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**Bringing the internet down to earth: emerging spaces of locative
media**

Bringing the internet down to earth: emerging spaces of locative media

One of the most important developments in recent new media is geography: with many mobile phones and cameras now equipped with geographical positioning systems (GPS), what is often referred to as locative media is ‘bringing the internet down to earth.’ The internet was earlier heralded as “the death of geography” with predictions that with anyone able to access information from anywhere, geography would no longer matter (for example Cairncross 1998), and would dissolve into a placeless, global “space of flows” (Castells 1989). And to some extent this was true: internet collaborations, social groupings, and content largely clustered around communities of interest rather than people’s geographical locations (Hamilton 2009). But locative media is changing this. “Locative media” generally refers to location-based and/or location-aware technologies, and is often sited within the broader category of ‘ubiquitous computing’, which itself is variously termed “pervasive, invisible, embedded, physical, environmental, and ambient” technology (McCullough 2006, 26). Locative media as a category comprises a wide range of applications, from personal navigation systems, to user-led “geotagging” of online content with geographical coordinates, to commercial location-based services which push advertising material to people based on those people’s physical location. Locative media as it is used here relies on the convergence of wireless internet, GPS, and internet and GPS-enabled mobile phones. Mobile location-based services are one of the fastest-growing segments of the mobile internet market (AIMIA 2009, 70). Townsend of the Institute for the Future claims that locative media is emerging as “the third great wave of modern digital technology” (2006). As locative media grow in importance and visibility, it is important that their specificities are understood.

The significant rise in mobile technologies is having a dramatic impact, not only on the way we communicate with one another, but also on how we interact with our surrounding environment. The very notion of “space” is being reconceptualised with developments such as locative media now adding layers and depths to understandings of geography. The emphasis has shifted away from the global to focus instead upon the “spatially localised, and centred on the individual user; a collaborative cartography of space and mind, places and the connections between them” (Tuters & Varnelis 2006, 357). The academic study of locative media has been fragmented across a variety of disciplines, while outside academia, those engaging with locative media are equally diverse: advertisers are interested in the marketing applications, artists are focusing on the creative opportunities it presents, and cartographers concentrate on how GPS is reshaping the landscape around us. It is difficult to conduct literature searches into this area as the field of study, despite being relatively new, is so diverse that it has generated a plethora of different terminologies and descriptions. There is a need for a common language so that locative media scholars, developers, and users can communicate clearly with each other. Similarly, “locative media” is often seen as a homogenous phenomenon, when in fact it is a category comprising a dynamic variety of applications, types, and spaces. This article therefore provides a taxonomy, a synthetic overview of the types of locative media—and the geographies arising from them--now emerging as a direct result of these developments. Such a taxonomy is necessary not only to clarify communication about locative media, but also to identify for users, scholars, developers, and policy-makers the specific contours and affordances of the different types of locative media, as well as the issues associated with them.

Our analysis of the literature currently available on this topic indicates that there currently exist five main categories of locative media: social annotative, gaming, navigational, commercial annotative, and location-based services. In addition to various sub-categories, it is quite common for particular locative media to sit within several of these categories. The literature also tends to segregate commercial location-based services, which provide services or advertising based on the user's location, from user-generated social applications of locative media, which allow multiple users to participate in creating site-specific content. Confusingly, the latter is sometimes referred to as "locative media" (Tuters 2004; Margerison 2005), while at other times (Nova 2004)—including in this article—"locative media" is used to refer to the entire spectrum of location-specific and/or aware technologies, including both social and commercial. Crawford and Goggin refer what this article calls "locative media" as "the geomobile web" (2009); Lake et al term it "the geoweb" (2004); O'Reilly calls it "Where 2.0" (2008, 1); and Zook and Graham coin the term "DigiPlace" to describe locative media (2007). Taxonomical uncertainty in the field of locative media thus emerges not only from the rapid development of the technologies involved, and the variety of academic disciplinary approaches to it, but also from deeply ideological debates and concerns about what locative media should and should not be.

