# A patchwork of online community-based systems: can social software be used to augment online individual social capital?

**Peter Mechant,** Research Group for Media and ICT (MICT), Ghent University (Ugent), Belgium

**Abstract**

The first part of this article discusses the conceptual differences between Web 2.0 and social software. We defend that in communication sciences the phrase social software is more appropriate than Web 2.0 and define the concept social software based on qualtitative data (expert interviews). From there, we develop a typology for social software based on four criteria: content management, communication, collaboration and community-related affordances. Each of these dimensions has its own theoretical significance and can be viewed as a key concept in the understanding of social software. Furthermore, these dimensions can be used to visualise types or certain usage-patterns of social software.

In the second part of the article we explore the relationship between social software and social capital. Social software affords explicit and implicit participation and tries to do so by means of social, bottom-up processes during which social networks are created and maintained. As social software enables explicit or 'real' online participation and channels implicit participation by design, we suggest that social software can be used to augment individual social capital. It can widen a user's experience of community (connecting people with others who have different beliefs or backgrounds) or it can deepen it (reinforcing and enhancing existing social networks).

## 1. Introduction

When Windows 95 was introduced some fourteen years ago, it contained, unlike previous operating systems, a build-in TCP/IP-stack (a software implementation of two communication protocols that enable a computer to make external connections ) and dial-up software that made connecting to the Internet relatively simple. Some months later, a new Windows 95 service release also included a build-in Internet browser (Internet Explorer 2.0). Thus, the introduction of Windows 95 onto the consumer market marks a significant moment in the history of the Internet and can be even seen as a starting point for the consumer's Internet.

Nowadays, the Internet is an important part of our lives. Online digital information is ubiquitous and accounts for a major part of the economic and cultural activity in western society. Hence, our society calls itself an information or network society. A quick glance at our written and oral vocabulary corroborates the growing importance of the digital with qualitative proof. Barely two decades ago, Internet service providers and software companies had to use metaphors such as 'World Wide Web', 'Information Superhighway' or 'Internet traffic' (Schäfer, 2008; Stefik, 1996) to represent, explain and promote the Internet.

Today, Internet terminology such as 'to Google', 'to Skype' or 'networking' has become common parlance. Still, it may be worth remembering that the World Wide Web is only a fourteen-year-old, considering the introduction of Windows 95 as its 'day of birth', and is subject to all the angst, mood changes, and transformations typical for a young teenager.

The end of the dotcom crisis in 2000-2001 marked the advent of one of these transformations, ultimately leading to new and more interactive and participatory models of online communication and interaction. Today, the Internet is going through a major shift in terms of the content and the services it supplies. The blogosphere, microblogging services and websites or webservices enabling, in a user-friendly manner, user-to-user, user-to-document or user-to-system interaction (see e.g. McMillan, 2006; Szuprowicz, 1995) appeal to tens of millions of Internet users worldwide. This recent shift in terms of content and services supplied on the Internet is referred to with phrases such as Web 2.0 or social software. One of the characteristics of this new generation of Internet services is its 'bottom-up' approach. The content and structure of these websites is no longer exclusively defined by the professional information providers 'behind' the website but by the website users themselves.

Social software is about the era of social media where people not only consume media content, but also (co-) create it, and where community and collaboration are no longer defined by physical proximity but by common interests and practices.

Web 2.0 or social software services arose on the Internet recently and are reshaping the (new) media field. Consequently relatively little research into social software and its relation with social capital has been conducted in the field of communication sciences.

The aim of our article is twofold. In the first part of the article we want to signal this gap in academic literature and distinguish and explore the different dimensions of social software based on a qualitative approach. The second part of our article elaborates on social software and its relation with social capital. Web 2.0 or social software services appear to be evolving into a patchwork of various independent or loosely connected community-based systems, where the synergetic effects that could emanate from it are neglected and lost. These and other arguments incited several authors to argue that the Internet and social software in particular are inimical to the creation of social capital. Others state that an individual's social capital can be augmented by the use of the Internet and social software.

