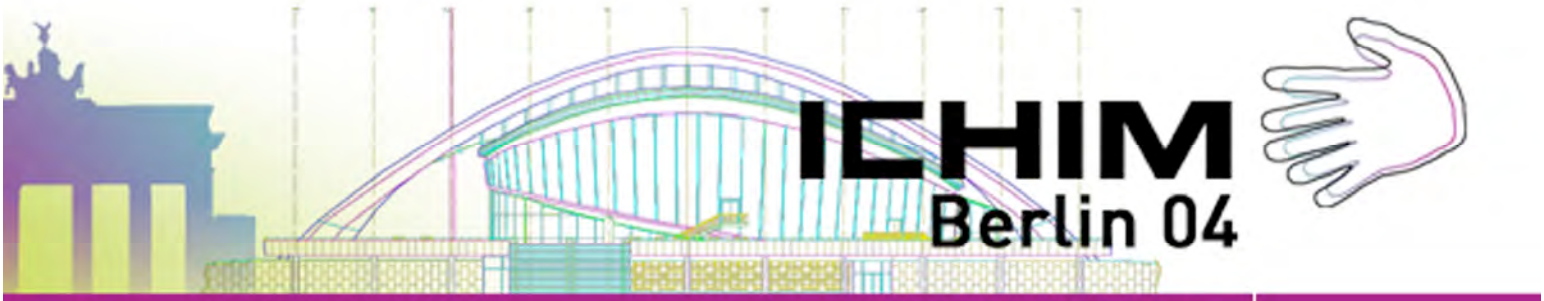

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THE VISUALISER: INTELLIGENCE MADE VISIBLE

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Abstract (EN)

Typically when we come across something new and complex we try and get a view of the whole, but when we know a field well we look for those particular aspects that concern us. Often to find our way through new territory we need guidance to help us navigate. At present most database driven web sites rely upon searching as a means of access. Accessibility is too often defined by what we cannot do, there is a real need to deliver new methods to make the breadth and depth of our worlds accessible to all. Searching is fine if you know what you are looking for, if you don't, frustration can quickly set in. Browsing is often poorly served on such sites. This tends to exclude the non-expert. We believe that there is a need for a method of access, which encourages the non-expert to explore and understand the scope and depth of the material available on a site. We call this type of browsing 'assisted browsing'.

We are developing a tool called the Visualizer which enables assisted browsing. It sits on the top of repositories of information, whether of museum objects, learning objects or other data and produces an interactive conceptual map of the objects and their interrelationships.

The Visualizer is a Java application, designed to work across networks, using z39.50 and OAI gateways.

Keywords : Navigation, positive accessibility, assisted browsing, metadata, maps, thesauri, conceptual art, networks, large datasets.

Zusammenfassung (DE)

Wenn wir auf etwas Neues und Komplexes stoßen, versuchen wir uns typischerweise einen Überblick zu verschaffen. Wenn wir aber einen Bereich gut kennen, suchen wir nach jenen spezifischen Aspekten, die uns interessieren. Oftmals benötigen wir eine Anleitung um uns in einem neuen Gebiet zurechtzufinden. Derzeit besteht der Zugang zu Datenbanken meistens in einer Suchfunktion. Zugänglichkeit ist allzu oft dadurch definiert, was wir nicht tun können. Es besteht ein realer Bedarf an neuen Methoden, welche die Breite und Tiefe unserer Welt für alle zugänglich machen. Eine Suchfunktion ist dann gut, wenn man weiß, wonach man sucht. Weiß man das aber nicht, kann schnell Frustration entstehen. Das Durchsehen (engl. browsing) wird auf den meisten Webseiten nicht unterstützt, was dazu führt, dass Nicht-Experten ausgeschlossen werden. Wir glauben, dass es einen Bedarf für eine Zugangsmethode gibt, die den Nicht-Experten dazu anregt den Umfang und die Tiefe des auf

einer Website verfügbaren Materials zu erforschen und zu verstehen. Wir nennen diese Art des Durchsehens „unterstütztes Durchsehen“ (engl. assisted browsing).
Wir sind dabei ein Tool zu entwickeln, den so genannten *Visualiser*, der dieses unterstützte Durchsehen ermöglicht. Dieser sitzt über dem Informationsspeicher einer Webseite, der Museumsobjekte, Lernobjekte oder andere Daten beinhaltet, und erzeugt eine konzeptionelle Landkarte dieser Objekte und ihrer Zusammenhänge.
Der *Visualiser* ist eine Java Applikation, die über Netzwerke hinweg funktioniert, indem sie z39.50 und Zugänge der Open Archive Initiative (OAI) nutzt.
Schlüsselwörter: Navigation, positive Zugänglichkeit, unterstütztes Durchsehen, browsing, Metadaten, Landkarten, Thesauri, konzeptionelle Kunst, Netzwerke, große Datenbestände.

Résumé (FR)

Quand nous abordons quelque chose de nouveau et de complexe, nous essayons d'abord d'obtenir une vue d'ensemble, mais quand nous connaissons bien un domaine nous recherchons directement les aspects particuliers qui nous concernent. Le plus souvent pour trouver notre chemin sur un nouveau territoire nous avons besoin de conseils pour nous guider. Aujourd'hui la plupart des sites web bâtis sur des bases de données comptent sur les fonctionnalités de recherche comme moyen d'accès à leurs contenus. L'accessibilité est trop souvent définie par ce que nous ne pouvons pas faire. Il y a un besoin réel d'établir de nouvelles méthodes pour rendre l'ampleur et la profondeur de nos mondes accessibles à tous. La recherche basée sur le texte est très bien si vous savez ce que vous recherchez, si vous ne le savez pas, la frustration peut vite poindre. Le feuilletage est souvent très malaisé sur de tels sites, ce qui tend à exclure les non-experts. Nous croyons qu'il existe un besoin pour une méthode d'accès qui encourage le non-expert à explorer et comprendre la portée et la profondeur de l'information disponible sur un site. Nous appelons ce type de consultation le "feuilletage assisté" (*assisted browsing*) Nous développons un outil appelé *the Visualize*r (le Visualiseur) qui offre cette assistance. Il s'applique aux banques d'informations, qu'il s'agisse de pièces de musées, de ressources éducatives ou d'autres données, et produit une carte conceptuelle interactive des objets et de leurs interrelations.
Le *Visualize*r est une application Java, conçue pour fonctionner sur les réseaux, utilisant les passerelles z39.50 et OAI.
Mots-clés : Navigation, Accessibilité positive, Feuilletage assisté, Métadonnées, Cartes conceptuelle, Thesaurus, Art conceptuel, Réseaux, Grands ensembles de données.

