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Abstract: In this article we seek to understand and to clarify the contribution of the multifaceted concept of sociality towards the design of social software systems. Our premise is that it is not software as such that is social, but the free choice of people to engage in social activities. Paraphrasing Wenger (1998): sociality cannot be designed, it can only be designed for. We adopt a soft systems approach to cope with the loosely defined concepts of social software. The paper's main contribution to the field consists of the theoretical work on the sociality based conceptual model, identifying if and to what degree a certain software system can be considered social, and the design framework that stretches beyond the more traditional functionality-based approaches and focuses on the realms of sociality. We consider this orientation toward sociality, not functionality, a valuable contribution to the field of study.

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Introduction

Friday afternoon, the pub is crowded. "Anyone a beer?", someone shouts. "Yes please, it's weekend!" and someone passes a beer and a bowl of deep fried snacks. Interestingly, the smell of the snacks is absent and so are the people involved. Or are they not? Forty-three comments have been made on the "Friday afternoon drinks" blog posting since 5 p.m. A couple of people were early. Did they skip work?

We are not observing a normal pub where you can meet your friends and have a drink. Instead we just typed in an address in our web browser and we ended up at a blog. Still, from the described picture it becomes clear that this blog has certain features a real pub has as well. People are shouting, passing plates, maybe skipping work and sometimes they complain about the music being played.

The promise of social software is that it allows for social relations in or mediated in cyberspace that are nearly as rich and meaningful as those in real life. Over the years, we have seen the development of a stream of services that people use when they engage in social activities (Kelleher and Miller, 2006; Efimova, 2004). We have seen the growth of social network services, social network search engines and social bookmarking, to name a few. All these services have in common that they provide functionality to communicate, to interact, or to form relationships in one way or the other (Boyd, 2007). Does that make these types of services social? We have also seen people using established services like blogs, forums or wiki's to create and maintain groups and group memberships. It seems that people use whatever they have at their disposal when it comes to engaging in social activity. So what is it that makes social software truly social?

We hold that sociality, not functionality, is the key concept in social software systems. In understanding sociality, we are able to understand what it is that makes people form or engage in social groups to pursue companionship. It will ultimately allow us to understand and improve the design and development of social software. Following Wenger (1998), we hold furthermore that sociality can not be designed, it can only be designed for. People have a free choice in their use of tools to engage in social activities. From the rich picture above, we learned that even an unlikely instrument as the comment section of a blog will serve as a community's tool of choice when it comes to seeking or enjoying the companionship found in social behavior. However, from a designer's perspective, one would like to learn what it is in social

software that makes it work in a social context. That is, how people feel that they are stimulated to engage in creating or joining a social group.

People have a variety of ways of building their social environment. These include communities, networks, objects and systems. In this paper we focus on social software systems as a means of pursuing sociality. Social software systems are soft systems in the sense that these systems are not confined to the software system itself but include the situated experience in real life as well. Certain facilities of social software are able to trigger mechanisms in people that make them engage in offline and online social activities. Based on our research, we present a conceptual model as well as a design framework to describe and explore the issue of social software design. The question under study is: "how does the concept of sociality contribute to the design of social software systems?". In answering this question we learn that the design of social software systems is a multi dimensional problem that stretches beyond connecting people and information. We hypothesize that, in order to create truly social software, a designer has to address in one way or the other all issues of enabling practice, mimicking reality, building identity and actualizing self. Given the current state of social software we consider this a world not yet explored, but worth discovering.

A Soft Systems Methodology approach

Following a soft systems approach, we explore the contribution of sociality for social software (see figure 1). We have chosen this methodological approach and have found it to be very effective and useful in this field of study, where concepts, theory and technology are in a constant state of flux. We refer to Checkland (1981) for an in-depth discussion of this methodology.
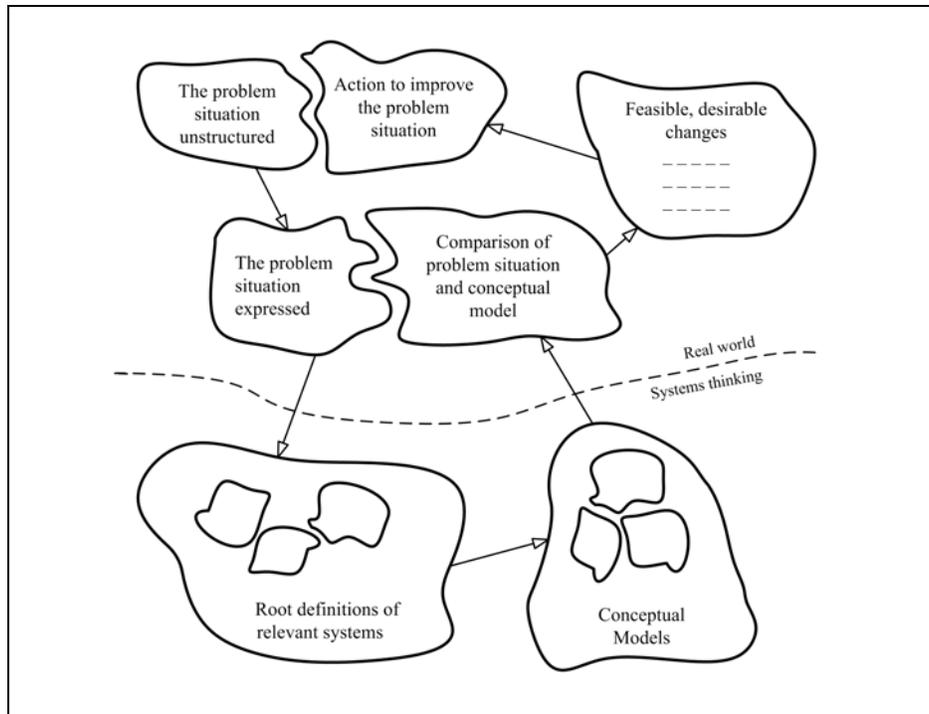
Figure 1.   Soft Systems Methodology

