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Cyberspace design: a new challenge for planners

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This paper proposes a conceptual framework for planning and design practice to incorporate self-consciously the hybrid space of the virtual and physical. Cyberspace has now become a commonplace environment for social and public life, and its complex uses are entwined with those of the existential life in the physical environment. Therefore, it is argued, planners must engage in the design of the parallel realities of social and public life in these spaces. This paper proposes to look at them in a rhizome-like spatial formation, and in their future design to apply related planning knowledge on places and communities. Based on observations of online activity, the paper illustrates a method to analyse cyberspace's quality by means of Kevin Lynch's taxonomy of images, and of William H. Whyte's method to evaluate spatial uses. Spatial elements are identified through analogies between the virtual and the physical social environments, in order to derive alternatives for future (hybrid) spatial design.

1. Introduction

The information and communication technology (ICT) revolution has created new possibilities for human communication leading to new social formations. The rise of 'network society' discussed by Castells (2000) is a case in point. The ICT revolution has led to new symbolic modalities for defining space and place, and has created possibilities for new social spaces by means of 'self-presentation and self-representation' (Lefebvre, 1991, p. 34). Will the possibilities of social life in cyberspaces pre-empt the public life in urban spaces, or counterintuitively, actually complement physical places?

Past visions of ICT transforming humans into 'cyborgs', living in networked cities of bits and wandering in different virtual realms as advanced by Mitchell (1995, 2003), are becoming increasingly possible in current augmented and smart cities (Aurigi and De Cindio, 2008), and as new disciplines such as urban informatics and ubiquitous computing create new opportunities (Foth, 2009). The role of technology in creating places in the physical world is often studied within a 'real time' hybrid space that citizens generate by publicly using mobile phones or other devices allowing simultaneous experiences of physical and virtual, remote, realities (de Souza e Silva, 2006; Dourish and Bell, 2011). Yet the hybrid realm manifests even when cyberspace is accessed from the privacy of people's homes, in social networks such as Facebook and Twitter, and especially when users residing in the same geographical location engage in online social interactions. In this case, their activity in these 'community venues' in cyberspace can shape explicitly or implicitly the physical space and the interactions therein. The possibility to enhance a community's social life through simple ICT tools such as e-mail lists has been experimentally demonstrated (Hampton and Wellman, 2003). At present, numerous privately owned social media explicitly aim to bridge the physical with cyberspace (e.g. EveryBlock, Peuplade, Front Porch Forum, i-neighbors). In this context an obvious research question is how to define design principles for building successful hybrid communities (Foth, 2010). More concrete proposals aim to incite online participation by researchers from the fields of human–computer interaction and computer supported cooperation work (Kim, 2000; Preece, 2000). It remains to be answered, how one can use online social networks to motivate participation in physical space, rather than only in cyberspace, or even to attain more ambitious objectives such as building community identity and enabling citizen participation in planning?

To answer these questions, the authors aspire to motivate planners to see technology and social software not only as an external tool that they could use in practice, but also as an extension of the spatial planning object. Planners' role in cyberspace design may require to go beyond understanding virtual environments either as copies of the physical space like, say, Second Life, or only as a form of cyber-infrastructure supporting planning processes in physical space (e.g. GIS applications, city navigability enhancement through powerful mobile devices and public displays, global networking for environmental sustainability, participatory planning in virtual worlds, online social networks that become collaborative spaces for decision making). For instance, hybrid community design can use models of traditional neighbourhoods that inspire a strong sense of place and community (Apostol *et al.*, 2008a), where members can engage in everyday social exchanges and also in participatory planning processes and public deliberations.

Understanding place making is key in the conception of spaces to deliberate about the common good, which presently also include cyberspace venues for social and public life. The creation of place in cyberspace or in real-time hybrid spaces is an early idea in the context of computer supported cooperation work (Dourish, 2006) inspired by urban studies of Alexander *et al.* (1977) and Whyte (1980). In context this question is addressed as a new challenge of planning practice: designing cyberspace that is deferential to physical space and takes into account public imperatives of place and its users.

