

Locative Media as a Tool for Landscape Interpretation

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1 Introduction

New media in its various forms, including social networking, virtual reality, augmented or mixed reality, wikis, dynamic data, online communities and geo-tagging among others, have now been in use for more than a decade. While these various forms of new media hold tremendous opportunities for application to the interpretation of natural and cultural landscapes to the public, those with particular promise are applications that link informational content to specific physical locations. These falls into two types: locative media and augmented reality.

The term locative media was coined in the late 90's, as an application of geo-tagging focused on creating an understanding of the landscape of cities and communities (2012b). By connecting location-specific information about the history, meaning, characteristics and/or social culture via a mobile device (cell-phone and later GPS enabled devices), locative media was intended to make an urban environment more understandable. In its simplest form, locative media refers to the virtual portal, often a web site, and its geo-tagged content. Early applications were primarily visual arts projects (NOVA, 2004; Townsend, 2006) that engaged people in exploring and understanding their communities through the connection between artistic content and location. However, the potential for landscape and site interpretation, particularly in urban areas, was recognized by the early 2000's and projects and various software applications have proliferated since that time.

More recently, augmented reality, an alternate form of new media that also links content to location has also been promoted for its potential application to the visualization of landscapes (GRAHAM et al., 2012). Developed as a concept in the early 1990's, augmented reality differs from locative media in it's inclusion of the „real world“ in the image displayed on the mobile device (STEUER, 1992). Augmented reality creates an image of a real site, often with Google street view, that is overlain with other images or floating tags – bubbles, arrows, etc., - that can be clicked to engage additional content about the feature. Although this may seem a minor distinction between augmented reality and locative media, the use and potential application of augmented reality for public information purposes has only recently become mainstream with the development of smart phone apps and augmented reality eye wear by Google and others (METZ, 2012), moving the application of the technology beyond bulky head and body wear that were the hallmarks of earlier gaming applications. However, both the technology and available software has developed very quickly in the past few years. Currently a number of software applications are available for smart phone applications (2013a), including open source software such as ARToolkit (2012a) to end-to-end branded apps such as Junaio (METAIO, 2013), WIKITUDE (2013b; Wikitude GmbH, 2013) and Layar (LAYAR, 2013).

Whether as locative media or augmented reality, by delivering content directly to a hand-held, GPS-enabled device, the downloaded content of these public information projects has the potential to create a user experience that is self-directed, has low infrastructure costs, and has minimal impact on the urban, cultural or natural landscape. Several key books, reports and journal articles have reviewed the use of multi-media projects in heritage (MARINOU, 2006), including interactive projects (AFFLECK & KVAN, 2008), games (CHAMPION, 2008) and digital visualization (JESSOP, 2008), and reviewed the opportunities and constraints of new media's applications to heritage resources (BRIZARD et al.; KALAY et al., 2008). However, the use and potential impacts of this technology, particularly with respect to diffuse resources such as heritage corridors and cultural landscapes, has yet to be fully explored. Landscape interpretation, particularly cultural landscapes which are difficult to make understandable to the public, show particular promise for this technology. Given the potential that this tool holds, a review of its applications is overdue. This paper reviews a series of twenty-one projects around the world, analysing the strengths, weaknesses, and hurdles to implementation of this developing technology.

2 Methods and Approach of the Study

2.1 Global Overview

A comprehensive web search was conducted to identify existing locative media and augmented reality projects implemented around the world. A total of twenty-one projects were found in a web search using the key words "locative media," "augmented reality" and "geo-tagging." Projects were limited to those that were specifically related to landscape heritage applications, linked content to a specific site location and conveyed heritage information to a physical or virtual visitor in a variety of formats. Information was gathered for each project on the number of physical sites included, date launched, technology used, and advertising of the site. Although an attempt was made to collect information from the developers of the sites about the number of website visitors and information downloads, data was only obtained for three of the websites.

