Wikileaks case shows that new parties are starting to play an important role in legal procedures and court cases. In this case, the crowd plays a role in the evidence-gathering, and this evidence has been used several times by lawyers to strengthen their case.

## 7.4 The drivers of social computing

While cross-analysing the cases and analysing the outcome against the survey results, we found that the following variables predominantly drive the social computing initiative.

–   *User interest*. All CEOs interviewed for this research stated that the key driver for users to join up is the community meeting one of their (specific) demands. On PatientsLikeMe, members can find support and information about symptoms, drug use and treatments; on Doctors.net.uk doctors can obtain specific advice and medical information; Connexions users can find content which they can use for preparing their lessons or exposure of their work, and on Wikileaks users can find or publish evidence of government misbehaviour. People participate because the community has added value for them. The survey results support this conclusion as they reveal that the perceived benefits are strongly related to the specific aim of the community. Whereas in support communities both the acquisition of knowledge (around 33%) and the mutual support among patients (31%) are important benefits, in the professional communities the acquisition of knowledge, skills and inspiration are dominant advantages perceived by users.

- *Critical mass.* Another driver for users to become involved is the fact that their peers are involved. In all cases studied, a significant increase in user numbers could be observed after the website had reached a critical mass of users. It seems that, at a certain moment in time, there is a tipping point in usage – i.e. when there is a solid base of users that rapidly attracts other users.
- *User-friendliness.* Both the CEOs of Connexions and Doctors.net.uk reported the fact that the usability of the site affects actual usage. The Connexions case in particular showed that users can easily become frustrated with a complex interface or slow website, and will then drop out.
- *Connectedness.* Furthermore, it seems that the connectedness of the community to other communities (e.g. Facebook, MySpace, etc.) stimulates take up by users. The more the community is networked in other communities, the more users (who make use of other networks) feel attracted to the community.
- *Brand.* The Doctors.net.uk case shows that the brand of the website (e.g. name, logo, look and feel) may influence users' decision to become involved. Doctors.net.uk was launched as a brand, and the look and feel have been deliberately aligned to the user values. The fact that users associate Doctors.net.uk with reliability, transparency and professionalism may be one of the motives for joining.
- *Content base.* All four cases show that a content base (be it textbooks, medical articles, patient statistics or government documents) attract users to the website. As the CEOs of Doctors.net.uk and Connexions reported, users are not interested in creating a textbook or Medipaedia by themselves but prefer to contribute pieces to a greater whole. The more users participate, the stronger the content base. As the CEO of PatientsLIikeMe stated: "the bigger our community gets, the more information there is for everyone to learn from." This finding is supported by the

survey, in which significant percentages of users state that they feel they benefit from the information published on the website (e.g. 24.5% ePractice, 33.7% Flu Wiki, 34.3% ECG-Pedia and 22.9% WikiCrimes)
- *Quality of the content.* The cases show that users find it important that the content published is of high quality. On all websites, high-quality content (be it an important textbook, clear medical images or valuable patient statistics) seems to attract users. On the other hand, not surprisingly, visitors seem to be put off by content of limited quality. The survey shows that, for many users, limited reliability of the information is an important drawback (e.g. 19.1% Endometriosis, 17.3% ePractice, 15.4% Flu Wiki, 21.1% WikiCrimes, 19.3% Platewire and 10.7% Petities)
- *Sustainable business model.* The sustainability of the business model behind a particular social computing site seems to drive participation. It appears that sustainable development of the community inspires confidence in users that the content delivered will be preserved.
- *Privacy protection.* The survey shows that privacy protection is an important issue for users. Significant percentages of users of the communities studied state that they see the risk of privacy infringements as an important drawback of the community (e.g. 20.5% Endometriosis, 16.6% Doctors.net.uk, 9.3% ePractice, 13.7 Flu Wiki, 6.7% WikiCrimes, 14.1% Petities).

## 7.5 Future risks and opportunities

The present research reveals the following key risks and opportunities for the social computing trend in the public sector:

### Opportunities:

- *Transparency.* Social computing applications may enhance the transparency of citizen demand and government services and

processes. Crowdsourcing mechanisms mean that public sector information can be more readily compiled, structured and disseminated and thus provide the potential to make government more transparent while empowering citizens to make public officials accountable.[326] In addition, social computing techniques may provide governments with powerful tools, for example to gain insight into citizens' demands. A recurring discussion, however, is the reliability and liability of the content generated by the crowd (see the section on Risks below).

– *Citizen-centred and citizen-generated services*. Forms of social computing (e.g. online communities) can stimulate the accessibility and personalisation of public services when groups of users are enabled to create those public services themselves and tailor them to their preferences. It seems that content-related (intangible) public services in particular can be provided by citizens (e.g. counselling, teaching, tracing, designing, criticising) and less tangible products (e.g. production of an infrastructure, public transport, housing) by government/ business alliances. A question that remains is whether the services provided by citizens are sufficiently inclusive.

– *Improvement of efficiency (cost/benefit) in the public sector*. Social computing trends may enhance the efficiency of the production of public value (e.g. public services or legislation). By using social computing technologies, knowledge for creating public value can be built in an efficient way (e.g. statistical data on drug use yielded by members of PatientsLikeMe). Furthermore, resources to produce public value (e.g. human resources) can also be

allocated efficiently (e.g. global teachers' network). However, evidence in the private sector shows that efficiency gain can only be achieved if existing processes are transformed.