I. Searching and not finding

Today many of us spend time, when researching, finding things on the web. No, let me rephrase that. Many of us, when researching, spend time looking for things on the web. To look for things we use search engines.

When we want to investigate a museum collection we use a search engine to examine the contents of the catalogue. Now, if we are experts this is very rewarding. We can find the things we want. But if we are not experts, where do we start? Well, we make guesses, which is fine. Then we go, via search results, to the things that we think look the most interesting. We do this for a while, searching and then examining search results, trying to get a sense of what is there. Often we become frustrated, unable either to understand the range of material available or to find the type of thing we were looking for. We need something else. Something, which gives us a view of the world we have entered and which assists us to discover the things, which are of most interest to us.

Relying solely on search engines is like only having a flash gun, rather than a torch, when trying to find your way in the dark. If the space is familiar the flash gun may be great, but if you are lost in new terrain, you desperately need the torch to discover the lie of the land.

II. Positive accessibility

Much has been said recently about the need to make websites and database accessible. Most of this has been couched in terms of what we must not do. This has given us a negative view of accessibility. We should be thinking differently. We should be endeavouring to increase accessibility for different groups of people in a positive way, giving them new ways to access information and control the environment in which they do this. This paper addresses one way in which we can allow people to access large bodies of data, without the need for significant prior knowledge of the domain.

We know there are fundamental problems in giving people access to large bodies of information. In the past many strategies have been used from the story to the map. For example, Homer gives us access to a vast wealth of knowledge by telling us the story of the Odyssey, Linnaeus uses a binomial system to describe the natural species, whilst the modern cartographer gives us detailed knowledge of a terrain by producing a map.

Museums now have large arrays of objects in digital form, catalogued in collections management systems. Others also have texts and other media held in content management

systems and digital asset management systems. Giving the non-expert access to this rich arena is now the task facing those in charge of these assets; making it possible for the life long learner to explore new territories and desire more knowledge.

We believe that making the data visible in appropriate ways can significantly enhance access (cf. Tufte). In this paper we will describe the Visualiser, a tool, which we are evolving to give such access. But first, it is instructive to look at how visualisation of concepts and ideas has been used in the past.

III. Lists, maps and world views

Some people work well with lists, others work well with maps and diagrams. In the history of world culture, we have, from the start, evidence of both list makers and of visual thinkers. At first, they are both endeavouring to deal with basic elements of life – the cost of grain or the nature of the hunt. As new ideological structures take hold in societies, there becomes a need to represent these; a need to present a world view of a particular possible world.

By the nature of the task, describing a world view is a complex task with a wide range of basic elements. Different strategies can be used to show the information, gross simplifications can occur or long elaborations can be fabricated. Certain forms take a hold. The narrative has a strong part to play in this context, whether as stories handed down in the oral tradition, or as written text or visualised as sequences in a solid form.

Figure 1. Trajan's Column, Rome

For example, Trajan's column in Rome depicts the story of Trajan's conflicts with the Dacians and shows this in a scroll like form twisting around the column, the narrative broken down into 155 scenes. The artist has created a structure on which to hang the narrative, as well as the eulogistic aspects of his endeavour. Narrative structures like this point the way to systematic approaches to visualisation.

IV. Systematic approaches

Whilst lists and sequences can be seen as a natural and basic way to structure a world, other structures are used to help us understand the conceptual apparatus that we need to articulate our world. In his Posterior Analytics, Aristotle sets out the use of a tree structure as a way to differentiate between different species. This was taken up by Porphry in his Isogoge and elaborated, although he stops short of actually showing the visual representation of a tree.(Eco, 1984) But by medieval times this has become a standard way to structure the world. It is used to show the different levels of being from gods down to irrational animals and plants. Later Linnaeus was to use an essentially two deep version of this structure to create his taxonomy of the natural world.

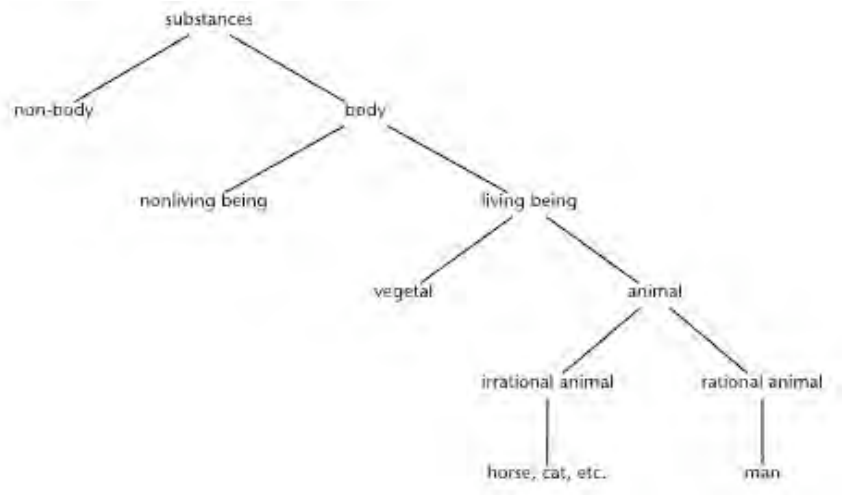

Figure 2. Porphyrian tree

Alongside the analytic use of diagrams, other visual representations were also being used to carry systematic information. The art of memory had been developed from its beginnings in Ancient Greece to become a part of the systemetising toolsets of the medieval and renaissance philosopher, preacher or ideologue.(Yates, 1969) In this context three dimensional structures were used to store in the memory specific ideas or large chunks of texts.

Figure 3. Pantheon, Rome

An ancient building like the Pantheon could be seen as a storehouse in which concepts and ideas could be lodged. And it is not hard to see how drawn and painted images were also used for similar purposes. These could be seemingly one off encapsulations of ideas, like Botticcelli's Primavera, or they could be an atomised collection of emblems like Cesare Ripa's Iconologia (Gombrich, 1985) or they could be structural diagrams like Ramon Lull's ladders, tables, trees and combinatory circles.

