Augmenting public urban spaces: The impact of the digital future on the design of public urban spaces

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Description
The impact of digital technology on the shape and behaviour of our cities is just starting to be realised. How will our public places and our relationships with them change in light of 'new media' and ubiquitous (or everywhere) computing? What are their implications and futures scenarios for planners, designers and architects?

PowerPoint presentation (possibly with need for internet connection for links)

Abstract

Social media digital and technologies surround us. We are moving into an age of ubiquitous (that is everywhere) computing. New media and information and communication technologies already impact on many aspects of everyday life including work, home and leisure. These new technologies are influencing the way that we develop social networks; understand places and location; how we navigate our cities; how we provide information about utilities and services; developing new ways to engage and participate in our communities, in planning, in governance and other decisions.

This paper presents the initial findings of the impacts that digital communication technologies are having on public urban spaces. It develops a contextual review the nexus between urban planning and technological developments with examples and case studies from around the world to highlight some of the potential directions for urban planning in Queensland and Australia. It concludes with some thought provoking discussion points for urban planners, architects, designers and placemakers on the future of urban informatics and urban design,

questions such as: how technology can enhance 'place', how technology can be used to improve public participation, and how technology will change our requirements of public places?

Introduction
Techno-romanticism (Coyne 1999) would have us believe that advanced technologies have the capacity to restore the role of genius, bring unity to the world and solve all our problems through the creation of *techno-utopias*. Whether the promise is true or not will best be judged by future generations, but one thing is certain, technology is continuing to shape and mould our social, political and physical environments. Computers pervade every aspect of our lives, ubiquitous – they surround us. Wieser(1991) highlighted the move of digital technologies away from the desktop to become embedded in everyday items to make them truly ubiquitous. Greenfield (2006) describes it as 'everyware' in his book 'Everyware: The dawning age of ubiquitous computing '. Digital technologies are used to govern cities and their infrastructure, to enhance our understanding of the urban environment, in the development of our social relationships and cultural identity, in health care and education, and in the interaction of citizens with government. As urbanism intensifies across the world digital technology is playing an important role in shaping our urban environments.

The rise of digital Information and Communication Technologies (ICTs) intersects with the development of urban form in several key ways. From spatial distributions (multi-media clusters, digital growth centers, silicon valleys); to telecommuting affecting flows and movements of people and information; to changing patterns of social networks; the installation of physical infrastructure both to enable the digital functionality and to visualize the digital screen. The urban implications occur on a number of levels: globally, nationally, regionally as well as specific localities. Whether it is the development of hi-tech knowledge precincts or large digital screens, the ICTs pervade our urban form.

It is the subtle changes in the way we interact with each other and our environment and how we interpret and appreciate our urban environments that will be the focus of this paper. 'Wayfinding' or personal navigation for instance is enhanced with the use of navigational tools such as mobile GPS, mobile internet and tagging. While digital surveillance of our cities is increasingly used, not only crime prevention but also monitoring, analysis and direction of urban flows, (eg. traffic management and environmental monitoring). Throughout our urban environments there is a new layer of information about our environment and for our environment a growing area of research described as *'urban informatics'*, which is 'the study, design, and practice of urban experiences across different urban contexts that are created by new opportunities of real-time, ubiquitous technology and the augmentation that mediates the physical and digital layers of people networks and urban infrastructures. '(www.urbaninformatics.net)

The main question raised in this paper is: 'can we utilize the developments in technology to inform change in the way places are designed and built, to work

together with urban design and the physical urban infrastructure to develop socially cohesive, liveable, sustainable environments? '

This paper addresses four areas of ICT impacts on the urban form:
1. The layer of digital information – augmenting space;
2. Physical installations with particular reference to large urban screens;
3. Social networks and communication;
4. Community participation in planning – engaging the networked audience.

Layer of digital information – Augmenting space

Mobile, wireless and location-based media delivers information directly to personal mobile devices such as, mobile phones, iPads, e-books, and laptops. Information can be location specific or globally accessible through the internet.

As a result of current research and development of ICTs there have arisen a number of different ways in which information and communication can be shared. Terms like ubiquitous computing, augmented reality, tangible interfaces, intelligent buildings, context aware computing, ambient intelligence, smart objects, e-print, wireless location and sensor networks are just some of the terms we are coming to grips with. Manovich (2006) suggests that 'the end result of development in all these areas is the same: 'Overlaying the physical space with the dynamic data '. In varying degrees this additional data layer is changing relationship between people and the spaces they inhabit and this will in turn impact on the shape and development of urban form.