**Risks:**

– *Ensuring principles of good governance*. Present research shows that, in many cases, citizens or new players are taking over tasks hitherto carried out by public-sector parties. Here the question arises as to whether the principles of good governance are sufficiently ensured in the new models of citizen-generated public service. The exercise of government power has been legally restricted and regulated by principles such as legitimacy, accountability, transparency, integrity, *audiatur et altera pars* and impartiality. These principles are not legally embedded in cases of citizen-generated public tasks. The regulatory framework is lacking. In addition, the cases studied for this research reveal that democratic involvement in decision-making on the type of data gathered and the dissemination and control of data is absent in most cases.

– *Privacy infringements*. Just as governments are becoming more transparent, more information on individual citizens can be found through social computing applications. A telltale example of privacy risks is the PatientsLikeMe case. Patients publish large amounts of sensitive data online, e.g. photos, residence, drug use, treatments and personal stories. The data on PatientsLikeMe are not protected; they are accessible for anyone with Internet access. Patients are willing to publish their information online in order to find peer patients, to exchange experiences and to build knowledge by aggregating the individual data (e.g. on side effects of drugs). The survey conducted for this research shows that patients are not naive; they know that their privacy is endangered. However, the

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326 Precondition: mashups and crowdsourcing can only be effective if the building blocks of public sector information are provided by government agencies. Research shows that in many western countries only a limited number of public sector documents are accessible online.

advantages of finding peers and gaining an increased understanding of a disease seem to outweigh the privacy risks. Vulnerable groups such as patients need more protection.

– *Reliability of published information*. High percentages of users in the survey conducted for this research state that they do not trust the information published within the community. Statements within communities often lack authoritative sources and many survey respondents said the opinion of a small group of users can be dominant within the network. The latter may cause a bias in the information provided through social networks. Also, advanced technologies enable people (and organisations) to easily manipulate content.

– *Inclusion of all*. Research results seem to be contradictory with regard to the question of whether social computing technologies increase or decrease inclusion of all. The results of the survey in this research show that women and men, all ages and education groups are represented within these networks, and that their participation seems to depend upon the subject and activities of the community. Resources such as time, knowledge and (in some cases) financial capital may be critical in terms of being able to participate in a social network. As inclusion of all is an important principle of public-service provision, further research is needed to assess the potential risk of exclusion of groups.

## 7.6 Research challenges and policy recommendations

### Research challenges

Studies on the broad impact of social computing in the public sector are scarce. In an exhaustive review of academic literature, we found that current research does not examine the generic social computing trend and its effects on the whole public sector, but is strongly focused on the application of specific social computing applications in a particular public sector. For example, there are many studies on the emergence of patient-support communities in the healthcare sector and the trend towards more open educational-content environments in the education sector.

In addition, we found that most studies are highly empirical, describing particular cases of social computing application and deriving conclusions from the cases. Inductive theory-building is limited to specific fields and case studies. A broader theoretical framework for evaluating the impact of social computing on public sector services is lacking. Such a framework could help to operationalise research following more rigid classification schemes (e.g. a typology of impact, typology of social computing applications). The fragmented character (in terms of unit of analysis, research questions and methodology) of existing research (and the paucity of reliable data) did not allow the design and validation of a more generic theory. Future research should address these gaps. An overarching conceptual framework is needed, in particular, to guide sector- and application-specific research. The framework could help to align units of analysis, research questions and methodologies in separate sectors or application-specific studies. Research results from different studies could then be combined and compared so that more general conclusions on social computing impact in the public sector can be drawn.

A further research challenge is to strengthen the quantitative base of evidence regarding the impact of social computing on the public sector. Most of the evidence found in this research remained at the anecdotal level and provided a limited foundation for assessing the magnitude of the impact. Propositions yielding from existing literature should be underpinned with more statistical evidence. An example is the proposition that crime-watch communities, such as Wikileaks, are increasingly influencing the

intelligence processes of traditional intelligence agencies. However, existing literature is not clear about the annual growth in the number of crime-watch communities, the percentage of intelligence agencies making use of these communities and in which percentage of cases. Consistent quantitative impact data is needed in order to be able to make an accurate assessment of the impact of social computing applications.

Furthermore, we found that specific impacts may need extra academic attention because the research results on the precise manifestation of these impacts were contradictory and – at the same time – the impacts may have the potential to substantially disrupt existing policy and government practices. An example is the question of whether the public services generated by users of social networks are all-inclusive (and thus impact on inclusion policy). Some studies found that most of these networks are all-inclusive, whereas other reports showed new mechanisms of exclusion within the networks. Another important topic may be privacy. The literature does not make it clear to what extent privacy is protected in the various forms of social computing communities. The same can be said about ensuring principles of good government within these networks, such as democratic involvement, integrity, legitimacy, and accountability. Since changes in the extent to which inclusion of all, privacy and good government principles are ensured may have considerable implications, more research is needed in these areas.

To conclude:

– More research is needed because literature in the area of social computing impact in the public sector is highly tentative, exploratory and lacks theory building and sound evidence (strengthening of the deduction and induction cycle).

