Communicating city histories
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New developments in electronic communications have the capacity to transform the ways in which people gain access to archaeological and historical information. Several projects are already under way, which aim to disseminate urban history to the public in London and other European cities.

One of the most active and interesting areas of research by historians and archaeologists is the history of cities. New discoveries are constantly being made, and yet people interested in cities, including many of us as cultural tourists, have to rely for information mainly on commercial guidebooks and the like. Such information is often inaccurate, and, however recent the publication, some of it is inevitably out of date. It can even be positively misleading.

The capabilities of information and communications technology (ICT) may now allow us to overcome these deficiencies. Rather than continue to rely on publishers and travel writers to re-work historical knowledge and deliver it at second hand, could the new technologies be used to take the results of scholarly research (as well as other material such as images from museums) and deliver it direct to the public in ways that they will find attractive, useful and interesting?

Digital technologies have several advantages. First, the whole process of printing and distributing physical books is cut out. Secondly, more diverse audiences can be served, by tailoring the content delivered to a person to his or her particular interests – a process sometimes referred to as narrowcasting, as opposed to broadcasting. Thirdly, information can more easily be kept up to date (given the continuing commitment of the researchers). Fourthly, information can be delivered in many different formats: for desktop use, through to high-speed networks; for home users; and, significantly, to people on the move in the cities themselves, via the variety of handheld and wireless devices that are now becoming available and are, in effect, electronic guidebooks. These advantages have the potential to link, as never before, researchers with those who would like to know about their discoveries. This possibility is of great interest to archaeologists and historians, and also to technologists, who would like to see their innovations applied in such a worthwhile way.

A group of historians and computer scientists have recently jointly developed, with a commercial e-publisher (electronic publisher), a proposal for a system, referred to as e-CITIES, that it is hoped will attract funding in due course.[1] The concept is generic: it could be implemented for any city, anywhere, although it was developed initially for European cities, including London – in particular, part of the historic City of London.

Components of e-CITIES

The e-CITIES system is shown in Figure 1; there are four major components:

- Content: historians and archaeologists creating information, images and other data.
- Repositories: the means of storing the data in permanent data repositories.
- Distribution: the means of distributing the information using telephony and Internet technologies.
- Publication and distribution: the delivery of information to users via a range of desktop and handheld devices.

The foundations for the required systems and technologies are relatively well established. Standards and guidelines have already been developed by means of large-scale content-creation projects, such as those recently funded by the UK Lottery New Opportunities Fund for museums, libraries and archives. Digital-data repositories are already operated to international standards on behalf of the UK universities' Joint Information Systems Committee, for example by the Arts and Humanities Data Service. The technologies for distribution and delivery are the innovative challenge, as this is one of the fastest developing areas of new technology. Also, the requirements for managing and sustaining a comprehensive information system on historic cities would be considerable.

Considering first the generation of content for e-CITIES, it can be said that many scholars working on urban history already use electronic tools to generate and store research data and information. There is also a wealth of material in libraries, archives and museums that could be drawn upon. The kinds of data and information generated by urban historians that would be used in e-CITIES include:

- Digitized maps: to be used as a means of navigating the city and providing links to information on historical or cultural places, interactively connected to brief accounts of the places held in digital gazetteers.
- Scanned images and texts linked to those places: historic photographs, manuscript illuminations, paintings, drawings and other material from cultural collections.
- Interpretive texts provided by both archaeologists and historians.
- Virtual-reality and 3-D reconstructions based on historical data.
- Video and sound recordings, derived from sources such as the UK National Sound Archive.
- Biographical information on historical people connected with the places.
- Material contributed by the users of e-CITIES.

For London, for example, where there is an active group of urban historians in the Centre for Metropolitan History of the University of London Institute of Historical Research, early Ordnance Survey maps are already being digitized (they are not subject to copyright). The Centre for Advanced Spatial Analysis (CASA) at UCL also has a project to develop virtual-reality representations of some London streets based on historical data.[2]

Before an e-CITIES system could be implemented, several other technologies would need to be developed:

- An information model of the content of an historic city, defining the basic elements of information relating to it.
- A generic model of content databases associated with digitized geographical information compiled to form a knowledge repository of the city's history and topography.[3]
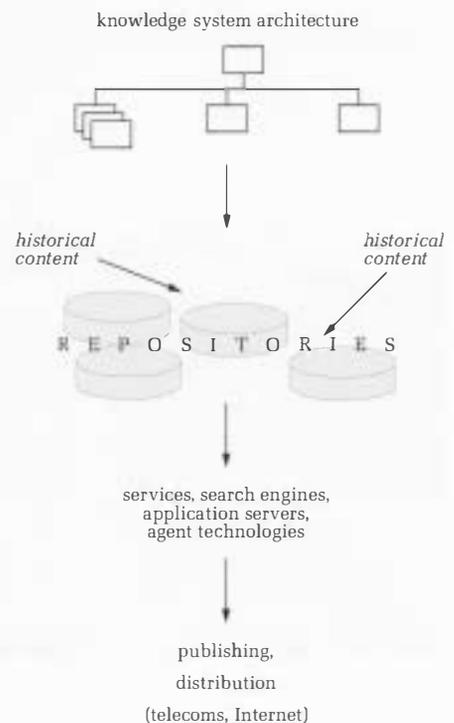