**2. A closer look at Web 2.0 and social software**

**2.1. Web 2.0**

In 'What Is Web 2.0 - Design Patterns and Business Models for the Next Generation of Software' Tim O'Reilly (2005a) stated seven basic principles defining the common features of Web 2.0 applications or websites. In a follow-up blog post, O'Reilly provided a short definition of Web 2.0 emphasising the use of the web as a platform. On this platform users control their own data and software is delivered as "(...) a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an 'architecture of participation' (...)" (O'Reilly, 2005b). Other authors approach Web 2.0 as a philosophy "(…) mutually maximizing collective intelligence and added value for each participant by formalized and dynamic information sharing and creation." (Hoegg, Martignoni, Meckel, & Stanoevska-Slabeva, 2006, p. 32).

Although the discourse on Web 2.0 is mainly affirmative (Web 2.0 as an empowering and democratizing tool), there are also critical voices (e.g. Albrechtslund, 2008; Cormode & Krishnamurthy, 2008; Keen, 2007;  Perks, 2003; Scholz, 2008 or Zimmer, 2008). The critique on the increased corporatization of online social and collaborative spaces and user generated content (e.g. Jarrett, 2008; Petersen, 2008) is in view of this article of importance as it states that Web 2.0 does not provide an 'architecture of participation' (O'Reilly, 2003) but rather creates an "(…) architecture of exploitation that capitalism can benefit from." (Petersen, 2008).

**2.2. Social software**

Although social software was already in use before 2002, the phrase started to gain general recognition thanks to the Social Software Summit held by Clay Shirky in November 2002. From then on, many definitions for social software started circulating and it became, and still is, a much talked about subject in the blogosphere.

Christopher Allen (2004) gives a detailed account of the origins of social software and states that the terminology has moved through a life cycle. He sees social software as the successor of computer-supported collaboration work (CSCW) and groupware tools. Bannon and Schmidt define CSCW as "(...) an endeavour to understand the nature and characteristics of cooperative work with the objective of

designing adequate computer-based technologies." (1991, p. 4). Greif (1988) describes the field of groupware as "(...) an identifiable research field focused on the role of the computer in group work".

This focus on the support of groups per se is abandoned in the more radical approach to social software. Stove Boyd (2006) even argues that social software will come to mean the opposite of what groupware and CSCW tools were intended to mean.

Boyd (2006) argues that social software starts from a bottom-up approach, supporting the desire of individuals, and that this is its main difference with CSCW: "Social software is based on supporting the desire of individuals to affiliate, their desire to be pulled into groups to achieve their personal goals. Contrast that with the groupware approach to things where people are placed into groups defined organizationally or functionally". Schiltz, Truyen and Coppens (2007) and Saveri, Rheingold, Soojung-Kim Pang and Vian (2004) take a similar perspective and consider group interaction and group affordances for self-organization key in the description of social software.

### 2.3. Web 2.0 or social software: a semantic discussion?

Despite its popularity, Web 2.0 remains a problematic concept. Web-developers, venture capitalists, programmers and analysts use the term mainly to underline the technological 'back-end' characteristics, such as the use of data-aggregation, micro-content and lightweight programming models, often excluding the social characteristics of Web 2.0. Moreover, the expression Web 2.0 delimits its range to Internet services using the World Wide Web (a collection of interconnected documents and other resources) and does not take into account other services mediated by the Internet (a collection of interconnected computer networks) such as peer-to-peer-file sharing, email and streaming media. Nor does it describe services mediated through other channels such as mobile phones or interactive television. Finally, the important advantage of the phrase Web 2.0 – emphasizing a turning point for the web by using the postfix 2.0 – is also its major downfall because it assumes a drastic break with the past (with Web 1.0) but does not explain where this breakpoint is situated.

Although various authors (e.g. Madden and Fox, 2006) consider Web 2.0 to be a useful conceptual umbrella, we prefer the phrase social software to describe the new generation of Internet applications and businesses emerging from the participatory web. Several arguments support this choice. Firstly, the concept social software is not laden with the semantic restrictions that are linked to Web 2.0. Secondly, social software describes interactive, participative websites or online services just as well as Web 2.0 does. Thirdly, the phrase has scholarly roots in the study of groupware and CSCW (see above). Finally, the

phrase social software encompasses an integrative view of how sociality manifests itself in software: it can refer to 'social' software in the Durkheimian sense (as a 'fait social'), in the Weberian sense (as communicative and cooperative societal affordances) or in the Tönniesian–Marxian sense (as community-building and collaborative tools) (Fuchs, 2009).

