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MAKING OPERA SING : OPENDRAMA AND THE MAGIC FLUTE

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Abstract

Opera is a significant part of, especially European, Cultural Heritage. It is also an area from which many feel excluded through lack of knowledge and understanding.

OpenDrama is an EU funded project which sets out to deliver new ways of accessing opera and its archives. Opera involves a wide range of media, which interact in a number of ways. It is essentially time based, sequential. Historical archives hold structured data, metadata and media elements. Bringing these together to create an accessible whole with extensible software was the challenge.

The OpenDrama system is designed to appeal to both the newcomer to opera and to the professional. It achieves this by having a number of different ways in which users can interact with the system. These vary from a memory palace as an exploratory environment where you can move from space to space encountering different thematic aspects of opera, "the jealous lover" or "revenge". Or a "karaoke" style interface where a singer can practice by dropping out a single voice from a recording, taking that part and singing a duet with another recorded singer and full orchestra. Or the learner/teacher can annotate media sequences with individual notes, with specified keywords or with links to build trails and interactions, which re-articulate opera and its contexts. Information can be built up for an individual performance, or a particular production or about the opera itself. Using international standards access to opera archives around the world can be given.

Scenarios have been used extensively in the development of OpenDrama, their use and effectiveness for creating user interfaces are discussed.

The paper discusses how the design and content for the OpenDrama system has been developed and will be delivered. It also discusses the applicability of the system to other time based media, and its communication and learning aspects.

Key words : Opera, access, content, design, scenarios, archives, time based media

EU IST Research programme

OpenDrama is a project funded under the European Union IST Research programme, Framework 5. The project is due for completion in May 2004.

The following are partners in the project: Space S.p.A., Teatro del Maggio Musicale Fiorentino – Fondazione, Opera North, Ministero per I Beni e le Attivita Culturali – Discoteca di Stato, Dynamic S.r.l., Politechinico di Milano, The University of Glasgow, Universitat Pompeu Fabra, Europe Online Newtorks S.A., System Simulation Ltd.

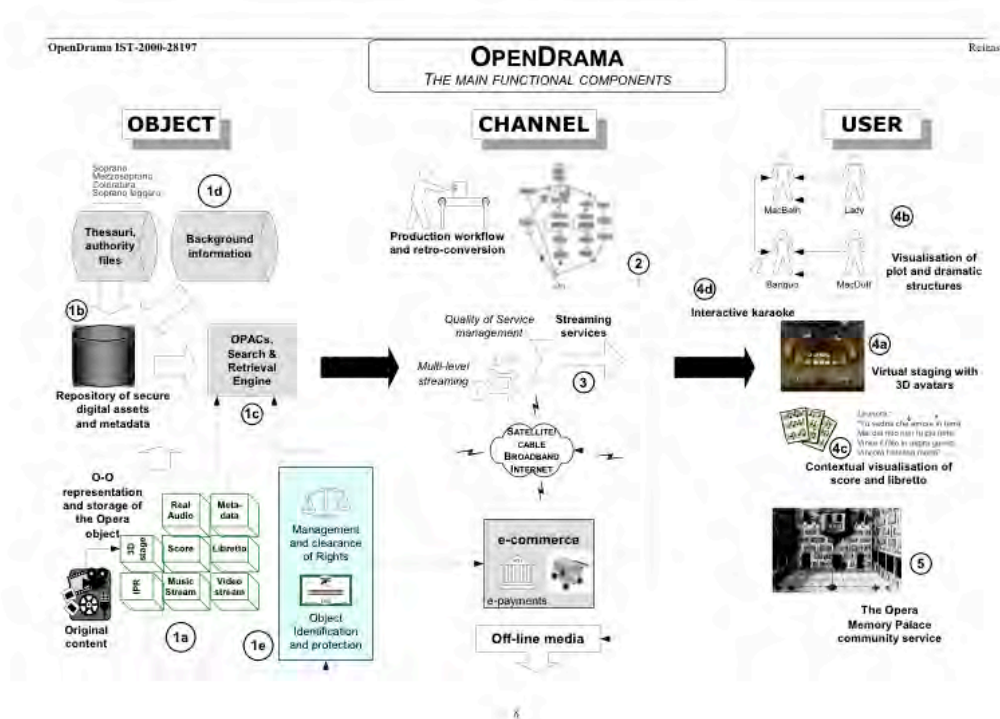This diagram outlines the whole of the OpenDrama system.

