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Analyzing the Factors Influencing the Successful Design and Uptake of Interactive Systems to Support Social Networks in Urban Neighborhoods

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ABSTRACT

In urban residential environments in Australia and other developed countries, Internet access is on the verge of becoming a ubiquitous utility like gas or electricity. From an urban sociology and community informatics perspective, this article discusses new emerging social formations of urban residents that are based on networked individualism and the potential of Internet-based systems to support them. It proposes that one of the main reasons for the disappearance or nonexistence of urban residential communities is a lack of appropriate opportunities and instruments to encourage and support local interaction in urban neighborhoods. The article challenges the view that a mere reappropriation of applications used to support dispersed virtual communities is adequate to meet the place and proximity-based design requirements that community networks in urban neighborhoods pose. It argues that the key factors influencing the successful design and uptake of interactive systems to support social networks in urban neighborhoods include the swarming social behavior of urban dwellers; the dynamics of their existing communicative ecology; and the serendipitous, voluntary, and place-based quality of interaction between residents on the basis of choice, like-mindedness, mutual interest and support needs. Drawing on an analysis of these factors, the conceptual design framework of a prototype system — the urban tribe incubator — is presented.

Keywords: communication network design; community information systems; global village; social impacts; social networks; urban environment; urban information systems

INTRODUCTION

The area of technology and human interaction is cross-disciplinary and requires many different academic fields and design practices

to work together effectively in order to generate a better understanding of the social context and human factors in technology design, development, and usage. This article focuses on

the social communication aspects of this field and hopes to establish a greater awareness of the contribution that community media and communication studies can deliver to the field of human computer interaction. It seeks to build a theoretical foundation for an analysis of two interrelated issues, which are discussed in turn.

First, the importance of place and the continued purpose and relevance of urban neighborhoods are established. New media and networked information and communication technologies have not led to the diminishment of local place and proximity. However, they have given rise to new types of social interaction and to new emerging social formations. Understanding the nature and quality of interaction in these new social formations can inform the successful animation of neighborhood community and sociability.

Second, appropriate opportunities and instruments to encourage and support local interaction in urban neighborhood networks are not limited to technology, but technology can be a key facilitator. Thus, system designers and engineers are crucial allies to social scientists in the search for hybrid methodologies that integrate community development approaches with technology design. The article questions whether it is sufficient to appropriate tools originally designed for dispersed online (that is, virtual) communities in the context of community networks (Schuler, 1996) for urban neighborhoods. Purpose-built tools and instruments are required that afford (a) interactive linkages between the resident's communicative ecologies of cyberspace and local place; and (b) personalized social networking between proximate neighbors of choice. Such an approach would allow the nonvirtual and place-based assets in a resident's portfolio of sociability to become more attractive. It would establish an opportunity to create and to maintain local social ties and, ultimately, to find out who is living next door and who is personally compatible.

From the discussion of these issues, some of the key factors influencing the successful design and uptake of interactive systems to support social networks in urban neigh-

borhoods are derived. Drawing on an analysis of these factors, the conceptual framework of a prototype system — the urban tribe incubator — is presented.

This article seeks to set up the interdisciplinary conceptual foundation necessary to drive a thorough theoretical and empirical investigation into the interaction of people, place, and technology and the way they function together to facilitate access to the social and cultural life of cities. The purpose of this article is not only to introduce and illustrate the issues at stake and to present a design framework but also to stimulate transfer and exchange of knowledge across academic disciplines and especially to invite discussion and comment from a broader interdisciplinary audience. Supporting efforts to build bridges between the social and engineering sciences is paramount to the field of technology and human interaction, and this article contributes to the development of a dialogue between these disciplines. An interdisciplinary approach that brings together views and expertise from sociology, urban studies, interaction design, and related disciplines will assist with efforts to facilitate urban neighborhood community building, social inclusion, public consultation and debate, fair access to local information and services, urban sustainability, and healthier local economies.

TECHNICAL AFFORDANCES AND NEW SOCIAL FORMATIONS IN THE CONTEXT OF NETWORKED INDIVIDUALISM

The Internet has found its way into many households of urban dwellers in Australia and other developed countries to the extent that Internet access is on the verge of becoming a ubiquitous utility like gas and electricity. The Internet has advanced to become a communication tool that coexists with other established communication devices such as the telephone, short message service (SMS), new media, and face-to-face interaction. E-mail, instant messaging, online chats, and other online applications

are now instrumental in establishing and maintaining social ties with family, friends, coworkers, and other peers, thus creating a private “portfolio of sociability” (Castells, 2001, p. 132).