'Augmented spaces have been defined as the physical space overlaid with dynamically changing information, multimedia in form and localized for each user' (Manovich 2006). An exciting and burgeoning area of human computer interactions (HCI) or ICT, it offers some interesting possibilities for urban planning interests.

The recent iPhone application released by the Museum of London is one example of how mobile media has been used to overlay information about the physical environment in a multimedia format. The application called *Museum of London Street Museum* allows you to view historic images of the city which co-ordinate with your physical location. The images include everyday situations as well as major events like The Great Fire of 1666. This new layer of historic information across the City provides a 'unique perspective ' of old and new London.
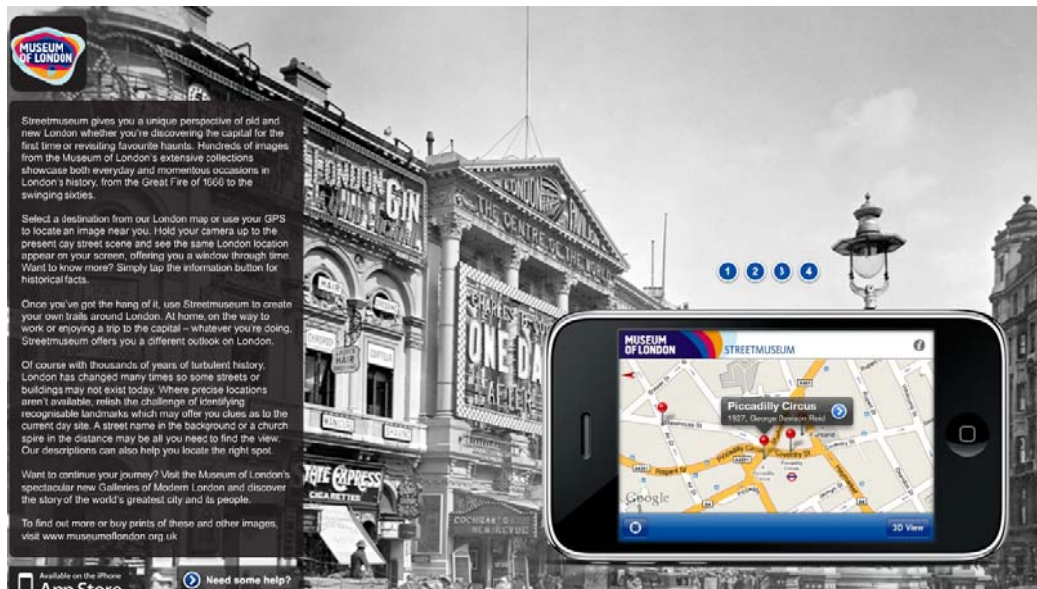
Image 1: Museum of London website

There have also been similar applications developed for tourism in various cities across the world.

With a slightly different focus an experimental study using mobile narrative was conducted at Kevin Grove Urban Village in Brisbane. The study allowed the user to experience the story of a soldier (written as historic fiction) at the physical location of the story, providing a historical narrative of the site. The project questioned the paradigm of *anytime, anywhere* that has become the catch-cry of mobile media by set restrictions on accessibility to the story base on the readers location as determined by the phone's GPS capabilities (Wiesner, Foth & Bilandzic 2009). This overlaying of digital narratives over physical place has the potential to enhance the meaning and understanding of heritage and the cultural significance of place. It could be used more broadly to clarify and explain the meaning behind the urban form. The study participants who trialed the narrative commented that, 'they had a better understanding of the place and its history ' as a result of the experience. This example is raised to illustrate that the entertaining and sometimes playful way that new mobile media is able to add meaning and understanding interaction with and sense of, 'place'.

Another area of research within the HCI discipline has been the development of location based games, for example: *'Pirates'* (Bjork et. al 2001) or '*The Gopher Game'* (Casey, et. al. 2007) which turns the physical environment into a game board, players use their mobile devices and interact within the larger physical environment. These games have the ability to bring new meaning and new uses into a public space and in many cases new interactions in fun and creative ways. The phenomena of computer games and new media games of all sorts is far reaching to the point that libraries are considering ways to utilize games both as draw cards attracting people to the library and as a mean of education. State Library of NSW is actively investigating 'Serious Games ' and the potential these offer for local libraries across NSW. They ran two days of workshops looking at best practice around the world and research areas being investigated. Location based games for educational purposes or serious games are also possible and

could provide a means of collaboration, education or participation in urban development.