Figure 1, OpenDrama system diagram

Opera and its European heritage

Opera has a rich and significant history as a European cultural form, although there are many parallels in other cultures, which can and have been described as opera. Opera in Europe has, like many aspects of our cultures, both reflected and interacted with the development of our societies. Opera, whilst being performed regularly throughout Europe has gradually acquired an image, which suggests that it is exclusive and obscure. This was

not always the case as opera often emerged as a direct political and social commentary in an immediate and accessible popular art form. It is one of the tasks of OpenDrama to try to develop new accessible approaches to the extant canon of opera, its archival heritage and the ways in which opera continues to be performed. But there is not just a need to increase accessibility, there is also a pressing need to make more knowledge about opera available and to provide ways in which learners can interact with this content. In other words there is a need not just to provide a 'search' model, nor just a 'search and discovery' model, but also a 'participation and communication' model. People need to want and be able to gain knowledge and understanding about opera and to communicate about their ideas with others. This is the challenge of OpenDrama: to find ways to use digital technology to deliver on some of these issues.

As a research project OpenDrama has set out to find ways of creating this new information space and to work out the principles for the way in which OpenDrama methodologies can be used both in new opera productions and in retro-fitting to historic opera productions. The OpenDrama system contains both methodologies and technologies. This paper concentrates on the content and design aspects of the methodologies and only refers to some aspects of the technologies.

Museums and access

Over the last ten years especially, a large amount of work has been going on in museums looking at many related issues. Typically these have started from both ends of the spectrum, either the conversion or development of cataloguing and collections management information, or the creation of public access points with interactive interfaces to museum information. Gradually these two apparently divergent approaches are being seen as part of a continuum and increasingly museums are able to give varying access, depending upon the access level required by different types of people, to their collections information and are also able to create new information, which mediates these object level descriptions for a wide range of people. These people may be visitors to the museum itself or visitors on the web. A further step is now underway where all of this underlying material is used as the basis for the development of learning materials, both for

specific learners and for the life long learner. Also this digital information is being seen as providing nodal points for the enablement of new forms of communication.

As a result of this work, important international standards are becoming current, which enables greater networking of information and communication.

Moving images and time based media

The related area of the moving image is not as well developed as that of the museum (Manovich, 2001). Film, television and sound archives are struggling with both a large preservation issue and with a cataloguing issue, which is more complex than that of the single discrete object. Digital preservation with its strategies of continuous migration will help to preserve the heritage. Cataloguing, access and rights management are complicated by the nature of the object (Coyne et al., 2003). A single television programme may cover a wide range of contributors, rights holders and topics. All of this needs to be made explicit, if access is going to be more than access to just the programme as a whole. Access needs to be to small time segments of the media, which consequently affords cataloguing at this level.

Performance

The capturing of performance in any similar way is made more intractable by its evanescent nature. A performance of an opera happens through a specific set of moments in time and space. Any performance is one instance of a specific production of that opera and any opera will have many different productions. Some opera performances will be the result of the revival of a particular production. Any recording is always of a specific performance, but it was decided early on in the project that any such recording would be treated as an element of a specific production and the project would work essentially at the production level. However any specific material is always derived from a particular performance but it is treated as a paradigmatic instance of the production. This metonymic

relationship is at the heart of the way content has been gathered and created in the project. Of course it is also at the heart of the performance recording industry.

Audience

From the outset OpenDrama was designed to address the needs of three potential audiences, the newcomer to opera, student and amateur operatic performers and opera buffs or academic researchers. At the initial level it was understood that the newcomer may be either a young person who, perhaps, approaches opera because they have become a fan of Baz Lehrman movies or they may be a 30 to 40 year old, and who suddenly finds the need to explore the area. The second level of users are the performers themselves who could use OpenDrama's karaoke features in order to familiarise themselves with the work in a simulated production environment. The third group would be able to access a wealth of archive and research material. Essentially all of these groups will be approaching the OpenDrama system with a wish both to enjoy and learn.