– An overarching conceptual framework should be developed that stimulates a more coherent research approach in the broad area of social

computing impact in the public sector. This framework should be operationalised and could build on the typologies defined in existing research. In the present research we distinguish between different types of impact (political, organisational, socio-cultural and legal), public service sectors (healthcare, learning, inclusion and government. This typology does not reflect the public sector very well and needs to be improved) and types of social computing communities (professional, support, crime-watch and political).

– In-depth research on specific social computing applications, specific sectors or specific impacts should be coordinated and based upon an overarching framework.

– Sector, application and impact-specific studies should be combined, following the general framework so that more generic conclusions on social computing impact in the public sector can be drawn, while advancing an overall theory.

– Specific attention should be paid to potentially high impact and controversial topics such as the effect of citizen-generated services on inclusion of all, privacy and good governance principles.

Policy recommendations

Based upon the conclusions and research challenges formulated in the previous paragraphs, the following policy recommendations can be made:

– Citizens more readily express and discuss their preferences with others when using social computing. This occurs on a basis of trust, among users in a social computing community and between the community and the platform 'providers'. For government to engage in this process in order to learn and discuss the needs of citizens, similar levels of trust will be required. A key ingredient in building trust is information symmetry. By embarking on an open process of actively

sharing data and information, government can establish the required levels of trust.

– Government organisations used to be the only agents delivering public services and they dominated public value creation. Now that social computing platforms are liberating the energies of the 'masses', they are increasingly directed at the public service domain. Communicated via the social connection, this enormous energy materialises in the form of information and news (blogosphere), knowledge (Wikipedia), creative content (Creative Commons, YouTube), social goods (social networks, online communities), virtual goods (Second life, MMOs) and even ICT 'hardware' (processing cycles, hard disk space). In each domain (or 'sphere'), public resources proliferate: social and legal counselling, environmental monitoring and crime-watch, virtual urban planning, etc, etc. With so much potential for user-created public value, public sector agents and agencies should very seriously consider including (financing, facilitating) a user-generated approach in order to address new and old challenges in service delivery.

– Social computing networks very effectively mobilise the energies of users (citizens) by allowing them to quickly and intuitively pool their resources and direct them at a particular challenge, all via the social connection. Even the smallest groups ('niches') of scattered users succeed in reaching critical mass and thereby become more visible. By employing social computing strategies (and 'tools'), government can enlist important niche audiences and leverage their insights. Overall this would contribute to a higher resolution of 'ground truth' to underwrite policymaking. In order to employ these strategies and tools, civil servants would need to become very familiar with them and the values of social computing communities.

– Where 'public' value and 'public' service are being generated or directed outside the usual sphere of influence of government, the

role of government is radically changing. To ensure that core values and rights continue to be respected, the government needs to enter this new participative public realm. One way to do this is to open up public service to third-party participation. This would ensure a continuing – albeit more facilitating – role in the design and delivery of public services.

– Crowdsourcing (e.g. mashups, wikis) techniques and online communities (e.g. activist and interest groups) can enhance the knowledge of government practitioners in a particular field and therefore strengthen the evidence and argumentation for new policy (many examples in the policing area, tracking and tracing of criminals). However, advanced technologies enable people to easily manipulate content (e.g. change photos, videos, formal writings) that is disseminated through the networks. To deal with the limitations in accuracy, the government could employ a staged approach whereby the use and scrutiny of user-generated data is guided by required security levels. Only sensitive uses would demand certified sources, while general-purpose applications would draw on wider, public databases.

– (Groups of) citizens are empowered by social computing technologies, which enable them to express their personal interests and preferences. However, the downside of citizen expression on social networking platforms is the growing number of cases of privacy infringements. Citizens may become more empowered to express themselves but at the same time they become more vulnerable to privacy violations (e.g. cyberbullying, happy-slapping, etc.). Any privacy infringements could be easily traced back to the perpetrator by enacting new legislation. However, this very legislation may set us on a course towards further potential privacy infringements, accidental or intended, this time by or through government agencies and third parties operating at arm's length in sensitive public-service domains

such as health and education. Any new data-gathering approach or act should therefore be preceded by a cost-benefit analysis that includes an element for assessing the short-term and long-term impact on privacy. Monitoring should address, in particular, any cumulative effects. To create awareness of these issues, critical analysis and cyber behaviour should be taught through formal, informal, lifelong-learning and vocational learning systems when appropriate and relevant (e.g. ICT courses).

– Social computing trends may, on the one hand, stimulate digital competencies as ever-more learning communities emerge and there may be a potential for learning digital skills in online communities. On the other hand (and this evidence seems stronger), social computing trends may – at least in the short term– contribute to a wider digital divide when, in particular, the digital literates are empowered by social computing platforms while digital illiterates lag behind. Over the years, however, this problem will decrease as new interfaces are increasingly embedded and intuitive and can cater for an ever-wider section of the population. However, studies show that although new generations will be more experienced in using social software

and software will be more user-friendly, users will not necessarily have the skills to understand the implications (e.g. social or legal) of their behaviour on social network sites. The government needs to continuously monitor the potential risks of participation in social network sites and inform citizens about these risks, for example through awareness, information and/or education programmes.