In our research and in this paper we essentially follow the steps depictured in Figure 1. The rich picture of the online pub acts as a narrative into our field of study. The problem situation has been identified as a design problem. We define the conceptual model using our root definitions of systems relevant to a theory of sociality that can be used to design and develop social software systems. We call these relevant systems realms, a realm being a set of cohesive theoretical constructs which are perceived as one concept if looked at from a distance. This perceived concept is known as the leading concept (De Bruin, 2007). For instance, in the realm of building identity, the concept of identity is leading but the realm itself comprises of many variables. We then build a conceptual model that unravels the broad concept of sociality in four domains: the realms of enabling practice, mimicking reality, building identity and actualizing self. The conceptual model helps us to understand and describe how these areas each have their own different mechanisms that trigger social behavior. By using the concepts from our conceptual model, we subsequently develop a design framework consisting of design domains, design parameters and design dilemma's that provide directions for practitioners in the field of social software. Finally, we confront the current state of affairs in social software with our conceptual model, illustrating the various concepts by case descriptions of well-known social software services. A short discussion on proposed

improvements for practice as well as theory concludes this paper, in order to provide rigor and relevance for regulative and reflexive purposes (Van Aken and Germans, 1994).

Sociality and Social Software Systems

Sociality refers to the tendency to associate or form social groups. Sociality is a derivative of biological anthropology practices, to understand how creatures organize their relations. Human sociality is thus about how actors relate to each other to organize their social practices and construe their identities (Fiske, 1998). Wittel (2001) describes sociality as a matrix of ephemeral social relations that are fleeting, transient and briefly intense. Sociality can be mediated through group-based or artifact-based interactions. In the first type of sociality, people form groups by relating directly to each other. In the second type a perceptible object situated between people acts as a connector (Star and Griesemer, 1989). Social groups are also characterized as being one-dimensional, strongly focusing on a particular aspect of a social group, or multi-dimensional, referring to more complex social relationships including various processes of negotiation, participation and sense making over time. Taken together, both distinctions lead to the classification scheme presented in Table 1.

Table 1.   Types of sociality

	One-dimensional	*Multi-dimensional*
People- or group-based	*Network-centered sociality* A sense of belonging arises from connectivity in a network. The degree of sociality stems from the number of people known, social invitations and so on.	*Community-centered sociality* A feeling of companionship arising from a community in which participation and membership shape social relations over time.
Artifact-based	*Object-centered sociality* A shared experience and meaning arises from objects valued as belonging to or characteristic for a certain group or an in-crowd.	*System-centered sociality* A mode of belonging based on the feeling of participating in a social software system.

Network-centered sociality is about people relating to each other by means of their personal network. In this type of sociality, social relations are not narrational but informational. They are not based on mutual experience or common history, but primarily on an exchange of data and on catching up (Wittel, 2001). This type of sociality is primarily about connecting to each other, without necessarily having a shared interest. If relations become more stable and interactions between group members evolve around mutual practices, the concept of community-centered sociality comes to the fore. Wenger (1998) ascribes

community-centered sociality to the level of participation and belonging by individuals within a community of practice and vice versa. Belonging to a community is mediated through so called legitimate peripheral participation, in which members gradually shift from participation with members at the boundary to participation with members at the core of a community. Nardi, Whittaker and Schwarz (2002) also mention that their sociality is kept alive by the acts of remembering and communicating with the participants within their community. Community-based sociality evolves from interaction between people to participation between members, which makes this type of group-based sociality more complex than network-centered sociality. When artifacts fulfill a decisive role in binding persons we speak of object-centered sociality. Objects that are situated between intersecting persons and communities and that are supportive to various practices affect sociality (Gal, Yoo and Boland, 2004). Boundary objectives were commonly perceived as being translational instead of relational artifacts (Pawlowski and Robey, 2004), while Gal, Yoo and Boland (2004) relate these boundary objects to the formation and adaptation of social structures, and thus to sociality. An example of object-centered sociality is provided by the iPod. At parties, iPod-owners are allowed to plug their iPods into a club's stereo system so that everyone can dance to a song or two from that person's playlist. Moreover, the existence of the iPod has given rise to the development of a community-specific terminology. A more complex form of sociality mediated by artifacts is system-centered sociality, where people find meaning and a sense of belonging when participating in a social software system. We hold that social software systems are soft systems because they entail the actual technological subsystem (e.g. the social software) as well as the human social practices that have grown around that technological subsystem and are directly connected to that system by intertwined interaction. Because of the constant flux between the physical world and the virtual world they become complementary to each other, which blur their boundaries. This is denoted as *soft* system-centered sociality. As an illustration; Xing is an online social networking tool to exchange business cards. The actual invitations to exchange these business cards frequently stem from physical encounters in the real world. Moreover, Xing also organizes real world meetings for its members.