Scenarios

To make the nature of the people who will use the system and the way they might interact with it more explicit, we used an approach based upon the creation of scenarios. These were written to describe the way in which a specific person might approach the OpenDrama system and to explore the way in which their needs and expectations could be fulfilled. Scenarios help to gain a clearer vision of the nature of the proposed system, whilst dispensing with the notion of the generic 'user'.

Here is one example of a scenario developed in the early stages of the project.

General scenario - Clara

Clara has had a long day at work, but is excited about her date on Saturday night. Except for one thing, they are going to the opera and she knows next to nothing about opera. Not only that, they are going to an opera she hasn't even heard of, by a composer she hasn't

heard of. Now if it had been Mozart or Puccini she might have recognised some of the arias, but who is this guy Martinu and what is Julietta about?

Having eaten her supper, she sits down with a glass of wine and decides to try and find out. She's heard about OpenDrama, where they have a collection of operas and all sorts of further information about them. She looks up the site and finds Martinu! Things are looking better. They have some extracts from the opera and a synopsis and it looks like a host of background stuff. It's all located in an ethereal architectural space, almost like a magic theatre. She feels she has seen something like this before but can't think where.

The synopsis is a bit strange, the opera seems to be in all sorts of bits, with dream sequences, and the plot seems to be circular. She decides to just watch some of it.

She is looking at the stage and clicks on the first sequence available. Its very surreal, set in a seaside town with the lead character searching for a girl whose voice he has heard through a window. Clara moves on to another sequence, this time in a wood with more men looking for the same girl. Everything is very emotionally charged. Who is the girl, Julietta? Around the stage there are ways through to other aspects of this strange world and she chooses to find out more about Julietta. A guide starts telling her about the character and then an interview with the director of the production appears and starts to talk about how he sees the character of Julietta.

She watches another sequence and this time a tune attracts her attention, it seems like a folk melody on the accordion. She follows it through and discovers an archive of material on Czech folk tunes that Martinu used in his compositions and listens to some historical recordings of gypsy bands in the 1930's. Somehow they are all so heart rending with a continuous sense of loss. Watching the score and seeing the translation of the words reminds her just how different this world is and yet how close.

She wonders about Martinu and what his life was like, the collapse of Europe in the '30s and his exile in the US.
Suddenly realising how late it has got, she is about to turn off the machine and go to bed, when she finds that tune recurring in her head and she goes back to it and realises that she

can sing along with it. Then she sees she could turn the singer's voice off and still the haunting music plays and she is gently sing it, feeling she is about to cry at any moment. She marks her place and knows she'll return to this other world soon. And then there are the stage sets, which she would love to know more about, they are reminiscent of some half remembered film. She must stop and go to bed.

Now she is desperate for Saturday and the visit to the opera to come around.

A scenario like this can be used both to test out ideas and help guide the project towards its goals. At the end of the project these scenarios can also be used to test against and in evaluation, to see the way in which the final prototype fulfils or fails to fulfil expectations. This particular scenario is fairly general and only indicates how the system will operate, concentrating more on an overall approach. More detailed scenarios are developed for specific aspects of the system. For example, at the heart of the OpenDrama system is the Advanced Delivery Client (ADC) and its use can also be explored using a scenario.

Advanced Delivery Client scenario - Ivan

Ivan, after spending some time exploring "Jealousy" and "Betrayal" in the Memory Palace, generally feeling sorry for himself, has decided that he really wants to investigate this Opera North production of Magic Flute in more depth. He has gone to the Advanced Delivery Client and is watching the first part of Act One. The video is only taking a small part of the screen because he has chosen to watch the score and the libretto at the same time and after wandering in the Memory Palace he has decide it is worth watching the semantic tags as well. Without really thinking about it, he has also put the links up. All the elements are running in real time. Suddenly a link to the director comes up, so Ivan pauses the player and clicks the link. Another window appears with a video pane and he plays the interview with the director talking about how we make decisions faced with a dilemma and surrounded by conflicting advice and going on to make a parallel with how we make decisions about the Iraq war. Then returning to Act One, Ivan realises he could annotate this connection for his students to follow in the seminar tomorrow. He highlights the annotation line in the interface and goes to edit and writes a short note for the groups and then drags out the highlit panel of his annotation to cover the twenty five seconds of the number, which it refers to.