On a more practical level location based media is already enhancing the way the urban environment is navigated. Mobile phone applications and web-based sites can assist in locating the nearest restaurant and its reviews (for example Urban Spoon), or avoiding traffic congestion and navigating the quickest way to your destination (for instance with the iphone application AUS Traffic).

These new location aware technologies have the capacity and potential to further augment spaces and places, architecture and civic experience, through a shared and collaborative development of layers of urban informatics enhancing local identity in the process.

Physical installations

The tangible and obvious implementation of ICTs within the urban fabric is the physical digital media installations such as the large screens, automatic tellers, digital signage, surveillance cameras and the missing elements such as, the removal of the public telephone booth (along with its replacement with the virtual phone booth created with body space or physical nodal points (Law 2010)). These elements of the physical environment can be considered and assessed within the same structures that any urban furniture or feature might be assessed, related to elements of good urban design such as the seven principles of good design set out in the Urban Design Compendium (Llewelyn Davies 2000) including: Places for People, Enrich the existing, Make connections, Work with the landscape, Mix uses and form, Manage the investment and Design for change. There are a number of positive ways screens can assist in the development of a public spaces good urban design.

Places for people can be interpreted in relation to ICTs and particularly public screens in terms of the contribution they can make towards enhancing the feeling of place and the inclusion of urban dwellers within the space. By careful placement and design technologies can *enrich the existing* and extend the relationships between existing elements, content of the screen or technical imagery is an important consideration when assessing this principle, along with the physical dimensions of screens. Screens can animate an existing gathering point our waiting area with news, images or entertainment in a visual and auditory form.

Making connections relates to movement and flow of people through a place, interactive maps and navigational tools can enhance this experience and issues such as congestion, lines of sight and areas of movement need to be assessed in light of behaviour around a screen as a point of interest. *Working with the landscape* that is the physical constraints of a space is a marriage between the technical requirements of the screen such as power and reflection and the physical constraints of the site.

Image 2: large urban screens http://www.ecopolis.org/tag/landscape/

Urban screens and technology are the masters of change and make them highly capable of providing *mixed uses and forms*. Content type and purpose can be changed quickly and relatively effortlessly. In one instant acting as a large television screen or link to public event and in another an interactive art work or public forum.

What these physical installations offer as new and innovative (that is beyond a glamorous billboard), is an ability to change quickly and provide for public interaction in new ways and with speed that has not be seen before. They add an element of entertainment and fun to public spaces bringing life and social interaction for inhabitants. Examples such as a large screen projecting the World Cup from South Africa cities across the world, alters our experience and perception of time and place. Similarly the 'Hole in the Earth Project' allowed people from opposite sides of the globe to interact and communicate in real-time in serendipitous and entertaining ways. One 'hole' was set up in Rotterdam while the opposite end of the 'tunnel ' was set up in Shanghai. A webcam and audio stream internet link was established between the two. This global connection between two cities of different culture and language, besides providing intrigue and fascination, has potential for building community based international relations, although the development of relationships on the same side of the globe based on the hole as a talking point is much more likely.

The challenge for the urban designer or planner is to manage to blend these technologies into the urban fabric so they do not disrupt the form and visual