The aim is to devise a conceptual framework capable of incorporating information age innovations in the design of hybrid (i.e. combination of virtual and physical) spaces that may offer future arenas for planning practice. The paper draws from everyday user experiences in cyberspace and presents some examples of design choices that influence online activity, but also may affect cyberspace use and the meaning of certain web pages. These findings on current spatial experiences can be further employed to understand how online places can affect and enhance physical places.

The paper is organised in five sections. First, to conceptualise a place deferential cyberspace, the relevant literature on place and community is reviewed briefly. Second, a planning perspective is presented in which cyberspace can be conceptualised as a spatial construct, in addition to a technical perspective. Third, the paper considers software design from a place-based perspective, by means of Lynch's 'imageability' (Lynch, 1960) analytical method of representational elements that orientate users' practice in cyberspace. Fourth, moving from individual to collective cyberspace activity, the production of online places and the possibility of analysing place qualities through their social uses are discussed. The authors conclude with this study's perspectives.

2. Guiding knowledge on places and communities

In the early twentieth century expansion of the US cities, planners like Clarence Perry (1929) and Clarence Stein (1942) advanced the concept of 'neighbourhood unit' to define the spatial containers for residential communities (Banerjee and Baer, 1984). Although inspired by anti-urbanist views at the turn of the century and the attendant imperatives of community and place, these visionary planners attempted social reform, misguidedly, through ordering principles for the built environment. Some three decades after Perry advanced the neighbourhood unit as an organising concept based on walking distances, Jacobs (1961) emphasised the preservation of neighbourhoods through community control and engagement. Drawing from her observations of the neighbourhood social life at the street level in West Village in New York City, she advocated commonsense choices to promote neighbourhood conviviality and social life. Indeed, neighbourhoods are still now the settings of appropriate scale where a sense of community and place can develop without being conflated into a single identity.

Planning knowledge about community building and social organisation can inform online social exchanges and network organisations that may further shape the identity of hybrid communities. If notions of individual identities, common outcome, and information management would be configured in the neighbourhood context, as central elements of the social software for current online communities, such hybrid characteristics may lead to strengthening place-based communities by bridging online and offline social life within identifiable neighbourhoods.

Moreover, social software can play an instrumental role in the creation of a new type of neighbourhood community based on the concept of multitude, which is implicit in Deleuze and Guattari's 'thousand plateaus' (Deleuze and Guattari, 2004) rhizome-like space. So far, one of the most impressive achievements of the online multitude is free and open source software and in general the 'creative commons' paradigm that, rather than ownership and control, favours creativity and free distribution of art and knowledge. That inspired Hardt and Negri (2004) to identify two key elements that can bring the utopian dream of a global democracy closer to reality: the acceptance of differences in a networked society of singularities, and the collective ownership of the commons. Yet a fundamental change in the definition of democracy and the required achieving means is necessary for its accomplishment at a global scale. The social software components of local hybrid communities open up various possibilities.

Place-related research can inform cyberspace design for network building, software design and organisation of the

information content. Among the four ontological constructs of place (Arefi and Triantafillou, 2005), one is a 'set of visual attributes' that can define a sense of place. From the standpoint of policy-making and problem-solving place is seen as 'product', and/or as 'process' when the focus is on the spatial production through time. Finally, place is explored as 'meaning' in the built environment focusing on associated values, symbols, phenomenological intuition, etc. Based on spatial experiences, Lynch says: 'A good place is one which, in some way appropriate to the person and her culture, makes her aware of her community, her past, the web of life, and the universe of time and space in which those are contained […] sensible, identifiable places are convenient pegs on which to hang personal memories, feelings, and values. Place identity is closely linked to personal identity. 'I am here' supports 'I am'. Intense familiarity will create a sense of place' (Lynch, 1981, pp. 132 and 142).

Accordingly, the works of Lynch and Whyte are particularly relevant for their possible cyberspace application. William Whyte's field studies (1980, 1988) led to rethinking the New York City zoning ordinance on the provision and design of public space. Such observations of collective uses of urban space may lead in cyberspace to corresponding interface configuration and social network rules. Lynch's taxonomy of images (1960) may help us understand better how various analogous design choices related to 'virtual' elements can enhance online user experience, and thus, even more importantly, to address the expanding linkage between physical and cyberspace.