A Conceptual Model

Following Wenger (1998), we hold that a social theory of software design is at the intersection of main axes of relevant traditions. These traditions include the well-known debate between social structure and action, as well as the dichotomy between identity and practice. It reflects scientific debates like those of Luhmann (the contemporary sociological systems theoretic) and Habermas (known for his theory of communicative action), and also spans philosophical concepts from Eros and Thymos as expressed by Sloterdijk. Our conceptual model of sociality as a driving force for the design and development of social

software is positioned in the middle of the vertical axis between social structure and situated experience (see Figure 2).

Theories of *social structure* give primacy mostly to institutions, norms and rules. They seek to understand action of social actors as a result of underlying structures, discourses and history. We concur to the view of Luhmann (1995), in that we view the social structure of the system as disembodied, e.g. as transcending the individual. Theories of *situated experience* emphasize agency and intentions. They address the relationship of people with their environment, or as Argyris (1993) puts it: action is how we put meaning to life. We hold that soft system-centered sociality is a matter of culture and history, i.e. design and development of the social software soft system, as well as a process of continuous interaction in which the social software soft system is reinvented and renegotiated continuously by the purposeful action of social actors. We also place our conceptual model between theories of social practice and theories of identity. Theories of *social practice* emphasize the social mechanisms or resources by which groups organize and coordinate their activities, whereas theories of *identity* are concerned mainly with the social formation of the person and the complex relations between individuals and groups. Identity refers to the construction of the 'self', the mental apparatus that underlies self-reflection (Leary and Tangney, 2005). In our view of sociality as a critical factor in social software, we hold that both the evolution of practices and the inclusion of newcomers and the development of identities should be incorporated.

Following another central concept in the work of Wenger (1998), we develop our conceptual model further to include the above dualities of structure and experience and practice and identity by creating *realms* on the diagonal axis, representing design areas to be included. These realms are spaces of co-existence, in the sense that they are spaces that are commonly overlooked or taken for granted and conceal information crucial to developing an understanding of what humans are (Sloterdijk, 1999). The resulting conceptual model is depicted below (see Figure 2).
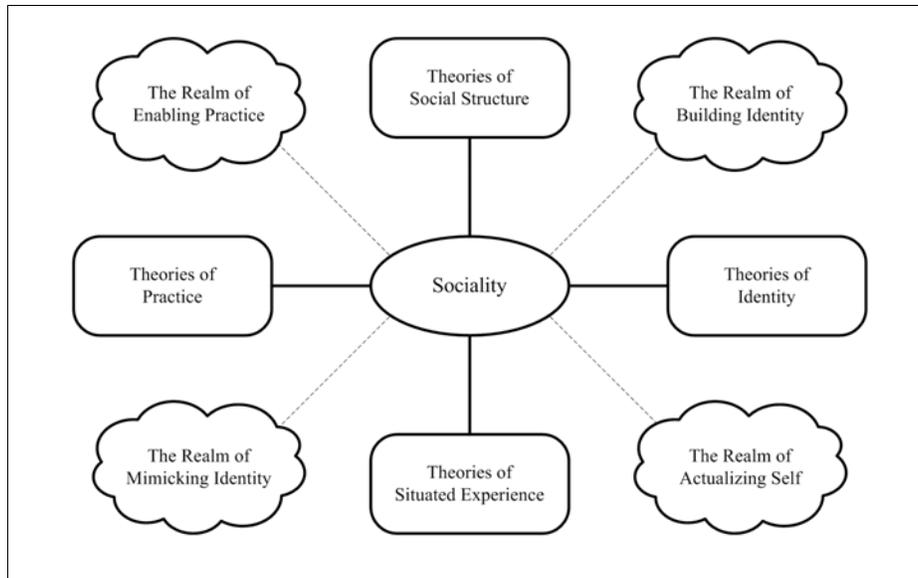
Figure 2. The Realm of Sociality: A Conceptual Model for Social Software