amenity of their setting. Too often they are placed as dominant animated billboards with no sympathy to their location and context.
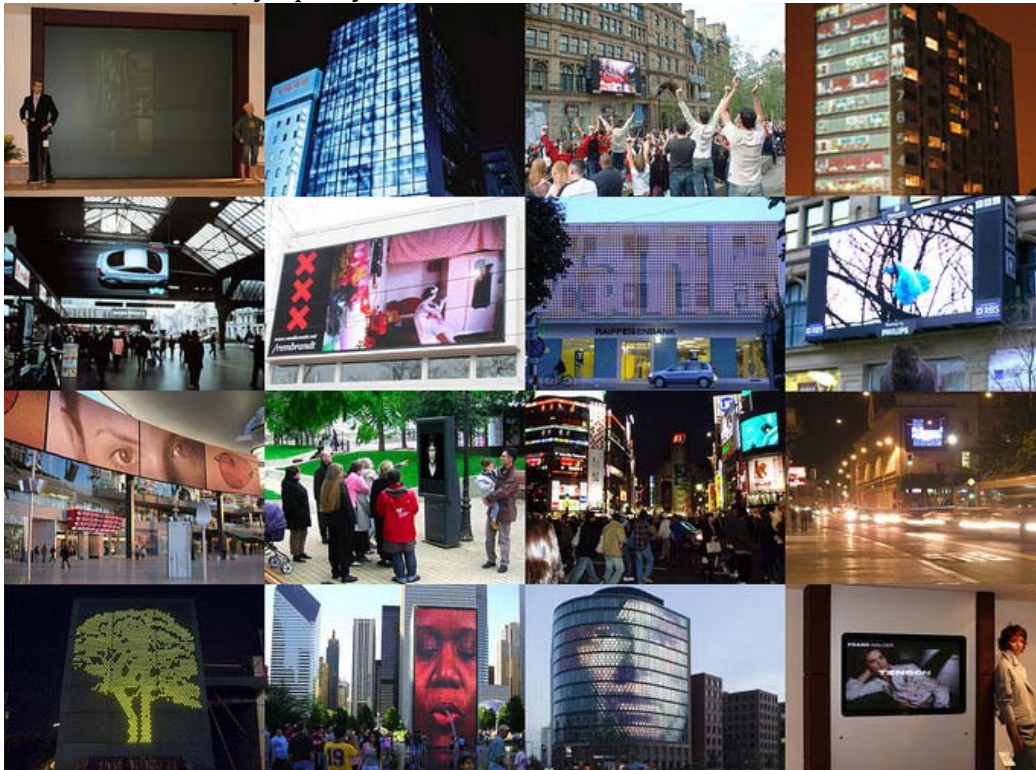

Image 2: large urban screens http://www.ecopolis.org/tag/landscape/

However urban screens and the technology behind them is evolving with increased interactive content, a sense of fun and general creativity that can give a place vibrancy. Localised content can enhance a place's unique identity and serve a civic function.

Screens are taking on new forms and constantly evolving. Projection allows the animation of buildings and almost any object, eliminating some aspects of installation that are required for large screens such as support structures, anti vandal construction and other specific physical requirements. The pace of technological development in these areas means that the planner must go back to the basics of good design, while assessing the specific technological needs. The urban designer can also look at the potential of integrating screens (in their many forms) into design at a masterplan level and utilize its potential to activate and animate public urban spaces. Placemakers can consider the inclusion of digital technology with its potential to enhance existing features of place and create points of interaction and serendipity.

Social networks and Communication

Behavioural changes brought about by ICT have been profound. The way we contact and communicate with each other and the subsequent changes in our actions and reactions is significant.

Social networking through web based facilities such as *Facebook, Myspace, Twitter* and *Friendster*, even planners' networks like *Planetcitizen* or *Project for Public Places* encourage and support the development of virtual communities, many of which are based on physical communities too. With the mobile internet interface these social networking tools can be even more instantaneous and interactive real-time.

Over the last decade or so, significant changes both in terms of social interaction and public behaviour have occurred as a result of the increased use of mobile technologies. Some of these changes include:

- Hypercoordination
- Co-presence, distant focus
- Mobile Phones for perception of security
- Productive use of transition or travel times
- Constant connection of work and contacts
- Public dance or choreography of the mobile phone

Each of these behaviours will be briefly described.

Hyper-coordination is 'the sense that every moment is caught in a web of planning and interaction with others, and that the plans can be changed quickly in light of circumstances and actions of others. '(Katz 2006, p63). The effect of this mobile phone phenomena is that plans become flexible and changeable and as Katz suggests 'the idea of being late may disappear altogether ' as we reschedule and adjust movements as events unfold.

Co-present, distant focus
The mobile phone has had significant impacts on our social relationships and use of time, our perceptions of place and communication. It has been heavily criticized for its impact on social interactions as the user's focus may be split between those within spatial proximity and co-present at a distance. Standing on a street corner the person engrossed in the conversation they are having with the distant other at the other end of the call is oblivious to the passers-by and only vaguely aware of their location and context. Similarly the development of mobile phone etiquette has taken some time to develop or adjust to become acceptable public behaviour.

Mobile phones and the perception of security
Proteophobia or fear of the stranger was a concern raised by Zygmunt Bauman. He stated 'that modernity tore apart the connection between social interaction and physical proximity ' (Clarke & Doel 2004, p33) and felt that the 'appearance of the 'stranger' on the modern stage was a direct consequence of the dissociation of the social and physical space.' Stating that 'the stranger was an alien presence within the lifeworld; a figure proximate in *physical space, yet socially distant.* As a consequence we cling to our mobile phone with our

connection to loved-ones and friends as a sense of security, we give our children mobile phones and tell them not to play on the street with strangers.

