

**Articles**

**Can Digital Mapping Re-Politicize Urban Mediation in the Indian Context?**

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**Abstract**

*This article examines the transformative potential of practices in the fields of digital mapping and DIY environmental monitoring as a means of incorporating alternative conceptualizations of urban space into official and commercial representations of cities. Using a recent media art project entitled Bangalore: Subjective Cartographies as a case-study, I argue that the political potential of digital urban mediation is shaped by an array of under theorized forces arising out of the intersection between issues of data motility and governance, soft power and livability initiatives of governments and urban planners, and the marketization of sensory, locative and media technologies more broadly. I suggest that despite the readily found celebratory accounts that accompany projects that aim to model alternative urban epistemologies, map the 'unintended' city and explicate hidden aspects of the urban environment projects like these are indicative of new and unexpected dimensions of urban politics relating to new media materiality in particular. These new dimensions result from the antagonistic nature of civic epistemologies relative to linear histories and the planned order of urban modernism and the internal tensions and transient nature of alternative spatial schematics produced through interventions made with networked digital technologies. In order to maintain and enhance the radical potential of civic-led digital mapping and environmental monitoring initiatives these dimensions demand consideration throughout their conception, planning, execution and documentation phases.*

**Introduction**

INDIAN CITIES are especially remarkable sites of urban critique for a number of reasons. Contemporary India sees itself at a stage in its development where dramatic changes are rapidly occurring through increased global economic

interdependence and the emergence of new political, economic and cultural initiatives aiming to transform urban life all with the aspirational image of Western development and livability as the desired outcomes. New corporate and governmental alliances have emerged to fill spaces left by the gradual recession of the state led modernist urban transformation that carried over as a legacy of the Nehru era. These being visible especially in the period leading up to and following the liberalization of the Indian economy in the 1990s which saw the emergence of many 'audacious schemes' such as plans for privately built towns and special economic zones, massive infrastructure projects and the empowerment of corporate actors in urban governance. Accompanying such activity are the inevitable efforts to evict squatters, cleanse the streets of hawkers and produce modern, profitable and 'secure' cities and regional centers. Yet such initiatives face overwhelming political obstacles that are characterized by a democratic framework in which the poor with their strength in numbers and the historical state rhetoric of grass-roots resistance exertions of power do enjoy some success in contesting, defending and redefining their stake in urban space, infrastructure and resources (Shatkin, 2014).

The Indian nationalist imagination had long been defined through an image of the idealism, simplicity and purity of village life. Viewed as the nation's authentic spaces they have symbolized self-determining domains free from the influence of the Western oriented sphere of international politics and industry, economics, science and technology. Subsequently 'iconized' peasant life and craft-scale production of villages ossified in *the* alternative to the nation's increasing urbanization and social movements remained skeptical of the 'monumental technology' of modern nationalism such as the industrial plant for instance (Sundaram, 2002: 125). However this sense of nationalism overlooked linkages and interdependences between villages and urban centers such as the flows of labor and capital between these loci and the long-running national initiative to educate or enlighten and bring vitality to the nation's village communities. Further it discounted the ontological complexity of the Indian urban landscape, which extends beyond the simple notion that India's cities, under British rule and in the period following partition, were sites of corruption, Western values and degenerate forms of sociality.

Contemporary urban politics in India are still marked by tensions between the egalitarianism of Gandhi era socialism and the hard-driving utilitarianism of a globalizing business and middle class; between the pluralist nature of Indian democracy and the allure of authoritarian models of urban governance and

between the modernist vision of an upward mobile middleclass and ‘the daily incursions on the planned order of the city by the poor’ (Shatkin, 2014). Further, the view of Indian urban policy administration, from within and globally, is marred by corruption and a history of infrastructure failures and industrial accidents while at the same time the nation is also fast becoming a mainstay of ‘soft power’ marked by among other things, its innovation in the technology and cultural sectors along with the mobilization of the middle class and the tech-savvy in the cultivation of vibrant ‘media cities’ (Pocha, 2003; Nye, 2004; McQuire, 2008).