Overall, we refer to the overall concept of the model as the realm of sociality. This realm combines all perspectives on sociality from the main theoretical perspectives. On the duality between social structure and practice, we identified the realm of *enabling practice*. It indicates the domain in which the social software system operates to support and enable a social practice that exists – or sometimes could or even should exist – in the real world. A well-known example is social networking, which is a real practice easily translated into software practice. Other examples include wiki's, aimed at opinion making or knowledge sharing, or storytelling as supported by blogs (Hoogenboom, Kloos, Bouman and Jansen, 2007). While the realm of enabling practice indicates *what* social phenomenon is being supported by a social software system, the realm of *mimicking reality* expresses *how* this is achieved. For instance, the concept of 'digging' a certain something exists as well in the real world as in the social software of Digg.com. This resembles what Lakoff and Johnson (1980) refer to as 'metaphors we live by'. From our research we learned that people actually are more inclined to use software systems that resemble their daily routines, language and practices than to adopt whole new concepts, interfaces and methods. Between social structure and identity, we identified the realm of *building identity*. As in any real world community or other social group, we hold that social software should provide the mechanisms that allow for building a proper social identity or constructing and activating relevant working self-concepts (Showers and Zeigler-Hill, 2005). A large part of this is concerned with the ability to show others a desired picture of self, a version of one self that is goal-relevant. Two examples of social software illustrate this. Creating a personal page on MySpace can be interpreted as mainly a matter of showing off: "Wouldn't I be your perfect friend?", thus reflecting the human urge to be popular. Social bookmarking

software like Del.icio.us likewise not only acts as a handy way of organizing one's bookmarks, but in doing so also reveals a picture of self to the world. In the realm of *actualizing self* we collect all mechanisms referring to personal identity, ultimately aimed at self-actualization (Maslov, 1943). We hold that humans are inclined to develop themselves by using their social environment to learn to discover new perspectives, challenge one self in terms of creativity and morality and so on. A practical example of this is referrals made in social software like Last.fm.

Case: Last.fm

Last.fm is an internet based radio station and social recommender of music. People can classify their music and give their opinion by rating it, find kindred spirits and get information about events of their likings. Last.fm is a social platform that has gathered millions of participants since its startup in 2005. It enables people to listen to music they like, based on what they listened to before. Last.fm creates these recommendations by gathering musical preferences from its users' local and online play lists. By combining this raw collection with collaborative filtering it aims to achieve a high accuracy of delivering the right music to the right people.

The realm of enabling practice. Listening to music, finding new music, finding people who like the same music, and sharing your taste - Last.fm supports the whole range of what the life of a regular music lover consisted of for the last fifty years. Hanging out in the local pub, talking to each other about the newest, hottest or most obscure bands, tipping each other about the newest venues in town, and showing off by means of your musical taste - it is all covered on Last.fm. And for those who are not that crazy about music, it can easily be a personalized, non-obtrusive radio station.

The realm of mimicking reality. Radio has an unpredictable character that stimulates curiosity in that the music its users are going to hear is rather arbitrary. However, listeners can customize their taste because of the various genre-targeted stations. Last.fm mimics these characteristics by letting users attune to their singer or band of interest, but the arrangement it plays is again rather arbitrary. A sense of real world appreciation is even simulated by offering the option to add music to your play list, which is a indicator or popularity. The metaphors Last.fm uses are also discernible in the music scene, like weekly charts, live events, concert registrations, images of record sleeves etcetera. However, the social engine for Last.fm is powered by "scrobbling", this appears to be a non-associative term for music lovers in that it is unclear that it represents the mechanism for unraveling and storing play lists.

The realm of building identity. Music is, at least since the emergence of pop music, an important part of a juvenile's identity - an identity that can linger on your whole life. Furthermore, copious empirical research is written about the relation between music and emotion, in that the choice of music reflects moods (see e.g. Scherer and Zentner, 2001). Thus Last.fm not only reifies stable identities on musical

preferences, but also builds fleeting identities based on moods and preferences. Identity building is not solely an individual action, but can also be mediated by groups. Last.fm enables people, even encourages them, to gather into groups, to benefit from group play lists and the forums enable fans to share details and to further strengthen their identity.

The realm of actualizing self. For music lovers, music annotates their lives. It is about reliving your past through your favorite songs, finding suitable music for your different moods and you are always on the lookout for great new artists or new versions of your all time favorites. Music helps them to make sense of their lives, whether they like Bob Dylan or Cher. Finding out who is related to you in terms of a shared musical taste can reveal a lot about who you are - or who you are not. Actualizing self is this search for your self, through exploring and getting surprised by what you discover. Last.fm supports these explorations by intermediating between isolated soul mates (the concept of neighbors) and musical preferences.

Triggers and mechanisms

In order to create truly social software, a deep understanding of the concept of sociality in relation to the design of social software is critical. We hold that social software should trigger mechanisms that allow us to associate in or form social groups, whether it be online or in the real world. To say it simple; it is not software that is truly social in nature, it is mankind. Such mechanisms would include human motivations, like eagerness for exploration, curiosity, inquisitiveness, civilization, valuation of belonging, achieving self-realization, enjoying one-self (Maslow, 1943; Beck and Cowan, 1996). Twitter.com is used as a case that illustrates these triggers and mechanisms.