In an analysis of 'Risk: the science and politics of fear' Gardner (2008) writes that 'we are the safest and healthiest human beings who ever lived and yet irrational fear is growing '(pi). To counter this swelling fear and irrational behaviour it can produce, there is a pressing need to consider ways of balancing our views of perceived and real risk, to investigate the nexus between urban form and technology and its potential to address these concerns in a collaborative way.

Productive use of time

Fortunati (2002) talks of the mobile phone as time management tool, increasing our 'productive use of time ', while we wait at the airport we can just send a quick email in response to the management report we just read on our PDF reader, or we can make a quick call home to adjust plans for the evening in light of the traffic congestion, or we can just organize a few household chores as we ride the elevator. We organize and re-organise our time to squeeze in the most we can into every minute, the counter to this is the moment '*in the praise of slow'*(Honore 2005) which encourages slowing down and focusing on one task at a time.

Constant connection to work

However it can also be argued that there is now no separation of time between home and work as emails continue to flow and contact is constantly available. The company has provided the phone so we are expected to be at their beckon call 24/7. The office has become elastic in even more ways. Now with wifi connection in the café on the corner the coffee break can extend into a work session and the flexible worker may chose not to have an office space at all but rather rent their café table one coffee at a time. Working from home either part time or full time becomes an easy reality with internet connection. What are the implications on our sense of place, home, work and leisure (or community)? While early analysis predicted an end to the city core the reality has been a strengthening of urban dwelling as the global population becomes increasingly urban telecommuting may have changed our work patterns but it has by no means diminished the desire for urban living.

Public dance and the choreography of the mobile phone

The movement patterns of the mobile phone user has been described as choreography of mobile communication by Katz (2005, p21). In his discussion he describing the particular way that the user behaves to faciliate their mobile call and the disturbance this can cause to others. There are a number of specific behavioural phenomena that have developed around the use of the mobile phone. Changes such as the rise in intonation and the pause or sweep to the side to concentrate on the phone call, with the creation of a virtual phone booth in locations best suited to pulling aside from the flow of pedestrian movement or the noise of a larger group. There is a removal of attention from the co-present to be with the distant other, unless it is a call where the distant other is known by

the rest of the group and becomes included in a disjointed way with the rest of the conversation. The choreography movement within public spaces has notably changed as a result of the mobile phone.

Theorist Jane Jacobs saw solutions in creation of places which allowed for serendipitous and incidental meetings in the urban setting when she stated that *'Social life of city sidewalks... bring together people who do not know each other in intimate, private fashion and in most cases do not care to know each other in that fashion '... 'if only interesting, useful and significant contacts ... if acquaintance-ship confined to private life, the city becomes stultified '*
(Jacobs 1997, p55) How the mobile phone and social networking can aid or support the development incident of social life of the street is the subject of a number of HCI studies.

Current areas of research are investigating ways in which the potential of these technologies can be harnessed to stimulate interactions, serendipity and social cohesion. Some of the most cutting edge research is investigating ways that HCI and ICTs can be used to encourage sustainable living practices and enhance healthy living within the broader community.

Community participation in planning – engaging the networked audience

Online community participation forums have become common over the last decade with most Council's and government bodies offering an online feedback mechanism. The extension of this type of feedback and citizen engagement is the subject of a current research project 'Discussions in Space ' at Queensland University of Technology, working with Brisbane City Council, is looking at ways of providing 'forms of in-place digital augmentation which refer to the ability to enhance the experiences of citizens in physical spaces through digital technologies that are directly accessible within that space ' (Schroeter and Foth 2009).