The twenty-one locative media sites reviewed are detailed in Table 1. Eight countries are reflected in this review, covering the USA, Canada, Brazil, Ireland, Scotland, Norway, Australia, and the Czech Republic. Although these are the sites discovered during the web search, there are likely many more applications of this technology across the globe. While the "locative media" and augmented reality" webpages in Wikipedia provided a good location to start, and an organizational blog lists some additional locative media sites (primarily arts-focused) (Adam, n. d.) there is no central clearinghouse for these sites, nor an organization or conference that deals regularly with these applications of new media.

The identification of sites was also hampered by the fact that the technology has changed very quickly. One example of early technology was Mscape, developed by Hewlett Packard in 2002 under the name Mobile Bristol. Originally developed as a mobile media gaming platform, its use was expanded to include information delivery and was previewed at the 3GSM Conference in Barcelona in 2007 (HEWLETT PACKARD, 2007). The application was used at several sites including the Gulbenkian Gardens in Lisbon, a walk from the Royal Meridien Hotel to the Peoples Park in Shanghai, the Tower of London, and

a walk through the Yosemite Valley (WIKIPEDIA, 2013). However the technology and software was discontinued sometime between 2010 and 2013 and all of the websites developed on this platform are currently unavailable. The Mscape technology has been replaced by other applications such as ARToolkit, Junaio, Layar, and Wikitude as the leading augmented reality applications. Although primarily developed for business applications, they are also currently supported for the delivery of general information. Specialized apps for these software programs have been developed for iPhone, Android, and Blackberry hardware, and are used on four of the sites reviewed. Barring the use of augmented reality, the state of technology has developed to the point that no specialized apps are necessary to deliver various types of information (video, audio, text) to cell phones and other GPS enabled hardware from a stand-alone website enabled by QR codes or GPS location.

2.2 Community Case Studies

The implementation of projects in the field was explored at four case study sites: Nove Hradý, Czech Republic (DOHAJE, 2012c); Chinatown (MURMUR, 2012) and Fraser Street in Vancouver, BC, (KLASSEN et al., 2012) and St. Helena Island, South Carolina (BRABEC, 2013). All four sites focused on providing historic and cultural information to visitors. Of these four projects, two used QR codes as the delivery system (Nove Hradý, Fraser Street, Vancouver) one relied on phone access to recorded stories (Vancouver Chinatown), and the fourth relied on direct download from a mobile website (St. Helena Island). Each case study site was evaluated based on ease of access/visibility of the signage, ease of access to the material, intrusiveness in the community and the publicity of the project.

3 Findings

While a total of 21 projects were discovered in the web search, six of those had been discontinued and were no longer functional leaving 15 projects to be fully reviewed in the study. These 15 projects had been developed between 2003 (Murmur Toronto) and the most recent five in 2012: Fraser Street Stories, Gullah Land and Community, Gloucester Harbor Walk, TXFile City, and Renaissance East Midlands.

3.1 Technology

As noted earlier, technology in this field has been changing rapidly over the past decade. The earliest projects were developed by the Murmur group, and relied on cell phone access to a phone number listed on signage in the city. The phone accessed audio recordings that the visitor could listen to while viewing the location where the story occurred. This application had, and continues to have, the virtue of being simple to implement, and inexpensive for both the user and the project developer. It does not require specialized smart phones, nor GPS or data access, a virtue felt particularly by visitors who face data roaming charges on their smartphones. The Murmur group has continued use this technology in its most recent project for the Textile Museum of Canada in Toronto, along with a specialized app for smart phones.