– There is much anecdotal evidence that social computing technologies enable (groups of) elderly and citizens with special needs to support each other, mobilise and organise (e.g. silver surfers, seniorweb). Social computing technologies enable self-organisation and self-regulation. With fewer options to orchestrate and regulate in an increasingly connected world, governments should stimulate the emergence of these mechanisms, particularly where they support key public values and goals. One way to do this is by promoting social computing architectures and governing models that facilitate self-regulation. Principles of good governance that apply to traditional government should extend to social computing initiatives when these initiatives cross into the realm of public-service delivery.

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# ■ ANNEX 2 – Involved Stakeholders

| Name | | Organisation | Involved in |
|---|---|---|---|
| Sylvia | Archmann | EIPA | Online validation session |
| Frank | Bannister | Trinity College Dublin | Online validation session |
| Ronald | Beelaard | Board Wikimedia Netherlands | Final validation workshop Online validation session |
| Maarten | Botterman | RAND/GNKS | Online validation session |
| Lee | Bryant | Headshift | Online validation session |
| Miguel | Cabrer | Innovation, Research & Communication | Online validation session |
| Loris | Di Pietrantonio | DG INFSO H3 | Online validation session |
| Suelette | Dreyfus | University of Melbourne | Interview |
| Antonio | Fumero | Universidad Politecnica de Madrid | Online validation session |
| Luis A. | Galindo | Telefonica | Online validation session |
| Syb | Groeneveld | Nederland Kennisland | Online validation session |
| Hans | Hellendoorn | TU Delft | Online validation session |
| Bernie | Hogan | University of Toronto | Online validation session |
| Ben | Heywood | Founder PatientsLikeMe | Interview |
| Edwin | Horlings | Rathenau | Online validation session |
| Gareth | Hughes | Eris@ | Online validation session |
| Ajit | Jaokar | Futuretext | Final validation workshop Online validation session |
| Isidro Maya | Jariego | Universidad de Sevilla | Online validation session |
| Nick | Kings | British Telecom | Online validation session |
| Miriam | Lips | Universiteit Twente | Online validation session |
| Guzman | Mancho Bares | Universidad de Alcala | Online validation session |
| Bogdan | Manolea | Association for Technology and Internet | Online validation session |
| Ian | Miles | Professor of Technological Innovation and Social Change PREST | Review future scenarios |
| Jose Luis | Monteagudo Peña | Instituto de Salud Carlos III, Madrid | Online validation session |
| James | Munro | Patient opinion | Online validation session |
| Dominic | Newbould | UK Open University | Online validation session |
| Jim | Norton | Sheffield University | Online validation session |
| David | Osimo | Managing partner at Tech4i2 ltd | Final validation workshop Online validation session |
| Arvo | Ott | Ministry of Transport and Communications | Online validation session |
| S | Paulussen | Universiteit Gent, Media en ICT - IBBT | Online validation session |
| Maria Chiara | Pettenati | University of Florence | Online validation session |
| Andre | Richer | DG ENTR, | Online validation session |
| Patrice | Riemens | Waag society old – new media Amsterdam | Online validation session |
| Tim | Ringrose | CEO Doctors.net.uk | Interview |
| Tomas | Sabol | Technical University of Kosice, Slovakia | Final validation workshop Online validation session |
| Lori | Scanlon | Marketing Manager PatientsLikeMe | Interview |
| Alexander | Schellong | Harvard Kennedy School | Online validation session |
| Fabrizio | Sestimi | DG INFSO F4 | Online validation session |

| Name | | Organisation | Involved in |
|------|------|------|------|
| Jamal | Shahin | University of Brussels | Online validation session<br>Final validation workshop |
| Torhild | Slåtto | Norwegian Association for Distance and flexible Education | Online validation session |
| Chris | Smissaert | Netherlands Ministry of the Interior and Kingdom Relations | Online validation session |
| Mildo | Staden | Netherlands Ministry of the Interior and Kingdom Relations | Final validation workshop |
| Joel | Tierstein | CEO Connexions | Interview<br>Final validation workshop |
| Chris | Smissaert | Netherlands Ministry of the Interior and Kingdom Relations | Online validation session |
| Leo | Van Audenhove | Vrije Universiteit Brussel | Online validation session |
| Hein | Van Duivenboden | CapGemini | |
| Freek | Van Krevel | DG INFSO H2 ICT for Government and Public Services | Online validation session |
| Pascal | Verhoest | DG INFSO H2 ICT for Government and Public Services | Online validation session |
| Philip | Von Haehling | Accenture | Online validation session |
| Dave | Waltho | SAS UK | Online validation session |
| Irina | Zalisova | European Projects & Management Agency | Online validation session |

# ■ ANNEX 3 – Sample Questionnaire

Dear <NAME COMMUNITY> member,

We would like to invite you to join our survey on *user experience* and *impact of online support communities*. How do you benefit from joining the <NAME COMMUNITY> community? And, how did the participation impact your life? Please fill out 10 questions and help us to reveal the user perspective and impact of online support communities. It only takes 5 minutes!

The information you provide in this survey will be treated as confidential. For the exact terms of this survey, please visit WWW.TNO.NL/HYPERLINK.