Traditionally, the collision of elite-driven visions of urban change and the unyielding object of grassroots resistance plays out in numerous flare-ups and conflicts, which are by and large unresolvable. In light of this Indian cities are benchmark examples of the contestation of urban politics shifting towards the mundane, the hidden and the everyday. By default this quotidian setting frames outcomes relative to a set of indicators that fall outside the traditional economically biased or rhetorically aligned models of measuring urban sustainability, livability, resilience, creativity, innovation and so on. Despite the ambivalent place of the city in India’s political spirit, the stewardship of urban political resistance has begun to shift away from a notion of grassroots action by labor classes and the poor to more non-violent methods of civic participation using, to a great extent, networked digital technologies and soft power routes to resistance. Such efforts have been decidedly designed to capture media attention globally, increase the visibility of activism at the community level and reduce the stake, and risks, of citizen participation in movements of political resistance in order to generate an adequate critical mass. Thus the ‘extent to which agency in urban space is now exercised at the junction between electronic networks and material structures’ is contingent upon the various conflicts of interest between championing and maintaining a critical focus on how, why and for whom virtual and material, or official and personal urbanities are mediated (McQuire, 2008: 105). Here, the main site of political resistance, or representation of actors traditionally sidelined in the states pursuing of various routes to soft power and modernization lie in ‘civic epistemologies’ given the state’s coopting of the urban ‘expertise’ of economists, urban planners, scientists and business leaders (Miller, 2005).

In this article my guiding questions are: how are these urban tensions being documented and critiqued by the use of digital methods now and in the near future? How well equipped are these methods for fostering meaningful political representation? In addressing these questions I examine methodological innovation in the field of urban mediation through the work of actors who seek to

shape change through the use of new and emerging forms of representing personal subjectivities and hidden aspects of urban space. As an example of civil order, power and resistance and art, theatre and performance based 'toolkit for interrogating public space (Orum and Neal, 2010: 208-211) I examine the media art project *Bangalore: Subjective Cartographies (2010)* as a model of a citizen driven online map intended to subvert official representations of the city from within this particular frame of reference. Using the project as a point of departure I explore the scope and limitations of digital practices to challenge preconceptions of urban spatiotemporalities, material relations and subjective experiences of city life. I begin with a brief discussion of subversive forms of cartography and DIY environmental monitoring as two interrelated practices in the production of alternative 'representations of space' (Lefebvre, 1991). I then discuss the Bangalore project in detail highlighting the ways in which it draws our attention to emergent dimensions of urban polity falling outside traditional values that underpin structures of urban governance. I then discuss the tense and dialectical relationship between celebratory accounts of such projects and the material politics of the infrastructural, institutional and administrative forces that bring enable such interventions to take place. I conclude the article with a discussion of several new dimensions of urban politics play a role in the extent to which subversive forms of urban mediation may have transformative effects.

### **Critical Cartography: Explicating the Unintended City**

Maps are generally perceived as accurate representations of a space. However, maps are not only the universal texts to be found in textbooks, newspapers, public spaces, on television, in print media, and on the screens of mobile phones and touchscreen devices, maps are also texts of concealment and disclosure. The mapping of a territory, or city involves active choices in what is to be included and is to be left out. Such a marking out of urban space, its relevant infrastructures, streets and various places of interest is, as Mark Neocleous puts it, a 'systematic exercise of political violence' (2003). The mapping out of city-schema produces for the state a social order that draws heavily on 'representations of space' that are particularly aligned to a neoliberal moment of 'spatial practice' (Lefebvre, 1991). These three realms –the lived, conceived and perceived, according to Lefebvre, should be inter-connected as a matter of 'logical necessity' for city-life to make sense to the citizen-actor –the individual member of any social group. The cohesion of these three instantiations of the city, for Lefebvre, would occur only under 'favorable' conditions, upon the establishment, or re-establishing of a

common 'code' for understanding space (1991: 40). On the politics of cartography Lefebvre asks:

How many maps, in the descriptive or geographic sense, might be needed to deal exhaustively with a given space, to code and decode all its meanings and contents? It is doubtful whether a finite number can ever be given to answer this question...It is not only the codes —the map's legend, the conventional signs of the map-making and map-reading —that are liable to change but also the objects represented, the lens through which they are viewed and the scale used (1991: 86).