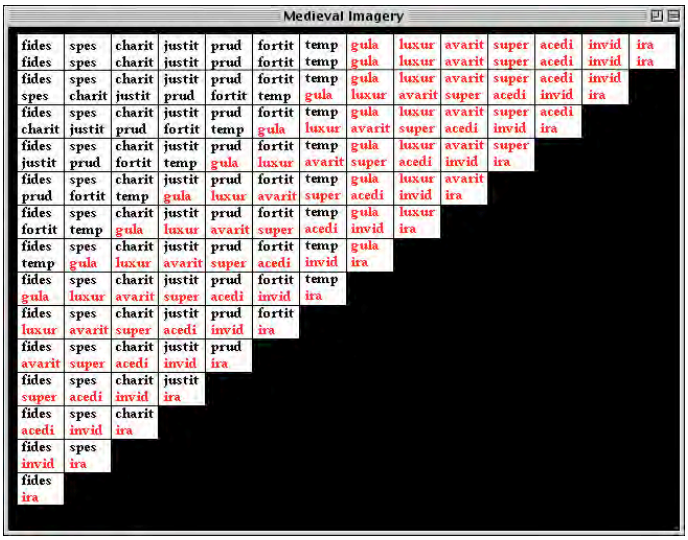

Figure 4. One of Lull's tables reconstructed by Graham Howard for Shakespeare's Twelfth Night CD-ROM, 1990

Lull's combinatory circles were also dynamic. You moved the concentric circles around to see the intended relationships. Giulio Camillo's theatre also required interactions, pulling documents and icons out of drawers in his elaborate structure. These dynamic uses of visualisation prefigure today's use of the computer as a dynamic storehouse with an interactive visual interface.

V. Scientific visualisation

Drawing in the Renaissance had also become investigative. We have only to think of Leonardo's anatomical drawings. Leonardo had also used drawing to envision his mechanical ideas. This was a strand of visualisation, which was to become particularly significant in the industrial age, with the development of technical drawing to specify the shape and function of things for manufacture.

As Tufte has pointed out, the use of visualisation for understanding complex quantitative data starts to show its power in the work of John Snow.(Tufte, 1997) Snow created statistical displays of data from the outbreak of cholera in the Broad Street area of London and by careful visualisation of this on a map of the district discovered the source of the epidemic, a well in Broad Street. His work led to the ending of the epidemic and to the discovery of the cholera bacterium.

VI. Metadata, truth tables and maps

From the start of modern logic with the work of Russell and Whitehead, truth tables became a fundamental tool of the trade, setting out truth values in what we would now call a matrix. In the early 1970's, in the conceptual art group Art & Language, we used such truth tables as the basis for creating semantic maps of texts.(Harrison, 1991) The maps were created from the analysis of texts with methods derived from modal logic, and the results displayed as large complex truth tables. These maps were also used to discover different points of view with respect to specific topics. This was done using an elaborate system of generating a range of values for any particular proposition. At the time, we attempted to put these evaluations into a computer, with the intention of generating a map dynamically from the introduced data. Whilst this attempt to dynamically visualise propositional attitudes failed, due to the unavailability of sufficient accessible computing power, it indicated a method for the future. Typically the maps used a set of keywords as the basis for evaluation of a specific text element. Today this would be described as attaching values to metadata for a particular element or object.

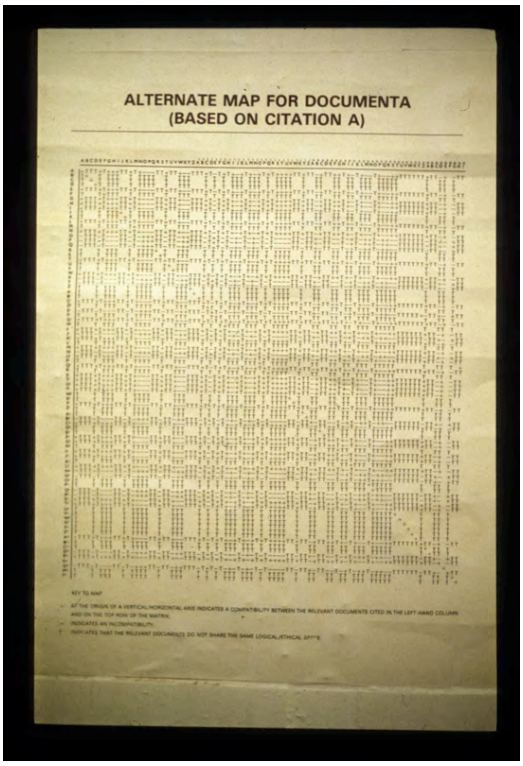

Figure 5. 'Alternate Map for Documenta', Art & Language, 1972

VII. Personal Computers & the World Wide Web

With the introduction of the first personal computer and the development of the World Wide Web, our possibility of encountering large data sets has increased significantly. Over the last twenty years the implications for museums has been enormous, it has impacted on their whole method of operation, from the cataloguing and curatorial level, through to their ways of presenting themselves and their holdings to the outside world.

What does seem surprisingly though is that, despite these paradigmatic changes, the ways in which data is accessed has barely altered. The currently-adopted mode of searching on-line information, both an intranet and internet systems, is based on traditional library cataloguing systems, where in order to successfully arrive at a given target you are required to have some, if not considerable, knowledge of the contents of a given collection and the manner in which it may be organised.

Though this method has a variable success rate, and often obscures the content from the user, it has continued to dominate. Darren Peacock from the National Museum of Australia has succinctly précised the issues with conventional searching as:- "To the uninitiated the keyword search is often barely adequate as a way of finding information. It is totally inadequate as a tool for stimulating knowledge." (Peacock, 2004)

Many of the alternative developments have adopted the more free-wheeling browsing methodology which internet users are now comfortable and familiar with, but which enables a random journey through unknown territory rather than a route to a required target.

VIII. Design & the experience

Tufte's principle focus in the analysis of information design has always been the identification of excellence, and the accompanying investigations into what effective design is comprised of. He uses a wide range of global sources from Medieval times to the present. His trilogy of books published over the last 21 years present this pioneering work on the use of graphics to display quantitative information. These publications are commonly cited as reference material for standards of excellence in information design in its widest context. The books are witty, relevant, beautifully illustrated and, most importantly, scholarly and apposite. (Tufte, 1992 & 1997)

The core dictums of Tufte's work have been described as his philosophical ideals, and are identified and utilised by many as a significant approach to new media design. These stress the importance of using graphics to intelligently represent data and that important information need never, and should never, be an over-simplified.