Thank you very much,

TNO Research Institute

1. *Please fill out your profile*

   Age _____

   Gender _____

   Education attainment _____

   Nationality _____

   Ethnic background _____

   Profession _____

   _____ years of Internet experience

2. *How much time do you spend on the community website?*

   _____ hours a week/ _____ minutes a week

   _____ visits a week

   _____ visits a month

   _____ visits a year

3. *What are your top 5 online activities (please rank on a scale from 1 to 5 - 1 being the most important answer)?*

☐ Updating my profile

☐ Browsing profiles

☐ Reading comments on profiles

☐ Reading statistical information

☐ Searching for new contacts

☐ Asking for advice

☐ Commenting on profiles

☐ Rating and/or ranking of treatments/services

☐ Chatting with other members

☐ Debating on the forum

☐ Donating money

☐ Other_____

☐ Other_____

☐ Other_____

4. *What are the top 3 topics are engaged with on the website (please rank on a scale of 1 to 3 – 1 being the most important answer)?*

☐ Personal health status

☐ Personal health experiences

☐ Medical research

☐ Personal feelings

☐ Non-health matters

☐ Other_____

☐ Other_____

☐ Other_____

5. What are the top 5 benefits you experience from joining the community (please rank on a scale from 1 to 5 – 1 being the most important answer)

☐ Valuable tips

☐ Medical facts about my medical condition

☐ Greater understanding of my medical condition

☐ Greater understanding of the medical condition of a family member or friend

☐ Meeting people with similar experiences

☐ Helps me choose the right treatment

☐ Complements the information from my general practitioner/physician

☐ Support and encouragement

☐ Personal advice from community members

☐ Making new friends

☐ Having fun

☐ Other_____

☐ Other_____

☐ Other_____

6. What do you think are drawbacks of joining the community (please rank on a scale of 1 to 5 (please rank on a scale of 1 to 5 – 1 being the most important answer)

☐ Reliability of information is limited

☐ Domination of small number of peers / opinions

☐ Impact of joining the community on medical condition is limited

☐ Peer pressure

☐ Risk of privacy; open access to my personal information

☐ Spam/inappropriate comments

☐ Unwanted contacts

☐ Intimidation/harassment

☐ Other_____

☐ Other_____

☐ Other_____

7. What do you consider to be the most important impacts of the online community *(rank on a scale from 1 to 5 – 1 being the most important answer)*

    ☐ I changed medications

    ☐ I changed treatments

    ☐ I changed doctors

    ☐ I changed healthcare institutions

    ☐ I changed health insurance

    ☐ I rely more on self-diagnosis

    ☐ I rely more on self-treatment

    ☐ My treatment has become more effective

    ☐ Improvement of my life circumstances

    ☐ I have made new friends

    ☐ My views on my medical condition have changed

    ☐ My opinion on my doctor has changed

    ☐ My outlook on governmental health policy has changed

    ☐ I have less contact with my doctor

    ☐ I have less contact with some of my offline friends

    ☐ I have less contact with offline health professionals

    ☐ Other_____

    ☐ Other_____

    ☐ Other_____

8. What are the top 5 values you associate with the community (please rank on a scale from 1 to 5 – 1 being the most important answer)?

    ☐ Openness

    ☐ Professionalism

    ☐ Community sense

    ☐ Informality

    ☐ Equality

- ☐ Expertise
- ☐ Law compliance
- ☐ Self-support
- ☐ Diversity
- ☐ Confidentiality
- ☐ Dedication
- ☐ Solidarity
- ☐ Respect
- ☐ Acceptation
- ☐ Empathy
- ☐ Security
- ☐ Recognition
- ☐ Conviction
- ☐ Engagement
- ☐ Reciprocity
- ☐ Righteousness
- ☐ Sharing
- ☐ Formality
- ☐ Empowerment
- ☐ Integrity
- ☐ Tolerance
- ☐ Cohesiveness
- ☐ Other_____
- ☐ Other_____
- ☐ Other_____

9. Which functionality of the community website do you use most (please rank on a scale from 1 to 3 – 1 being the most important answer?

☐ Blog

☐ Forum

☐ Wiki

☐ Chat box

☐ Map

☐ Tagging tool

☐ Rating tool

☐ Voting tool

☐ Tool to upload photos/videos

☐ Other_____

☐ Other_____

☐ Other_____

10. What would you like to see improved in a next version of the community website?

<open answer>

11. Which further comments would you like to make?

<open answer>

**Thank you very much for joining our survey!**

The results of the survey will be published on the website of the TNO Research Institute, www.tno.nl/. If you register below you will receive an automatic notice of the publication of the survey results. Your email will be removed from our database as soon as we have sent the notice.

<CHECK BOX> Yes, I would like to receive a message about the publishing of the survey results. My email is: <open answer>

# ■ ANNEX 4 – Survey Tables

The next tables provide a more detailed overview of the survey results. The columns of the tables represent the websites on which the survey was published (Endometriosis, Doctors.net.uk, ECGpedia, ePractice, Flu Wiki, WikiCrimes, Platewire and Petities.nl) and the rows show the specific survey results for each website. The first table gives an overview of the user profiles of visitors to the websites. The tables on benefits, drawbacks, impacts and values rank the answers of respondents (see rows for numbers 1 to 10 ranking). The survey was online for two weeks and was filled out by 1,406 visitors. 83.5% of the respondents completed the whole questionnaire.