The Internet has entered people’s everyday life and plays a significant role in the communication pattern of urban residents. The Internet has not substituted but supplemented off-line interaction with online interaction (Fallows, 2004; Wellman & Haythornthwaite, 2002). People still chat on the phone and meet face-to-face. However, the Internet as well as mobile communication devices such as mobile phones, laptops, and personal digital assistants (PDA) allow people to maintain social ties in different ways by taking advantage of new features. The mobile phone introduced place-independent communication, and the emerging third- and fourth-generation (3G, 4G) mobile telephony adds audiovisual telepresence. E-mail and SMS afford asynchronous communication and notification mechanisms. Online chats offer broadcast-style, many-to-many communication, whereas private chat rooms enable users to engage in multiple peer-to-peer dialogues. Instant messaging tools combine the features of online chat rooms with ambient awareness by adding availability or other status information to a user’s nickname (e.g., Jean|busy, Lucy|out to lunch).

However, these tools are used more often to connect with family, friends, coworkers, and peers and less with neighbors. The telephone has evolved into a ubiquitous communication device, but it has not contributed per se to overcoming urban alienation. Sociologists such as Wellman (2001, 2002) and Wellman et al. (2003) describe how people construct their social networks with the help of the telephone and other devices. Wellman argues that, while people become more accustomed with the features these tools offer, the nature of the social ties that people establish and maintain changes from “door-to-door” and “place-to-place” relationships to “person-to-person” and “role-to-role” relationships. He creates a holistic theoretical framework that builds on the dual nature in the interplay between community and the

individual. He describes the emerging qualities of this behavior as *networked individualism*.

Residential areas, such as apartment buildings, townhouse complexes, master-planned community sites, and the residents and tenants of these units form the focal point in this article to examine the interplay between people, place, and technology. The results and findings of this theoretical analysis will help to shed light on some aspects of the community question, especially the continued purpose and relevance of neighborhoods in urban habitation, by investigating the ironic relationship between endemic urban alienation and the widespread use of mobile and ubiquitous communications technology by urban dwellers that allows them to interact with each other (Walmsley, 2000).

Before this technology became ubiquitous and entered the everyday life of city dwellers, predecessors and variations had been designed for or had first become popular in workplace-based environments in order to support communication and collaboration among professionals. This was followed later by their diffusion into everyday life and their reappropriation for social use. The act of reappropriation (e.g., from the professional use of a pager to the social use of SMS) implies that there are opportunities to design and develop purpose-built systems from the ground up, which, instead of merely trying to make ends meet, take the unique requirements into account of the social- and place-based context in which they are used. Tools to animate and network urban neighborhoods require a consideration and treatment of notions of sociability, place, privacy, and proximity in order to take full advantage of the communicative opportunities that this environment offers its inhabitants and the wider society.

PLACE MATTERS: COMMUNICATION AND INTERACTION IN URBAN NEIGHBORHOODS

Tönnies’ (1887) idea of community as *Gemeinschaft* implies a well-connected, place-

based, collective, village-like community. However, this notion of community represents an overly romanticized image of community and ignores more contemporary forms of community that have been explored by recent sociological studies (Wellman, 2001, 2002). *Gemeinschaft* might resemble Hobbiton in the Shire described by Tolkien (1966). This communitarian notion (de Tocqueville, 2000; Etzioni, 1995) is still referred to frequently in the community development literature, although the homogeneous, egalitarian, and all-encompassing nature of *Gemeinschaft* is a utopian ideal that is less and less compatible with contemporary characteristics of community as social networks in today's network society.

Before the advent of modern information and communication technology, human interaction was limited by the reach of the physical presence of self or the representations of self (e.g., letters and photographs) and available means of transportation. The need to socialize and to communicate was usually satisfied with family members in the same household, with friends and peers nearby, at work, or within the vicinity of the neighborhood people lived in. Human relations were door-to-door or place-to-place (Wellman, 2001). The fact that people residing in the immediate surroundings were known also established a feeling of security, community identity, and a sense of belonging — a feeling that clashes with the experience of living in today's high-density, compact urban environments.

