

INTERACTION DESIGN AS A STRATEGIC DRIVER FOR PERVASIVE TECHNOLOGIES ENABLING CONNECTED COMMUNITIES

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Abstract

The accepted definition of social sustainability is being extended to embrace a new range of personal expectations, specifically the need to belong, feel welcomed and included. The social sustainability measures of identity, positive community culture and a strong sense of place are therefore becoming key indicators. A successful community can be defined as one which people seek to join and do not wish to leave. The action of people co-incidentally living next door to each other can not make or guarantee a community, this requires interaction and engagement. The term Social Capital has been defined as “the power of connecting people together and forming social relationships, networks and shared values in a community, or in other words the act of establishing a social fabric” (Putnam, 2000). Within an urban community context Social Capital requires face to face interactions to succeed and that the proliferation of electronic forms of communication is a significant challenge to establishing and maintaining Social Capital (Putnam, 2000).

This paper presents a case study which identifies the design and development of emerging interactive technologies aimed at enhancing social capital within a Master Planned Community. The case study is based on an inner-city mixed use / broad demographic development. A critical element of the project is the engagement of all stakeholders of this community, ranging from government organisations, property developers, commercial tenants and residents. The participatory design process used to engage stakeholders both at the conceptual definition stage and design refinement stage is discussed. A key aspect of the project is the use of interaction design as a strategic driver for development of emerging interactive technologies, grounded in an understanding of the human dimension within a community. The paper will contribute to the themes of the conference by providing a model for the role of design research leading innovation within an industry context.

Keywords

Interaction Design, Master Planned Communities, Information Communication Technologies (ICT), Social Capital, Community Engagement.

Creating Sustainable Communities

Accepted definitions of sustainability incorporate an equal focus on ecological, economic and social measures and the interaction between them – emphasising the needs of individuals and their communities. In social sustainability terms, accepted needs generally incorporate achieving equity, fostering democracy, valuing diversity, promoting inclusiveness and connectivity contributing to the recognition that quality of life matters.

Notwithstanding the absolute and ongoing validity of these needs (which are implicit in Maslow’s Hierarchy of Needs), there is a new range of expectations emerging. People increasingly need to

feel that they belong, are welcome and can contribute to the community in which they live and/or work.

There is much discussion as to the meaning of 'community'. Membership of a community can be a major part of an individual's identity and self-image or recognition of their professional status. People will identify themselves with a community when they feel strongly connected to it and may resist being labeled as a community member simply by virtue of location or collocation. Traditional definitions have tended towards communities as geographical places with definable boundaries whilst emerging definitions emphasise the community of interest or identity. In each case, the similarities relate to the notion of a common experience. Communities arise out of connections established between people, their shared values and experiences. Purely the action of people coincidentally living alongside each other cannot make a community if there is little interaction between them. The interaction resulting from social networks stimulates the development of a community in a defined domain, at any given point in time. The definition of community used within this paper is therefore based on the '*physical and virtual interaction of people with a shared experience of a defined place, interest or moment in time*' (www.horneryinstitute.com). Just as people are unique and subjective in their preferences, every community is different.

A measure of a successful and therefore sustainable community is one where people have made such an investment or contribution to the place that it is hard for them to contemplate leaving it.

This paper provides an overview of the role of emerging digital media (pervasive technologies) in functioning communities and discusses how new approaches to the design of such technologies is required which are grounded in the needs of the stakeholders of a particular community.

Pervasive Technologies and Community

Technology and its role in supporting community culture and social interaction is a complex task. Firstly an understanding of the emerging technology is required and then approaches to its application or contextualization to a particular community is required. The technology referred to within this paper can be broadly categorized as Ubiquitous Computing and Pervasive Technologies.

"The most profound technologies are those that disappear ...They weave themselves into the fabric of everyday life until they are indistinguishable from it" (Weiser, 1991). This is the often used description, coined by Mark Weiser, to describe the concept of Ubiquitous Computing. However the challenges of Ubiquitous Computing within a community development context, has until recently been overlooked. Several researchers have noted that it relates more to the contextualisation of the technology rather than embedding technology within an environment.

It is the application of such technologies within the context of a functioning community which causes most concern. Although the technology demonstrates innovation (when viewed in isolation or relative to other technologies), its deployment within the community grounded in the needs of the particular community is often not resolved. "As computers move out into the physical world, better design becomes essential. Pervasive computing has been hailed as an escape from the desktop and a chance to start over. On the other hand, unless design can intervene, it is also a chance for computer technology to become even worse and far less escapable" (McCullough, 2004).

Putman (2000) notes that some of the most significant challenges to the endurance of healthy, vibrant communities is the reduction in coherence or social networks precipitated by:

- Electronic medium which includes entertainment replacing group associations
- Digital technology and on line services which may replace face to face transactions (other issues relate to urban sprawl, personal mobility and transportation are also noted).