Tufte's five principles of information design:-

- Quantitative thinking comes down to one question: Compared to what?
- Try very hard to show cause and effect.
- Don't break up evidence by accidents of means of production.
- The world is multivariant, so the display should be high-dimensional.
- The presentation stands and falls on the quality, relevance, and integrity of the content. (Kim)

Tufte's thesis is that graphics is 'intelligence made visible', and by utilising data rich plots appropriately large amounts of complex information can be viewed and understood from different perspectives (cause and effect, relationships, parallels, data limitations, authentication and exceptions) "The best information displays allow people to understand large and complex data sets, not just in terms of what the data is, but also in terms of the process it represents." (Luca, 2002)

Interesting examples of innovative dynamic designs providing access to complex on-line data are to be found in the work of Thinkmap, previously known as Plumb Design, a web design company based in New York. They have produced dynamic interfaces derived from classic Porphyrian structured thesauri. Their interfaces form intriguing worlds where the user is enabled to explore content intelligently.

The Visual Thesaurus operates as an on-line thesaurus sitting over Princeton's database of 140,000 English words, which Thinkmap describe as a visual representation of the English language. Colour coding has been incorporated to indicate different parts of speech, individual words can be re-ordered and investigated dynamically, Different graphical features are used to indicate words with the same meanings, and varying types of relationships between words. (Visual Thesaurus)

Increasingly design companies and collections institutions are working to present improved graphical modes of access to the underlying material, though this is often still dependent on keyword searching or on hand-crafted 'Tours'

Marvin Minsky's research group at MIT describe the basis of their investigations as "The main idea is that the key to human flexibility and resourcefulness is mental diversity: we have many ways to solve every kind of problem, so that when we get stuck trying one method of solution, we can switch to another." (Minsky MIT) This broad-minded approach offers a key to comprehending the frustrations when faced with intransigent systems when one is trying to access information on-line. Modes of on-line searching in no way reflect our normal range of problem-solving tools. We operate in the real world with a mixture of previous knowledge and a willingness to investigate and the balance of these human faculties is paramount.

Hiroshi Ishii, also at MIT, sets out in the introduction to his research programme, "People have developed sophisticated skills for sensing and manipulating our physical environments. However, most of these skills are not employed by traditional GUIs (Graphical User Interfaces)". (Ishii MIT) Within his programme Ishii is looking to create tactile interfaces that utilise our rich sensory understanding of the world.

Matthew Brand has worked on moving from the hand-crafted indexing of narrative material to a generated thematic index. The resultant interface is typographically based; the entire text is always present whilst the keywords, themes, plots are indexed and foregrounded.

Brand articulates that two important premises have formed the basis of recent thinking on how to access complex collections data. That of relying on graphical interface solutions and that of providing access through various methodological structures. "The visualization of structure in qualitative data is generally considered the province of graphics designers, as

opposed to the visualization of structure in quantitative data, for which there are scientific conferences." (Brand MIT)

IX. The Visualiser

Introduction

As well as its origins in the historic ways of visualising large systems, the Visualiser began to appear as part of work that we were doing in the OpenDrama project and also as a response to the general demands of making publicly accessible museums' collection management information. It is now developing in the context of the requirements of a UK JISC initiative giving access to educational resources and services, and creating an interface to the cluster of systems(collections management, books, archive, image library and academicians), which we have installed at the Royal Academy of Arts in London.