The invention and introduction of new information and communication technologies into society has usually been accompanied by foresights that predict that people will be less dependent on place and location. To an extent, this is true. The phone was the first major invention to introduce personal telepresence and to allow everybody to communicate in real time with others outside their own physical locality. Instead of being restricted to people within proximity of oneself, the phone enabled long-distance communication to maintain work and social relationships. However, it is unlikely that anyone lifts the telephone handset to introduce

themselves to a neighbor nearby that they have not met before.

The Internet affords both synchronous and asynchronous applications that enable communication between one or multiple users, one-to-many or many-to-many broadcasts to a closed group, and public announcements to an open audience. The abstract nature of Internet-mediated communication gave rise to the widespread use of the metaphor *cyberspace*, which visualizes the emergence of a new spatial dimension.

However, people's bodies cannot be atomized in the same way that their audiovisual representations can be digitized, mediated, and sent across the world. Thus, people depend and will continue to depend on place and locality and on co-located face-to-face interaction. Bits and bytes travel in the virtual space of flows spanned by the Internet, but humans travel in the physical space of flows that modern transportation affords. Place and proximity continue to matter in every socioeconomic context, because there are no Internet applications that can completely substitute real-time, co-located, face-to-face interaction. This is evident by rising car and air travel sales (Wellman, 2001), by people commuting to work instead of working from home and by the formation of economic clusters, precincts, and hotspots where industries based along the same value chain co-locate to take advantage of synergy effects. Florida rightly argues that "the economy itself increasingly takes form around real concentrations of people in real places" (Florida, 2003, p. 4). In light of new urbanism (De Villiers, 1997) and master-planned residential community sites (Gleeson, 2004), his statement holds true not just for the economy but for society, in general.

Attempts to bridge distance for the purpose of more than just communication have seen initiatives such as telework and distance education, yet they remain at the edge of mainstream usage and have not replaced face-to-face interaction (Dhanarajan, 2001; Gillespie & Richardson, 2004). To enable economic efficiencies, the goal of Computer Supported Co-operative Work (CSCW) and groupware applica-

tions is to supplement not substitute place-based work practices.

Wellman (2002) points out that the dichotomies of physical place and cyberspace or of online and off-line are misleading. Even as the Internet grows exponentially, place-based units such as home, work, and school remain at the core of our understanding of everyday life. The Internet and other information and communication technology add new qualities to the portfolio of communication tools available to us, enriching our communicative ecology and adding on to the variety of media channels at our disposal. We do not rely on the central location of traditional meeting places anymore, such as the marketplace or town square, in order to meet with friends and peers. Instead, we use mobile communications technology that we can carry around (e.g., mobile phone, SMS) or ubiquitous communications technology that we can access anywhere (e.g., wireless networks) not to avoid but to negotiate on-the-fly meeting places and venues anywhere and anytime. Teenagers, for example, use their mobile phones to arrange meeting places on the spot; this could be the local café, the shopping mall, or someone's home (Satchell, 2003). This emerging behavior introduces challenges to conventional understandings of place and public places and opens up opportunities for residential architecture, town planning, and urban design (Castells, 2004; Florida, 2003; Grosz, 2001; Horan, 2000; Mitchell, 2003; Oldenburg, 2001; Walmsley, 2000).

In a lively online discussion about the continued purpose and relevance of neighborhood communities, one participant (eric_brisette, 2004) illustrates the point that having less exposure to neighbors (as opposed to coworkers or friends) does not mean that it is less likely that there are, in fact, prospective friends living in the neighborhood:

I guess it all depends on where you live. I live in a rural town of about 10,000. Most people say "hello" or "good morning" to you as you pass them on the sidewalk. I can't say I've known all of my neighbors well, but I have at

least spoken with them enough to know a bit about who they are. Visiting larger cities like Boston or New York makes me feel weird. Nobody looks you in the eye, and everyone seems constantly pissed off, almost like everyone is scared of everyone else ... yet this all seems perfectly normal to them. ... Chances are good that there are people in your neighborhood that share your [interests] or are at least [compatible] at the personality level who you wouldn't normally interact with on a daily basis.

In today's networked society, it is questionable to project the image of the rural village and use it as a best practice urban village model for a city because of inherent differences between both places and their inhabitants. Yet, the specific characteristics of a city can give rise to a different model of urban village that acknowledges the potential opportunities that this particular environment offers its residents. For example, the simple fact that a city accommodates a larger number of residents could offer the individual greater choice and, thus, a chance to find the right social interaction partners.

