Our cities are traditionally mapped by their monuments and architecture, street-signs and roads, canals and waterways.

Yet what defines the city; our understanding of its flows, its pulse and beat?

Who are the authors of its composite facade.

Given half a chance, many people would like to leave their mark on the city. To author in some way ~whether that means leaving notes for friends, devising their own walking tours, developing in-situ information resources, or any one of dozens of other possibilities.

Traditionally an elite of architects and planners have monopolised the superstructure of the city, with the monuments and thoroughfares that form the enduring picture of London, Paris or any other city.

A counter-tradition of writers, artists and thinkers has offered different urban realities and redefined notions of urban space, attempting to expand authorship of the city - but these have mostly been top down approaches for educated, literate populations.

Delve deeper and we find an alternative authorship: a cartography of informal landmarks.

Far from the monuments, boulevards and fashionable districts, life leaves its mark on the built environment that rarely fits tidy planning categories.

Graffiti and flyposting inscribe the facade of the city.

Over time places become known not just by their municipal names, but through the informal names given them by communities.

These places, these landmarks are more than a set of co-ordinates –

they are layers of unwritten stories and memories of daily life. We hear about them through word of mouth and by chance encounter.

Few of these efforts leave a persistent or visible impression on the city.

Yet all these factors reveal the desire to enhance our geographies of the city.

Urban Tapestries explores what can happen when people are invited to annotate the city with stories and experiences of specific places;

and how tools can be designed to make sharing them the central relationship to create a common tapestry of urban experience.

This path towards enhancing urban geography involves designing ways to enable contributions to a new layer of the city from a broad section of the population.

A site for people to be co-creators of their own environment through toolsets and skillsets that broaden their capabilities as actors, agents and authors, not merely consumers of a culture created by others. Developing this sense of personal agency revolves around our changing perception of citizenship and its role in how we construct our identity.

The communications revolution has shifted perceptions of space and territory so that we are no longer defined, or our horizons limited, by nineteenth century notions of nationhood and belonging.

For centuries people have been developing new ways to communicate and share knowledge,

but these have traditionally been bound by landscapes and physical objects.

As wireless and mobile technologies seep out beyond physical boundaries, our expectations are of high tech communications responding smoothly to our needs, context and location...

The reality is somewhat different.

The confluence of mobility and geographic systems unlocks new dimensions for communications and reflects changes not only in our perceptions of private and public space, but our behaviours too.

Commercial services that attempt to build on these systems remain shackled by a traditional broadcast model that casts people as consumers of content served to them by networks and media corporations.

Everyday life is richer and more complex than this, thriving on social networks, personal experiences and chance interactions.

The kinds of information about our environments that we need and desire on an everyday basis are far more likely to come from our friends, neighbours and colleagues than from large corporations or the media.

Urban Tapestries is an experimental software platform, yet it is driven not by technology but by trying to understand why people might use these mobile and pervasive, context and place-aware technologies; and what they might do with them in mundane everyday settings.

Combining mobile and internet technologies with geographic information systems it enables people to author, map and share their knowledge, weaving their experiences into the tissue of the environment.

Urban Tapestries might be used to embed local history;

or as a creative platform for artists;

for sharing and swapping resources within local communities;

or by activists and residents groups to create instant, geographically-specific campaigns around local issues such as housing and pollution,

or by friends to create pathways and treasure hunts.

Like a tapestry, each person's experiences are woven into the fabric of the city as 'threads', each one binding together and making whole the rich mix of day to day life.

Urban Tapestries offers a model of playful experimentation for how society can question and understand how we can be social beings in a networked world.

As 21st century communications evolve, the Urban Tapestries vision of grassroots knowledge mapping and sharing

is a reminder that people are not just consumers - but that they are actors, agents and authors of their own experiences.
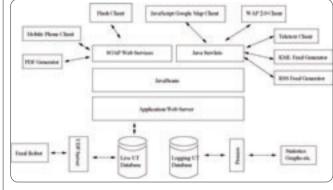
Urban Tapestries Version 2
from public authoring prototype to public knowledge commons

As part of the Social Tapestries research programme Proboscis undertook to redesign and rebuild the original Urban Tapestries prototype to provide a stable and extensible platform for projects in actual communities, with participants engaging as part of their everyday lives. In summer 2006 we are introducing the new system – initially to communities with whom we are already collaborating and, later in the year, more widely to the general public. Our aim is to continue to stimulate innovative uses of spatial annotation and its relation to culture and society, by demonstrating what can be achieved by public authoring in real-life settings. Our community collaborators include a primary school, a local residents' organisation, a short-life housing co-op, two government departments and members of the local community around London Fields, Hackney.