Case: Twitter.com

Twitter.com became public in March 2006 and nearly a year later, it suddenly became the new web's darling. According to traffic analyses of Alexa, at the moment of writing this paper, it is number 633 on their list, moving up an astonishing 10,000 places in three months time. Twitter is, technically speaking, a large-scale, device agnostic, message routing system. Its proposition is to be a global community of friends and strangers inviting to let the world know what they are doing. Therefore users refer to it as a micro-blogging service. Messsages are limited to 140 characters, and can be posted via SMS, instant messaging or on the web itself. Twitter is about a continuous flow of very short updates on your life. It is less a web site than an enabler of mediated presence (Nevejan, 2007). Users will seldom visit the website, but will stay in touch with their Twitter friends by using their cell phone.

The pace of Twitter reinforces the feeling of situated connectivity, and enables group formation. This situated connectivity approaches a pure form of Wittel's definition of sociality (Wittel, 2001), in which

relations are briefly intense and are solely based on particular point of interest and not on history. Users of Twitter can express themselves, without necessarily making a lasting impression. The ephemeral character of your minute to minute diary and its non-directive character make the platform rather safe for spontaneous reactions. Discussing or eavesdropping is avoided by the medium, minimized because of the pace. Therefore, comments are relatively simple and unsalted, which makes the easily accessible for new users, because pressure to comply with the intellectual level of the audience is absent.

Twitter triggers mechanisms like politeness, curiosity and friendship. Since Twitter's device agnostic service offers a low barrier to participate, independent of time, place or device, people use Twitter to tell their peers what they are doing continuously. The interesting observation is that conversations are kept open. This triggers the mechanism of politeness: one does not walk away from an ongoing conversation. With Twitter you even can not physically walk away. It might be one of the explanations why a vicious circle is initiated of keeping each other updated. This might help to build trust and will reinforce friendship. The mechanism of intense curiosity - maybe voyeurism - is triggered by facilities like the public time line. The public time line shows every single subsequent message sent to Twitter. This means that everything happening in the world, at least in the world of Twitter users, is visible. The earth quake in Mexico was earlier reported on Twitter - "Hey, I feel the world is shaking" - than on any official news channel. That is why groups of people monitor this time line just like having CNN or their favorite soap, always on on a television in the background of the room. Something might happen, and you simply don't want to miss it. Another mechanism triggered by Twitter is fear. Fear to forget or to be forgotten. Some users use Twitter just like Hemingway used his Moleskine: writing any thoughts for later referral and reflection, building a historical trail of your self. Anthropologists may call it materialized culture (Deetz, 1977). For instance, Democratic Candidate John Edwards twitters about all his past visits and upcoming events, blurring on-line and real life interaction.

Twitter also triggers the mechanism of freedom. Twitter does not preordain its usage or topics of interest, topics are completely absent or dependent on external contributions. What is more, users can make Twitter inter operable with third party services, to support geographical visualization of comments, instant messaging synchronization, et cetera. Twitter hereby nears one of the fundamental design axioms: sociality can not be designed, it can only be designed for. Last but not least, Twitter triggers the mechanism of "being part of the hype". Many users are twittering, just because of the fact that they would like to identify themselves with the cool and trendy innovators. One way or the other, Twitter triggered mechanisms that encouraged and enabled users to form or engage in social groups.

As the above conceptual model and cases illustrated, sociality is the key concept in understanding social software and we saw how Twittering relates to both online and offline actions which is exemplary for

being a soft social system. Next, we translate the concepts from our realm of sociality into a design framework.

A Design Framework

Based on the conceptual model, we developed a design framework that could help designers and developers of software systems to create software that is truly social in nature. This means software that triggers social actors to engage in social activities online as well as offline, to associate in or form social groups, ultimately leading to seeking or enjoying companionship. The design framework is depicted in Table 2 below.

Table 2.   A Design Framework for Social Software

Design Domains	The realm of enabling practice	The realm of mimicking reality	The realm of building identity	The realm of actualizing self
Design Criteria	*Economic criteria* Use, purpose, value	*Empirical criteria* Empirical reference ability	*Social criteria* Trust, connectivity, identifying with, trajectories.	*Individual criteria* Love, social needs, esteem, cognitive needs, aesthetics
Design Principles	*Supportability* Social software needs to be designed in such a way that a (possible) social practice is supported	*Alignment* Social software needs to be designed as a real life social experience with valuation, rating, individuation, repudiation.	*Belonging* Membership, participation, relations, brokering	*Discovery* Feedback, discovery, surprise, association
Design Parameters	*Practice* Facilities of engagement, alignment and imagination	*Metaphor* Metaphors of engagement, alignment and imagination	*Presentation* Conversational interaction, social feedback, social networks	*Feedback* Guided exploration sharing
Design Dilemma	Creating new practices while economizing on old ones	Finding new ways, words and worlds without losing reference ability	Balancing between factual and self depiction	The act of balancing between unknown and unfamiliar

The first element of the design model consists of the *design domains*, the areas a designer needs to take into consideration. We find these to be the realms identified in our conceptual model. In the *realm of enabling practice*, a designer is faced with the task to create facilities that enable the support of a practice that exists or could exist within the social group that is the intended audience of the social software system. In the *realm of mimicking reality*, a designer faces the challenges of finding or creating metaphors

that relate to the empirical world. In the *realm of building identity*, the designer's job is to provide the user community with the mechanisms that allow for the development of an online identity. Finally, in the *realm of actualizing self*, a designer needs to create the mechanisms that allow users to tap into the collective wisdom and experience and use it for his own benefit, learning processes and actualization.