Annotative

Annotative locative media allow users to add or access layers of information to certain locations or sites. Just as textual metatags allow users to add descriptive data to online content, locative media annotative metatags—generally shorthanded as geotags—add geographical data to content. What differentiates geotags from textual metadata is the capacity of ubiquitous wireless internet to anchor the tagged content to actual physical spaces. The geographically significant power of locative media is that it does more than just add geographical data to content; it adds that content to physical geography itself. In Schmitt et al's summary, annotative locative media involves "amplifying physical places with information so that, for instance, users utilizing mobile devices with location technologies, can retrieve additional information related to their current locations. This includes stories, photos, videos, historical accounts, or even location-based ads and listings for nearby shopping, dining, entertainment, and business outlets" (2006). Annotative locative media can be divided into two subsets: social and commercial.

Social annotative

One of the early applications of social annotative locative media was the 2003-7 "Urban Tapestry" project in the United Kingdom. This artistic experiment combined the internet with mobile technologies and geographic information systems to allow people to "'author' the environment around them" (Proboscis 2008). In this project, users could upload stories, images, and audio and video files which were geotagged, or connected to specific geographical locations. As a user moved through the city, other users' geotagged content appeared on her/his mobile phone, depending on her/his location. Townsend refers to this form of annotative locative media as "bottom-up" (2006); Nova calls it "location annotation" (2004); Tuters and Varnelis term it "virtually tagging the world" (2006, 359), while McCullough describes it as "public-access urban markup language" (2006). A variety of early social annotative locative media applications emerged from the art community, often, as with Urban Tapestries, from artists working in partnership with commercial telcos and

government geographical data departments. Weight identifies a connection between locative media and graffiti, and states that “many locative projects using the mobile phone have taken inspiration from graffiti cultures” (2008, 6). One such project is the Graffiti Research Lab’s L.A.S.E.R geotagging system which enables artists to temporarily tag various locations digitally, thus partially overcoming “problems derived from permanently marking public space” (Weight 2008, 6). [murmur], similarly, is described by Wershler (2008, 405) as being “an archival audio project that collects and curates stories set in cities around the globe”. Users can ‘tag’ certain locations with personal information or historical details that others can then access via a unique telephone number and code displayed at each tagged site. Artists have been quick to take up the affordances of locative media, particularly the space-authoring capabilities of social annotative locative media. Paul (2008) concludes that mobile devices are now changing the public landscape “into a canvas” onto which artists can now project their thoughts and visions.

Many scholars and media activists argue that annotative locative media has the potential to create entirely new geographies out of existing ones; that, for example, the ability to access multiple users’ stories, images, and experiences transforms anonymous urban spaces into dynamic, lived (LeFebvre 1991) ones. With users able to annotate spaces on their own, Tuters argues that “a new type of public space [is] made available through mobile technologies,” a form of “open-source architecture” which lies beyond the reach of urban planners and authorities (2004). Lane similarly observes that annotative locative media allow “ordinary citizens [to] embed social knowledge in the new landscape of the city” (in Sant 2004), in effect creating a new space jostling with stories and meanings. In what is generally recognised as one of the foundational texts of social annotative locative media, the 1999 “Headmap Manifesto,” Russell stated emphatically the radical democratising potential of locative media: “what was once the sole preserve of builders, architects and engineers falls into the hands of everyone: the ability to shape and organize the real world and real space” (1999, 4). Sanders similarly observes that “everyone will have the ability to shape and organize the real world and real space...geography will get really interesting” (2008, 179). The capacity of locative media to open up the creation of geographical meaning is, indeed, exciting. In its opening up of geographical meaning-making affordances to ‘the public’ (at least those with the technology and technological literacy required) it resembles the impact of Wikipedia on knowledge-creation (Crampton 2009). To return to LeFebvre’s concept of space as comprised of physical, legal and official, and lived spaces, locative media allows the dynamic space of the lived—generally ephemeral and unrecorded, and uninscribed on the landscape—to emerge, permanent, legible, and available. Social annotative locative media, as Townsend writes, “offer powerful ways to let groups write alternative classifications of places and objects” (2006, 347).