This is further highlighted through the information technology and mass transportation opportunities occurring within the cadence of daily life - facilitating real time global communication, blurring traditional work/leisure patterns, enabling remote working/independent living and increasing chances for travel. Stimulating the creation of community identity, fostering culture and engendering a strong sense of place, incorporate the measures traditionally identified in social sustainability. More significantly, these emerging attributes also contribute to the intangible reasons why people choose to live or work in an area and address what encourages them to stay and become involved in the long-term success of their community.

Community Development and Interaction Design

Community development is still an emerging professional discipline, although it relates closely to the creative practices of architecture and urban design as well as the analytical arenas of spatial planning or economic development. Early forms of community development were largely intervention strategies used to increase the pace of regional economic and industrial development.

The role of community development has recently been popularised by the works of Putnam (2000) and Florida (2002) and it is increasingly critical to developing sustainable and successful places. As each community is unique the first step in building a community is to identify the existing and/or potential participants or audiences and start to build an understanding of their preferences and dislikes. Approaches to achieving this include interviews, focus groups and community consultation workshops. These practices are widely understood and adopted by community development professionals. However the challenges of ICT impacting upon community development has not been widely addressed within this sector. Therefore tools and approaches to assist community development practitioners consider the impact of ICT application within a community is required.

The discipline of interaction design is about finding better ways for people to interact with each other through communication technologies. This requires an understanding of how communities prefer to live, learn, work and play so that better technologies can be designed to value add their lives. As every individual and therefore every community is different interaction design is critical in identifying the needs of a particular community and the development of new applications based upon these needs. Participatory Design (PD) refers to an approach to ensure that the engagement of users is considered in the design of such application

Participatory Design

Participatory Design (PD) Practise and Theory extends a variety of contexts so diverse that a single definition is increasingly becoming more difficult. Amid the varied PD applications, there are common motivations of most PD practitioners and advocates, (Bortolussi et al, 2004). These are:

- To view systems as a network of people, practises, and technologies embedded in particular organizational contexts and to understand people's relevant activities within these networks (Bortolussi et al, 2004).
- Facilitate collaborative and cooperative approaches to establish and address actual means of improving the lives of users. This is achieved by the discovering of true needs in a dialogue with users, rather than demonstrating the capability of technology, (Blomberg & Kensing, 1998; Bortolussi et al, 2004).
- Respect the needs of the users of technology as they are recognised as a substantial source of inspiration (Bortolussi et al, 2004).
- Be a reflective practitioner by being conscious of each project team member's role in the PD process (Bortolussi et al, 2004).

To achieve the full potential of user engagement in the development of meaningful applications, professional PD practices must acknowledge any user engagement does not in itself secure meaningful and successful development (Bodker & Iversen, 2002). User involvement is something that needs to be structured, facilitated and interpreted into direction for future design (Bodker,S & Iversen, O. 2002).

The spectrum of user participation within PD projects has varied with respect to how and why users participate (Blomberg & Kensing, 1998). At one end of the spectrum, user participation is limited to providing designers with descriptions or evaluations of technology where users contribute little within the design process and its outcomes (Blomberg & Kensing, 1998).

At opposite ends of the spectrum, user participation is valued and considered central to the success of the project. When users are engaged throughout the design process Blomberg & Kensing (1998: 173) note that the participants contribute to the:

- analysis of needs and possibilities
- evaluation and selection of technology component
- design and prototyping of new technologies
- organisational implementations

When looking at Information Communication Technology's (ICT) integration within a community, (particularly those that are seeking to enable citizens to make use of new technologies), technology must be considered as being part of a complex array of social and technical forces (Bortolussi, 2004). The successful implementation and uptake of ICT applications within a community is dependant on mobilising the individual project, institution or company and the national arenas of participation. The applications of PD process must engage all parties to identify all various parties' needs and expectations (Bortolussi, 2004).

User Engagement in the Development of Community ICT Applications

Several examples exist which demonstrate the development of ICT applications based upon an understanding of the users or stakeholders of a particular community. Project such as the Familiar Stranger (Paulos & Goodman, 2004), Interliving (<http://interliving.kth.se>) and Sonic

City (Gaye 2003) are all excellent examples of the role interaction design can play in developing unique ICT applications grounded within a particular community. Varying levels of user engagement using a variety of tools and approaches is demonstrated within each of the projects. Such projects reveal how such approaches can value add existing community development approaches to consider the application of ICT scenarios.

However often in master planned community projects (as opposed to the communities identified in the above mentioned project), the complexity of stakeholders go beyond that of a family member or community resident. Typically they include governments, property developers, investors, the project team together with potentially a broad social cultural mix of resident and tenants of the particular community. Approaches to engaging all stakeholders at the initial stages of a master planned community, focusing on the aspects of ICT and its impact on sustainable community will be the remaining focus of this paper.