However, the phrase social software can also be criticized for its highly positivist interpretation of social phenomena and for the perpetuation of the artificial separation between 'social' and 'non-social'. Nevertheless, based on the arguments above, we find the phrase social software more appropriate than Web 2.0, to describe interactive and participative websites, platforms or web services such as Flickr (http://www.flicr.com), Digg (http://www.dig.com), Delicious (http://www.delicious.com) or YouTube (http://www.youtube.com). We consider the concept social software to be part of the discourse of innovators and researchers, while Web 2.0 has become too popular to be useful as a research concept.

## 2.4. Defining social software

Desk research revealed an abundance of definitions for social software. However, most definitions seem to share some common ground. They all subscribe to the importance of creating networks and relations between people. In addition, most of them acknowledge the bottom-up approach as described by Boyd (2006). Clay Shirky and Tom Coates articulated significant definitions for social software. Shirky describes social software as "(...) *software that supports group interaction"* (2003) *and Tom Coates defines it as* *"(...)* software which supports, extends, or derives added value from, human social behaviour - message-boards, musical taste-sharing, photo-sharing, instant messaging, mailing lists, social networking." (2005). Using these statements as a starting point we developed a definition for social software that was presented to a group of experts in the fields of social software and Web 2.0 by means of an online qualitative survey. The next section briefly describes the methodology and results of this survey.

## 2.4.1. Methodology

In October 2007, a request to fill out a brief online questionnaire on social software was sent out by email to 43 international experts in the fields of Web 2.0 and social software. The survey tried to determine how social software was perceived by this panel of academic researchers (from disciplines such as communication studies, sociology, computer sciences, pedagogy and psychology) and experts from

various international consultancy firms or research and government institutes. Three days after the initial invitation email, a reminder email was sent to those respondents who had not filled in the questionnaire. The survey was closed after a period of 14 days. A response rate of 58% (25 respondents) was reached.


## 2.4.2. Results & discussion

First, the experts were asked to what extent they agreed with the suggested definition for social software: "Social software is software that enables communication through digital technologies during which people connect, converse, collaborate and form online networks in a bottom-up fashion."

Table 1 shows that the majority of the respondents agreed with our definition distilled from the literature review. Sixteen experts indicated their agreement, three people gave no opinion and six respondents were dissatisfied with our definition. Overall, the majority of the respondents agreed with the definition we provided.

Next, the experts were asked to give their definition for social software. People who did not agree with our definition placed more emphasis on network effects, social interaction and social data. Based on the analysis of this feedback, we rephrased the definition for social software to incorporate some of the remarks made by the experts. This resulted in the definition: 'Social software is software that enables communication through digital technologies during which people connect, converse, collaborate, manage content and form online networks in a social and bottom-up fashion."

From this perspective social software is a very broad concept incorporating software such as email, P2P-clients and Web 2.0 websites or services. In order to use the phrase as an equivalent for Web 2.0 we need to restrict it further by dividing the concept into 'web based social software' and 'non-web based social software'. The first referring to websites or services based on the Hypertext Transfer Protocol (HTTP) of the World Wide Web, the latter referring to websites or services using other transfer protocols (e.g. the Post Office Protocol (POP) for e-mail). In the remainder of this article we will focus on web based social software.
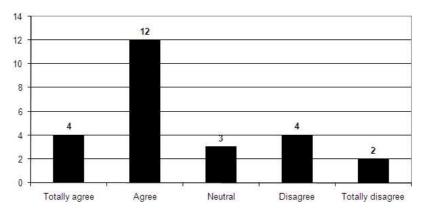
**Table 1: 'Do you agree with this definition in terms of capturing the key aspects of social software?'**
**(N=25)**



## 2.5. A typology for social software

In his speech at an MIT conference on democracy and new media, David Winston (2003) explained how digital technology has changed historically. Digital technology moved fundamentally from computing to communications. When the Internet became a reliable means of communication between individuals, online content started to get better, richer and more searchable. In the end, this led to more effective collaboration than in the past and to the emergence of online communities where people can, in new ways, share interest, practices, engagement and knowledge.