Commercial annotative

This ability to annotate certain locations with audio or visual content is also of substantial interest to advertisers and other commercial groups. Annotative locative media, to these groups, is a development with “enormous unharvested business opportunities” (in Tuters and Vernelis 2006, 358). They are hoping that this technology will enable them to send advertisements or promotional material to consumers on a one-to-one basis through their mobile phones, based on customers’ physical locations. As Watson et al. (2004, 35) state:

“While e-commerce and the Internet have suggested that location is irrelevant, suddenly location matters again.” Commercial annotative locative media—which is sometimes broadly called “location-based services”—can work in two ways. One, as individuals pass certain geographic points, a message will be sent to their phones informing them of promotional deals and sales available at particular stores in a nearby radius. This is called a “triggered location-based service” (D’Roza & Bilchev 2003, 20). Two, users can access information about specific products or services available in the vicinity: Margerison refers to this type of application as “thing-finders” (2005); D’Roza and Bilchev term them “user-request based” (2003, 20) locative media; and Dao et al term them location-based “concierge services” (2002). For example, *GoCart* allows users to scan a product’s barcode with their phone, and then to receive a list of comparative pricings from other local stores; the mapping feature provides users with a map to find the local store with the best price. As Kolivos and Kuperman explain, locative-based mobile phone advertising “has huge potential reach due to the very personal and intimate nature of the devices and high targeting possibilities” (2008, 36). The difference between social, bottom-up annotative locative media and commercial locative media relates, in some ways, to the difference between web 1.0 and web 2.0. For example, social annotative locative media allows users to contribute their own content to space, as in web 2.0. Commercial annotative locative media however, is often more of a straightforward one-way ‘push’ approach, as in web 1.0. Commercial annotative locative media certainly still allows space to be inscribed with additional meanings, images, and ideas, but these are created by authorised commercial content-producers rather than by “the mob” (Rheingold 2003). Business models involve either charging end users for a subscription, or charging listed companies/services for inclusion on the map. While location-based advertising is an obvious application of commercial annotative locative media, it is not, at present, its only use. Tourism bodies and museums are making use of annotative locative media to tag locations with “additional information that elaborates or explains something already present” (Hemment 2006, 351), unobtrusively enriching cultural sites with additional informational meaning.

Commercial annotative locative media, like social annotative locative media, has the capacity to alter geography, add meanings to it, and change people’s experiences of a given space. It is around the space-changing potential of social versus commercial locative media that the most heated ideological debates have emerged. For some social annotative locative media exponents, the key affordance of locative media is its ability to allow for anarchic re-inscriptions of space. In the UK, for example, where most geographical data is held by government departments (Tuters and Varnelis 2006, 358), social annotative locative media proponents see locative media as a means to overturn state control of geographical data ownership and authorship. This group tend to argue that commercial annotative locative media should not be allowed into the category “locative media” at all, claiming that only social annotative locative media should be afforded the title (Hamilton 2009, Russell 1999, Broekmann in Tuters and Varnelis 2006, 360). Townsend simply states that “bottom-up approaches...are superior on a variety of levels [to commercial approaches]: ideologically, socially, and economically” (2006, 346), while Lovink complains that commercial annotative locative media have diluted the radical potential of locative media into “a shopping-driven locative spectacle” (in Tuters and Varnelis 2006, 360). As Tuters and Varnelis observe, locative media is “the Next Big Thing to some and a capitalist apocalypse to others” (2006, 361).