Redesigning the System

After the first prototype implementation, the system was completely redesigned and implemented from scratch, aiming to produce a modular and extensible architecture that would allow future requirements and extensions to be handled quickly and simply. As part of this effort it was decided to migrate the system service implementation from XML-RPC to SOAP, migrate from MySQL 3.x to PostgreSQL 8.0.1 database system and use various other state-of-the-

art web application frameworks as part of adopting a more flexible and standardized approach.

The first prototype was confined to a subset of the ideal public authoring functions which the team defined in the initial project phase; additional requirements and refinements also emerged from the public trials and demonstrations held in 2003 and 2004. The new system has extended and partially redesigned the existing database schema to accommodate a larger set of functions and refinements and has adopted a completely different approach to system logging. This has been migrated from flat files to a new dedicated database schema which offers the ability to process the logs to extract plots and graphs of system use for users and administrators alike. Furthermore, a lot of the functionality, previously implemented in client side or as a part of the other system components, has now been integrated on the server-side making extensive use of database stored procedures and triggers.

Public Authoring

Public authoring is the term used by Proboscis to describe the mapping and sharing of knowledge, information, memories, stories and experiences. We contrast the concept of a publicly authored knowledge and experience commons to the traditional way in which information is passed from a centre to the margins – the broadcast model of newspapers, television and radio. Public authoring offers an alternative to the passivity and narrow focus of consumerism. It presents a new opportunity for people to be agents, actors or authors in the world of communications and knowledge sharing. Urban Tapestries enables people to describe and share *relationships* structured around place.

Proboscis has proposed four guiding 'principles' of public authoring:
- it should be cooperative not hierarchical, based on sharing knowledge in the public domain;
- it is about co-creation by everyone not just consumption of 'professionally' produced content;
- it should be organic and accretive, but not static so that some material might decay and be forgotten, just as other memories and stories persist;
- it is about people, not systems – a trigger for social encounters across time, place and cultural barriers.

A Pocket is a Place

A 'pocket' in Urban Tapestries is the relationship a person make to a geographic place, and which can be filled with text (including HTML tags), audio, images and video clips. The original UT prototype could only create single point pockets (much like sticking a pin into a map), but we have enabled the new system to support multi-point, or polygonal, pockets. Now it is possible to mark off a whole area, such as a building or a stretch of street or a specific feature in the landscape (for instance a pond, fountain or tree).

Three types of pocket can thus be created: *points*, *lines* and *clusters*. What this enables is more complex relationships to places to be articulated, bringing in concepts like *time* and *duration* to the mapping of experiences, as well as knowledge and more basic information that might otherwise be simply represented as points in space.

Future Developments

Our vision for public authoring far outstrips our limited resources for building and developing the UT platform. The following are some of the interfaces we are currently devising for future versions:

UT Pocket Postcards & Thread Posters
Proboscis' DIFFUSION Generator will be integrated with UT to create PDF files of individual pockets for printing onto commercially-available postcard format sheets. The Generator will also create PDFs of individual threads to print out as A3 or A4 posters.

UT Print on Demand Publications
Books remain a key human communication format – sharing the knowledge stored in UT by enabling users to create print on demand books (via external services such as Lulu.com) is a major goal for our vison of public authoring.

Location-Based Audio/Video Streaming
A 'podcasting' extension to the RSS Feeds gathering audio/video files specific to a defined geographic area and streaming them to mobiles and low power FM radio for community radio or TV.

UT Teletext Interface
A simple interface to access local UT content using the interactive text capabilities of existing analogue and digital television.

External Web Service Inputs
Enabling the insertion of dynamic data from external systems and sites (such as BBC Backstage, OpenGuides or Boundless).

Peer-to-Peer Architecture
Proboscis believes that the future of public authoring technologies lies in peer-to-peer hosting. As the network effect of distributed communications is felt through the massive sharing of knowledge and experiences, so too should its architecture mirror the messy and heterogeneous nature of everyday life.

Personal BioSensor & Embedded Device Networks
Interfaces are being developed for embedded devices (such as static environmental sensors) and Personal BioSensors (measuring individual health data) to upload data to UT, juxtaposing human sentient knowledge with machine data.

UT Flash Client

The Flash UT Client provides an easy to use map-based interactive interface to the Urban Tapestries system. Macromedia Flash provides an important capability missing from HTML and the web document model: vector graphics. Flash is used to draw the thread lines and pockets and give the user the ability to interact with them. Zooming and panning is easy with vector graphics, and there is no loss of quality as maps are zoomed in and out. It is relatively easy to compute the transforms backwards and forwards between screen vector space and coordinate systems (such as OSGB and Longitude/Latitude).

Flash communicates with the remote UT server using XML, performing reads and writes via the web service interface (SOAP). Flash displays raster images and streams audio and video files, adding multimedia capabilities in the UT Client.