Beginnings in OpenDrama

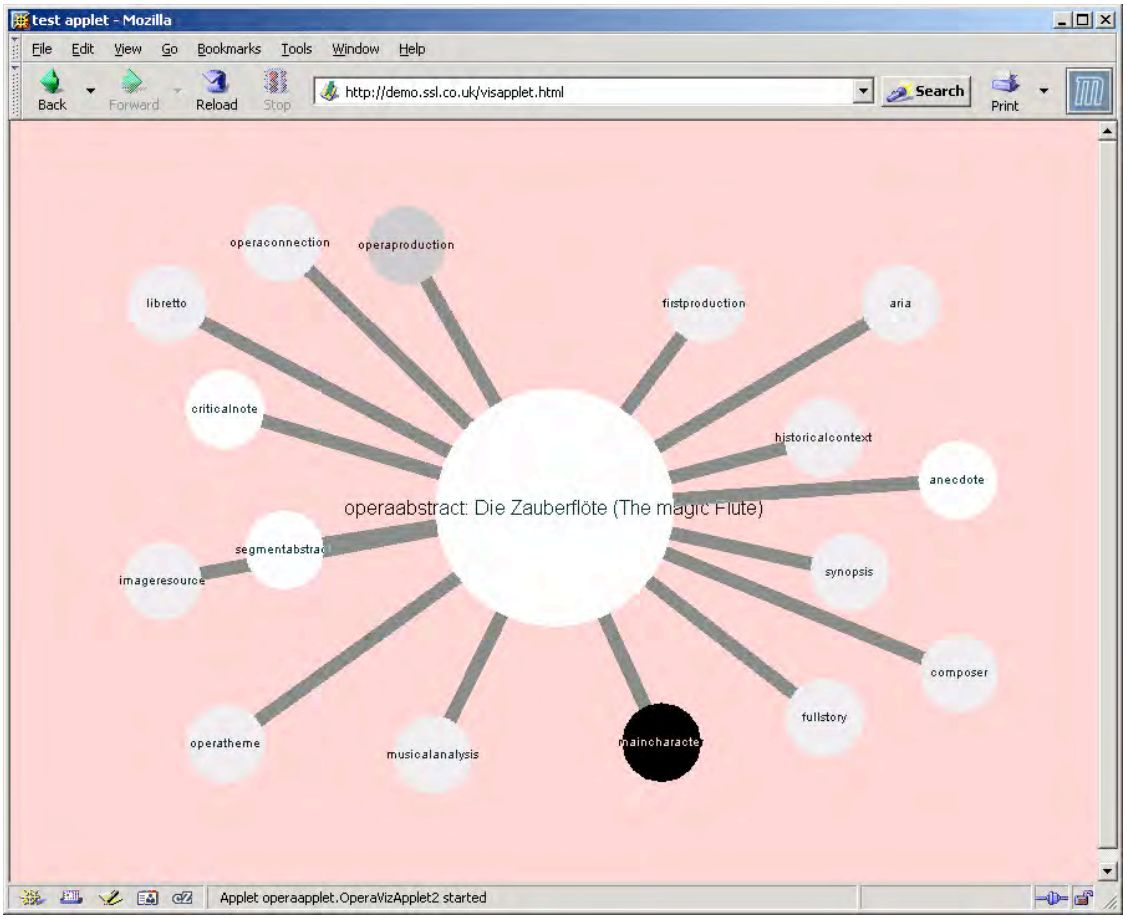

Figure 6. Opera Abstract from the OpenDrama system

In the OpenDrama project we had a database, which contained information held as OperaObjects.(Howard & Beecham, 2003) These objects were structured to hold the significant aspects of an opera. An opera can be said to be a work created by a composer and a librettist, it has productions and each production has performances. From the first night on an opera has many performances, each one with specific attributes of its own, some common to the production, others, like the date, specific to a performance. There is a conductor, a director, stage designer, lighting designer, a choregrapher, an orchestra with all of its players, as well as the principle singers and the chorus. A production will also have a version of the libretto, a version of the score, production books, reviews, interviews and other associated material. It became obvious that there was a need to be able to see these related attributes, so that they could be explored. If you do not know about opera productions there are many elements of which you might be totally unaware. It was the job of the first prototype of the Visualiser to try and make these relationships apparent. It was built in Java as an applet, so that it could be used on any contemporary operating system that would support a browser. It essentially depicted the relationship between objects and allowed access to associated media resources. So if you followed a route through it to a specific performance of, say Magic Flute, you could look at the Queen of the Night and be able then to see an photograph of the singer who played the role in the specific production. The Java applet was connected to an Index+ database holding data upon an array of operas. This database was gathering data from multiple sources using a z39.50 gateway.

The display of information was fairly crude, but was built to show that such a display was possible based upon the OperaObjects held in the database. And, of course, it suffered from occasionally having too much information to display in a clear manner.

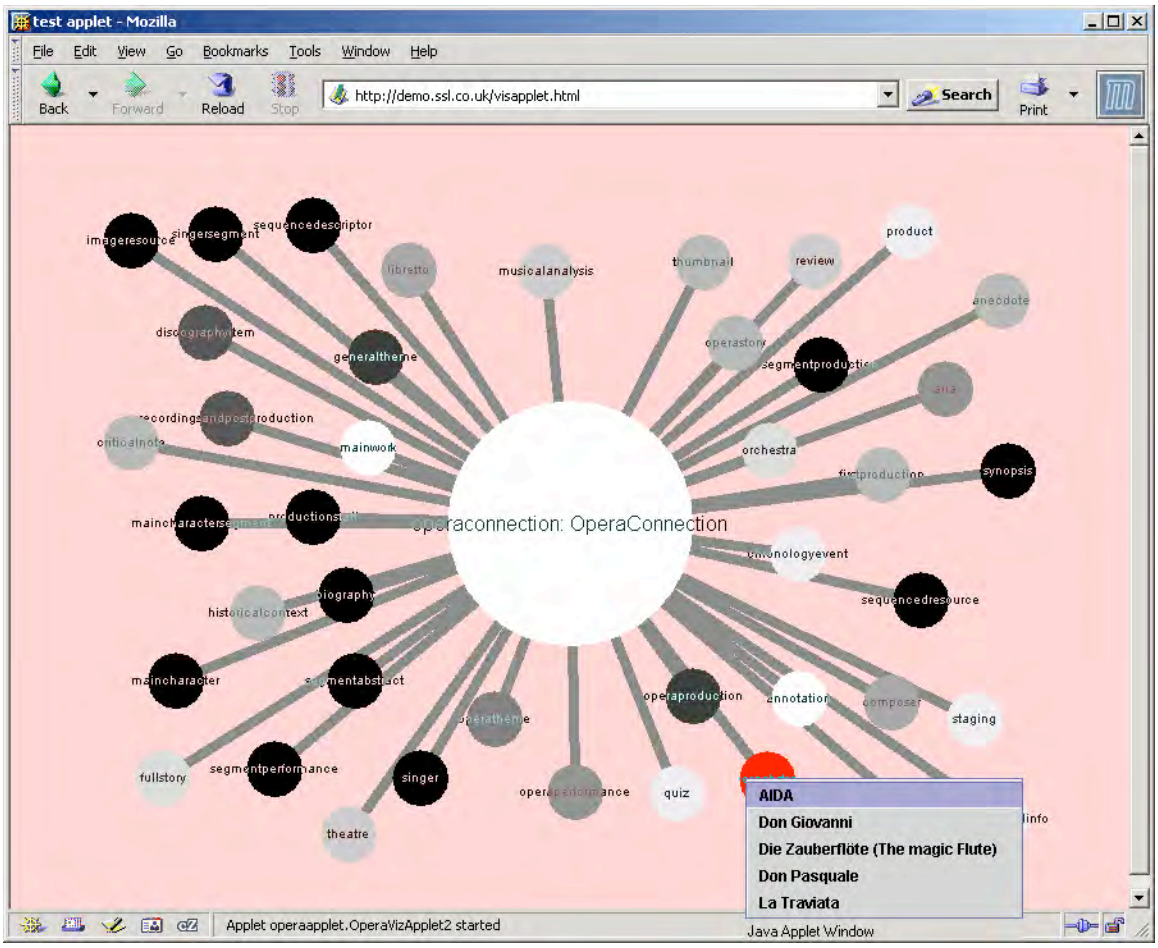

Figure 7. Opera Connection from the OpenDrama system

From the point of view of the research project, this was of little consequence, but it served to indicate where some key pitfalls might appear in the future. However the simple ability to display complex information in this way, brought some very positive reactions in both in the field trials and in the project's final review.

Whilst this prototype had been set up to depict the relationships between objects, another aspect of the project had been looking at the significant use of semantic metadata in the context of opera. It had been considering how, by marking up or tagging sequences in a recording of an opera performance, these semantic metadata could be used to see the connections between different operas, productions of operas and performances of operas. Within the project we were not able to produce a metadata map, which could show these connections. But clearly it was a natural next step, as well as reconsidering how the look of the whole could be made more appropriate to its use.