3. Planning in cyberspace

This paper proposes the practice's engagement in cyberspace design based on planning imperatives for the provision of public goods and collective welfare, and for promoting civic values. Planners may exercise their role as mediators for the implementation of (hybrid) community choices. In the spirit of participatory planning they may facilitate citizen involvement in decision-making processes through online and offline public deliberations. As in deliberative practice for effective community participation (Forester, 1999), planners may provide critical information and skills for genuine citizen engagement in documenting and representing the urban sensorium and city life experiences.

In the planning processes that allow for an informed public discourse on spatial policies, the elaboration of values and principles is essential. In the 1970s, Kevin Lynch examined the values that commonly influence spatial policies. He identified certain values that are either rarely achieved ('wishful') or their achievement is difficult to prove or measure ('weak'). Among 'weak' values are the creation of strong communities, support of a preferred lifestyle, enhancement of future flexibility, choice, diversity, stability, social integration, etc. (Lynch, 1981, p. 55). He also spoke of values that appeared to be 'neglected' at the time of his study, like the degree of user control over the space. However, with the advent of ICT and Web 2.0, and due to intensified social activity and group organisation in cyberspace, opportunities are sensed to reconsider these values in the future design of the hybrid realm.

Moreover, social software design for hybrid communities should shift shortly from first-order objectives such as neighbours' meetings or exchanges of local services, to include more ambitious and complex objectives such as facilitating the expression of community identity and citizen participation in planning processes (Apostol *et al.*, 2008b), which require customised solutions and a deeper understanding of cyberspace's spatial nature. So how is the spatiality of cyberspace to be characterised? It might be that it is predominantly of social and relational nature, thus inherently topological and non-Cartesian. The relational space cannot be separated from time, and is 'regarded in the manner of Leibniz, as being contained in objects in the sense that an object can be said to exist only insofar as it contains and represents within itself relationships to other objects' (Harvey, 2006, p. 271). On the nature of space Harvey proposes three different understandings that are not mutually exclusive, namely absolute, relative and relational, being possible to keep them 'in dialectical tension with each other and [to] think constantly through the interplay among them' (p. 276). The relative space arises from relationships between objects (e.g. GIS applications), while the absolute space is a 'thing in itself' independent of the matter like in Descartes' and Newton's view, in which time does not play an explicit role in spatial formation (e.g. GIS coordinates).

The relative and relational understanding of space led to community engagement in neighbourhood development. Comparably, this is a moment in the evolution of cyberspace design (Web 2.0) when users begin to appropriate, and shape their particularised space defined by the social software beyond the full control of software designers. By means of (self-) representation and identity in online communities, toward spatial appropriation, users derive meaning from the language employed and through frequent system operation and process reiterations. Current trends in user behaviour suggest a sense of belonging and identity in cyberspace analogous to a shared 'sense of place', only here involving a sense of 'e-places' (Apostol *et al.*, 2009).

From a technical perspective, a communication network (the Internet) structures cyberspace, which comprises the digital information exchanged between the network nodes (e.g. text, images, sounds, three-dimensional representations) and the computer software that defines the rules for using and transforming this information. From the design point of view,

the possibilities to structure cyberspace are unlimited, due to the technological progress that allows representations of the infinite human imagination. Yet the design outcome in terms of user interface and social software depends on the ownership demands and on the designers' technological as well as spatial and social knowledge.

Currently, the rights over information and content shared online belong to corporations like Yahoo, Google or Facebook raising issues of privacy and control power, as the collected information is used for commercial objectives, targeted advertising, behaviour analysis, manipulation, etc. In the currently successful online communities, the same corporations also own the underlying social software that defines the rules of the game and impacts the online experience's quality by constraining the expression of user identity, and the way users appropriate space. Implicitly, it can also influence user behaviour and activity roles that users assume online, affecting the community dynamics. Its analogues in physical space are the privately owned public spaces such as downtown corporate plazas and shopping malls that allow for different social dynamics than those generated in the traditional public square. As in real life the private control of cyberspace could also lead to exclusionary practices.