Winston regards content, communication, collaboration and community as the new arbiters of culture and political discussion. We want to use these four key concepts as a theoretical foundation for a typology for social software. Social software is not a single service aimed exclusively at creating online networks or communities but is, rather, composed of affordances such as content management, communication, collaboration and community-related features.

Social software is a complex and multi-dimensional concept consisting of a mix of these four 'C's' (content, communication, collaboration and community-related dimensions). Each of these dimensions has its own theoretical significance and is a key concept for the understanding and evaluation of social software. We want to analyse the complexity of social software by presenting a synthetic approach that combines these four dimensions. Such an approach can help us in explaining the multifaceted nature of social software and will enable us to visualise the different uses or design patterns in social software by means of a radar

plot.

We will first describe the four C's that we want to use as guidelines for evaluating social software and will then show  a theoretical example of the visualisation.

We will use the term *content management* to refer to social software functions that enable users to manage and create content for personal use or gain. This dimension is prominent in, for example, social bookmarking software (e.g. Delicious). Social bookmaking software enables online information and content management, as it provides users with an online archive and easy, intuitive and efficient access and cataloguing mechanisms.

The *communication* dimension reflects social software services that assist in the exchange of information between people. E-mail, instant messaging and most of the weblog mechanisms for example, are situated in this dimension, as their design is primarily focussed on publishing ideas and supporting the conversations that arise around them.

Social software functions enabling users to cooperate with a person or agency are classified under the *collaboration* dimension. This dimension for instance, incorporates software features typical of wiki-websites such as the ability to look at a document's revision history or the ability to restore an older version of a document.

Finally, social software functions that mediate in the creation and maintenance of online communities and networks are placed under the *community* dimension. In this context, I will use Wellman's approach to communities as "(...) networks of interpersonal ties that provide sociability, support, information, a sense of belonging, and social identity." (Wellman, 2001, p. 227).

Each of the four dimensions is present to some degree in a social software application. In the previous section we gave examples of how some social software services place more emphasis on a particular dimension than others. However, as several authors (Bijker, 1995; MacKenzie & Wajcman, 1985; Silverstone & Hirsch, 1992) point out, software design features may not be regarded as the only determinants of the impact on culture and society. It is how these features are adopted and used that will determine their position on the four dimensions and their impact on society.

Figure 1 shows a theoretical example of how certain types of social software can be visualised by means of the '4 C's' framework. The visualisation has some important merits. It allows easy and quick identification of the dimensions on which specific social software applications place more emphasis. Furthermore, the visualisation enables analysis of the multi-dimensionality of a particular social software service by looking at the area it covers in the radar plot. Finally, it affords comparison between the design of a social software application and its actual use, because both can be mapped onto the same radar plot.
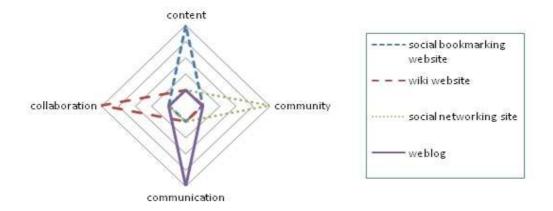
**Figure 1:** 4 social software services mapped in 4 dimensions

## 3. Social software and social capital

### 3.1. The impact of new media and social software

In general, the introduction of new (media) technologies gives rise to questions (Jankowski, 2002; Williams, 2002) and moral panic (Winston, 1986) about their effects or impact on society. These concerns about the impact of new media technologies are not new at all. For example, Socrates bemoaned writing as he foresaw that memory would be weakened by our reliance on text (Peters, 1999, p. 37). The possible effects of new forms of mediated communication were examined each time a new communication technology reached the market (radio in the 1920's, television in the 1950's, etc.). Thus, the same questions were raised in the 1990's when the Internet became available to the general public and it reached the point of critical mass as a cultural practice. What is the impact of the Internet on our lives? Does the Internet undermine community or does it create new possibilities for its expression?