Case Study - Kelvin Grove Urban Village

Kelvin Grove Urban Village (KGUV - www.kgurbanvillage.com.au) is a mixed use, master planned community strategically located 2km from the GPO on the western fringe of Brisbane's CBD . The vision for the project reflects the promotion of sustainable solutions to inner city living and its interaction with the emerging creative industries and life science faculties of the Queensland university of Technology (KGUV Community Development Plan).

The Australasian CRC for Interaction Design (ACID) Connected Communities project referred to within this paper has relied heavily on aspects of the KGUV Community Development Plan (undertaken external to this project), to ensure the research remains focused and relevant to the stakeholders of this development. This focus has also allowed researchers to direct research to specific needs identified within this Community Development Plan. Specific aspects of this plan which have been used within this project include:

- To foster a sense of community by using facilities, spaces, events and technology to deliver experiences that enrich the village life (derived from the Kelvin Grove Urban Village Integrated Master Plan July 2004)
- Community is defined as being created by the 'physical and virtual interaction of people with a shared experience of a defined place'. In other words anyone who is interested in and connects with Kelvin Grove Urban Village is a member of its community. Within this definition, there are three key subsets determined by the nature of their interaction:
 - a. Residents and Regular Users (workforce and students)
 - b. Visitors and Infrequent Users
 - c. Virtual Users

The strongest sense of community (or community spirit) will evolve through the creation of social capital, and this is most likely to involve those in subset a, although Kelvin Grove Urban Village's emphasis on creativity suggests that a strong community of virtual users (subset c) is also possible.

Approach

A subset of the ACID Connected Communities focuses on the approaches to engage all of the stakeholders in the development of innovative ICT applications within this community. This sub project referred to as How Do You Know What You Don't Know aims to contribute to the understanding of how to conduct (and repeat) a reflective participatory processes for all stakeholder and designer engagement. It is envisaged that this process would be used as a strategic driver for development of emerging interactive technologies for future master planned communities, grounded in the human dimensions of the desired community. These participatory design activities would not only be an open dialogue between designers and users, but simultaneously engage institutional and national stakeholders in shared conceptual definition and design refinement. The successful development of ICT applications is not secured by any random stakeholder engagement. Instead, a structured, facilitated and reflective process must be interpreted into directions for future design.

The approach we are suggesting of reflective community participation endeavors to be repeatable as a strategic development tool for ICT applications. It aims to allow for the development of applications which embrace the needs of the community, while also addressing infrastructure or hardware needs and gives all stakeholders a shared understanding and ownership for the resultant ICT application. Through a structured, reflective, interdisciplinary and design driven process, reflective community participation actively engages all stakeholders and designers in the development of specific applications which enable and support social interactions in a community.

This process begins within the identification of the project team, which we are suggesting should include three representative groups, Future residents/users, government and developers, and designers. These groups are then engaged using the suggested process broken into three stages: People, places, things and their environment; Who, what, when, where, why & how, and; Imagine if. As the process proceeds, members of each group may vary depending on the framing and reframing of the specific situation. If additional skills or services are needed, these people would be asked to join the process. The addition of people part way through the process will be possible as each phase will be documented for viewing, compiled in a concept book like format, where each progression in the process can be forward and back tracked by all project team members. This will be possible as the structured documentation of each phase will be in an easily accessible and understandable format, consisting of a combination of still visual, video snips, narratives and prototypes.

The process is about to be implemented within the KGUV context. It will be undertaken during a condensed timeframe of twelve weeks so the process could be implemented as a repeatable and acceptable strategic driver for the effective development and implementation of ICT applications in future Master Planned Communities. Results of this pilot will be presented during the conference presentation.

Conclusion / Future Research

This paper has highlighted that a successful community can be defined as one which people seek to join and do not wish to leave. The action of people co-incidentally living next door to each other can not make or guarantee a community, this requires interaction and engagement. The role of ICT within such communities has been shown to be a threat to the success of the notion of

community. The role of Interaction Design is uniquely placed to tackle such issues as its focus is about finding better ways for people to interact with each other through communication technologies. This requires an understanding of how communities prefer to live, learn, work and play so that better technologies can be designed to value add their lives. Interaction Design is also capable of synthesising the various needs of the stakeholders of such communities. An approach grounded in reflective community participation has been suggested to ensure the needs of the stakeholders become apparent in the design of such technologies. This is the first of such studies we are undertaking. The method being developed will be refined and reapplied to the development of innovative interaction design solutions supporting social sustainability in future master planned community contexts.

Acknowledgements

The Authors would also like to acknowledge the funding support of the Australasian CRC for Interaction Design (ACID) and the Cooperative Research Centre Program through the Australian Government's Department of Education (<http://www.interactiondesign.com.au/>)

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