It is not the purpose of this article to make judgmental pronouncements as to which locative media are “good” and which are “bad.” But these debates point out areas for policy and scholarly scrutiny. Annotative locative media will unsettle current distinctions between public and private space (Tuters 2004, 2): the once-private spaces of buildings, for example, can be overwritten by, and opened up to, the permanent, legible, inscriptions of “the mob.” One’s own house could be geotagged by others. Similarly, spaces considered public—the street, for example—become sites in which the spectrum can be infused with commercial content and messages. Many commentators have expressed concern about the privacy implications of locative media (for example Ku et al 2008). While some worry about the potential governmental “authoritarian abuse” of locative media, McCullough is more concerned about the distribution of users’ locational information to numerous commercial operators: “before raising the usual Orwellian red flag,” he notes, “consider how much more likely than Big Brother are ten thousand pesky ‘little brothers’” (2006, 27). What happens when one’s location becomes a commercialisable property? Who has access to the commercial databases on which one’s geographical history is stored (Ku et al 2008)? Will locative media become, as Holmes argues, an invidious “imperial” penetration of US military-owned surveillance technology—GPS—into huge numbers of users’ daily lives (2004)? If individual users walk on the same street, with each experiencing entirely different geographies—depending on the locative media applications to which one subscribes, has a sense of ‘public space’ been eroded (see Zukin 1991)? How can privacy regulations be applied when the very concept of private/public space is in flux (Kolivos & Kuperman 2008, 36)? Tuters cautions that enthusiasm about the geography-democratising potential of social annotative locative media fails to take into account that fact that, unlike the internet, “the vast majority of the spectrum of mobile connectivity belongs to corporations, who also have controlling interests in the delivery systems (both at the level of hardware and software” (2004). The emerging geography of locative media, he observes, is more of a “walled garden” than an open “locative commons” (2004). Locative media might thus increase privatised space, rather than diminishing it. As locative media diversifies and becomes further embedded in geographies, such ethical, legal, and policy questions will need to be considered.

Navigational locative media

By far the most prominent current application of commercial locative media is navigation. Users can use their internet- and GPS-enabled phones to call up dynamic maps of where they are at a given moment. This service parallels the explosion in GPS location devices for cars. In 2007, both Nokia and Motorola launched GPS-enabled handsets with downloadable maps (Ogg 2007), with Nokia paying US\$8.1 billion to buy electronic map data company Navteq (Crawford & Goggin 2009, 8). This price signals the emerging commercial importance of locative media. But not all navigational locative media content is strictly commercially-authored. Navigational locative media can be a category in which social annotative and commercial spatial data interpenetrate. Authoring geographical data is expensive for companies: they must employ people to drive in specially-equipped vehicles along the streets of places they wish to map (O’Reilly 2008), or purchase data from government or private Geographical Information System (GIS) agencies. At the same time as commercial navigational locative media services work to build and update their proprietary geographical datasets, user-generated navigational content is appearing through social navigational applications such as *Breadcrumbz* and *Pocket Journey*, in which users upload maps of their own routes, often accompanied by photos, and overlay these on Google Maps.

OpenStreetMap, similarly, allows users to contribute their own road, trail, and land maps, becoming a “Wikipedia for roads” (O’Reilly 2008, 7). Creating ways for user-generated navigational content to be integrated into commercial applications is a logical next step for many companies; this step, however, raises significant issues about ownership of user-generated content and user labour (see for example Banks & Humphreys 2008), and thus about the ‘ownership’ and control of geographical space. Commercial providers of geodata also raise concerns about the validity and safety of user-generated navigational content; as ESRI’s (a GIS company) CEO Jack Dangermond notes of user-generated maps, “who wants to dig a hole and run into a pipe?” (in Hall 2007). The ramifications of combining user-generated navigational locative media with commercial navigational locative media thus raise several significant questions, not only about the ownership and authorship of space, but also about the ethics and safety of collaborative mapping.

Location-based services

Location-based services are a related commercial development, combining annotation with navigational affordances of locative media. For example, the location-based service *cab4me* uses the phone’s GPS to allow users to order a taxi: with a single click it automatically contacts the nearest taxi company so that the user does not have to look up its phone number, informs the taxi company of the user’s location, and informs the user as to the taxi’s location as it approaches.