	Site Name	Location	Country	year started	# of sites	technology	format	content	associated sites/ social media	active
1	Murmur	Toronto	Canada	2003	173	Signage; phone number	audio	history	Website	yes
2	Murmur	Vancouver	Canada	2003	14	Signage; phone number	audio	history	none	no
3	Murmur City of Greater Sudbury	Sudbury	Canada	nd	7	Signage; phone number	audio	history	Website	yes
4	Murmur Kenora	Kenora	Canada	nd	16	Signage; phone number	audio	history	website; geocaching; map download	yes
5	Murmur Orange	Orange, New Jersey	USA	nd	20	Signage; phone number	audio	history	Website	yes
6	Murmur San Jose	San Jose	USA	nd	15	Signage; phone number	audio	history	Website	yes
7	Scape the hood	Mission District, San Francisco	USA	2005	10+	HP IPAQ Pocket PCs and GPS receivers	audio	history and culture	YouTube; Flickr	no
8	Murmur Sao Paulo	Sao Paulo	Brazil	2007	19	Signage; phone number	audio	history	none	no
9	Murmur Dublin	Dublin	Ireland	2007	36	Signage; phone number	audio	history	Website; brochure	no
10	Murmur Galway	Galway	Scotland	nd	14	Signage; phone number	audio	history	Website; brochure	yes
11	Murmur Edinburgh	Edinburgh	Scotland	2007	24	Signage; phone number	audio	history	Website	no
12	Mississippi Blues Trail	Mississippi; Chicago; Los Angeles; Memphis; Tallahassee; Rockland, ME; Helena, AK; Ferriday, LA; Notodden, Norway.	USA; Norway	2007	156	Website; smartphone apps; physical markers at sites	text and photos, 16 videos	Blues history	Website; Facebook; Wikipedia; Geocaching; Google Map	yes
13	dohaje.cz	throughout	Czech Republic	2007	2,500	website; signage with Tagg QR codes	text and photos	nature and history	Website; Facebook, Twitter	yes
14	Echo	Atlanta	USA	2008		unknown	audio	personal stories	none	no
15	Connecting Identities	Geelong	Australia	2008	65	website download; signage	video and audio	nature and history	Website	yes
16	Black History mobile	Washington, DC; Baltimore; Boston; Charleston; Chicago; Cleveland; New Orleans; Philadelphia; Phoenix; Richmond, VA.	USA	2008	10	Layar app ; Iphone app	text	history	Website, YouTube	yes
17	Fraser Street Stories	Vancouver	Canada	2012	10	website; signage; QR codes	text and photos/PDF	history	Website; downloadable map; Flickr; Facebook; Twitter; Google Map	yes
18	Gullah Land and Community	St. Helena Island, South Carolina	USA	2012	9	Website download	videos, text, photos	history and culture	Website; Facebook; Vimeo; Google Map; YouTube	yes
19	Gloucester Harbor Walk	Gloucester, MA	USA	2012	41	website; phone app; signage; QR codes	videos and stories	history	Website; Facebook; Twitter; YouTube; downloadable map	yes
20	Txtile City	Toronto	Canada	2012	67	signage; phone number; smartphone app	audio and video	history	Website; YouTube	yes
21	Renaissance East Midlands	East Midlands	United Kingdom	2012	65+	smartphone app; QR codes	text; video	historic and cultural	Website; Google Maps	yes

Table 1: An overview of the 21 projects identified. Fifteen of the projects are currently active; six were either intended as limited-term installations, or have been discontinued and are indicated with grey shading in the table.

Table 1 – URLs:

1 – murmur.toronto.ca; 2 – murmur.vancouver.ca; 3 – Sudbury.murmur.info;
 4 – murmur.kenora.ca; 5 – murmur.orange.com; 6 – Sanjose.murmur.info;
 7 – no URL available; 8 – Saopaulo.murmur.info; 9 – no URL available;
 10 – galway.murmur.info; 11 – Edinburgh.murmur.info; 12 – msbluestrail.org;
 13 – dohaje.cz; 14 – echoatlanta.com; 15 – geelongcity.vic.gov.au/connectingidentities/;
 16 – hillretha.wix.com/blackhistorymobile; 17 – fraserstreetstories.com;
 18 – gullahcommunity.org; 19 – ghwalk.org; 20 – txtilecity.ca; 21 – mpedia.org

Projects implemented since 2007 all utilize GPS and data access on smart phones, whether through the use of QRcodes, or a specialized smartphone app that links content with GPS phone location (figure 1). These configurations enable the use of both image and video streaming as part of the information delivery. Six of the projects – four of the most recent created in 2012 – use videos to deliver information. This has the advantage of being more engaging to an audience that grew up on YouTube, and also allows the delivery of information that cannot be delivered on a physical – and static – signboard.