Given the present conditions, it is important to provide public alternatives in cyberspace that build on open source software (e.g. Drupal, Diaspora) allowing for customised solutions, collective decision-making and transparency at all levels. Therefore, to focus on the tangible public benefits of cyberspace, the authors advocate collaborations between software designers and planning professionals. Such collaborations can take advantage of the expertise on place making in the physical space, to create design guidelines based on observations of cyberspace uses. Ultimately, collaborative practices may create a synoptic view of the hybrid environments in which people live today, or may live tomorrow, shedding some light on the complicated nature of linkages within the spatial rhizomes that might guide future spatial development.

4. Cyberspace imageability

Since the early years of online networking, cyberspace has often been represented through place metaphors like 'chat room', 'information superhighway', 'electronic frontier' or 'city of bits' (Adams, 1997; Boyer, 1996; Mitchell, 1995, 2003; Rheingold, 1993). Physical references help the organisation of cyberspace by making it imageable and consistent with such actions as entering, dwelling, surfing, building, inhabiting, etc.

It is possible to imagine browsing online community pages, whether they are individual or group homepages, like strolling through the streets of a global neighbourhood, even if cyberspace enables immediate scale variations from local to global, making the 'walking distance' of Perry's neighbourhood unit inconsequential. Nevertheless, despite scale differences, spatial experiences are guided mainly by visual attributes, for which urban design analytical methods can be borrowed. Accordingly, the paper describes below elements of cyberspace imageability parallel to Lynch's taxonomy of city images (see Table 1).

'E-landmarks' are interface particularities like names, logos, mottos, colours and visuals or, at a more personal level, addresses and pages to which users create special attachments. The main role of landmarks in cyberspace is to build a container of activities and a global identity similar to, say, the Parisian Eiffel tower. For example, the Facebook logo gives users the feeling that they browse 'inside' Facebook social network.

'E-nodes' could be considered the online interest groups and chat rooms where exchanges like commenting, content sharing or voting take place. Allowing and/or stimulating user interactions in an e-node depend on various design choices about comments, rating, expressing the level of activity like statistics on participation or visualisation (Erickson and Kellogg, 2000).

Similarly, 'e-districts' are the 'containers' of online activity like interest groups in large online communities (Flickr, Facebook), and specialised online (neighbourhood) communities (i-neighbors, Peuplade).

The limits of online information may generate 'e-edges', and subject to restricted access are specific web pages, content items, users' online presence and past activity. At the global community level some of these restrictions require users' subscription by attaching a username and a password to an e-mail address. Many communities allow users to set different access rights for different types of social ties (e.g. strangers, friends, relatives), and also the possibility to form smaller interest groups that have various membership rules and corresponding visibility rights. For example, until recently in Facebook the content visibility was restricted to one's social network, while in Flickr there is a large amount of publicly visible content. In both systems, however, unsubscribed users cannot comment on the network pages like they can do in many publicly accessible blogs.

'E-paths' may be defined in cyberspace as the succession of clicks and links to get from one entity or activity to another. The main cyberspace path enabler is the hyperlink, the World Wide Web's core element. Users looking at a web page are given for the next hop a wide variety of choices in the form of either top or side menus, and/or of underlined text or icons. An important difference between 'e-paths' and real paths is that

Lynch's elements	Physical space	Virtual space	Hybrid space	Spatial relations
Landmarks	Monuments, domes, towers, natural elements, trees, signs	Logos, names, labels, mottos, colours, visuals	Meeting places or online logos of hybrid games	Identifiable, singling out, unique/contrasting with the context
Nodes	Squares, intersections, exits, transport nodes, central districts	Chat rooms, interest groups, interactive websites	Physical places with online access and activity (e.g. cafes, libraries). Cyberspace place-related forums, offline activity on online spatial representation (maps)	Space of gathering crowds, for social activities, time defined
Paths	Streets, promenades, system of public spaces	Menus, 'encouraged' hierarchy in surfing the web	Hybrid paths (Meetup, bookcrossing) or in real-time games	Space navigation, include or determine rhythms, temporalities
Edges	Walls, natural (green/water) features, motorways, rail tracks	Constraints on access and membership (groups, networks)	Exit and access points, and boundaries between the two spaces	Space separation, division, possible hierarchies
Districts	Areas of clusters with similar character	Collection (coalition) of interest groups, on-line communities	Hybrid neighbourhood communities and groups within them	Space unification, possible hierarchies