However, the motivation for and process of the search itself remains to be examined. Getting to know someone in their role as a neighbor is less likely than getting to know them in their role as a coworker or being the friend of a friend. Neighbors may still be part of a resident's social portfolio, but the communication devices used to maintain these ties are inherently place-independent and ephemeral: A phone call or an e-mail does not distinguish between close or distant friends. Proximity does matter when it comes to physical encounters and face-to-face meetings. Most frequent social ties, including online interaction, are maintained with people who can easily be reached physically; that is, they usually reside within the same city, the surrounding suburbs, or the same neighborhood (Horrigan, 2001; Horrigan et al., 2001). The majority of phone calls, SMS, and e-mails helps the parties involved to coordinate meetings or social gatherings (e.g., to catch up over coffee in a café nearby).

These ties are based primarily on common friendship, workplace, or interest, and not on shared locality. We may be introduced and subsequently get along well with the friend of a coworker who happens to live on the same street, but it is unlikely that we would have found out about that person without the coworker introducing us first.

Many urban neighborhoods are the result of what town planners and developers call master-planned communities. Traditional conceptual models of community development limit action to tangible places of public interaction such as kindergartens, public schools, parks, libraries, and so forth (Gleeson, 2004). This build-it-they-will-come approach lacks engagement with the findings of recent community development research (Gilchrist, 2004; Pinkett, 2003). It ignores both the human factors involved in urban renewal and sociocultural neighborhood animation as well as the potential that information and communication technology can offer urban residents such things as online community networks and location-based new media (Day & Schuler, 2004; Rheingold, 2002).

Gilchrist points out that “community development involves human horticulture rather than social engineering” (Gilchrist, 2000, p. 269). Social encounters in urban neighborhoods cannot be master planned. They are based on coincidence and serendipity. Neighbors meet through friends of friends, who happen to live close by; they meet when walking the dogs or, in some cases, when a local problem affects multiple residents (Hampton, 2003). However, more often than not, they do not meet at all, and even if they wanted to, there is usually little opportunity beyond serendipity. Our preliminary results indicate that the majority of residents surveyed believe, just like Eric, that chances are good that there *are* people in their neighborhood who share their interests or with whom they are at least compatible at the personality level, people they normally do not interact with on a daily basis. For those who would like to find out about them and who still believe in good neighborhood relations, the question remains: What can be done to avoid

relying on good fortune and fate? How can those who want to, coax luck?

A step toward a more strategic approach to develop urban neighborhoods encompasses online community networks (Schuler, 1996). Community networks are integrated online systems designed for residential communities that, so far, have usually been comprised of communication tools such as mailing lists, discussion boards, and newsletters. Ideally, community networks allow residents to communicate and interact with other users and to take advantage of the proximity to other residents in the neighborhood. Thus, these systems have the potential to build a bridge between virtual public spaces and physical public places and to foster network social capital and neighborhood identity.

COMMUNITY NETWORKS IN URBAN NEIGHBORHOODS

Arnold (2003) states that “for the ordinary citizen, social interaction is the ‘killer application’ of the Internet” (p. 83). This development has sparked an increased interest among researchers from a range of disciplines to investigate online communication and online communities (Preece, 2000). Yet, the majority of the work undertaken so far in this research field focuses on globally dispersed online (virtual) communities and not on the use of information and communication technology for communities of place (Papadakis, 2004).

There is a small but growing body of literature that reports on the use of information and communication technology for community development in place-based contexts, mostly within the emerging discipline that Gurstein (2000, 2001) terms *community informatics*. However, most of these accounts investigate communities that are in one way or another deprived (e.g., telecenters or community access centers in rural and remote locations; ICT for development and poverty reduction in developing countries). The transferability of these studies to urban settings is questionable. Urban dwellers may think of themselves as being quite well-off and may lack common disadvan-

tages, such as low income or unemployment. Such instances of deprivation could contribute to shared agony, which ultimately may help to establish a collective need for change (Foth, 2004b) and, thus, a reason to make use of technology for action and change. In its absence, however, alternative motivations to form neighborhood community need to be found.

