

Record and Reuse of Contextualised Information

Mark J. Weal, David E. Millard and David C. De Roure
Intelligence, Agents, Multimedia Group
School of Electronics & Computer Science
University of Southampton, SO17 1BJ, UK
Email: {mjw, dem, dder}@ecs.soton.ac.uk

ABSTRACT

This position paper describes a possible scenario at Chawton House where curated content is recorded in situ with accompanying descriptive context. It is this context that is used to orchestrate the replay of the content for visitors who use the system. In addition, the hypermedia model developed for the City project can be used to smooth the transition between content fragments and provide additional motivation and explanation.

Finally, a Linky Recer prototype is described along with how it could be used in the scenario to steer the visitors and create tours through the physical space. Key issues in the recording and reuse of the context in the scenario are discussed in the conclusions.

1. INTRODUCTION

The initial vision for the Chawton project was to use the Chawton 'Great House' and landscape as a testbed for deploying a series of small experience projects over the Equator infrastructure, to develop the infrastructure activity in particular but also to contribute the broader Equator agenda.

The eventual aim is to work with a new kind of user, the experience-builder, the target for the Equator infrastructure 'deep track'. Chawton House Library is ideal in this respect because it will service a variety of users visiting for different purposes and activities, at different times and with experiences of different durations. Also, these activities include 'work' but not in a conventional workplace setting, which is consistent with the original Equator proposals.

This document describes one possible experience to construct at Chawton, detailing the aims and objectives of the experience, how it fits into the broader Equator infrastructure agenda, and draws out issues arising from the scenario concerning record and reuse.

2. THE SCENARIO

The scenario is simple. The aim is not to create a radical new experience as previous Equator experience projects have, but rather to build a simple application using novel tools and techniques. And to look at placing the tools in the hands of the experience builder.

The example is a museum guide type system allowing people to wander the grounds of Chawton and hear audio commentary on the plants and landscape around them. There

might be multiple commentaries available and the content is triggered based on the visitor's context, comprised of such things as location, focus of view, time of year, interests etc. The output could be entirely audio, keeping the focus of the visitors on the plants rather than on digital representations of them.

The capture system would record the commentary of experts, along with their context during recording, which will be used to match with during the visits. An additional authoring stage may well be required to generalise the context appropriately, for example the specific day might be generalised into a season for certain plant descriptions or perhaps for broader locations such as the Walled Garden. Tools for the experience builder would form a key part of this section of the scenario.

3. CONTEXT CAPTURE: RECORD

The content creation takes place in two stages. First, the curator walks round the grounds capturing audio using a microphone connected to a PDA. When a fragment of content is recorded, context is simultaneously captured. The context could be generated by a number of devices both new and previously deployed within Equator. It could include location, orientation, time, perhaps even weather; 'those buttercups always look stunning with the sun on them'.

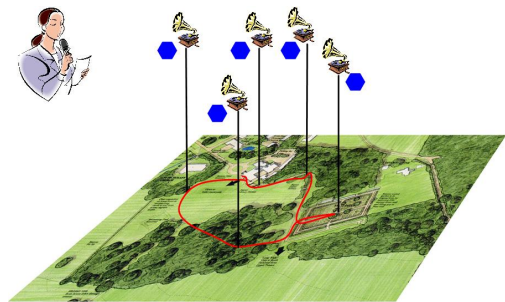


Figure 1: The initial content recording and context capture

Figure 1 illustrates the curator walking the grounds with their path shown on the map. At various points the curator stops to record audio files for the content. When the audio is captured, the context at that point is also captured, represented by the hexagons.

Once the raw context has been captured alongside the con-

tent, a second authoring stage takes place. The content creator / experience builder broadens the context to a more appropriate matching context. For example, the specific time captured might be expanded to the current season if the plant described would only be in bloom during that season. Location might be expanded to named regions; the apple trees are visible from anywhere within the Walled Garden. A similar approach was taken in the City project where the Mack room was zoned into named regions which had information associated with them [4]. Tools such as the Colour Map authoring tool from Citywide might be appropriate for this type of task.