The violence and territorial imperative of planning out the neoliberal Indian city is both legitimated and hidden within the dogmatism of established cartographic conventions. As Elizabeth Grosz reminds us:

By *city*, I understand a complex and interactive network which links together, often in an unintegrated and de facto way, a number of disparate social activities, processes and relations, with a number of imaginary and real, projected or architectural, geographic, civic and public relations. The city brings together economic and informational flows, power networks, forms of displacement, management, and political organization, interpersonal, familial and extra-familial social relations and an aesthetic/economic organization of space and place to create a semi-permanent but ever-changing built environment or milieu (1998: 32).

In light of this, citizens confront an ontological complexity that is produced out of these relations and flows. The city, on the one hand is a site of discipline in the sense that it presents a range of normative and permissible practices and routes that must be adhered to. For instance in many of India's new shopping malls personal drivers are not granted entry, many apartment complexes have annexed areas for domestic servants to congregate, and in many cases, to reside. On the other hand, when the ordered infrastructural and social coding of the city meets the experiential reality of Indian cities as vibrant, chaotic and uniquely in their own neoliberal moment:

the city can be seen, as it were, as midway between the village and the state, sharing the interpersonal inter-relations of the village (on a neighborhood scale) and the administrative concerns of the state (hence the need for local government, the preeminence of questions of transportation, and the relativity of location) (Grosz, 1998: 32).

What we do not see on official and commercially produced mappings and documentations of cities are regarded to be non-existent, irrelevant, obsolete or

unintended. To include some or another feature of the urban infrastructure on a map is to admit it into an official representation of the city reflecting a view of the city optimized to the achieving the interests of those doing the mapping. Similarly to measure some or another aspect of city life through demographic census, or statistics on crime, traffic, pollution and so on admits it to an official and auditable record. The discoverability of items included on maps and in data has, more often than not, to do with facilitating policy administration and commerce than it does documentation and archival.

In response there has also been a long tradition of using cartographic conventions to produce maps offering alternative interpretations that ‘reveal implicit relations between power, control and spatial practice ‘ (Mogel and Bhagat, 2010: 29). An example of producing subversive maps of a city to ‘tactically’ confront expressions of power and violence inherent within traditional cartographic production in the Indian context is found in the work of the Kolkata (Calcutta) based organization, Unnayan. Formed in 1977 as a civil organization operating as a workers’ collective in support of the poor and ‘unintended’ inhabitants of the city, the group was one of several taking part in a first wave of civil initiatives in the mid 1970s attempting to draw attention to the harsh economic and social realities that marked the era. By preparing maps that documented unauthorized settlements –along the margins of drainage canals, rail lines and major roads –that existed in the city that had been omitted from official civic and commercial maps.

The maps produced by Unnayan were intended as a means to help settlers plan out improvements such as where to locate common resources, for instance water pumps. In reflecting on the organization and its work, founder Jai Sen writes:

By locating where houses were [within the settlements], relative not only to each other but also to roads canals and the rest of the already recognized and visible world, our maps also made these communities visible, whereas in official maps the areas they dwelled on were labeled ‘vacant land’. Our maps were part of a wider range of measures we took to highlight to the public how the most basic rights of such people were violated, and to help them gain their rights (Mogel and Bhagat, 2010: 14).