A little further on and he has jumped out to a commentary by the conductor, and wants to follow through his comments about the way in which some previous productions have treated Mozart's score. There are some links out to the Discoteca di Stato's archives in Rome. He clicks on the link and a list of the referenced recordings are returned from the archive in Rome. There's an opportunity to play some of them, but at the moment he doesn't have the time, so he copies the reference information into his notes for the seminar and returns to watching the last part of the sequence they are studying.

Scenarios like these help to delimit many of the aspects of the project from the interface to key functionality, and they also indicate the nature of the content that is required to make an effective OpenDrama production.

Content

Opera North's production of Mozart's Magic Flute was chosen as the opera production, which would be used for the creating of new content material. This decision was taken for pragmatic reasons, sometime after the initial scenarios were developed. The original production of Martinu's Julietta was already too far into its rehearsal period for many of the content decisions to be acted on in time. Further to this, there was the possibility that the BBC would record the Martinu piece, which would have jeopardised any possibility of its use for the OpenDrama research project because of the further IPR complications of such a situation. The production of Magic Flute, directed by Tim Supple, was a new production with a new translation of the libretto into English by the poet Carol Ann Duffy. It was possible to follow it from its inception. So it was also possible to schedule the gathering and development of content, in the light of the schedule of the production itself. This turned out to be a more critical decision than was at first realised.

As well as the new material coming from Opera North, there was also the possibility of accessing the archive material held in the Discoteca di Stato in Rome.

From a content point of view, it became necessary to consider what material was already available, what would be made available by the production of Magic Flute and what

further material needed to be created to deliver a rich enough basis for a prototype system to be built.

Archive access

The archive material could be made available over Z39.50, a protocol used typically by libraries and archives. More material appropriate to the specific content of the prototype would also be available, including some archive sound recordings. Further to this, access would also be developed to the results of another project, in which the archive was participating, on the music of Venice. Once this facility is built into the system then the amount of material available to the system is only limited by the amount of data available from the archive server. As that material is updated and increased so the OpenDrama system is enriched. This archive has been used as an example but other archives, serving up data in similar structured forms and using common protocols, could be made available in a full system. Such systems might be delivering information which is not essentially operatic, but which is related in some way,like historical and political information. For example, some of the interviews gathered for this particular OpenDrama production make reference to, and would act as links to, historical and political data about Vienna in the 1780s.

Recording the opera

Opera North's production of the Magic Flute, whilst forming the basis for the new content, could not for legal and financial reasons be recorded in its entirety. By utilising existing contracts covering television broadcast rights, a recording session of a maximum of twenty minutes duration was possible. The selection of this section was based on gaining a representative spread of the Magic Flute's content. An important further parameter governing the selection was the need to acquire a number of arias with singers performing simultaneously, this was to enable more complexity in the karaoke function. The final decision was worked out with all those involved that the first twenty minutes of the opera after the overture would be recorded. The recording session was carefully

planned and had to fit into the very tight schedule that all opera productions run to. A day was taken to record all of the video and audio material from the first twenty minutes. This involved having all of the staff normally involved in any performance from stage hands to the conductor and orchestra, available throughout the day. The twenty minute section was shot as a performance in a five camera shoot. Then a version of the same section was shot with the singers miming their singing parts but not singing, and speaking the spoken parts. One of the cameras always recorded the conductor, who conducted the singers throughout although they were not singing. After this, each singer was recorded separately, using the orchestra track from the previous recording and the video of the conductor to conduct them. This recording would then allow individual singers voice tracks to be faded in and out for karaoke. The multiple camera shoot also resulted in the possibility of multiple views of the twenty minute sequence. These were left unedited. The desire being for raw material not for a television programme. The separate recording of voices stretched the singers considerably as it was not a normal way for them to perform.