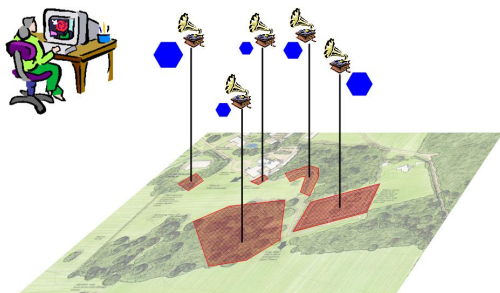


Figure 2: The context is edited to create broader regions or time frames

Figure 2 represents this stage, with the specific location contexts being expanded to represent regions on the map. The temporal context can also be scoped to become a temporal range where appropriate, for example, snowdrops only being present in the spring.

Curated context could also be added at this stage to scope the content to particular topics for example; landscaping, botany, architecture etc.

4. CONTEXT MATCHING: REPLAY

A visitor goes for a walk around the grounds carrying an enhanced PDA and wearing a headset. As their context matches the context of stored objects, the content is replayed. The visitors context might be comprised of static, pre-chosen topics combined with dynamic context captured in the same way as during the content creation.

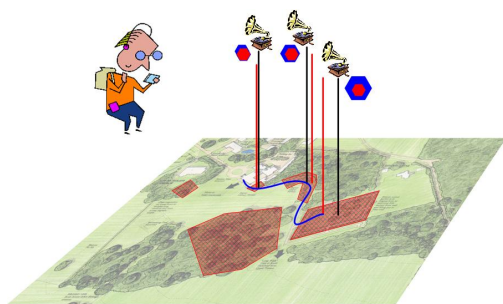


Figure 3: The visitor receives content as their context matches

Figure 3 depicts a visitor walking the grounds wearing a headset. As their context matches that of the curated content they are played the previously recorded audio files. The

specific context of the visitor e.g. accurate GPS location, matches to the more general, expanded context of the audio fragments, for example the region defined as the Walled Garden. This approach incorporates the sculptural hypertext methodology first coined by Mark Bernstein [1] and previously explored by the authors in terms of hypertext fiction [8, 2] and information delivery for the Ambient Wood experience project [7].

5. THE HYPERMEDIA TRANSITIONS

As the visitor moves around the grounds, content fragments will be delivered to them as discrete, unconnected pieces of audio. To smooth the narrative, link structures developed as part of the City project can be used. Each link connects two pieces of content and contains various items of metadata. These can loosely be described as *before*, *transition*, and *after*.

Before: Describes why the visitor may wish to move from point *A* to point *B*. ‘A better example of traditional hedging can be seen in the Walled Garden.’

Transition: Describes how the visitor gets from point *A* to point *B*. This could be map based, or if an audio only delivery system, recorded verbal instructions. ‘If you follow the path up the hill you will reach the entrance to the Walled Garden.’

After: Describes point *B* in the context of having previously been at point *A*. ‘As you can now see, the hedging is grown wider here compared to the kitchen garden, to act as more of a wind break.’

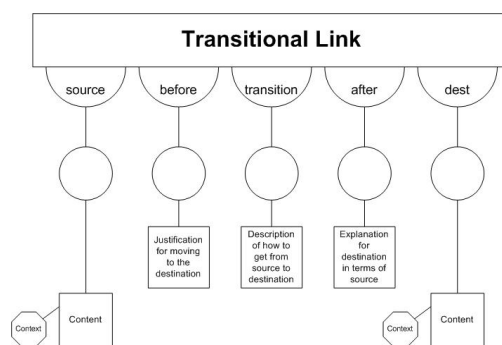


Figure 4: The transitional link structure

These links were modelled in FOHM [6] and served by the Auld Linky contextual structure engine [5] which performs context based queries of the link structures returning only those structures that match the specified query and context. Figure 4 shows a pictorial representation of such a link modelled in FOHM.

6. LINKY RECER

As part of the City project we have been exploring the way in which a Recommender system might be coupled with link structures to help form an eventual narrative. Auld Linky is the Southampton link server and Recer is the recommender system developed in Glasgow, we call these two processes working together Linky Recer.

Links on their own can form a rich network of possible transitions, but there is no overall structure to the network, and to a user exploring it the resulting experience can feel disjointed and unsatisfying. Auld Linky provides a query mechanism where context metadata (captured at record time and edited in a later authoring stage) can be used to filter the visible network. This results in a view of the link structures that is always appropriate to the current user and thus less confusing, but still lacks any overall guidance mechanism.