Table 1. Expansion of Lynch's taxonomy of images: parallels in cyberspace

cyberspace offers the possibility to 'fly' directly to the desired destination, to visit a page stored in one's bookmarks through typing a new web address or using a search keyword. Words thus become powerful navigation tools, and how communities build their own vocabulary through collaborative tagging is central in the understanding the notion of an 'e-path'.

'E-paths' are often followed in isolation, usually users do not have the opportunity to observe their neighbours' 'movements' in cyberspace. Within a particular online community, the required e-paths to reach different destinations depend on specific design choices according to software priorities for the possible 'next' hop destinations. The software design may require a minimum number of clicks to go from a page to another, and the manner of placing menu items gives priority to different website parts. As such, software designers can encourage certain paths when the user 'strolls around' instead of acting purposefully like searching for a specific content item. In many cases, users' experience online is not related to going to a predefined destination, but to arrive at a definite starting point from where to 'wander' around online in a flânerie manner (Apostol *et al*., 2008b). In this case, 'e-paths' shape by drawing users' attention to explicit links depending on software ownership and/or community purpose, if not pop-up commercials. So a very important attribute of an 'e-path' is the notification of information update. The more aggressive the notification, ranging from personal e-mails, to a new icon or a change of priority in a list, the more probable it is that users will be directed more often to precise pages. Given the possibility of numerous readily available online choices, priority by design is an important keyword for content accessibility and path formation.

5. From e-nodes and e-paths to e-places

If users 'inhabit' virtual space, is it then possible to think about the construct of 'e-places'? From observations of the current practice in online communities, it may be claimed that through cyberspace appropriation users transform certain online locations into 'e-places' that are socially constructed through exchanges within nodes and flows, and configured by the space–time link of the relational cyberspace.

'E-places' are considered those homepages to which one develops a sense of attachment due to personal engagement in its construction, and in the representation of one's identity. Indeed, they suggest images, products, processes and meanings. The space is appropriated and invested with meaning over time, having the potential to induce a sense of place after familiarity is

created through process reiterations, everyday paths, labels, ads, comments, uploaded images, answers to forms and questionnaires, social exchanges, and the like.

In cyberspace, the design choices and software configurability are responsible for the capability to express the user 'profile', to build identity, to affect online behaviour, and to enable social exchanges and the formation of groups and communities. Two types of elements are identified that compose users' identity in current online social networks. The most ubiquitous is a fixed framework that corresponds to the absolute view of space. The software uses labels to serve for various members' identities, and thus requires users to provide names and personal information that configure profiles through predefined forms. It is noted that in such structures there is already a place-related profile section created through users' locations in cities, neighbourhoods, schools or meeting places. A more fluid and spontaneous framework comes from the relative view of space. It generates information on users through group dynamics and their exchanges within discussion forums, and some of these social activities are related to places. In the Peuplade hybrid community the software requires users to add to their profile answers to a questionnaire regarding their neighbourhood experience, which initiates an interesting (self-)reflective process. However, a phenomenological take on the information content, like visual (re)presentations of Flickr users that appeal to the intuitive knowledge, is by and large a missing feature for a holistic framework to define users' identity, and so to create 'e-places'.

To consider possibilities for future hybrid design, professionals must be aware that the nexus of places and 'e-places' may approximate a rhizome type of spatial formation. In the universe of hybrid places, quality may be defined as Lynch's 'good places' or what Oldenburg calls 'third places' (Oldenburg, 1989), which are the places to 'hang out', to relax, to socialise, and make social contact. Increasingly, citizens are using their discretionary time in 'e-places' that draw them for such activities and can be seen as 'third places', particularly appealing due to the lack of travel time or significant cost involved. One can access the third place in cyberspace, while simultaneously being in a physical location of first or second place (home or work).