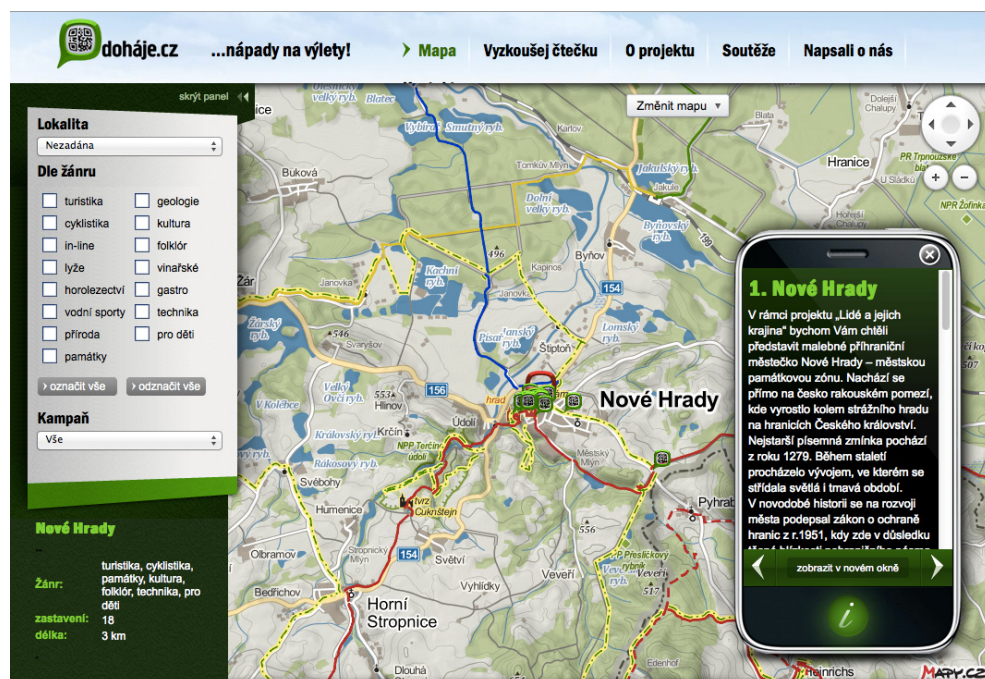


Fig. 1: Screenshot of the website of the interactive map of sites in Nove Hradky, along with an image of site data on a cell phone screen. This is the most developed website of the group surveyed, allowing a visitor to create a customized tour from among the over 2500 locations listed.

3.2 Virtual Presence

Diversity in the web presence of each project was an important factor in their accessibility, and also their accessibility to potential visitors. Generally the projects that had the highest number of associated web (e.g. YouTube, Google Maps, Wikipedia, Geocaching) and social media presence (e.g. Facebook, Twitter, Flickr) were the easiest to identify for this study. The accessibility necessary to find these sites should also translate into higher visitor numbers, although the information collected was insufficient to complete this analysis. Although web count data for the sites is incomplete at this time, the most heavily networked sites also had the most linked articles, and showed high and escalating web counts where that information was available (e.g. the Mississippi Blues Trail). The [murmur] Toronto project, the longest site in existence in this study, showed an increase over time in online articles that discussed or linked to the site (figure 2). Whether it is the online presence that drives the publicity, or the online presence is merely a part of a robust advertising and outreach campaign is an important question for future research. However, the use of social networking seems to have potential: the Mississippi Blues Trail had the most developed Facebook page (set up in March, 2009) and has 11,735 likes (Mississippi Blues Trail, 2009). In comparison, [murmur] Toronto does not have a Facebook presence.