Figure 1 *Diagram showing the main components of e-CITIES, starting with the knowledge system architecture that determines the organization of the electronic information, allowing for input to permanent repositories, data processing on demand via Web services and search engines, and finally delivery to users through a variety of devices (derived from a diagram drawn by Nikolas Mitrou of the National Technical University of Athens, 2002).*

Figure 2 *Engraving of Cheapside and the church of St Mary le Bow, c. 1700, with the comment "Cheapside is a very stately spacious Street, adorned with lofty Buildings, well inhabited by Goldsmiths, Linen-drapers, Haberdashers, and other great dealers." (from William Maitland's* The history and survey of London from its foundation to the present time, *vol. 2, p. 1136 (London: Osborne & Shipton, 1756).*

institutions, and also those researching for their own interest and enjoyment, would benefit from the tools and information provided by e-CITIES. Historians themselves would be able to contribute to and build on e-CITIES information, and there could be tools for the general public to use and possibly contribute to e-CITIES information, and general users might be able to interact with and contribute to e-CITIES.

It is easy to imagine how e-CITIES information could be used. Researchers wishing to gain up-to-date knowledge of the history of a city would use their desktop computers. Using interactive maps of the city at various stages of its development, they would be able to click on an area or building, such as Cheapside in the City of London with the church of St Mary le Bow (Figs 2, 3), to discover what was currently known about it. Someone planning a visit might want the same information. In addition, they would be able to link via the maps to find convenient practical facilities such as the location of the railway station or of major museums. A lecturer or teacher would be able to collect a portfolio of electronic e-CITIES information for use in lectures, seminars or classes.

These uses are relatively familiar and static. A particular feature of e-CITIES would be its availability to people out and about in the city itself. It should be possible for the user to stand in a street and access information about that location, via their PDA (personal digital assistant) or mobile telephone, such as text about buildings and their uses, images of it in the past, and even historical soundscapes. Other potentially useful information would be the location of nearby cafés and shops, also linked to the e-CITIES interfaces. There might be deals with telecommunications companies to provide income for the development of e-CITIES systems, and commercial publishers would be able to make

Figure 3 *Cheapside with the church of St Mary le Bow, 2004. Cheapside is still a busy street close to the financial heart of London; businesses have shifted from retail and merchandizing to finance, with shops and cafés serving the many people who work nearby; only buildings such as St Mary le Bow could be said to adorn the street today.*

- Software to make complex virtual-reality and 3-D representations of cities available via desktop computers.
- Translation technologies to make the content available in several European (or other) languages.

The dissemination and exploitation of the content of the e-CITIES system would also need to be developed. Marketing studies would have to be undertaken and copyright negotiated. If the content were to be made available for payment, the repositories would need to provide for this.

Users and uses

The primary e-CITIES users would be all those interested in the history and culture of cities. Researchers within academic

more detailed information available to users who were prepared to pay for it.

The state of the art

The challenge is to develop and implement the entire process of knowledge management, from drawing on scholarly research data to provide information of general interest to the dissemination of it to users through a framework based on geographical context and precise location. Although many of the technologies exist or are being developed in some form (especially via projects funded through research programmes of the European Commission), they have not yet been implemented in an integrated manner and applied to city histories.

For some cities (such as Bologna and Pisa in Italy) research findings have already been represented in virtual reality and 3-D, allowing a dynamic appreciation of their development over time, with virtual walkthroughs of each city.[4] The CASA project to make virtual-reality representations of historic streets in London has already been mentioned. The Museum of London's LAARC Online (London Archaeological Archive and Research Centre Online) system is another example of information that already exists, although it would need to be configured and augmented for popular use.

Two relevant European projects are ARCHEOGUIDE and IMAGE. ARCHEOGUIDE is developing a local-information system for the Classical archaeological site at Olympia in Greece.[5] The information delivered includes that which might be found in a good guidebook – textual information, supplementary images and site plans – but using personalized technologies to select content according to the user's profile and what they have already accessed. Information and images are delivered to users via a choice of hardware platforms to be rented on site: either a small handheld PDA or a mobile unit that consists of a wearable computer and a head-mounted display similar to a pair of binoculars. Both types of device are also location- and direction-sensitive by means of electronic compasses and GPS (global positioning system) technology. The PDAs can display limited text and images, but the mobile units can display a virtual-reality re-creation of the structures of the site in their correct perspectives and alignments. Events such as foot races can be depicted in the racetrack where they used to take place. The ARCHEOGUIDE project is still being developed, so it is too soon to know whether the technology will work adequately, although reports are optimistic. However, this project requires a great deal of communications infrastructure, designed and installed specifically for Olympia, whereas e-CITIES would use generic channels of communication.