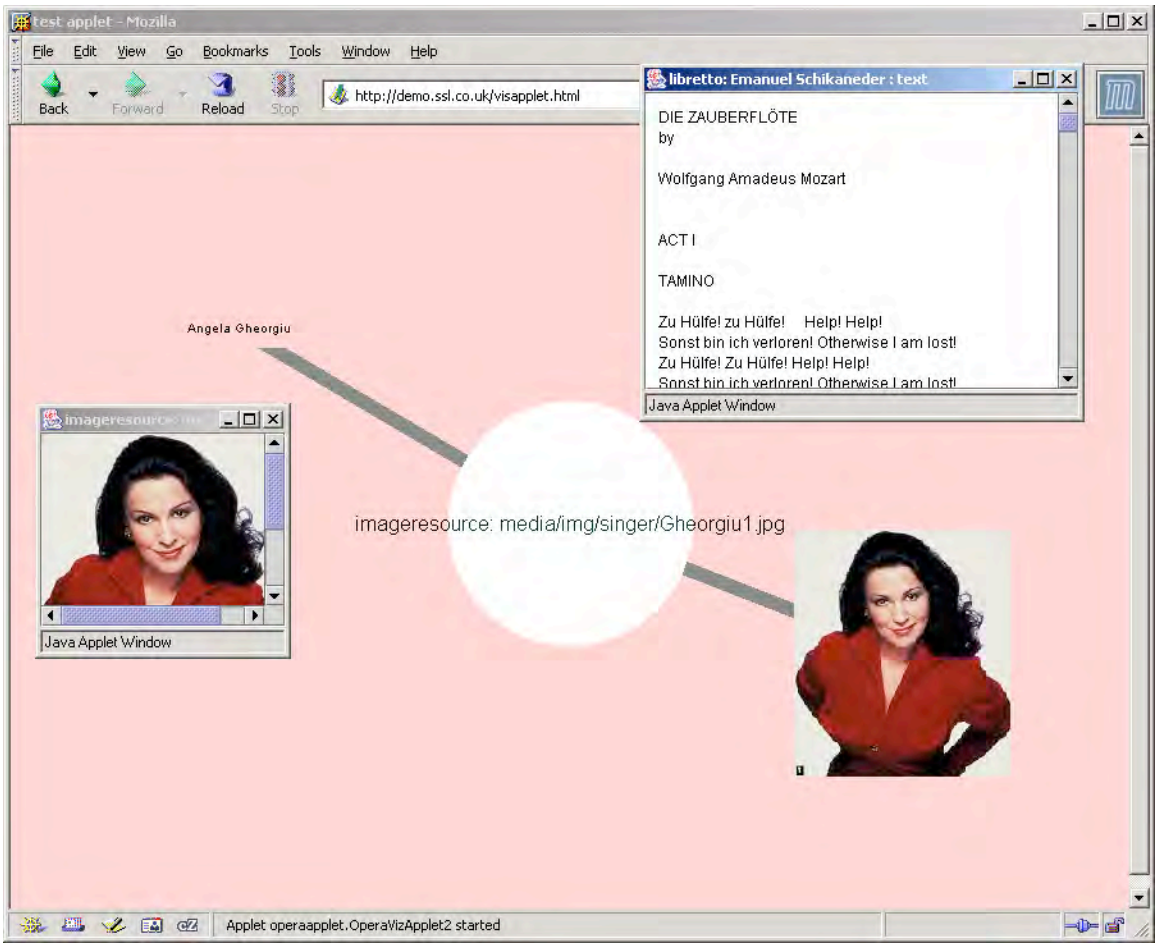

Figure 8. Image Resource from the OpenDrama system

In this first prototype, resources like texts and images were typically displayed in pop up windows. This demonstrated the need to have multiple aspects of the data displayed at any one time and therefore the need to design an interface, which would take this into account and see this aspect of the approach as a significant feature of how a user can understand the material that is present. We were rapidly gathering parameters for a further application, which would take into account the lessons learnt in OpenDrama. We had shown that an interactive dynamic map interface to structured dynamic data was a significant move in creating new means of accessing large and complex bodies of data. The next step was to specify a more powerful version of the Visualiser and build it in the context of different projects with different types of data. One version to be developed was based upon Royal Academy data held in an Index+ Musims collection management system and the other upon data held in an Index+ content management system for Connect.

Visualiser description

The Visualiser is an application designed to sit over the top a database or a series of databases and its aim is to make the data they contain visible in a new way. Whilst doing this it does not preclude the standard ways we might expect data to appear. In our example we show typical collections management data from the Royal Academy. The Visualiser is designed to allow searching as well as assisted browsing. It is a multi window or pane application so that a range of data can be displayed at once.

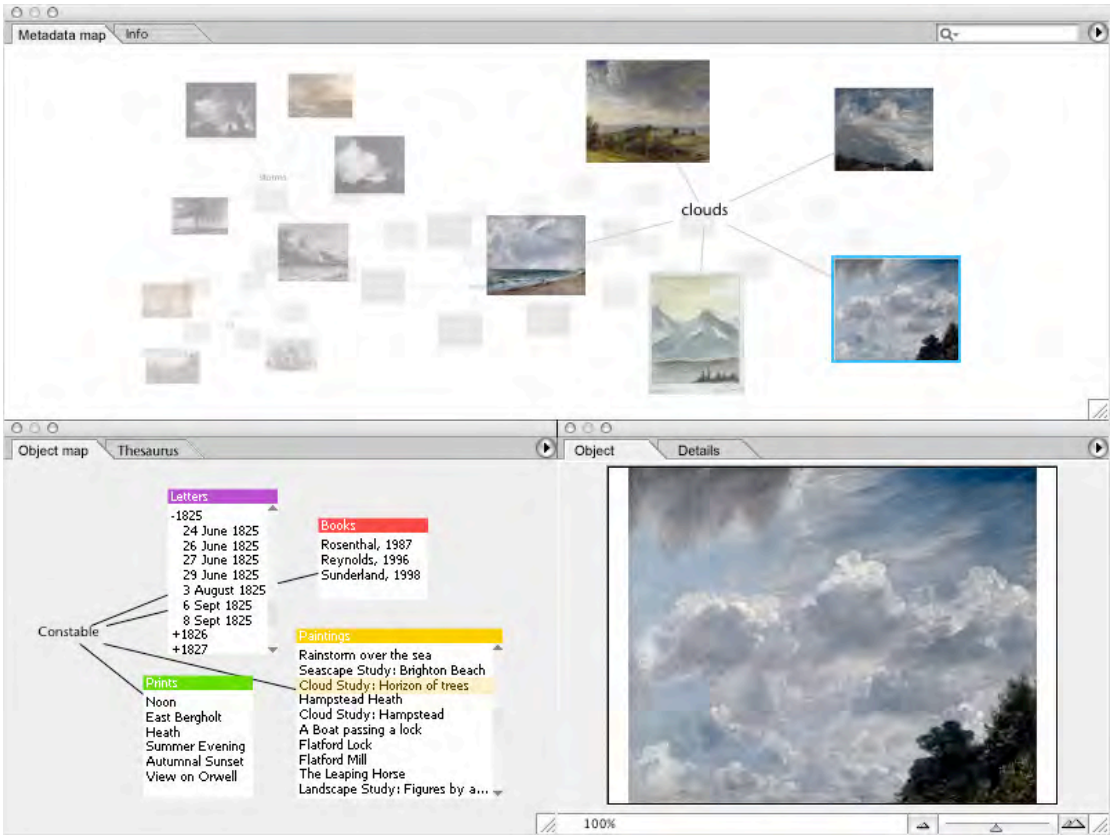

Figure 9. Visualiser: Metadata map, Object map, Object

Searching

In the top right of the main window a search box is displayed, so that if you want to start from a specific term it can be entered here and the results shown. Alternatively the Visualiser can be set up to show specific data at the start, so that in a particular context an appropriate starting point for exploration can shown. Searching for a specific term, if it is found in the metadata will bring that term to the foreground in the Metadata map and in the Thesaurus.