Conclusions and opinions are diverse. Utopians or boomers (e.g. Friedman, 2005; Gilder, 2002; Negroponte, 1995; Rheingold, 1993) believe that the Internet can increase social cohesion and that it will allow us to do more. Dystopians or doomers (e.g. Kraut et al., 1998; Parks & Floyd, 1996 or Turkle, 1996) however, state that interaction in an online environment becomes mechanised and empty. They believe that without the richness of face-to-face communication the Internet only creates 'the illusion of

community'. Finally, others (e.g. Anabel, Wellman, Witte & Hampton, 2002) claim that the Internet neither increases nor decreases social cohesion but instead works to supplement it.

Ågren (1997) describes three similar perceptions on the concept of communities and its relationship with new media technologies: 'community lost'; 'community saved'; and 'community liberated'. He believes that the difference between these perceptions lies in the relationship characteristic. 'Community lost' is typified by the absence of informal relationships. 'Community saved' is characterized by few strong informal relationships and 'community liberated' is marked by many weak informal relationships.

An important factor in this discussion is the supposition about how and by whom online access to information and people is controlled. In computer-mediated communication (CMC) studies, digital information technologies and their applications are often supposed to break through boundaries and hierarchies in society (Flichy, 2007). Although new technologies can also result in the creation of new boundaries and classes (e.g.: the digital divide), the idea of more emancipation and freedom returns every time a new technology is introduced. Enzensberger, for example wrote about the emancipatory potential of the transistor radio: "For the first time in history the media are making possible mass participation in a social and socialized productive process, the practical means of which are in the hands of the masses themselves." (2000, p. 52).

This emancipatory feature is also present in the discourse and research on social software. The unique properties of social software afford new forms of participatory culture in which consumers take media into their own hands, through bottom-up processes, to serve their personal and collective interests. They allow cyberspace to become "(…) a new arena for participation in public life… users can act as media audiences … yet users are also authors, public rhetoricians, statesmen, pundits." (Fernback, 1997, p. 37).

A participatory culture enables consumers to produce, distribute and consume online content at marginal or zero cost, and thus enhances our involvement in the 'negotiation of meaning'. This involvement is important because it defines who we are: "At stake is the capacity of the household or the family to create and sustain its autonomy and identity (and for individual members to do the same) as an economic, social and cultural unit." (Hirsch, Morley, & Silverstone, 1992, p. 19).

In a network or information society, the individual occupies centre stage. Communities and groups are often no longer based on a specific location but on individuals and their practices and interests. The person has become the portal (Wellman, 2002) in an atomised society. Wellman describes this move from densely-knit and tightly-bounded groups to sparsely-knit and loosely-bounded networks as a move towards 'networked individualism'. In this networked individualism, Internet users can access almost infinite amounts of information, share their favourite files, communicate and interact with others. The digital information they handle is hyper-individualized and continually renegotiated. It reflects what they

feel (e.g. entries on web logs or online discussion boards), find important (e.g. subscriptions to RSS feeds) or want to share (e.g. 'seeding' files in a peer-to-peer network).

In a seminal article called "The Age of Egocasting", Christine Rosen (2004/2005) described how technological advances accumulated in the capability to create a personal bubble, inside which we as 'content consumers' are the sole masters of what we see and hear. She called this 'Egocasting' and defined it as "(...) the thoroughly personalized and extremely narrow pursuit of one's personal taste." (Rosen, 2004/2005, p. 52), where we exercise an unparalleled degree of control over what we watch and what we hear.


## 3.2. A closer look at social capital

Social capital has become a major topic of discussion over the last twenty years. Although social capital does not have one precise or universally shared definition, its central thesis can be summarised as 'relationships matter' or 'networks are a valuable asset' (Field, 2003). The word capital suggests that we can invest time, effort and money and that we can expect a returned value. This returned value can take different shapes. It can be emotional (e.g. expressions of approval and respect) or informative (e.g. receiving factual information or support in the information-seeking process). It can be instrumental (e.g. practical help and the relief of certain burdens) or evaluative (e.g. receiving feedback from peers).