Today, the value of door-to-door and place-to-place relationships in urban neighborhoods seems to be on the decline. Researchers and practitioners endeavor to counter this trend through community networking; that is, the application of Internet- and Web-based tools in residential environments to introduce and sustain local communication and interaction among neighbors (Day, 2002). Although the term is sometimes used broadly in other contexts of community development and community informatics, the focus in this article is on urban neighborhoods.

A residential community comprises people who live or stay in a geographically demarcated area. Such communities are sometimes also referred to as local communities, physically or geographically based communities, or communities of place. Apart from the fact that members of a residential community share the same location or address, they are not bound necessarily by any other common characteristic such as interest, age group, or occupation. As such, residential communities are not communities or neighborhoods *a priori*. An apartment complex might consist of residents who do not know each other.

A range of research projects have been undertaken to examine whether online community networks can facilitate the process of establishing neighborhood identity. These projects set out to design and implement online community networks for both large and small residential sites with various aims and with varying degrees of success (Arnold, 2003; Carroll & Rosson, 2003; Cohill & Kavanaugh, 2000; De Cindio et al., 2003; Hampton & Wellman, 2003; Meredyth et al., 2004; Pinkett, 2003).

Reaching a critical mass of users is considered to be one of the key criteria of success

(Arnold et al., 2003; Butler, 2001; Patterson & Kavanaugh, 2001) and has been reported as one of the most common stumbling blocks: "If you build it, they will not necessarily come" (Maloney-Krichmar et al., 2002, p. 19). This statement seems to be common sense; nonetheless, it provides the opportunity for a deeper analysis of the reasons and motivations for urban residents to communicate, interact, and get together with other residents and to participate actively in an urban neighborhood network.

Dunbar (1996) suggests that the size of human social networks is limited for biological and sociological reasons to a value of around 150 nodes. Barabási (2003) and Watts (2003) provide a more far-reaching overview of recent advances in network theory and their impact on business, science, and everyday life. Some ideas are crucial in understanding community networks: They usually increase or decrease in size, that is, social network research and systems design need to find ways to capture their dynamics. Their structure is not random or chaotic but follows preferential attachment (rich get richer) and fitness (fit get richer). In the context of communities of place, Jankowski and his colleagues support this thesis with empirical research by pointing out that "those geographic communities already rich in social capital may become richer thanks to community networks, and those communities poor in social capital may remain poor" (Jankowski et al., 2001, p. 113). Hampton & Wellman (2003) support this notion by stating that "connectivity seems to go to the connected: greater social benefit from the Internet accrues to those already well situated socially" (p. 283). Then, the next questions are, what constitutes richness and fitness in urban social settings, how do residents get rich (and become a hub in their social network), and how can community networks facilitate enrichment in a fair and ethical manner?

The reasons and motivations for participation in dispersed online (virtual) communities provide further insight into the answers to these questions. A person suffering from cancer might prefer the expertise, empathy, and perhaps anonymity available in an international

online community of cancer patients. Philatelists will find more like-minded people in an appropriate virtual community of interest, such as a newsgroup or discussion board that is open to any Internet user and that is not restricted to the residents of just one apartment complex or one suburb. The impossibility or impracticability of a face-to-face exchange in a dispersed online community does not usually impact negatively upon the value that participants derive from such online interactions. The large number of active online communities tells its own tale.

The core characteristic of such dispersed online communities is their collective nature; that is, they accumulate participants who share a common interest, profession, or support need with an entity that acts as a collective group with a shared purpose. The tools that are used to support online communities, including mailing lists, newsletters, discussion boards, and so forth, are more closely designed toward a many-to-many broadcast approach instead of a peer-to-peer networking approach. They assume a pre-existing motivation to participate in and use the virtual space. In the case of shared interest, profession, or support need, that may be the case. However, in the case of residents of urban neighborhoods, the only shared attribute is place and colocation. Apart from occasions where an item of discussion or a topic of interest relates directly to the shared place that residents coinhabit, most interaction is located *within* place but not necessarily *about* place. Thus, place and proximity are insufficient attributes to attract residents to a community network and to sustain it. Furthermore, a reappropriation of the tools used to support online (virtual) communities in the context of urban neighborhood networks opens up further issues, because a community of place is inherently different from a dispersed community of interest. In addition, connectivity *per se* does not ensure community, and proximity does not ensure neighborliness (Foth, 2003, 2004b).