Alternative maps like this have played an important role in negotiating the terms – such as access to water bodies –on which communities affected by redevelopment and urbanization projects and the formal planning associated with them that went on with little or no consultation. Following the official recognition of laborer settlements (*bastis*) in the 1950s and 1960s which led to the provision of basic services a decade later, the legal recognition of government established and some

unauthorized refugee colonies and the recognition of pavement dwellers as official citizens of the city, work to map communities dwelling along the land flanking the city's infrastructure continued the process of putting bodies on maps. In reflecting on Unnayan's work Sen writes:

I realize that although we at Unnayan had definite reasons for preparing the maps that we did, we did not have a clear idea at that time of maps being used as instruments of vehicles for building power-to. Despite the fact that all other work was imbued with a politics of empowerment, we clearly had not grasped this possible potential of mapping. I would like to think that the very act of spelling this out here might be useful for others interested or involved in doing similar work (Mogel and Bhagat, 2010: 24-25).

Pre-1990s tactical mapping practices, however did present some material and epistemological constraints, Sen reflects on this, stating:

... there remain some unanswered questions –unanswered perhaps because they were never asked. After all is said and done, the maps that we at Unnayan prepared used the same vocabulary of mapping the world as those with power-over did. The techniques of representation we used were drawn from our skills as professionals trained in the formal worlds of planning and architecture. We rarely discussed or developed the maps with those whose lives and struggles we were documenting (Mogel and Bhagat, 2010: 24-25).

By the mid- to late 1990s 'tactical cartography' had emerged out of a host of divergent media practices, which were embracing themes of political empowerment and increasing accessibility and representative potential of digital media. These engagements with city-spaces attempted to bring together new forms of digital representation of information and traditional cartographic conventions. Properties such as universal numerical representation in the form of binary code afforded an unprecedented tactility over maps that allowed for the reification of spatial information in uniform formats that could be stored and retrieved by computers but also more importantly, manipulated, superimposed and altered (Manovich, 2002: 49-63). The onset of advanced telecommunications and digital media use in India delivered new impetus to the project of contesting official city cartographies. Geo-locative devices, and open source mapping platforms were by the early 2000s beginning to be ideologically linked to the project of 'value free transcriptions of the environment' (Wood and Krygier, 2009: 340).

The use of location data, GPS and other digital techniques in mapping removed the need for direct intervention and human interaction in the processes of collecting,

recording, documenting and transcribing spatial data. These techniques also provided alternative mappings of a city with a layered and real-time dimension. The process of mapping could now produce, in textual, affective and accessible form a 'heterotopic' space 'capable of juxtaposing in [the representation of] a single real place several sites that are themselves incompatible' (Foucault, 1986). A city mapped in this way involved live texts where changes over time could accumulate, a limitless number of refinements and edits be made, and various parameters drawn and redrawn to document or predict incremental change. The widespread growth and accessibility of online digital mapping tools such as MapQuest, Open Street Map or Google Maps also, importantly, laid the groundwork for such techniques of grassroots urban documentation to go mainstream and mobile, through user led initiatives which exploited mobile telecommunication, WiFi, GPS and digital imaging technologies (Hemment, 2006: 349; Jethani and Leorke, 2013). Taken together this gave digital cartography the momentum of political violence through drawing together conflicting representations of space and juxtaposing them with official mappings and the momentum of a potentially critical mass afforded by the mainstreaming of locative technologies and mapping platforms.

In the Indian context many of these techniques were enthusiastically embraced by the country's burgeoning media arts scene. The public access media center, Sarai was established in Delhi in February of 2001 as a linked yet independent program of the Centre for the Study of Developing Societies (CSDS), which was founded in 1964. Sarai was also funded with support from The Dutch Ministry of Foreign Affairs and various other Dutch and Australian foundations and partners. One of Sarai's founders, Jeebesh Bagchi describes the organization as a:

unique combination of people, practices, machines and free-floating fragments of socially available code ready for creative repurposing. Here the documentary filmmaker can engage with the urbanist, the video artist jam with the street photographer, the film theorist enter into conversation with the graphic designer and the historian play conceptual games with the hacker [sic] (Lovink, 2002: 2005).