Metadata map

The Metadata map is one of the key windows of the application. It displays the current metadata term surrounded by any objects, which have that term associated with them. Where the metadata term is related to another term, that relationship is shown by a link to that term. By clicking on that other term, it will be brought to the front and the original term will sink behind it. By moving through metadata terms, the user can explore the range of material in the underlying database, discovering quickly related objects. Unlike a traditional search in a database proximate material is not missed but displayed. Also, at a glance, the quantity of material can be judged. The map can be used to browse through a large data space.

Object map

In the object map, the relationship between objects is shown. Having discovered an object of interest in the metadata map and selected it, it is shown in the object map clustered with objects of a similar sort. So that if a painting of clouds by Constable has been selected, then it appears in the object map clustered with other paintings by Constable. Further to this, other objects relating to Constable are shown, such as letters, drawings and books. These can be selected as objects to view.

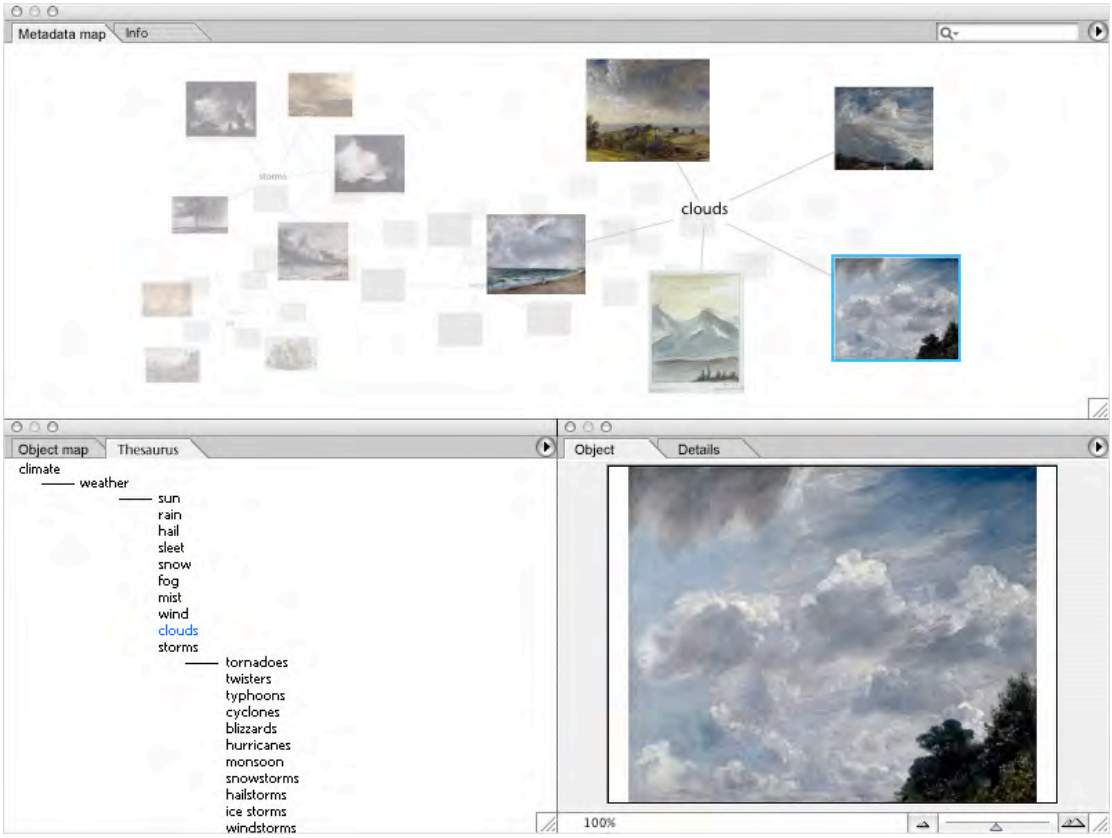

Figure 10. Visualiser: Metadata map, Thesaurus, Object

Thesaurus

Underlying many of the functions in the Visualiser is its ability to handle thesauri. The use of thesauri and controlled terminologies in collection management systems has grown and they serve as some of the most powerful means of description within such systems. The Visualiser displays the thesaurus being used as a classic tree structure. Its branches can be opened and closed. When a term has been selected in the metadata map, it is automatically displayed in the thesaurus view. This helps to establish an understanding of the terminology being used and its relationship with the objects.

Object

The object view typically displays an image of the current object. When there is an image available it can be zoomed or opened in a separate window to view it at a larger size. In some cases there may not be an image of the object available or the object may be a resource on the file system, for example a pdf document, in which case an icon would appear, with the option

to open the document in an appropriate application. We aim to be able to have all media types available here, so that sound, video or animation could also be accessed in this view.