The unique selling proposition that could give online community networks for urban neighborhoods a competitive advantage over

dispersed online communities is proximity. Community networks allow residents to interact online and to take and continue online interaction off-line, in real life, and face to face with other residents who live in the same location. As such, they can be an effective tool for local community engagement and activism, if the community faces a shared problem or a common enemy that provides the required motivation for residents to come together. Hampton (2003) describes the experience with residents in Netville, who faced the prospect of losing broadband Internet access, which previously had been provided to them free of charge. The issue and the presence of a common enemy; that is, the Internet service provider, unified residents in community activism to advocate for a continuation of the service, and the traffic in the online community network (in the form of an electronic mailing list) increased significantly. The unifying vigor of a common problem or issue can (temporarily) transform a certain number of residents into a residential collective and, thus, sustain an online community network (Foth & Brereton, 2004).

In the absence of a common enemy, a shared purpose or a pre-existing village-like atmosphere, are there other reasons and motivations for social encounters to occur and for the formation of residential networks in urban neighborhoods? Examining existing urban communities may help to answer this question. Watters (2003) describes the emergence of clusters of under-35-year-old urban dwellers mostly in America but also in other parts of the world as *urban tribes*. They represent a social network, a swarming group of friends who live in the same city and who are all connected with each other through strong and weak ties. The interaction between members of urban tribes is facilitated through the use of mobile phones, e-mail, and face-to-face gatherings. Watters (2003) does not mention the use of neighborhood or similar ICT-supported networks, but his account of the behavior of urban tribes allows one to imagine a new generation of purpose-built interactive community networks for residents in urban neighborhoods.

THE URBAN TRIBE INCUBATOR: NETWORKING SERENDIPITOUS SOCIAL ENCOUNTERS IN URBAN NEIGHBORHOODS

The previous section discussed the conditions under which residents might ultimately engage in neighborhood community networks and, thus, talk to people within their vicinity. In order for these conditions to emerge, competitive tools need to be designed that allow residents to find out who is living around them and that facilitate local communication and interaction that so far has relied on coincidence and serendipity. However, conventional community networks do not necessarily address these needs. They are very delicate, organic entities. They thrive only in favorable circumstances (e.g., similar demographic and professional orientation) with special nurturing (e.g., free Internet access) (Hampton & Wellman, 2003; Kavanaugh et al., 2003), and chances are high that, otherwise, they may fail (Arnold et al., 2003).

The findings of these sociological studies provide essential insights for a new design methodology that can guide the successful development of interactive systems and devices that can stimulate local interaction and animate urban neighborhoods. A prototype system of an urban tribe incubator is currently being developed and tested in three urban residential sites in Australia (Foth, 2004a). Action research (Hearn & Foth, 2005) and participatory design (Churchill et al., 2004; Greenbaum & Kyng, 1991; Schuler & Namioka, 1993) play crucial roles in iteratively constructing and testing a successful prototype. The participation of residents in the design and development is essential to integrate the range of communication channels that they use and to allow residents to take social ownership of the system.

The previous discussion of the factors influencing systems that support social networks in urban neighborhoods gives rise to a set of design considerations that are being integrated into the design of the urban tribe incu-

bator prototype. These are now discussed in turn.

Size, Growth, and Critical Mass

Popular services and functions in conventional community networking systems include electronic newsletters, mailing lists, and discussion boards. In order to keep these systems interesting and appealing, content needs to be generated either by a systems administrator or a delegate but ideally by the community of users itself. Thus, a critical mass of users is required to maintain an ongoing supply of discussion board postings and responses, mailing submissions, and newsletter contributions. It requires residents to invest a reasonable amount of time and effort in order to collectively sustain the system's viability.

The urban tribe incubator may include such collective, broadcast-style, many-to-many functions, but the core will be a residents' directory that does not require maintenance on a regular basis, unless details have changed and need to be updated. A resident's personal profile may comprise information about skills, trade, interests, hobbies, and contact details. The profile becomes the virtual representation of a potential node that invites other residents to link to and from. The system does not require users to use the directory on a regular basis in order to interact with all other users. Rather, the system allows users to opt in and opt out as they please and as a need arises by facilitating personalized networking; that is, voluntarily initiating contact and building social ties with people of their choice. Thus, the directory becomes the catalyst for personalized peer-to-peer social networks to form.