Interviews

Beyond this recording, it was recognised that there was a need to develop supplementary material about the production. This was primarily done by recording a series of video interviews with a number of the key people in the production. These included the director, the conductor, the designer, the choreographer and the singers. The interviews were done throughout the rehearsal period and into the run of the opera. The timing of these was critical. Typical the director of an opera is only around for the rehearsal period and leaves the production after the first night. The designer may work mostly at a distance and in this particular production was only in the country for a very short time throughout the life of the production. Carrying out the interviews at any other time would have resulted in considerably higher costs and also would have lost the immediacy, which resulted from the interviewees intimate involvement with the production, at the time the interview was recorded.

These interviews had to be structured to maximise their purchase upon the other content available and to demonstrate the potential for future extension of the OpenDrama system.

Figure 2, Jean Kalman, designer of Opera North's production of Magic Flute, © Opera North, 2003

Score

Whilst any production of an opera is based upon the original score in whatever from it is available, the actual score used for a particular production will have been altered to account for edits and changes which a director or conductor may require. So a version of the score is produced for the individual production. In Opera North's case this sometimes held in an electronic form, but even if it is then it is only held as a bitmap. For the purposes of OpenDrama it was necessary to put the specific score into a digital form, which could be manipulated by the system. For this the score was transcribed into Finale.

Libretto

Also because this production of Magic Flute was based upon a new translation of Schickenader's original into English, the libretto was transcribed into a digital form. These changes in both score and libretto indicate the ways, at a very basic level, different productions of a particular opera can vary. This aspect of opera productions demonstrates the limits of generalisability, which can be applied to a particular opera. We cannot always say that this aria is sung at this point in Act 3, when in a particular production Act 2 and Act 3 have been merged and some of the action omitted. So for each production of

an opera there will be many different structures and timings, whilst any performance of a particular production will normally not vary in structure and will only vary in timing by small amounts.

The book

In the opera house there is a way of recording the way in which a particular production is structured and produced. This is referred to as "the book". Actually there is often more than one book for a particular production, each one recording different aspects of the entire show. Probably the most important book is the one kept by the assistant director. This book, like the others, has the piano score on one side of the page and space for writing on the other. In it the assistant director records such things as position of the singers on the stage, comments the director has made about how the action should occur and the ideas, which are being emphasized at this point in the production. These remarks are numbered and the points they refer to in the score also numbered.

When a production is finished, this book is held by the opera company, often as the sole record of the production and as the basis for any revival of that production. In some cases a fixed camera video of the production is also held, for use only within the company. These tend to be of poor quality and give only a limited idea of the production compared with the depth of information available in the book.
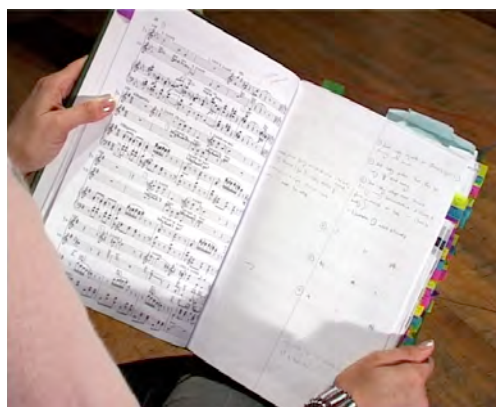

Figure 3, The book, © Opera North, 2003

Semantic tagging

Once the new content had been created, it had to be tagged to allow its integrated use in the full system. Following on the opportunities for developing semantic tagging within MPEG 7, a list of keywords for describing opera was developed. This list was devised to try to capture the emotional and ideological aspects of an opera production, in addition to the specific musical terminologies, which were also being used under MPEG 7. Typically this brought up aspects of granularity. Whilst the terms "aria" and "soprano" can happily be applied at the equivalent to a track level, terms like "jealousy" and "love" will require a much finer granularity down to a few bars or seconds. This level of granularity is more easily tracked using SMPTE timecode or similar.