Lynch's taxonomy of images may be useful in identifying the characteristics of 'e-places' as sets of cyberspace visual attributes (i.e. interface, logos, labels, text, images), but the method is not relevant for the social and temporal components that are so important in cyberspace. For that careful observations of the social life performed for cyberspace activities are needed.

In adapting Whyte's framework for analyses of cyberspace use, the authors take into consideration 'e-places' accessibility, image and comfort, uses and activities, and sociability (Whyte, 1980). Accessibility in cyberspace is directly related to the notions of 'e-edge' and 'e-path' that were analysed previously. Then an important element that affects e-places' comfort is users' visibility. One of the main attractions to cyberspace is the possibility to 'appear' only when users choose, which actually decreases the e-places' 'conviviality'. Examples of software design that encourage users to denote their presence are either building in possibilities for live chatting or revealing users' last connection time (e.g. MySpace). Moreover, the interface design is crucial, as details such as colours and images may facilitate or cause discomfort during exchanges (e.g. capital letters in comments are often interpreted as 'shouting' in cyberspace).

In terms of uses and activities there is a wide variety of possible user interactions, from encoded interactions like 'poking' (Facebook), to commenting, rating content and building interest groups. The notion of groups is a central component of social software; again the numerous possible design choices could lead to different levels of e-place making. For instance, in Flickr users are encouraged to participate in lively discussions by informing them when a new reply is posted to a certain discussion thread. Users thus invent interesting ways to use the tools provided to organise complicated voting games and contests that generate intense activity, often to the level of addiction. On the contrary in Facebook, instead of encouraging the creation of e-places on groups' pages, users' attention is drawn to their homepage 'news feed', where the news is automatically selected without any possibility for users' involvement. Only recently Facebook added the possibility for notifications on group activity and upgraded its shared 'wall' functionality to resemble somehow parallel discussion threads.

Such interface details play a role in defining the character of e-places, impacting their sociability that is mediated through the user interface. Online sociability may be determined depending on the groups' diversity (e.g. age, interest) attracted to an e-place, and further stimulated to participate in social exchanges. Within interface design, details' choices that have a significant impact on sociability are user-defined interface options such as visuals, colours and wording in welcoming messages or vision statements. Finally, configurability is an important characteristic of social software for particular local hybrid environments, which can contribute significantly in the appropriation of cyberspace.

6. Perspectives

The paper advocates planners' engagement in cyberspace design, in collaborations with software designers, for promoting public imperatives and civic values. Practitioners may employ planning knowledge on places and communities to devise

ordering principles of social interactions, and to build an understanding of cyberspace experiences by means of analogies of Lynch's and Whyte's methods for place analyses. To inform further alternatives for spatial design, rather than descriptive records, the authors suggest deriving explanatory accounts of direct or cognitive associations between virtual and physical space.

The possibility to intervene in the physical space in interaction with the evolving cyberspace situates planners in an important position to affect the future of current hybrid environments. Hybrid space development may also find guidance in Lynch's view, 'There are pleasures (and there is food for development) in puzzles, ambiguities, and mysteries. We want definable elements, rather than defined ones, complex connections, regions remaining to be explored, and some freedom to camouflage. Privacy – the ability to deny information about personal beliefs and actions – is a sensitive issue and a shield against tyranny' (Lynch, 1981, p. 143). For improving hybrid spatial experience, online communities built on top of specific geographical locations are good starting points, in which planners have the possibility to record activities, to monitor changes, and measure the achievements of community building, after revisiting the 'weak' values that Lynch identified in spatial policies.

In light of current ICT and social software evolution, planning contribution to cyberspace design can produce a synoptic framework of place making in hybrid space for deriving alternatives of future spatial design. That implies a more comprehensive understanding of 'place', and the formulation of analogies between spatial elements selected for analysis in both virtual and physical social environments. Cumulative observations of users' experience in successful online communities outline some principles that help the formulation of software design guidelines that are mindful of the hybrid environment.

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