Location-based gaming

Location-based gaming comprises the second broad category of locative media. Location-based games utilise players’ geographical positions to enable users to engage with and compete against other players in real life. For instance, the *BotFighters* platform notifies users by phone when another player is nearby. The players must then locate and “shoot” at each other by sending text messages. Similarly, *Uncle Roy* and *Can You See Me Now?* are based upon players reporting their own positions “either explicitly by declaring their position to Uncle Roy or implicitly by their PDA sending information about which area of the map they were looking at to remote online players” (Nova 2004, 7). However, according to Polson & Morgan (2007, 1), location-based games allow people to not only play with other users but also with the city itself, evoking “at once playful and culturally meaningful experiences of place”. The authors thereby highlight the potential for mobile phones to “act as tools for creative engagement and production” (Polson & Morgan 2007, 1). Sotamaa similarly notes the capacity of location-based gaming to “bring[] new nuances and levels to the production of urban space. If the mobile gaming ideal is to free players from the chains of time and place, location-based gaming on the contrary operates through creating new meanings to familiar locations” (2002, 42). Designers of the location-based game *City Slikkers*, under development, state that the purpose of the game itself is to alter geographies: “the players in action form packs, hordes, and gangs. They contrast with the institutionalized and organized space and give it spontaneity and dynamics...Secret societies which, metaphorically of course, are about to take over the private and public urban space...the outcome of the actions as well as the new connections made between people, will affect normal life as the everyday city is no longer the same due to the players’ experience” (*CitySlikkers*). As with annotative locative media, then, location-based gaming has the potential to alter the geographies of the city.

It also empowers users to “co-construct” their surroundings through collaborative interaction. De Lange (2009) drew upon the Dutch location-based gaming system called Blinn to demonstrate how places can be inscribed through “ongoing mobilities and social processes in ‘hybrid space’”. People can transmit their position in real time to the Blinn receiver. They are then able to take photographs with their mobile phones and attach tags and descriptions to add layers to their physical location. In doing so, users are able to “create a myriad of dynamic micro-narratives” (De Lange 2009). It is also through such mobile gaming applications that we are now seeing what Hjorth (2007, 375) describes as the development of “unofficial imaging communities that will impact on official imagined communities and transnational synergies”. Hjorth explains that the way people interact with mobile technologies and mediated spaces is highly dependent on the notion of the ‘local’, with various cultures and communities using the technology very differently. Location-based games thus have the potential to amplify the local specificity of particular geographical spaces, countering fears that locative media will detach users from their local environment by “substitut[ing] an abstract ‘connectedness’ for any real engagement with people ... in their own locale” (in Tuterts & Varnelis 2006, 360). Yet location-based gaming is not uniformly celebrated; as Sotamaa notes, locative games may be inadequately referenced to local specificities, and may thus lead users into areas in which they may experience some degree of danger (2002). Whether location-based gaming augments or ignores local geographical specificities is thus a key matter for games designers and gamers to consider.

Conclusion

The geoweb (Lake 2004) is such a new concept that to date, critical discourse has treated it as a somewhat homogenous spatial formation. In order to counter this, and in order to demonstrate the dynamic complexity of the emerging spaces of the geoweb, the article has provided a topography of different types of locative media space, including: the social annotative, in which individual users geotag specific physical sites with their own content and meanings; the commercial annotative, in which companies geotag specific physical sites with commercial content and meanings; location-based services, which provide users with information about proximate businesses or services; the navigational; and gaming, in which physical spaces are transformed into game worlds. The central tenet of cultural geography is that places are culturally-constructed, comprised of the physical space itself, culturally-influenced perceptions of that space, and people’s experiences of the space (LeFebvre 1991). As this overview article has demonstrated, locative media is already transforming cultural geographies; this transformation is going to accelerate. In order to be able to develop policies to regulate the new spaces generated by locative media, it is first necessary to understand the nature of these emergent spaces themselves, and to establish a common language with which to discuss them. “The social and cultural implications of these geomobile technologies...” as Crawford and Goggin correctly observe, “are all something that needs close study and debate, and public attention” (2009). Understanding the emerging geographies of locative media is a key part of that critical process.

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