It is the hope that a recommendation system such as Recer will add this final guidance layer by identifying and encouraging the paths (or trails) that people have most commonly taken through the grounds. In effect the recommendation system is suggesting where a user might go, while the link structures are supporting these suggestions with pre-authored content.

This adds a final component to the Record system, as visitor's navigational decisions must be automatically captured and fed into the recommender so that subsequent visitors can benefit from them. The original curators navigational paths might also be captured and used to seed the recommender. This would ensure that the recommendations are initially based on navigation decisions taken by experts familiar to their subject.

This recommender technique could be tested against other types of path matching for example the fast trajectory matching techniques previously presented at the Equator conference [3].

7. CONCLUSIONS

The scenario described above raises a number of issues about the capture of content and context, its subsequent manipulation by experience builders, and then the reuse of the information during a later visitor experience.

Context in the scenario above, extends beyond just location. How the context is modelled and subsequently matched is at the core of the scenario, with the development of information structures (maybe even ontologies) that represent space, task and time. The expertise of the AKT IRC can be drawn upon as part of this effort. Equator has utilised a variety of different devices for the sensing of location, and how these fit together in either a common spatial model or a location subset of the ontology would form a useful part of a recording toolkit.

Tools to help experience builders in manipulating this context would be required by this scenario, in the case of the recording, taking very specific context and broadening it to named regions, temporal periods, or perhaps based around prior knowledge. Capturing how specific events connect together may also be important both for the record of trails for the recommender system, but also for the capturing of causality. Often this has had to be reconstructed after the fact based on implicit chronology.

The focus of the scenario described in this paper is less to do with recording and replaying of an experience but rather recording and reusing context in the construction of experiences.

8. ACKNOWLEDGMENTS

This research is funded by EPSRC IRC project "EQUATOR" GR/N15986/01.

9. REFERENCES

- [1] BERNSTEIN, M. Card shark and thespis: exotic tools for hypertext narrative. In *Proceedings of the twelfth ACM conference on Hypertext and Hypermedia* (2001), ACM Press, pp. 41–50.
- [2] BERNSTEIN, M., MILLARD, D. E., AND WEAL, M. J. On writing sculptural hypertext. In *Proceedings of the Thirteenth ACM Conference on Hypertext and Hypermedia* (2002), pp. 65–66.
- [3] GUNN, S. R., AND DE ROURE, D. C. A probabilistic method for estimating the similarity of trajectories of mobile objects. In *First Annual Internal Equator Conference, Brockenhurst, Hampshire* (2002).
- [4] MACCOLL, I., MILLARD, D., RANDELL, C., AND STEED, A. Shared visiting in equator city. Tech. Rep. Equator-02-021, Equator, September 2002.
- [5] MICHAELIDES, D. T., MILLARD, D. E., WEAL, M. J., AND DE ROURE, D. C. Auld leaky: A contextual open hypermedia link server. In *Hypermedia: Openness, Structural Awareness, and Adaptivity (Proceedings of OHS-7, SC-3 and AH-3), Published in Lecture Notes in Computer Science, (LNCS 2266), Springer Verlag, Heidelberg (ISSN 0302-9743)* (2001), pp. 59–70.
- [6] MILLARD, D., MOREAU, L., DAVIS, H., AND REICH, S. FOHM: A Fundamental Open Hypertext Model for Investigating Interoperability Between Hypertext Domains. In *Proceedings of the Eleventh ACM Conference on Hypertext and Hypermedia, San Antonio, Texas, USA* (2000), pp. 93–102.
- [7] WEAL, M. J., MICHAELIDES, D. T., THOMPSON, M. K., AND DE ROURE, D. C. Hypermedia in the ambient wood. *To be published in the New Review of Hypermedia and Multimedia, Special Issue on Hypermedia beyond the Desktop* (2003).
- [8] WEAL, M. J., MILLARD, D. E., MICHAELIDES, D. T., AND DE ROURE, D. C. Building narrative structures using context based linking. In *Proceedings of the Twelfth ACM Conference on Hypertext and Hypermedia* (2001), pp. 37–38.