The size and growth of the directory itself is in no linear relation to the size and growth of an individual resident's social network. The system acknowledges different levels of social richness and fitness, and thus, the point of saturation remains a personal preference. If an individual's personal limit of social saturation is reached, he or she can opt out. In conventional community networks, for example, users usually cannot control how many people will

respond to their posting on a discussion board: It may be none, or it may set off an avalanche of responses. In an instant messenger application, however, users remain in control of the social network with which they engage — their private buddy lists.

Diversity, Individualism, and Choice

The urban tribe incubator is not designed to host an online community of a particular interest or support need but rather allows for the diversity of individual residents with different interests and support needs to find each other and to form smaller social clusters. The system presents residents with choice in relation to the number and characteristics of communication partners and modes of interaction. It provides easy and convenient ways for residents to identify “birds of a feather”; that is, to find like-minded people with common interests or support needs.

The system raises awareness among residents of who is living around them in order to facilitate peer-to-peer connections. The resident directory that links to individual profiles allows residents to choose what personal information they publish online or whether to keep certain information private or only available upon request. The goal of a resident directory is not to facilitate residents initiating virtual contact first (although it can be used in this way) but rather to simplify the process of strengthening serendipitous social encounters that happen while “walking the dog.” Without an urban tribe incubator, such informal contacts that have the potential to develop into rich interaction may remain superficial and transitory.

The system does not require residents to keep communication within the system but allows them to move it to other synchronous or asynchronous communication platforms and devices. Having access to an online directory, a resident is able to maintain contact with a new acquaintance and to integrate this contact into their established usage of existing personal peer-to-peer communication devices, such as instant messenger, e-mail, SMS, and online chat.

Privacy and Social Control

In order to safeguard privacy, residents have control over their personal information and the scope of their online engagement. Enhanced local sociability is welcomed by most residents but must not come at the cost of losing security and control of the voluntary and selective nature of one’s social networks. Our preliminary results are encouraging insofar as residents seem to be trusting their (yet personally mostly unknown) neighbors with personal details such as name, phone numbers, e-mail addresses, photo, occupation, interests, hobbies, and so forth. In our survey, the majority of residents indicated that they are willing to share this kind of personal information online with other residents in the building.

Nevertheless, issues of privacy and social control have to be translated into appropriate terms and conditions that govern the usage of the system and the interaction among residents of the building. It is imperative to ensure that residents have the chance to opt in and opt out at any time without missing out on any essential information. Hence, it is worthwhile to consider supplementing official online communication channels with public announcements on neighborhood pinboards in prominent places within the building (e.g., parking lot entry, reception or entrance area, manager’s office door, elevators) in order to provide alternative ways to access community information.

Network of Networks, Identity, and Sense of Belonging

The urban tribe incubator may resemble more the networked nature of, for example, an online dating site than the collective nature of, for example, an online discussion board. What may emerge from this process of personalized networking (or online dating) is a complex web of social networks that span the anonymous void of the building complex, a web of urban tribes (Watters, 2003). Social hubs will continue to play a crucial role as their bridging links (Kavanaugh et al., 2003) connect different social networks and establish connectivity in the sense of community and solidarity. Drawing on

viral marketing strategies (Godin, 2001; Goldsmith, 2002), the incubator allows individuals to cross-invite and introduce peers to the other networks in which they participate, both inside and outside the neighborhood. The feeling of a neighborhood identity and a sense of belonging can only emerge if bridging social links between members of different urban tribes contributes to the formation of a mesh-work of urban tribes that is “networked to the ‘edge of chaos’” (Gilchrist, 2000, p. 264). In this context, identity and a sense of belonging are not derived from the collective feeling of being colocated in the same place but from the feeling of being connected to a group of friends who are part of a greater group of peers living close by.

CONCLUSION AND OUTLOOK

The design considerations presented here will guide the development of the core prototype system. We then envision to extend this core with more sophisticated features that, for example, allow users to produce and to exchange creative content (photos, audio, video) through sociocultural animation (Foth, 2006) and that simplify the tasks of organizing and managing social gatherings, such as calendaring, inviting, RSVPs, synchronizing with SMS and e-mail, and so forth. As well, in this environment, the social aspects of the urban tribe incubator can be combined with managerial features that allow apartment owners to interact with the body corporate and tenants with the on-site management. In this role, the system can manage rates and rent payments, entry notices, mailings and notifications, personalized information on contractors, and house rules, thus adding further value to the system and encouraging uptake and usage. Cross-platform compatibility is key. As such, the urban tribe incubator is anticipated to be a technical framework that can be accessed not only on the home or office computer but also on mobile and other devices.