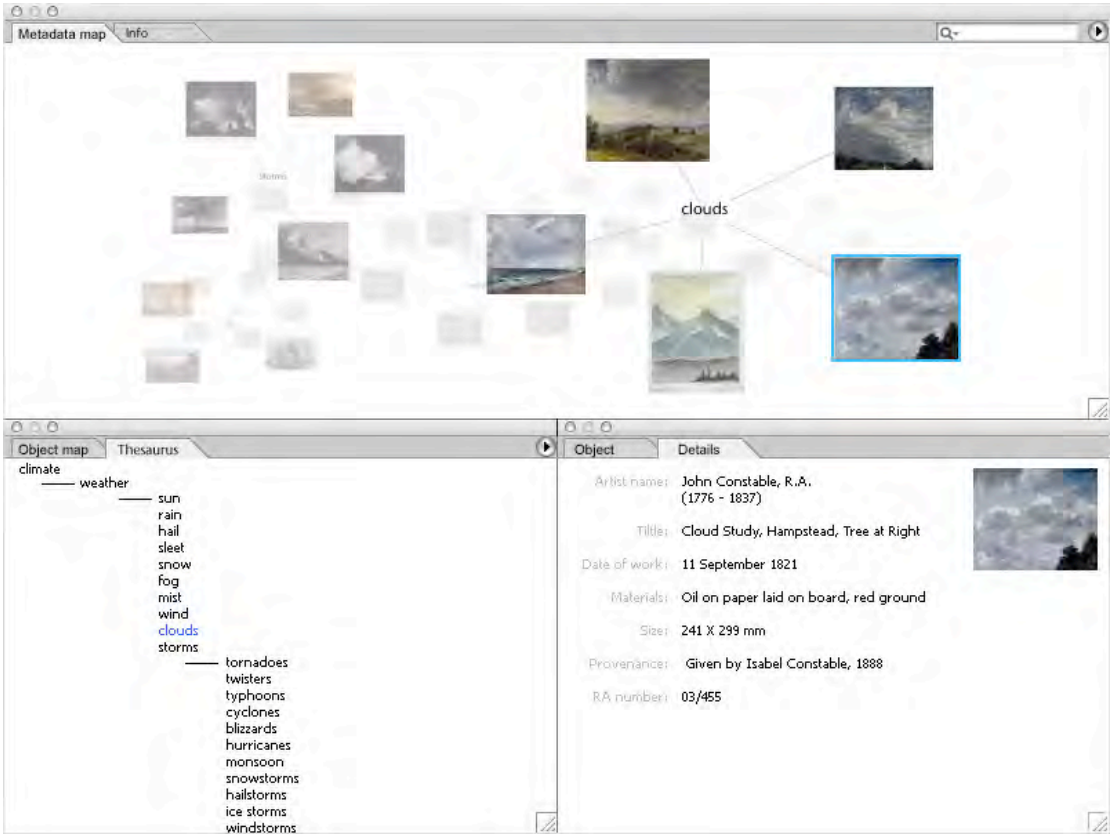

Figure 11. Visualiser: Metadata map, Thesaurus, Details

Object details

When the Visualiser is connected to a collections management system, the object details displays the information held about the object in the system. The fields that are shown will depend upon how the system has been configured, but it is most likely that a reduced set of the fields normally held within such a system will be displayed in a public access context.

Filters and limiting the density of information

In any visualisation of large amounts of data, there is a need to be able to restrict the amount of data that is being displayed at any one time. Otherwise the screen becomes overloaded and navigation becomes almost impossible. We are building into the Visualiser filters that will help restrict the information. For example, in the metadata map you may decide that it is

sufficient to see only five metadata terms at a time and restrict the number of objects associated with a term to twenty. Or further terms may be shown just as terms but only have their objects attached when they are brought to the front. Tuning the application in this way to the density and reach of the data and the context in which it is being used is an important factor in the development of the Visualiser. We aim to give the user full access to the filters as Preferences/Options, so that the user is in control of how the data is seen.

Viewing data from multiple sources

The Visualiser is capable of not just viewing data from a single database but is also capable of viewing data from multiple distributed databases. By using z39.50 or OAI gateways it can draw in data from other sources and display it as if it was a local source. This opens up the possibility of being able to browse in new ways, for example viewing clusters of objects not just within a particular museum but all those objects available in all the connected museums.

Assisted browsing

The Visualiser is designed to be more than just a visual representation of data. It is set up to allow the user to explore the information in the system, but not in a haphazard fashion, but in a guided way, where supplementary information is being displayed to assist in making informed choices when browsing. This has been called ‘assisted browsing’. It does not preclude searching and it does not just let the user take a walk in the woods, it aims to spill out details of information along the pathways, so that choices can be made in the light of key content. It does not require you to understand the nature of the territory before you set out, it will elaborate for you as you start to encounter it.

Changing other parameters

For certain groups of users, the ability to change some basic features of the display of information is very important. We aim to provide ways for the user to control aspects of the display. For example, in the object map the different types of object are colour coded, some will want to set their own colours, whilst others may want them to be a simple grey.

We also expect that, for some museums, restricting the views in the metadata map to foreground certain topics within a collection may be an interesting way to provide public

access. In such circumstances the initial view in the map would be prescribed by the museum to introduce the visitor to the specific topics appropriate for a particular exhibition.

One aspect of the way in which we might want to access information is to have some sense of the relevance of the relationships depicted. This is of course additional information and would need to be entered as data, but if it is available then the possibility is opened up of being able to display relevancy in the metadata map. This is certainly a way in which curators could show an approach to a topic by valuing the metadata on a scale and allowing that to generate the clustering of objects around the metadata terms. A complex system of valencies to express different views upon a specific topic was at the heart of the Art & Language Indexes in the early 1970s. (see above).

X. Conclusion

The Visualiser is in its early stages of development and as the current projects progress and user's responses are obtained, many aspects of it may change and develop. Some will be simple changes, others may be more radical. For instance, we can imagine it, in the future, moving away from being restricted to only appearing on the screen, to being capable of creating an information space within a real architectural space. Or it may be showing divergent views about a particular set of objects and giving the user ways to show their views.

Whatever its future, we believe that its ability to provide assisted browsing in the context of dynamic and networked large datasets is a real asset in the move towards providing positive accessibility. Our aim is to continue to make intelligence visible.

About the authors

Graham Howard is a designer and educator with a wide range of experience in both the academic and the commercial world. Starting as a conceptual artist working with Art & Language focussed upon logic and communication, he developed a special interest in the relationships between technologies and social change, broadcasting for the Open University on the impact of illustrated printed pamphlets in C17th England. He has run both the MA Electronic Graphics at Coventry and MA Computer Related Design at the Royal College of Art. In 1989 he started Art of Memory, a design consultancy specialising in multimedia. For the Open Society Institute he has devised and run an education and training programme in the new media for 34 countries. He has lectured and written papers on a wide range of topics from the role of metaphor in narrative communication to artificial intelligence.
Since the late 1980s, with Art of Memory and later with System Simulation, he has been involved in the creation and production of a large number of interactive products from CD ROM and videodiscs to web portals with large distributed datasets. He specialises in knowledge architectures and interaction design. He is Design Director of System Simulation.

Sarah Beecham, originally a fine artist, is an art historian who has worked for many years as a designer, co-ordinator and producer of multi-media systems. Art of Memory, the company she co-founded in 1989 with Graham Howard, specialises in consultancy, design and production services for collections, galleries and museums. Sarah specialises in conceptual information organisation and its subsequent visualisation. She has had key roles in various bench-mark products such as ‘The Story of Glass’ for the V&A in London, ‘EleKtra’ for the OSI Electronic Publishing training programme and the Fine Rooms kiosk for the Royal Academy of Arts. She has recently worked with Opera North on OpenDrama, an EU Framework 5 project, and continues to work with the Royal Academy on the digitisation of their collection.