The second and third elements of the design framework are the *design criteria* and the *design principles*. In the realm of enabling practice, *economic criteria* play the most important role. Users will ultimately value the social software in terms of its added value to enable or create practices that play a certain part in their social life. Any social software therefore should have its use, purpose and value clearly expressed in both software functionality as well as user communication. The criteria will be further elaborated in the case about LinkedIn and Friendster. *Empirical criteria* are the driving force in the realm of mimicking reality. We have seen successful social software concepts align to the mechanisms and metaphors that we know from ordinary real life. Users feel comfortable if they face an interface that uses logic, language, graphics and concepts they can relate to from their everyday life. The concept of Digg has been mentioned above, but likewise the Amazon functions for rating, nearly all elements of the site's content refer to the everyday process of valuation. In the realm of building identity, *social criteria* are most important. That means that belonging becomes the central concept. Identities are based upon trust, persistency and the ability to present a desired image of self within the social environment. A typical example is that users choose the lay-out for their profile pages that is common to the group they identify with. Also the explicit visibility of the users' social groups in MySpace comes to mind when discussing social design principles. *Individual criteria* refer to 'what does this software do for me?' in the realm of actualizing self. People not only enjoy companionship in online and offline experiences, they also appreciate the feedback the system provides them with that can help their quest for self-fulfillment. So, designers should design systems that are not only aesthetically pleasing and surprising but also provide for creativity, spontaneity, and mechanisms that build self-esteem. People like to discover new and unchartered territories, as seen in the case of Last.fm.

The fourth element in the design framework are the *design parameters*. We found that the constituting elements of the learning architecture as described by Wenger (1998) serve the designer well when it comes to identifying relevant *design parameters for enabling practice*. Design parameters to support practice include mechanisms to support mutuality, such as virtual places and spaces, joint tasks, things to do together as well as the availability for help, and peripherality, mechanisms for boundary encounters. Other design parameters support competence, varying from knowledge transfer to decision making, and continuity, like stored bookmarks and FAQ's. Design parameters in the field of imagination address issues of orientation, such as visualization tools, reflection mechanisms, such as models and facilities for comparison, and exploration, such as places to create and discuss common plausible futures. Also, the

design parameter set includes mechanisms for coordination, like standards and methods, communication and feedback mechanisms such as found on forums. Design *parameters for mimicking reality* are largely metaphor driven. Designers need to find words, logic and graphics that help their clients that use the social software to understand not only the functions but also the meaning of the functionality presented. Every social engagement is in the here and now of social reality, and designers face the task of making that engagement as clear and interesting as possible. For instance, networking is a common activity, at least in western societies, in which a social repertoire is developed over the years. Therefore, as we have seen in the case of LinkedIn, adjusting the social software system with the metaphors and language of the accompanying human subsystem is a contribution to the user's acceptance of the software system. *Design parameters for building identity* refer to mechanisms that can present one or even more images of self to the community. Whereas some social software concepts focus on presenting a real, factual picture of their users, we feel that sociality is also grounded on the ability to adjust the picture of self towards the desired picture of self. This is a minefield for tag-based operations. For instance, posting an opinion on a website does not imply I consider myself an expert on that topic, even if I am the first or only person known to use that particular tag. *Design parameters for actualizing self* rely on the presence of reflection and feedback from the social environment to enrich the user with new, unexpected or refreshing insights that help to actualize self. A designer therefore needs to create a space where users can explore and reflect on new and interesting information, or are stimulated to understand suggested connections between people or topics without annoyance or harassments.

Finally, four design dilemma's are identified. In the realm of enabling practice, the designer's dilemma is to refer to practices in the real world as much as possible without losing sight on possible improvements or alternative ways to improve that practice. The dilemma here is to economize on the existing practice of for instance social networking while maintain the drive for (combinatorial) innovation (Varian, Farrell, Shapiro, 2004), by bringing in elements from neighboring disciplines or technological innovations that are new yet acceptable to the practitioners. The wave of new and inspiring concepts, often by new and innovative names, point to the second design dilemma. A designer needs to balance by accentuating the new and unique of the social software concept, without losing sight on the real world driven perception of the users. We suggest that it is no coincidence that most popular social software concepts bear resemblance to real world names and concepts, though we are fully aware this association needs to be further researched. The third design dilemma is concerned with the veracity of the identities used online. The designer's dilemma is leaving the individual user with enough room to make his or her own online profile and identity and meanwhile guaranteeing the well-being of the social group by restraining non-factual information wherever needed. For instance, people have a tendency to put trust in each other's opinions, so people should maybe not be allowed to call themselves an expert. Finally, a designer needs

to realize that people's ultimate social need is to actualize self (Maslow, 1943). Yet, at the same moment nobody feels comfortable in informational or social environments that are too far beyond comprehension. So, even when sharing new and refreshing information is a goal of every learning system, a designer needs to create mechanisms that allow users to dose this in a way and to a degree that fits their needs.