Sarai's work aims to be deeply rooted in local cultures and among their themes of investigating ethnographies, film, language and social justice, projects that map cities are commonplace demonstrating a strong orientation to using urban mediation and explication as a mode of critique and resistance. Since its inception Sarai has achieved some success in producing key resources in the aural, textual and visual archival of contemporary Indian urban life and its projects readily attract the attention of artists, writers, activists and theorists globally.



Sarai emerged at a time when new conceptions of public participation in politics were challenging, or at least being presented as alternatives to, public square, collectivization of the masses ideas of civic engagement. Defined through a belief in collaborative practices helped along by the free and open source software movements, the breakdown between lines of media production and consumption, and the enunciation of counter-power at the level of everyday experiences of the middle-class as significant actors in urban politics the possibility of new urban epistemologies outside the intended/unintended frame of reference began to take shape as a thematic force in the contestation of urban spaces in India. In their own words Sarai worked 'at the cusp of both the interpretive and the material' to 'revisit' cities as 'post-national' landscapes (Vasudevan, 2002: vii).

The ensuing decade saw information activism play a significant role in citizen driven political movements based on visual and spatial advocacy by, and on behalf of actors ordinarily sidelined in mainstream political discourse and urban policy-making. Independently of this movement and at around the same time various experiments were also being done in a number of hacker and DIY communities to appropriate everyday electronics. One particular stream of the hacker community began to use DIY sensors, open source hardware and software to encourage community pollution monitoring, and the provision of real-time data streams for a range of environmental indicators of general pollution levels such as carbon monoxide, carbon dioxide, dust, noise, radiation and water purity (Gertz and Di Justo, 2012). Nishant Shah of the Bangalore based Centre for Internet and Society suggests that with this, there has also been a relocation of digital activism positioning it between 'the stirrup and the ground' which, is to say that these technologies have a significant role to play in urban transformation yet at the same time 'we do not have any sustainable, replicable models of technology-driven transformation despite four decades of intervention' through the appropriation of technology by activist and advocacy groups (Shah and Jansen, 2011).

Shah and Jansen go onto suggest that what is endemic to understanding digital interventions in urban politics is an urgent need to view the recalibrated relations between state and citizens through the prism of technology and agency (2011). To this end tactical mapping practices are already intersecting other hacker and maker communities who are experimenting and a range of sensory, wearable, and biometric systems and spatialising the data produced (see Kera, 2012 for an example from the Asia-Pacific). What I wish to argue in regards to this point, and for the remainder of this article, is that in order to view these relations in a way that is productive we must focus emergent and under theorized dimensions of urban mediation and technological appropriation rather than on celebratory

accounts of work already being done. In the next section I outline one art-based example of digital activism that encompasses digital mapping and DIY monitoring. I follow this with a discussion of some of the emergent dimensions of urban politics arising through such practices, and gaps in our understanding methods of urban mediation in the networked era.

### **Mapping Urban Subjectivities and Latencies in Bangalore**

*Bangalore: Subjective Cartographies (2009)* was a project conducted by French artists Benjamin Cadon and Ewen Chardonnet as a workshop with students at the Sristi School of Art, Design and Technology in November and December of 2009 and exhibited later in 'Mutations III: Photography and Networks' during the European month of photography presented in major galleries in Berlin, Rome, Bratislava, Paris and Luxembourg. It used the simple online cartographic tool, Metamap ([metamap.fr](http://metamap.fr)), which allowed users to add content such as text, images, video, audio, and location tags to digital maps. The workshop participants were instructed to use an ethnographic, transverse geographic, historical and thematic approaches to collect, interpret and map their own data reflecting certain 'subjectivities' of the everyday urban experience of the city.