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## User profiles

| | Support communities | Professional communities | | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECGpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities, n=86 |
| **Age** | 52.4% 25-40, 33.3% 40-55, 11.9% 18-25, 2.4% > 55 | 42.0% 25-40 32.3% 40-55 23.3% >55 2.4% 18-25 | 42.9% 18-25 42.9% 25-40 9.5% 40-55 4.8% > 55 | 58.5% 25-40 24.6% 40-55 9.2% > 55 6.2% 18-25 1.5% <18 | 53.5% 40-55 32.3% >55 13.1% 25-40 1% <18 | 45.2% 25-40 34.8% 18-25 15.7% 40-55 2.4% < 18 1.9% > 55 | 42.9% 25-40 42.9% 40-55 11.4% > 55 2.9% 18-25 | 41.6% > 55 35.1% 40-55 18.2% 25-40 5.2% 18-25 |
| **Gender** | 97.6% female | 53.7% male | 66.7% male | 67.2% male | 64.4% female | 89.0% male | 76.3% male | 65.4% male |
| **Education** | 45.2% Bachelor's degree, 14.3% vocational / technical school 14.3% high school 11.9% some college 7.1% Master's degree | 76.1% medical training 24.6% medical trainee/ student | 27.3% professional degree 27.3% Bachelor's degree 18.2% Master's degree 18.2% high school | 57.1% Master's degree 17.1% Doctoral degree 15.7% Bachelor's degree 5.7% some college | 30.4% Bachelor's degree 23.5% some college 21.6% Master's degree 10.8% Doctoral degree 8.8% professional degree | 47.6% Bachelor's degree 36.7% high school 10.5% Master's degree 3.3% grammar school | 39.5% some college 21.1% Bachelor's degree 15.8% vocational / technical school | 37.8% Bachelor's degree 20.7% Master's degree 25.6% vocational/ technical school |
| **Employment** | 21% healthcare 15.3% Finance and Insurance 9.1% retired 9.1% Arts & Entertainment 9.1% Government 36.4% other | 81.8% healthcare 11.4% retired 6.8% other | 50% healthcare 35% medical students 5% Education 5% Information, services and data 5% Scientific or Technical services | 29.9% government 23.9% other 13.4% consultancy 11.9% research 11.9% Scientific or Technical Services 9.0% Education | 20.4% healthcare 16.1% retired 10.8% government 8.6% education 7.5% ICT sector 36.6% other | 34.4% ICT sector 23.4% other 19.3% student 12.% government 7.3% administration 3.6% military | 20% retired 17.1% ICT sector 8.6% Finance and Insurance 8.6% Retail 5.7% student 40% other | 52% other 23% retired 9% ICT sector 6% government |
| **Internet Experience** | 69% 3-10 y 23.8% >10 y 7.1% 1-3 y | 50.2% > 10 y 47.9% 3-10 y 1.9% 1-3 y | 55% >10 y 45% 3-10 y | 69.1% > 10 y 26.5% 3-10 y 4.4% 1-3 y | 64.7% > y 33.3% 3-10 y 2% 1-3 y | 53.5% >10 y 42.3% 1-3 y 4.2% 1-3 y | 51.4% >10 y 40.5% 3-10 y 5.4% 1-3 y 2.7% < 1 y | 63.5% > 10 y 32.9% 3-10 y 2.4% 1-3 y |
| **Time spent** | 33.3% 0-1 h/w 25.6% 4-10 h/w 15% 2-4 h/w 10.3% 10-20 h/w 7.7% > 20 h/w 7.7% 1-2 h/w | 29.7% 0-1 h/w 23.4 1-2 h/w 21.8% 4-10 h/w 20.2% 2-4 h/w 3.7% 10-20 h/w 1.2% > 20 h/w | 57.9% 0-1 h/w 15.8% 1-2 h/w 10.5% 2-4 h/w 15.8% 4-10 h/w | 59.1% 0-1 h/w 212.1% 1-2 h/w 10.6% 2-4 h/w 10.6 > 20 h/w 6.1% 4-10 h/w 1.5% 10-20 h/w | 31.1% 0-1 h/w 18.4% 4-10 h/w 16.5% 1-2 h/w 16.5% 2-4 h/w 12.6% 10-20 h/w 4.9% > 20 h/w | 53% < 10 m/w 42,3% 10-30 m/w 4.7% > 30 m/w | 45.7% 0-1 h/w 22.9% 1-2- h/w 11.4% 4-10 h/w 8.6% > 20 h/w 5.5% 2-4 h/w 5.7% 10-20 h/w | 40.3% monthly 38.7% weekly 35.5% yearly |