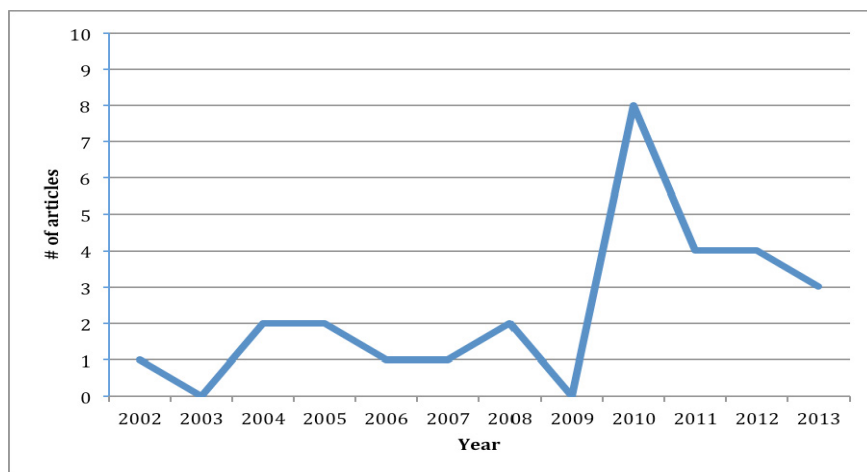


Fig. 2: The number of online articles per year referencing or linking to the [murmur] Toronto website between 2003 and 2013

3.3 Physical Presence in the Community Case Studies

The review of the four case study sites resulted in several significant findings for future project development. Key among the findings are an analysis of the potential to create a user experience that is self-directed, has low infrastructure costs, and has minimal impact on the urban, cultural or natural landscape.

The projects all offer the flexibility to the visitor, to access one, several or all of the information/story locations that are part of the project. The Czech project in particular provides the ability to search for and create a map of locations on their website, along a

particular route or with a particular focus. Many of the recent projects, particularly those that use smartphone apps in conjunction with data that is pre-downloaded, provide the ability to access information based either on GPS location or through the use of QR codes. This is a strength in those areas where cell coverage is spotty or expensive.

All of the projects reviewed displayed a consistent logo and color format. However, even though the signage was well designed, placement in the field often resulted in a lack of visibility. Unless located at points of high pedestrian traffic, such as a bus stop, bus shelter or community signboard, project signage was uniformly difficult to locate on site. Particularly when signs were located with a proliferation of other municipal or directional signage, project signage tended to become invisible in the urban environment.

In many instances, the information conveyed by the mobile application was duplicative of the information on the physical sign. Merely repeating the text information located on the sign did not add value to the project, leaving project visitors with little incentive for downloading content. While text downloads can be easily read on a smart phone, it was clear that this was a less preferred method of information delivery: observed site visitors tired of reading very quickly, while their engagement with audio, photo or video content was more lengthy.

Few conflicts between user access to the project locations and private property owners were observed during site visits, underscoring the lack of intrusiveness of this type of landscape interpretation. However, the locations where these conflicts occurred were those where site visitors did not perceive private property boundaries. To avoid these conflicts, clear instructions should be given within the downloaded content, in addition to careful placement of signage to direct visitors away from private spaces.

4 Conclusions

While the technology holds promise for the interpretation of landscapes and their cultural, heritage and ecological resources, there are several significant issues in its implementation. Careful placement of site locations and signage, along with clear instructions for the boundaries of private property are essential in minimizing potential conflicts and privacy issues. The marketing and onsite visibility of projects must be addressed in multiple venues including extensive, on-going social and traditional media campaigns. Finally, the locations for signage and downloads must be carefully chosen to limit intrusion into private space, particularly in the urban environment. Signage that is set or directs the viewer to a private yard or garden runs the risk of unintentionally inviting visitors into private property. Finally, to engage the visitor, the downloads must have an added value for the viewer to what can be gained from onsite signage, and offer access to the community through video, voice or photographs.

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