The project's goal was to produce an online collaborative map to produce narrative documentary works that organized various materials constituting a 'new thematic sight one or several maps allow[ing] any web user to easily "watch" [the map] in geo-localized mode'. By modeling a citizen-driven effort to produce a catalog, inventory and archive that subverted official and commercial cartographic representations of the city, the works produced by the participants attempted to demonstrate the extent to which a rapidly developing, postcolonial city 'is comprised of spaces of superimposition and locations where overlapping meanings have existed over time' (Jethani and Leorke, 2013).

In suggesting how such mapping interventions can contribute to urban politics the artists' statement reads:

Each device that enriches our perception for the possible action on the real is worth of attention. Even if it means the use of subjective method, that may not be considered "evidence". However, we must admit that any subjective investigation, when used systematically and in parallel with the results of technical measures could lead to new possibilities of knowledge ([emop-mutations.net/index,2.html](http://emop-mutations.net/index,2.html)).

An important characteristic of the commentary that a mapping project like this makes is that any questioning of the contemporary state of civic services such as

the water supply, modes of public instruction and way-finding or the possible directions for future urbanization must reflect on the diarchy of power between British officials and Indian legislators which occurred during British rule. As a result, many Indian cities still function as dual territories where the flows of bodies and commodities performed a circulatory exchange between localized enclaves that each specifically caters to a specific type of good and the centralized and heterogeneous arrangement of trade in British built areas (Hoselitz, 1961: 423-433).

Of the many themes that were covered in this mapping of Bangalore – such as the changing aesthetics of street signage, archiving family collections of Super 8 footage from the 1940s and 1950s and others – I will focus on two themes in particular which draw heavily on the technical affordances of online mapping platforms, hacked DIY instrumentation and experimental techniques of data visualization and sonification. Firstly, I discuss two contributions to the project that investigated the impact of electromagnetic radiation on citizens' everyday lives. Electromagnetism as a subject of urban politics has significance given that it forms the medium and material of communication between people in the city yet it may not be directly perceived. The artists, and workshop participants aimed to use the invisibility of electromagnetic radiation to explore the relational complexities of communication technologies and their impact on human behavior and subjectivity. In doing so they hoped to explore alternatives to state commercial communications infrastructures and to draw attention to the latent environmental and health impacts of electromagnetism using experimental sensing instruments such as homemade electromagnetic field meters.

Bangalore is an appropriate site for such an investigation given the rapid and recent development of its communications infrastructure. Since the first television sets appeared in the average domestic setting at some point in the early 1980s, the media, telecommunications and their affiliated industries flourished swiftly and by the mid-1990s the city had its first Internet Service Provider (ISP) which had previously served corporate clients exclusively offering dial-up services to domestic customers. Today, it is referred to as the 'IT [Information Technology] city' and has one of the highest concentrations of Internet connections in India.

The maps *Electromagnetic City* and *Signal to Noise* looked at the city's sources of electromagnetic radiation, primarily by placing location coordinates of mobile phone towers onto a digital map of the city, then ethnographically investigating the various narratives present in everyday citizens' concerns about issues such as the proximity of their homes to this infrastructure, issues around mobile phone signal strength at various locations in the city and the belief that the increasing intensity

of electromagnetic radiation being emanated from televisions, mobile phones, WiFi, computer screens and so on were interfering with the meditative practices of the city's ancient sages (*sadhus*) (Jethani, 2011). Interview footage of citizens discussing these various concerns was incorporated into the map which was then distorted using Pure Data, a real time programming software package for processing audio, visual and graphical input to distort the audiovisual quality of the interviews in proportion to the fidelity of mobile phone signal at the location where the footage was captured. Moving beyond the subjective artistic merit of a work like this what it does demonstrate is how a certain aspect of a city's communication infrastructure can be mediated and given spatial significance relative to the material forces that govern urban planning, resource allocation, property values and other measures of livability.