**Benefits**

| RANKING | Support communities | | Professional communities | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECGpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities, n=86 |
| #1 | Greater understanding of my medical condition 20.6% | Having an email account 24.6% | Acquiring knowledge 34.3% | Acquiring knowledge 24.5% | Acquiring knowledge 33.7% | Access to information about crime areas 22.9% | Sharing experiences 25.4% | Being able to affect politics 23.7% |
| #2 | Meeting people with similar experiences 17.6% | Medical news 16.2% | Acquiring skills 17.9% | Inspiration 17.5% | Access to specialist knowledge 15.4% | Access to information about how to avoid crime 12.8% | Discussing violation related topics 13.9% | Being heard by others 15.5% |
| #3 | Support and encouragement 12.7% | Continuing Professional Development 15.2% | Complementing my (professional) expertise 15% | Complementing my professional experience 11% | Acquiring skills 13.2% | Knowing the problems in my neighbourhood 11.7% | Fun 12.3% | Mobilising people around a specific issue 13.7% |
| #4 | Medical facts about my medical condition 12.4% | Learning from clinical guidelines and best practice 10.8% | Access to specialist knowledge 10% | Enriching my experience 10.4% | Inspiration 12.1% | Raise political/media attention 10.9% | Valuable information to judge traffic occurrences and risks 12.3% | Collecting more in-depth information on a political issue 9.7% |
| #5 | Valuable tips 11.8% | Information searching 8.4% | Enriching my experience 8.6% | Cross-cultural experience 8.7% | Enriching my knowledge 7.6% | Share the philosophy of WikiCrimes website 8.6% | Increased understanding of traffic policy/ regulation 10.1% | Sharpening my opinion 7.9% |
| | Other 24.9% | Other 24.7% | Other 14.3% | Other 27.9% | Other 18% | Other 33.1% | Other 25.9% | Other 29.6% |

## Drawbacks

| RANKING | Support communities | | Professional communities | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECGpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities n=86 |
| #1 | Risk of privacy infringements 20.5% | Domination of a few peers /opinions 17.3% | The impact of the website on my work is limited 17.9% | The impact of the community on my work is limited 26.2% | Domination of few peers /opinions 17.2% | Reliability of information is limited 21.1% | Impact of reporting violations is limited 22.6% | Political impact is limited 22.4% |
| #2 | Domination of small number of peers 20.5% | Risk of privacy infringements 16.6% | Quality of online services is limited 17.9% | Reliability of information is limited 17.3% | Reliability of information is limited 15.4% | The access to Internet is a limitation for people in some regions 19% | Domination of few peers/opinions 20.9% | Risk of privacy 14.1% |
| #3 | Reliability of the information is limited 19.1% | Spam / inappropriate comments 15.5% | Spam / inappropriate comments 14.3% | Quality of online provided services is limited 15.9% | Risk of privacy infringements 13.7% | Impact of reporting crimes is limited 18.2% | Reliability of information is limited 19.3% | Domination of few peers / opinions 12.6% |
| #4 | Impact of joining the community on dealing with medical condition is limited 8.0% | The impact of the community of my work is limited 13.4% | Reliability of information is limited 8.9% | Domination of few peers/opinions 12.2% | Spam / inappropriate comments 10.9% | The obligation to register in the system to have access to data 9.9% | Intimidation / harassment 11.8% | Reliability of information is limited 10.7% |
| #5 | Spam / inappropriate comments 7.4% | Quality of the online services is limited 9.5% | Intimidation / harassment 8.9% | Risk of privacy infringements 9.3% | The impact of the website on my work is limited 10.1% | Risk of privacy infringements 6.7% | Spam / inappropriate comments 7.2% | Peer pressure 10.4% |
| | Other 24.5% | Other 27.7% | Other 32.1% | Other 19.2% | Other 32.6% | Other 25% | Other 18.2% | Other 10.1% |

**Impacts**

| RANKING | Support communities | | Professional communities | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECQpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities, n=86 |
| #1 | My views on my medical condition have changed 16.2% | The quality of the service I provide has improved 18.3% | I am more capable of solving professional problems 28.4% | I apply ne w approaches to my work 16.2% | I/my organisation introduced new policies/strategies 15.7% | The information on the website is used to avoid crime 21.9% | Due to the website the violations receive more political/media attention 26.3% | The discussion on the website has put an issue on a political agenda 27.2% |
| #2 | I have made new friends 13.9% | I am more knowledgeable about the latest clinical research 16.5% | The quality of the service I provide has improved 27.3% | I save time 13.3% | I save time 13.7% | Due to the website, crimes receive more political/media attention 18.9% | The interests of pedestrians/cyclists/ drivers are being mobilised 19.1% | I feel more engaged in politics 14% |
| #3 | My treatment has become more effective 11.3% | It saves me time 14.5% | The efficiency of the service I provide has improved 20.5% | I make better use of my network 11.3% | I apply new approaches to my work 10.6% | The information on the website is used by the police to detect offenders 16.7% | The information on the website is used by the police to detect offenders 17.3% | Politicians have acted upon community initiatives 12.7% |
| #4 | I rely more on self treatment 10.9% | It has improved the standard of clinical care that I provide 8.4% | I apply new approaches to my work 9.1% | I cooperate more with external players 11% | I/my organisation has applied new methods 10.1% | The information on the website is used by the police to arrest offenders 13.3% | The information on the website is used by the police to arrest offenders 4.7% | Government policy changed as a result of community debates/initiatives 7.5% |
| #5 | I rely more on self diagnosis 9.3% | I am more aware of new pharmaceutical products 8.1% | I save time 4.5% | The quality of the service I provide has improves 9.4% | The quality of the service I provide has improved 7.7% | The information on the website has resulted in regulation amendments 13.3% | The information on the website has resulted in policy amendments 4.3% | Others altered their political view points more than once 7.1% |
| #6 | I changed medications 6% | I make better use of my network 7.9% | I/my organisation introduced new products 3.4% | I am more capable of solving professional problems 8.7% | I/my organisation implemented new processes 6.4% | | | Others feel more engaged in politics 6.0% |
| #7 | My life circumstances improved 5.8% | I apply new approaches to my work 5.5% | I/my organisation introduced new policies/strategies 3.4% | The efficiency of the service I provide has improved 8.7% | The efficiency of the service I provide has improved 6.4% | | | I am more politically active outside this community website 6.0% |