Our resume on design domains, design criteria and principles, design parameters and design dilemma's illustrates the various elements derived from our conceptual model. A case combining insights in both LinkedIn and Friendster is presented below, and serves as a practical example of how designers can use the design space build on the realm of sociality to create social network enabling software.

Case: LinkedIn and Friendster

LinkedIn and Friendster are social networking sites. Both social software systems evolve around organizing and maintaining relations, whereas LinkedIn targets professionals and Friendster targets alleged friends and acquaintances. Although both systems are frequently lumped together (e.g. Carpenter, 2007; Churchill and Halverson, 2005), the design framework can be used to illuminate design differences. *Design domains*. Social networking is about reifying belonging. In LinkedIn the emphasis is on organizing professional contacts, which it facilitates by exchanging profiles that resemble the layout of curriculum vitaes. By structuring profiles by personal information, work experience and other experiences it mimics the average professional résumé. Choices to omit customization of profiles and avatars and in using a light interface further illustrate the copying of the real world. Furthermore LinkedIn uses metaphors of building your network, colleagues, recommendations etcetera that are important business values. The foregoing refers to domain of *mimicking reality*. Conversely, Friendster expresses a multitude of unique profiles that range from colorful to chaotic. Moreover, profiles can get exposure by getting visited, rated or discussed. Obviously Friendster focuses more exclusively on the domain of *identity building*. LinkedIn in turn practices the exchange of virtual business cards and résumés, which is quite common in business domains. Friendster also supports the sharing of friends, however from a real life perspective this is more difficult to grasp. Friendster flattens those networks, collapsing relationship types and contexts into the ubiquitous "friend" (Boyd, 2007) and relegates friends to weak ties (Granovetter, 1982). Exemplary of this flattening is the commonly seen request for "Interested In: Friends" on profiles. So the design of the domain of *enabling practice* seems to be more distinguishable in LinkedIn. The domain of *actualizing self* is elaborated quite differently within these two systems. Within LinkedIn the emphasis is on getting valuable network connections and by getting recommended by and to others. In other words, stable connectivity is the key word. Friendster is about dynamic interaction, by commenting of profiles, by sharing videos or by surprising someone with a popularity rating.

Design criteria. The main reason to connect on LinkedIn is based on economic criteria and empirical criteria, to safeguard future remembrance. Friendster aspires the same objectives, but the purpose or value of this objective appears to be blurred. What is the use to record virtual friendships? LinkedIn is about personal valuations of colleagues, while Friendster is about anonymous valuation of superficial information. The social criteria, especially the veracity of information, appear to differ in both systems. The value of LinkedIn is based on representative information, while so called "fakesters" at Friendster (Boyd, 2004) do not necessarily undermine its use. However, what are the returns for its users or what are the individual criteria? LinkedIn and Friendster offer rather one-dimensional feedback on personal networks, which is where we see challenges for the design of social software in achieving self actualization.

Design principles. LinkedIn functions as a market in which it aligns job an hiring, which reinforces its business related and professional identity for both job seekers and employers which is a means for LinkedIn. For Friendster the practice it supports remains rather vague. The help functions mentions "to discover the people and things that matter to you most" (Friendster, 2007). However, the role the system plays in fulfilling this agency and in exploiting its massive networks seems rather obsolete. The principles of alignment have already come to the fore for both systems in the previous sections on rating and recommending. Principles of belonging are highly visible in both social software systems. Concepts of membership and brokering plays an important role as membrane in upgrading weak ties in strong ties or so called members or friends. Discovery is a principle as is illustrated earlier that offers significant opportunities for sociality, in which a first step is facilitating the sharing of information instead of the grouping of information.

Design parameters. Friendster offers a variety of mechanisms to support sociality. It offers features to continuously update sites, by means of templates, pictures, news, video's etcetera to ensure "grabs" or visits. Parameters of practice, like facilities of engagement and alignment, are mediated by networking at Friendster, but practice is also reinforced through group formation. Group formation can be set up deliberately or it can be deduced from profile information. The latter is also supported by LinkedIn. Imagination in the sense of exploration is guided by the system technical mechanism in Friendster, and not by the systems social mechanisms, namely its users (which is the parameter of feedback). LinkedIn integrates principles of feedback in its recommendation of professionals, which can be categorized by network proximity or service area. One can view first tier recommendations by users in your direct network, which alleviates issues of trustworthiness and taps in on the alleged fruitfulness of the "wisdom of the crowds" (Surowiecki, 2005). Both LinkedIn and Friendster supports principles metaphorical mechanisms (like recommendations, posting vacancies, promotional activities versus birthday reminders and sending SMS). Parameters of presentation are quite extensive in Friendster. While profiles are the

central objects in both Friendster and LinkedIn, Friendster offers various mechanisms for conversational interaction trough blogging, requests and discussion forums.