In this experimental project large public screens were utilized to facilitate the discussion of topics related to the development of the Brisbane City Blueprint. Passers-by were able to interact with the screen by messaging through their phone's SMS, Bluetooth and internet (twitter and email) capabilities. The large screen interface invited comment and share opinions on a range of civic topics, 'providing a platform for collective expression and public discourse amongst Brisbane residents. ' (Schroeter & Foth 2009)
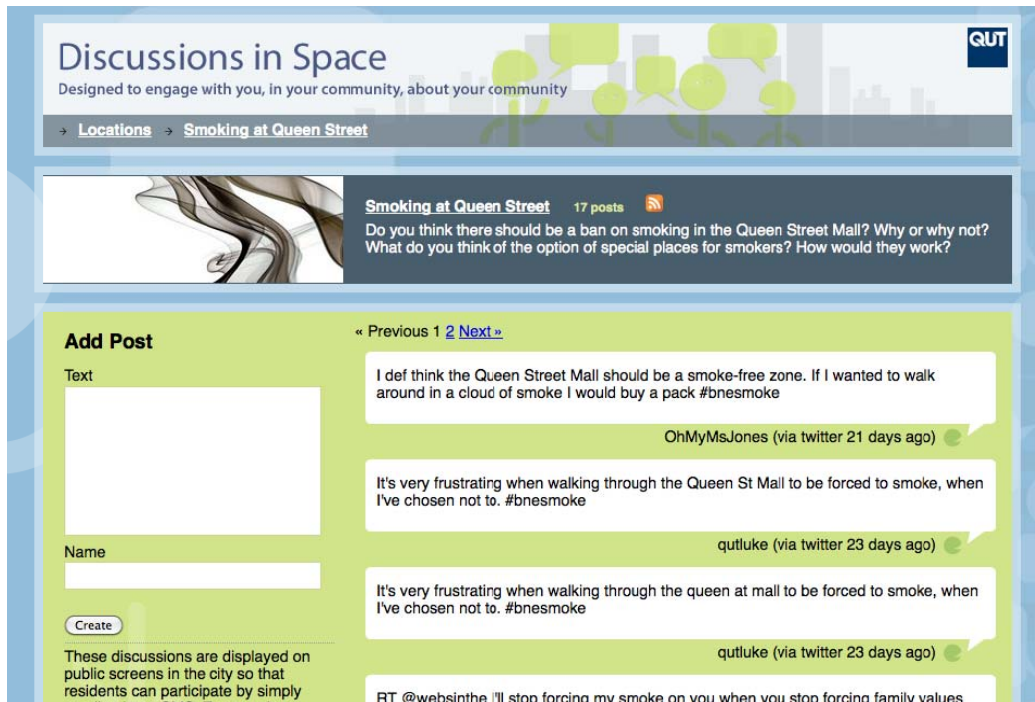
Image 3: Discussions in Space webpage
http://dis.urbaninformatics.net/topics/25

Image 4: Urban Screen display discussions in Space

The specific interest of the study was the capture of opinion and discussion of those who Council have trouble engaging, those identified were the younger populations who are often transient and not involved, or the older professionals too time poor to make the connection with the standard methods of engagement.

The potential for further research and development of new and create ways to engage with a digital population is not only a matter of interest, it is vital for truly representative engagement. New ways of establishing terms of engagement within the community are required in a digital age were the 'digital natives'

(Prensky 2001) are socially connected, technologically savy and often disinclined to connect with traditional forms of media and engagement.

Conclusions

'Since the Industrial Revolution, society and culture have been subservient to technology. One of the compelling tasks today is to reverse the process and make technology serve culture and society. ' (Bagdikian 1992) Like any other focus of society and development urban planning can harness the potentials of ICT and technological development.

The discipline of Urban Informatics and Human Computer Interactions' (HCI) offers the urban planner a range of potentially significant opportunities. From the development of regional and global economies to the design of our civic and community spaces the digital age is influencing the urban form. In a similar way to Brand's (1995) suggestion that buildings learn, so do our public spaces. Their design is part of an 'evolutionary design process' and these places need to be adaptable, flexible and enduring in order to serve the community well.

Finally the role of public spaces and the development of social capital through the serendipitous, the familiarly local and the development of community are well noted (Putnam 2001, Oldenburg 1989, Jacobs 1997), augmenting these spaces through the use of ICT interfaces can be further explored in terms enhancing these capabilities and directing the attention of ICT development to work with urban form and frameworks to develop socially cohesive, livable, sustainable environments. Similarly a dialogue from ICT development to urban planners could also be instrumental in creating physical spaces that are responsive to the changing behaviours and expectations of the digital age.

It was Christopher Alexander (1977) in his work Pattern Language who suggested that 'this is a fundamental view of the world. It says that when you build a thing you cannot merely build that thing in isolation, but must also repair the world around it, and within it, so that the larger world at that one place becomes more coherent, and more whole; and the thing which you make takes its place in the web of nature, as you make it.'

The message for planners is not to sit back and let HCI have all the fun! Planners can have an active and meaningful input and participate in the area of new medias and ICT. Who knows spaces and places better than the designer, can ICTs enhance and work with the physical design to make place even more animated, enjoyable and build socially cohesive communities. Secondly what are the implications for planning and design as this area of research 'hits the street', are planners leaving this new subtle urban shaping to the technical 'geeks' and developers.

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