Technical Report Series

| RANKING | Support communities | | Professional communities | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECGpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities, n=86 |
| #8 | I changed treatments 4.4% | The efficiency of the services has improved 4.2% | I/my organisation has applied new methods 2.3% | I/my organisation applied new methods 5.4% | I am more capable of solving professional problems 5.5% | | | A new interest group has been established as a result of community initiatives 5.4% |
| #9 | My opinion on my doctor has changed 4.2% | I cooperate more with my professional peers 3.5% | I/my organisation implemented new processes 1.1% | I/my organisation introduced/developed new policy strategies 4.8% | I/my organisation implemented new business models 4.0% | | | I altered my political view points more than once 3.4% |
| #10 | I changed doctors 3.9% | | | I/my organisation introduced new products 3.5% | I/my organisation introduced new products 3.5% | | | Politicians have responded to community initiatives 2.6% |
| | Other 14.1% | Other 5.3% | Other 0% | Other 9.8% | Other 16.7% | Other 15.9% | Other 28.4% | Other 8.1% |

**Values**

| RANKING | Support communities | | Professional communities | | | Crime-watch communities | | Political communities |
|---|---|---|---|---|---|---|---|---|
| | Endometriosis-uk, n=42 | Doctors.net.uk, n=901 | ECGpedia, n=22 | ePractice, n=71 | Flu Wiki, n=103 | WikiCrimes, n=215 | Platewire, n=38 | Petities, n=86 |
| #1 | Empathy 12.3% | Professionalism 18.7% | Professionalism 26.4% | Expertise 14.1% | Community senses 17.8% | Respect of norms and values 18% | Openness 11.8% | Community sense 12% |
| #2 | Openness 11.1% | Community sense 10.8% | Expertise 21.7% | Openness 13.8% | Expertise 14.7% | Expertise 10.5% | Informality 11.8% | Openness 9.8% |
| #3 | Community sense 11.1% | Informality 8.4% | Openness 14.2% | Professionalism 12.8% | Professionalism 9.1% | Security 10.4% | Community sense 11% | Engagement 7.8% |
| #4 | Self-support 7.8% | Expertise 7.7% | Sharing 8.5% | Community sense 12% | Openness 8.9% | Openness 10% | Sharing 8.4% | Solidarity 7.2% |
| #5 | Sharing 7.6% | Openness 7.6% | Informality 7.5% | Sharing 11.7% | Dedication 8.6% | Sharing 8.5% | Diversity 7.5% | Law compliance 5.8% |
| #6 | Professionalism 6.8% | Self-support 5.4% | Community sense 5.7% | Diversity 5.6% | Sharing 6.1% | Participation 8.8% | Respect 6.6% | Respect 5.2% |
| #7 | Empowerment 6.8% | Sharing 4.8% | Dedication 4.7% | Informality 5.6% | Empowerment 6.1% | Professionalism 8.7% | Empathy 6.6% | Righteousness 5% |
| #8 | Expertise 5.2% | Confidentiality 4.7% | Self-support 4.7% | Engagement 3.3% | Diversity 5% | Informality 6.9% | Professionalism 4.3% | Informality 4.2% |
| #9 | Respect 5% | Security 4.2% | Empowerment 4.7% | Recognition 2.6% | Informality 3.5% | Solidarity 6.9% | Confidentiality 4.3% | Expertise 3.8% |
| #10 | Informality 4.8% | Diversity 4.1% | Security 0.9% | Equality 2% | Integrity 3.5% | Confidentiality 4.5% | Empowerment 4.3% | |
| | Other 22.3% | Other 23.6% | Other 0.9% | Other 15.7% | Other 17.1% | Other 3.4% | Other 23.4% | Other 31.5% |

**Abstract**

This report presents the findings of the study on "Public Services 2.0: The Impact of Social Computing on Public Services" conducted by TNO and DTI on behalf of IPTS from 2008 to 2009.

The report gives an overview of the main trends of Social Computing, in the wider context of an evolving public sector, and in relation to relevant government trends and normative policy visions on future public services within and across EU Member States. It then provides an exhaustive literature review of research and practice in the area of Social Computing and identifies its key impact areas in the public sector.

The report goes on to discuss four case studies of Social Computing-enabled communities in different areas: education (Connexions), health (Doctors.net.uk), inclusion (PatientsLikeMe) and governance (Wikileaks). This is followed by the findings of a scenario-building exercise in which two alternative scenarios were developed and related future opportunities and risks discussed. Additionally, the report presents the results of a cross-case analysis and an ad-hoc online survey which identifies the level of usage, the general characteristics and the key drivers of Social Computing for public services. The report concludes with a summary of research challenges and policy-relevant recommendations.

Evidence from the study indicates that Social Computing technologies, applications and values have already been adopted in many areas of government activity. Social Computing affects several aspects of public service, related to both the front office (citizen-government relations) and the back office activities of public administrations. Social Computing is leading to new forms of ICT-enabled participation, capable of enhancing users' social awareness and involvement. Social Computing is also transforming relationships and ways of working within and between public sector organisations and opens the way to innovative service delivery mechanisms.

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