Design dilemma's. Design dilemma's are about adding, while averting alienation. One of the most significant design dilemma's concerning practices at Friendster are the "classifieds". This section features an online rummage sale in which it is unclear how friends relate to classifieds. The second design dilemma concerning metaphors is the title classifieds in which there is no empirical reference relating it the real world concept of sales. The third design dilemma is about the integrity of your identity. Social systems offer freedom of identity, in which LinkedIn enables mechanisms of verification, which can positively lead to group behavior or belonging, while it otherwise impoverishes the user's true identity, which can negatively lead to exclusion or delusion. The last dilemma is about not yet incorporated in either LinkedIn or Friendster. Both tools facilitate unguided explorations which lead to surprises but also to going astray and quickly loosing recognition which makes explorations less meaningful.

The application of the framework to the cases of LinkedIn and Friendster shows how two social software sites, both labeled social networking sites and having comparable high level functionalities, differ dramatically in the way they stimulate users to engage in social activities. It illustrates the contribution of our design model based on the multifaceted concept of sociality compared to a functionality based approach. The design framework enables designers to move away from well known social software concepts like tag clouds, micro content or sharing, towards a system that triggers mechanisms to engage in social activity.

Towards sociality driven design

In this paper, we aim for a deeper understanding of the contribution of the multifaceted concept of sociality towards the work of designers. The answer to that question has been formulated in terms of our conceptual model as well as in our design framework.

In the conceptual model, four realms relating to the broad concept of sociality have been identified. These four realms allow for a more complete perspective on social software, a perspective encompassing theoretical views on practice, identity, social structure and situated experience. Combining these perspectives, a designer should be able to design and develop software concepts that are more relevant, interesting and bear more resemblance to the real world. In the design framework, we have expanded the traditional design kit beyond the usual tools for sharing and connecting such as tagging, blogging and collaborative editing, and found it to incorporate design parameters, criteria and dilemma's stemming from the four realms as well. A designer can use these insights to create more systematically and more rooted in theory. In the end, it is not social software as such that is social, but the free choice of people to engage in social software. Yet the ultimate lesson learned and the most valuable contribution of the

concept of sociality to a designer's perspective on social software is in the mind shift from functionality to triggers and mechanisms. A designer may think he can design the mechanisms that make social software truly social, yet from our research we learn that he or she can only aim to create triggers that activate mechanisms that encourage people to explore their social environment and seek or enjoy companionship.

In the article, a soft systems approach has been followed to cope with the loosely defined concepts of social software. This methodological approach has been of great value in structuring the research design, as well as creating the conceptual model in a logical and systematical way, and has proven valuable in presenting the results in this paper also. This research project also gave rise to a few research questions which we think are worth exploring in more detail in further research. An issue not covered by our design framework is whether a designer should incorporate all four design domains, and to what extend these domains should be incorporated, in order to sustain a claim for delivering social software. From our theoretical propositions, it is legit to assume that a certain degree of balancing could contribute to a users' perception of a social software system as more or less effective in supporting sociality. Yet, this has to be studied in a more systematic and methodological way. Another issue that could extend our work on the model and the framework and make it even more useful for designers, is to have a clear understanding of the relationship, if any, between the design characteristics of a social software service and its success. This relationship has intentionally not been covered in our research strategy, as we focus on the practical contribution of the concept of sociality and not on its empirical success, the latter being defined in terms of economic or any other measures. We would encourage research trajectories studying the concept of sociality and its meaning for design involving issues of balancing design parameters throughout the various design domains, creating archetypical configurations of various design elements, the relationship between the degree of sociality, success and a specific context, and technological issues relating to sociality as well. As a final remark, we note that the shift from functionality towards sociality which we observed and described in this paper matches with the shift from objectivism towards subjectivism as seen in the research area of information systems in general (Huizing, 2002; Fitzgerald and Howcroft, 1998).

The paper's contribution to the field consists first and foremost of the theoretical work on the sociality based conceptual model and its broad, underlying theoretical foundations and the design framework that has been formulated according to the logic of this conceptual model. Whereas the literature is still scarce on exploring topics related to our realms of sociality, in proto-theoretical works on blogs and journals, we can observe a tendency to discuss and develop these new concepts in the designers' toolkit. Our model is illustrated by means of five cases that highlight aspects of the conceptual work. It shows a promising degree of validity to describe and even to a certain degree explain the various characteristics that make a

software service social. The design framework stretches beyond the more traditional functionality-based approaches on social software design and focuses on design choices, parameters and dilemma's in various design domains related to the realms of sociality. We consider this orientation toward sociality, not functionality, a valuable contribution to the field of study.

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