Street food is a marker of not only a city's liveliness and diversity but also of its general cleanliness, and standards of quality control and regulation of food services. Concerns about microbial contamination of ready-to-eat food and beverages dispensed by the numerous street vendors and hawkers working in the city are thus a major health concern for the state, locals and tourists. Street snacks such as the cheap, readily available and hugely popular *chaat*, *panipuri* and *bhelpuri*, which are consumed by a massive population throughout Indian cities on a daily basis. Sold at most public places and in specialized, often makeshift roadside shops with dusty conditions and heavy vehicle traffic, vendors also readily make use of objects such as wheelbarrows, improvised storage containers, mats, trays and utensils (Das et al., 2010). The quick handling and cleaning practices relating to the 'on the go' dispensing and consumption of such foods has been linked to outbreaks of disease caused by *E. coli*, *Salmonella* and *Shigella* contamination.

In the maps *Microbial Streets* and *Water Use and Reuse* the water sources of various street food vendors were traced with the aim of mapping street vendor movement throughout the city in relation to various water supply sources. Samples from vendors were analyzed using simple microscopes constructed from hacked webcams and the resulting data was converted into audio, again using the Pure Data software, so that users could visualize flows of goods from producer to consumer and 'listen' to the extent of contamination in the offerings of various vendors.

## Critical Perspectives

Alexander Galloway, aptly articulates the problem with political transformation and digital mapping based projects such as the one that is described in this article. In regards to the unprecedented ability of representation afforded in digital mapping platforms in an age of information and data saturation where not much is un-representable he sates 'lack of light will blind representation, but excess of light will dazzle it. Across this canyon lies the antinomy of the material' (2011).

Thus, a critical approach to projects like the one discussed in this article raises several considerations for how we might assess the potential of digital mapping and DIY sensory devices as tools for transforming paradigms of urban dwelling. First, to what extent does the historical context of Bangalore, and by extension Indian cities more generally shape the scope and resulting outcomes of mapping projects that incorporate other data sources and media into the production of alternative representations of space? Would a project like the one conducted in Bangalore produce its intended outcomes in a different setting, perhaps one with a different relationship to networked and digital technologies for instance?

Accordingly, the extent to which alternative maps produced on digital platforms might be successful in their production of counter hegemonic sites of urban critique cannot be divorced from its physical landscape, built environment and civic, communications, technological, legal and regulatory infrastructures that underscore its urban fabric. Tactical strategies aimed at subverting representations of city space cannot start with 'Western-style avant-garde attacks on the old [forms and means of representing the city] to pose a new elitist counter culture' (Sundaram, 2002: 129). Tactical interventions like the project conducted in Bangalore need to look deeper into the endemic everyday media practices of publics as opposed to porting them in through various channels of artistic practice and tactics used in other parts of the world. An enmeshing of old and new media practices and literacies along with a device oriented, temporal approach to urban mediation will be particularly important for work like this conducted in India, especially given that the literacy levels will remain to be low and thus traditional, simplistic means of spatial knowledge production and dissemination should not be discounted as a means of mobilizing large constituencies.

Secondly, the technological and industrial development of the various tools and platforms that are used in developing the various configurations of instruments, software platforms and means of archival and storage dictates how we view the critical value of digital counter-mapping and DIY environmental data

overlays in extracting new perspectives out of established cartographic schemata and data visualization methods. A real-world application of the type of project proposed in *Bangalore: Subjective Cartographies* would rely heavily on mapping platform data, satellite, telecommunications and computing resources and the policies of vendors such as Google and Apple's App Store for instance. This impacts the perceived legitimacy and radical potential of data and tactical media-based interventions by virtue of the mainstreaming and absorption back into the existing power structures of traditional mapping practices combined with the business models of various data vendors.