Nahapiet and Gohsal (1998) distinguish between structural, relational and cognitive social capital. Structural social capital refers to the network structure or overall structure where communication, interaction and relationships take place. Relational social capital covers the attributes of these relationships including trust, norms and values. Shared meaning, interpretations and other cognitive elements enabling communication form cognitive social capital. Each of these types is affected by the use of social software. Membership to a social network site (SNS) for example is likely to affect one's personal network because the website gives access to new online contacts (structural social capital). Trust, norms or values may be altered by interaction (relational social capital) occurring in the SNS and new shared meaning may be created (cognitive social capital).

Social capital can be traced back to a Marxist or communitarian tradition (Huysman & Wulf, 2004).

The Marxist or conflict perspective was provided by Pierre Bourdieu. In his book 'The forms of capital' (1985), Bourdieu, inspired by Weber, distinguishes three types of capital: economic, cultural and social capital. He described social capital as access to various currently held and other potentially accessible resources that are based on group membership: "(...) the aggregate of the actual or potential resources

which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition … which provides each of its members with the backing of collectively-owned capital." (Bourdieu, 1985, p. 248). Bourdieu was especially interested in understanding social hierarchy and inequality and saw social capital as an asset of the privileged and upper classes, as a means by which they maintain their superior position.

In the communitarian tradition social capital is community-centred. This normative approach to social capital refers to "(...) features of social organisation, such as trust, norms and networks, that can improve the efficiency of society by facilitating coordinated actions." (Putnam, 1993, p. 167). Robert D. Putnam emphasises the role of norms and values in social capital. His attitudinal approach describes social capital as "(...) connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them." (Putnam, 2000, p. 19) and states that: "(...) the core idea of social capital theory is that social networks have value." (Putnam, 2000, p. 179).

In relation to information technologies and social software specifically, the perspective on social capital held by J.S. Coleman (1988) is particularly interesting. In his view, social capital consists of the resources available to an actor by virtue of his or her participation in a social group. Social capital can be mobilized to achieve an individual's aims. Just like Bourdieu, Coleman stresses the role of networks and groups in the formation of social capital.

However, in order to fit the concept into his rational choice theory – a theory that assumes that individuals pursue their own self-interest – he stated that social capital arises as "(...) a by-product of activities engaged in for other purposes'" (Coleman, 1994, p. 312). Following this train of thought, implicit participation on social software websites (e.g. users storing their pictures, bookmarks or videos) creates social capital 'as a by-product' in the form of collective resources and weak ties between people who did not have a cooperative action plan or altruistic intention in advance. Furthermore, Coleman's highly individualistic approach fits the age of networked individualism and Egocasting as it highlights the role of agency.

The three seminal authors above can be criticised for their homogeneous and undifferentiated approach to social capital. They downplay the negative effects that social capital can have and do not differentiate between different types of social capital. Furthermore, their approach to social capital and how it evolves over time is rather crude (Field, 2003).

Social capital however, is not necessarily always positive for the health or the common good of all. Baron, Field and Schuller (2000) point out that, in general, social capital is referred to in positive terms. This way, social tension, inequalities and discrimination in society stays hidden (Franklin, 2003). Communication, collaboration, community and group-forming processes can, however, be disadvantageous for people who

are not involved in these activities or who do not belong to the network. Putnam describes this as the 'dark side of social capital' (Baron et al., 2000). He tries to explain this phrase by making a distinction between 'bridging' groups (inclusive groups that join different sorts of people into a community) and 'bonding' groups (exclusive groups that join people who are similar to each other). An important distinction because: "(…) the externalities of groups that are bridging are likely to be positive, while networks that are bonding (limited within particular social niches) are at greater risk of producing externalities that are negative." (Putnam, 2002, p. 11). Hyper-pluralism and overspecialization can be expected to encourage bonding among regular members (Norris, 2004). Too much bonding can result in the exclusion of outsiders, excess claims on group members, the restriction of freedom and a downward levelling of norms (Portes, 1998). Too much bonding can thus climax in dark or negative social capital in groups which – to a dysfunctional level – claim their uniqueness as more important than the common good.

Social software enabled communities can bring people together across diverse social divisions (bridging social capital) or they can reinforce exclusiveness and maintain homogeneity amongst a group of people (bonding social capital). This conceptual distinction however, is not a dichotomy but rather a continuum, as many social software applications afford for both bridging and bonding functions (Norris, 2004, p. 32).