The UT Client uses Google Satellite imagery tiles to provide a backdrop to the Urban Tapestries map with 16 levels of zoom. Each tile is referenced by a 'keyhole string' (which can be computed from the long/lat) and is used to request the tile from Google's map server. Once the tiles are displayed on the UT Client screen, threads and pocket vector graphics are drawn over the top.

UT Mobile Client

The mobile client is designed to take full advantage of the Urban Tapestries platform. Users can upload their own maps to the mobile phone's external memory, or choose to stream them via Google Maps for Mobile. Users can select either their own location or another place and get the map of the area on the phone's screen where they can create, edit and delete pockets and threads. Pockets can be associated with video, audio and pictures created on the phone itself – these can be stored locally or uploaded to the Urban Tapestries server. Specific pockets and threads can be downloaded, along with the media associated with them, and stored locally for offline browsing.

The technologies used for the mobile client have been chosen in order to support as many devices as possible. The platform selected is Java 2 Micro Edition (J2ME) for its ubiquity across modern mobile phones, the security it provides and the variety of Java packages available. The packages used in the UT client are the PDA profile (JSR75) for the connectivity with the external media, the mobile media API (JSR135) for video and audio, recording and playback, the location API (JSR179) for identifying user location and the Web Services API (JSR172) for accessing web services.

UT AJAX Client

The AJAX web client for Urban Tapestries is designed to extend the the geographical scope and public accessibility of the platform. Using a dynamic mapping representation, the web interface makes it possible to browse or edit Urban Tapestries pockets and threads from anywhere with internet access. The interface was implemented using a combination of AJAX (Asynchronous JavaScript and XML) and the Google Maps API, making it possible to add pockets or threads to any global location covered by Google Maps.

The Google Maps API offers developers a way to create 'mash-ups' between Google Maps and content determined by the developer. The API provides commands for reading and writing content to a database, enabling the content of the site to be updated dynamically. Using this API the pockets and threads of Urban Tapestries are called on by the AJAX commands and overlaid onto an instance of Google Maps as geographically-situated markers which can then be edited and added to by visitors to the website. For viewers and authors of Urban Tapestries the Google Maps interface provides the ability to drag and scroll the map and a choice of fifteen zoom levels at which to view information. Switching between satellite map, graphical map and a hybrid view increases the range of ways in which to look at the geographical representation of pockets and threads.

UT Sensors Interface

The UT Sensor Interface is an extension to the UT AJAX Client. Again using the Google Maps API, the Sensor Interface associates sensor data collected from devices such as the Feral Robots with other contextual knowledge drawn from Urban Tapestries pockets and threads. The selected subset of pockets and threads have been tagged by their authors with the word 'environment' and are represented as markers on the map alongside markers visualising data produced by the sensors for that map location.

The Feral Robots generate a reading every two seconds, creating a detailed analysis of the environmental conditions in their vicinity. This is, in fact, too detailed to represent on the web interface since displaying so many markers significantly slows the performance of Google Maps. A work-around for UT disregards every other reading, leaving sensor readings at a time interval of 4 seconds. Given the scale of the map and the distance covered by the robot in this timeframe, this is sufficient information to enable the interface to produce a dense visualisation of the sensor readings on the map.

Each sensor reading is represented as a marker, differentiated from other Urban Tapestries pocket markers by colour and symbol. The colours indicate sensor values and, when viewed as a cluster, the density of markers illustrates the environmental conditions across that space, represented by the position and colour of the individual markers.
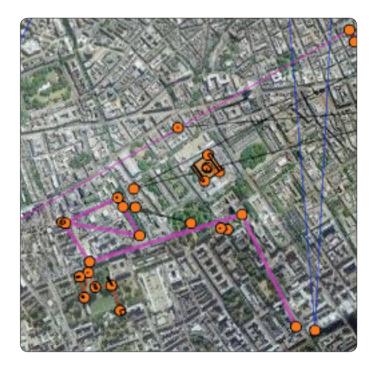

UT RSS Feeds & KML Generator

As part of the set of innovations adopted in Urban Tapestries version 2.0 we have developed new and alternative ways of viewing the stored data. The RSS feed generator of version 1.0 has been further extended with the ability for each user to customise and personalise the generated RSS feeds by a combination of location, threads, tags and authors.

In addition the ability to generate Google Earth-compatible KML feeds describing a set of pockets and threads has been enabled, using a similar approach to the RSS feeds. These can be imported, viewed and shared directly in Google Earth. Future system extensions propose to offer the opportunity for users to manipulate KML files in Google Earth and then upload them back to the UT system where the updates are committed to the database.

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http://urbantapestries.net/