Thirdly, given that projects that call on citizen involvement need to enable sufficient rates of participation, often achieved by using accessible technologies such as smartphones and other off the shelf systems as the basis for their work. Software, device obsolescence and data legacy concerns are rarely taken into account in the conception, design, performance and exhibition of critical mapping projects by artists or activist groups. This inevitability, given that projects cannot continue forever, is a natural part of any attempt to map a city or document city life thus projects are largely accessible through the means by which they have been captured and archived on websites, gallery catalogues, news articles and in some cases in academic discourse. Essentially, just like the static maps they try to critique digital mapping projects over time become increasingly difficult to preserve in a form that gives credence to their original essence of 'live' texts. Website servers will close down, data will be corrupted, forums will go quiet and those who initiate and contribute will eventually move on. Further, and more problematically, the technologies that these projects employed – the numerous Personal Digital Assistants (PDAs), mobile phones and software applications – gradually become obsolete and outmoded. Not only that, but they have been replaced by increasingly more sophisticated and standardized platforms: technologies like the PDA, traditional cell phones and the custom-made tools of early hacker and DIY activism are far less commonplace today as devices like the iPhone and Android become more and more ingrained with the lay-practices of mediating and navigating the city. These also become convenient tools for the large scale mapping of urban geographies and the production of significantly large geographic information systems. Any potential for translation beyond the initial 'moment(s)' captured by a digital mapping project is likely to be contingent on a sustained effort on the part of participants and other interested parties to maintain legacy content in the form of documents, images, video, websites, books, articles, instructions and computer programming code which would allow for updating, migrating and revisiting the work for only a short amount of time. These efforts to

preserve often come too late and need to be integrated into the design of such works from their outset.

Finally, works that incorporate data from various contributors, sources and equipment rely on a seamless interoperability between activist and citizen projects, across media formats, collection, visualization and interpretation methods, units of measure and moreover, the agendas motivating their production which are likely to control the degree to which citizen generated spatial information can be juxtaposed with conventions for officially produced –and what is to be regarded useful –data produced outside these non-professional initiatives –the cornerstones of decision making at the policy level.

## **Conclusion**

This article has identified a number of methodological gaps facing the application of digital mapping and DIY environmental sensing initiatives as a means of generating better understandings of the urban environment. While the traditional ideology of revealing the hidden aspects of the city, and the explication of the various hegemonic processes that impact citizens as a result begins to fade, and as representation becomes less of a challenge due to advances in digital technology combined with the ingenuity of communities and individuals engaged in urban interventions, a new set of concerns emerge. In this sense contemporary, and future, urban politics contain new and in many ways unexpected dimensions relating to processes of mediation, sensing, and locative technology appropriation *and* assimilation back into the structures that regulate and administer their use. In addition issues of data production, ownership, storage, motility and governance associated with their use are becoming equally as important as intervention based on thematic, bio-political explication. It is here that work already occurring in the fields of materialist media studies including ‘media archaeology’ (Kitler et al., 1999, Zielinski, 2006, Parikka, 2012) should be continued, and continue to be related to questions of urban mediation in localized contexts. Without a deeper more nuanced understanding of the materiality of digital forms of urban mediation, and in particular their dialectics of ‘counter’ and ‘soft’ power the transformative potential of digitally produced civic epistemologies is likely to remain only partially understood.

## Biography

Suneel Jethani is a PhD candidate and lecturer in the media and communications program in the school of culture and communication at the University of Melbourne. Suneel has an undergraduate degree in genetics and postgraduate qualifications in both marketing and media and communications. He returned to doctoral study after having spent eight years working in the academic publishing and documentary film production industries. His current research looks at technologies that assist perception and track activity with a focus on their relationship to politics of space, time and body in the network epoch. His broader research interests include: critical disabilities studies, locative media, sensory studies, science and technology studies, philosophy of body and new media art. Suneel is currently a co-editor of *Platform: Journal of Media and Communications* and has published work in *M/C Journal* and *The International Communication Gazette*.

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