The future holds interesting outlooks for platform developments. New urbanism, urban renewal, and the move toward more and more

compact cities create opportunities to rethink the communicative paradigm of apartment complexes and vertical real estate as well as the sociological qualities of the office environment in which most social software is accessed. The kitchen is associated with the preparation of food, which is an essential part of one’s social life, as opposed to the office, which is the center of professional life. Hence, modern residential architecture often links the kitchen area with the living room in order to form one seamless space that can be re-purposed for entertainment and leisure. In this context, the much-scorned Internet fridge might see a revival as an integrated local communication hub that combines the functionality of a simple touchscreen display interface, a ubiquitous instant messenger, and a synchronized resident buddy list with location-aware services and groupware functionality. The rationale for choosing the fridge is not based on the inherent cooling functionality of the fridge itself, but its position and prominence within the environment of many urban homes.

The article contributes to substantiating a new zeitgeist of designing residential community networks for urban neighborhoods, which is characterized by combining current understandings of social networks inherent in Wellman’s theory of networked individualism with the affordances of ubiquitous communication devices and applications for personalized place-based networking such as the Internet, instant messengers, and mobile phones. Putnam (2000) argues that “the Internet will not *automatically* offset the decline in more conventional forms of social capital, but that it has that potential. In fact, it is hard to imagine solving our contemporary civic dilemmas without computer-mediated communication” (p. 180). If online community networks for residential communities are designed to include features that cater to both collective and network interaction, then they have the potential to contribute to the creation of neighborhood identity and to increase network capital and social capital in urban environments (Florida, 2003; Huysman & Wulf, 2004; Quan-Haase et al.,

2002; Watters, 2003). Thus, they may prove to be a milestone in the quest to animate urban neighborhoods, to revive forms of civic engagement in society and to enact global connectivity for local action, in order to move from the vision of the *global village* to a new understanding of the *urban village*.

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Discussion on Article 4

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Essential to the argument presented in this article is the assumption that technology alone is not enough to cause social change. Empirical evidence supports this point by showing that Internet applications most likely are adopted if they better enable or enhance actions that already occur in everyday life. For example, despite the Internet's capability to support virtual communities (i.e., forums where people interact online), only a small percentage of Internet users actually participate in such communities. By contrast, e-mail remains the most popular application on the Web, because it enables interaction with others who are already known off-line. As Foth rightly points out, motivation is key to the adoption and sustained use of new technologies. It follows that Internet-based tools designed to support social interaction must take into account what motivates people to interact with others in their everyday lives. Foth discusses a number of such motivations, including like-mindedness, shared interests, and shared problems.

Of the motivations listed, like-mindedness may be the most important for the formation and sustainability of engaging and meaningful interactions. Empirical research has shown that affiliation based on commonality is one of the most pervasive social tendencies in contemporary society (McPherson, Smith-Lovin, & Cook, 2001). For this reason, the personal profile feature of the urban tribe incubator prototype proposed by Foth may be the most promising part of the system. Nevertheless, people using the system must be motivated sufficiently in order to create this profile

in the first place. Although recent history shows that large numbers of people can be motivated to use profile-based social software, such as Friendster or Spoke, such software typically is used only by those who are young, professional, and computer-savvy. This means that the urban tribes incubator proposed in this article has the potential to be adopted in certain neighborhoods where there are high concentrations of affluent and young individuals but, not as much potential to be adopted elsewhere. Unless specific strategies are developed to overcome this problem, it is difficult to see why this system might be widely used.

Moreover, while this system would aid in the development and sustainability of relationships between like-minded individuals, it is not apparent that this is necessarily a good thing. Although homophilous relationships may be more prone to provide emotional and financial support, there is a danger that a lack of social network diversity may limit access to new and important information (Burt, 2004). To his credit, Foth mentions at the end of the article that social hubs may use this system to form bridging ties, creating a sense of community and connecting people to others who are unlike themselves. Nevertheless, a more thorough discussion of exactly why these hubs would be motivated to create a sense of community remains to be seen.

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