A project that is using generic technologies is IMAGE.[6] It uses both wireless and telephony networks to provide tourists or business visitors with information on services, shops or transport that is location-sensitive. For example, it could provide users with information about nearby restaurants. The IMAGE system is now being tried out in Tampere (Finland) and Turin (Italy). In Canada a project funded by the National Research Council is using virtual-reality software to enable history students to test out their assumptions about sets of historical data or information by making 3-D reconstructions of buildings or even streets.[7] Other successful 3-D or virtual-reality projects include Virtual Egypt, developed by UCL's Petrie Museum of Egyptian Archaeology in collaboration with CASA.[8]

Other fast-developing aspects of mobile technology that are not only applicable to urban history are the portable computers and the corresponding wireless networks for which the computers are designed. The availability of this hardware and software is driven by and drives the growth of portable devices that can connect with the Internet anywhere without the need for cables. In the UK, continental Europe and elsewhere there are frequent reports of providers planning or implementing wireless networks in cities, such as British Telecom in Starbucks and Costa Coffee cafés.[9]

Conclusion

It would be sad if city tourists could use their brand new electronic guides only to find out when the next bus is due or when the next football match is going to start. A ready audience undoubtedly exists for information relating to city history, as does much of the technology. The concept of e-CITIES has aroused a great deal of interest, especially among historians and archaeologists, who would like the knowledge they generate to be more widely accessible.

The idea also responds to European priorities and strategies. It arose in the context of the European Commission's Sixth Framework research programme, in which culture is seen as one of Europe's core assets, a key to diversity and identity within the European Union. ICT is now the EU's second most important economic sector.[10] Using technology with digitized cultural materials to explain and explore city histories is not just an attractive option for Europe. For example, historians of New York have already expressed interest in the idea, and in Afghanistan UNESCO is facilitating Internet access via satellite for an enthusiastic local population. Given the will and the means, the new technology could be applied in any urban context in the world and could deliver to city dwellers the results of archaeological and historical research.

Notes

1. The principal contributors to the e-CITIES concept are Nikolas Mitrou (National Technical University in Athens), Derek Keene (Institute of Historical Research, University of London), and Sheila Anderson (UK Arts and Humanities Data Service), as well as the author of this article. Urban historians interested in using e-CITIES include those in London, Dublin, Bologna, Pisa, and Toru (Poland), all members of the *Commission Internationale pour l'Histoire des Villes*. Manolis Koutlis of Talent SA in Athens and Michael Schnaider of the Zentrum für Graphische Daten Verarbeitung in Darmstadt have contributed proposals for technology, and Adam Hodgkin of Xrefer in London has represented electronic publishing.
2. This project is being undertaken by a doctoral research student, Melina Giannakis, supervised by Michael Batty, the director of CASA, and Derek Keene of the University of London Institute of Historical Research.
3. The generic model for repositories for historical information and other data would be developed from the UK Arts and Humanities Data Service (http://www.ahds.ac.uk).
4. See F. Bocchi, "Nuove metodologie per la storia delle città: la città in quattro dimensioni", in *Medieval metropolises, proceedings of the Congress of Atlas working group*, F. Bocchi (ed.), 11–28 (Bologna: Grafis Edizioni, 1999; English translation by J. Maloney: http://www.storiaeinformatica.it/nume/english/ntitolo_eng.html).
5. ARCHEOGUIDE project: http://www.aec2000.it/archeoguide/ and http://archeoguide.intranet.gr/.
6. IMAGE project: http://www.image-project.com/image/.
7. 3-D Virtual Buildings project: http://3dlearning.iit.nrc.ca/3DVirtualbuildings/.
8. Digital Egypt project: http://www.digitalegypt.ucl.ac.uk/Welcome.html.
9. J. Schofield, "Radio ahead", in *Guardian Online supplement*, 13 March 2003; also online at http://www.guardian.co.uk/online/story/0,3605,912599,00.html.
10. For a statement of EC policy, see *Decision No. 1513/2002/EC of the European Parliament and of the Council of 27 June 2002 concerning the sixth framework programme of the European Community for research, technological development and demonstration activities, contributing to the creation of the European Research Area and to innovation* (2002 to 2006) (Brussels: European Commission, 2002).