### 3.3. The 4 C's in social software and their relation to social capital

In our definition for social software we stated that social software provides affordances for the fulfilment of certain needs (the need for content management, communication, collaboration and community) and that it tries to do so by means of social, bottom-up processes mediated through online networks. These networks resemble the 'natural communities' that authors such as Putnam and Fukuyama regard as ideal for the development of social capital (Syrjänen & Kuuti, 2004, p. 167).

Social software provides platforms for explicit participation based on extrinsic or intrinsic motivations. But social software also channels participation by its design, taking advantage of the implicit participation – the habits and practices - of its users. In this way, the design and the interfaces of a social software application subtly channel user actions (Schäfer, 2008). Most social software services thus afford participation from 'the edges', from the periphery of the group.

In this sense, users do not have to participate fully in order to be recognised as a member of the group or network. One can participate from the fringes of the group or not participate explicitly at all and merely observe. Thus, getting connected to the Internet or becoming a user or member of a social software

website often means getting access to a stock of social capital. Social software can widen the experience of community (helping to connect with others who have different beliefs or backgrounds) or deepen it (reinforcing and enhancing existing social networks). This indicates that social software can be used to augment individual social capital online.

When evaluating social software and its relation to social capital, the typology of the 4 C's can function as a framework. This framework analyses each social software application or service on four dimensions. A user-centric approach to the four C's provides researchers with information on how the social software service is used. For example: a web log is used by person W to create and sustain conversations on a certain topic (emphasis on communication), by person X as a tool to archive online content (emphasis on content management), by person Y as a way to obtain a sense of belonging, a sense of membership to a specific group (emphasis on community) and by person Z as a tool for the accomplishment of certain collaborative tasks (emphasis on collaboration). A more functional, design-related approach to the four dimensions provides researchers with information on how certain social software services are designed.

Each of the four dimensions can be used to create bonding or bridging social capital. Each of these dimensions can create emotional, informative, instrumental or evaluative value for the user of the social software application.

Social software primarily used for *content-management* such as Delicious or its academic counterpart Citeulike (http://www.citeulike.org) makes the solitary process of web browsing a social experience because the 'tagger' suddenly belongs to a group of people with whom he/she has at least one thing in common (they used the same tag to give meaning). In this way, the process of tagging creates 'ad hoc' social networks that can bond peers or create 'bridges' to different kinds of people.

*Communication* can take place in closed (invitation-only) environments (e.g. an instant messaging application or private conversations on SNS) making the communication process one of bonding amongst peers, or in an open environment (e.g. certain parts of the blogosphere or public conversations on social network sites) which may result in bridging.

Online *collaboration* or *community*-forming can take place in peer groups closed to non-members (e.g. certain file-sharing networks, also called 'darknets'), or amongst all those with (Internet) access (e.g. Wikipedia, MySpace or SecondLife). It may be inclusive or exclusive. It may connect different sorts of people or people who are similar to each other.

## 4. Conclusion

Social software websites and services, expanding on the social capabilities of web browsing and email, have inherent qualities for creating and sustaining social capital. Distinguishing different dimensions in social software and acknowledging the dark side of social capital provides us with a framework that allows a more subtle approach to the analysis of social software services and the complexity of online sociability. The framework does not consider social software as a one-dimensional concept but as a concept that includes different types of use. Furthermore, we argued that each type of use can have different relations with social capital. The complex interplay of content, communication, collaboration and community-related use of social software features will reflect in how they connect (or divide) similar or dissimilar people online.

How will these two seemingly contradictory tendencies play themselves out? Will the use of social software result in a flowering of the social sphere (bridging or outward-looking social capital), or in the retreat into a balkanized social clique (bonding or inward-looking social capital)? People need both: they use bonding to 'get by' and bridging to 'get ahead'. Therefore one of the big challenges for social software design will be to incorporate both tendencies: facilitating a dynamic environment in which selective associations (friends, communities of interest, colleagues) can operate, while at the same time enabling social software users to expand and explore their boundaries without loss of identity and cohesion.

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