Semantic tagging of this nature is both time consuming and personal. However there are some degrees of natural agreement, which will occur. Certain sections of Tosca will be seen by most people as tragic. However many other aspects may vary from production to production and from person to person. So any tagging may be regarded as personal. The OpenDrama system allows this kind of tagging to occur but has not yet built an authoring tool for this, but proposals have been, which might combine an authoring tool with the Advanced Delivery Client. This would be needed for any system to become usable for future productions and for its use as a learning tool.
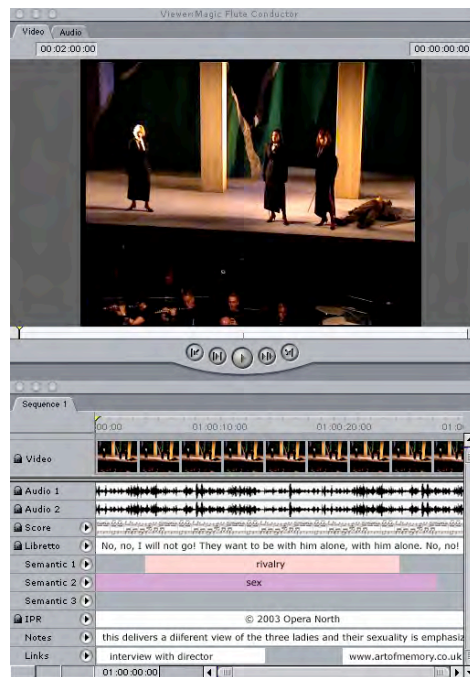

Figure 4, Authoring Tool and Advanced Delivery Client, © Graham Howard, System Simulation, 2003

Annotation and learning

Further to the structured tagging, which is dependant upon a restricted vocabulary, the system also allows the possibility of creating annotations. The learner or teacher can annotate media sequences with individual notes, with specified keywords or with links to build trails and interactions, which re-articulate opera and its contexts. Information can be built up for an individual performance, or a particular production or about the opera itself. Such annotations form a narrative layer, which can be very effectively used in the teaching/learning environment. Indeed it is possible that they could be used for communicating different views about the opera. It is easy to see how this could be transferred to the communication of critical thinking about film or video or any other time based sequence. The direct relationship between the specific time based sequence and the annotation has considerable significance for the critical discourse of all time based media. The discourse becomes available at the specific point as which it is applicable. And these discourses can be created to refer to specific points in the sequence. This brings the critical discourse of time based media into line with the critical discourse of texts and images, giving the same power of specificity of reference. Parallel work to this has been undertaken in a number of European projects, for example, Presto (2002). Once the authoring toolsets are developed, this work will move into the wider public domain. For education this means not just new ways in which media education can be carried out, but also enables the use of time based media, in a more sophisticated and articulate fashion, in many other subject areas.

Delivery

To deliver the content of the OpenDrama system a number of methods and channels have been considered. These have included the traditional portal, the advance delivery client, the memory palace and narratives. The channel for delivery has always been seen as essentially through satellite, to give broadband capability and interactivity.

Memory palace

To access the wealth of information delivered by the OpenDrama system a metaphor was proposed which could be used to encapsulate the space and articulate it for those using the system. This metaphor of the memory palace is an ancient metaphor and early on in the development of interactive multimedia was highlit as a key metaphor for the domain (Howard, 1986 and Howard, 1991b and Laurel, 1991). The device of the memory palace or memory theatre was based upon the ancient Greek ideas of the art of memory, where memories were located in architectural spaces. In a society where books are rare, this enabled the remembering of large amounts of text by associating sections of the text with particular aspects of the building. The more the building was filled with grotesque and idiosyncratic images the better. In the renaissance, just as print was changing everything, a number of people built small buildings, which would house memories or knowledge. The most famous of these was probably Giulio Camillo, who constructed one for the king of France with enough room for two people to get inside. Frances Yates (Yates, 1969) has suggested that theatres were also used in this way and as such there is obvious resonance with world of opera.

At first the approach in the project was to follow up this traditional view of the memory device and, indeed, if you are looking at just one opera and specifically one production of that opera, it is a strong potential candidate for an interface. However it became apparent that the particularity desired by the ancients would have to be loosened if there was to be a more generalised approach, which would be responsive to the dynamic data underpinning the system. With a dynamic environment there is a necessity to devise an architecture which articulates the information space but which does not restrict it or over determine it. It needs to be flexible and responsive and yet retain enough structure to prevent disorientation. It was therefore decided that the space should be more abstract and dynamic, based upon clusters of information or activity. These clusters are centred upon the key terms used in the semantic tagging. So that you can move from space to space encountering different thematic aspects of opera, "the jealous lover" or "revenge", as you move from one cluster to the other.
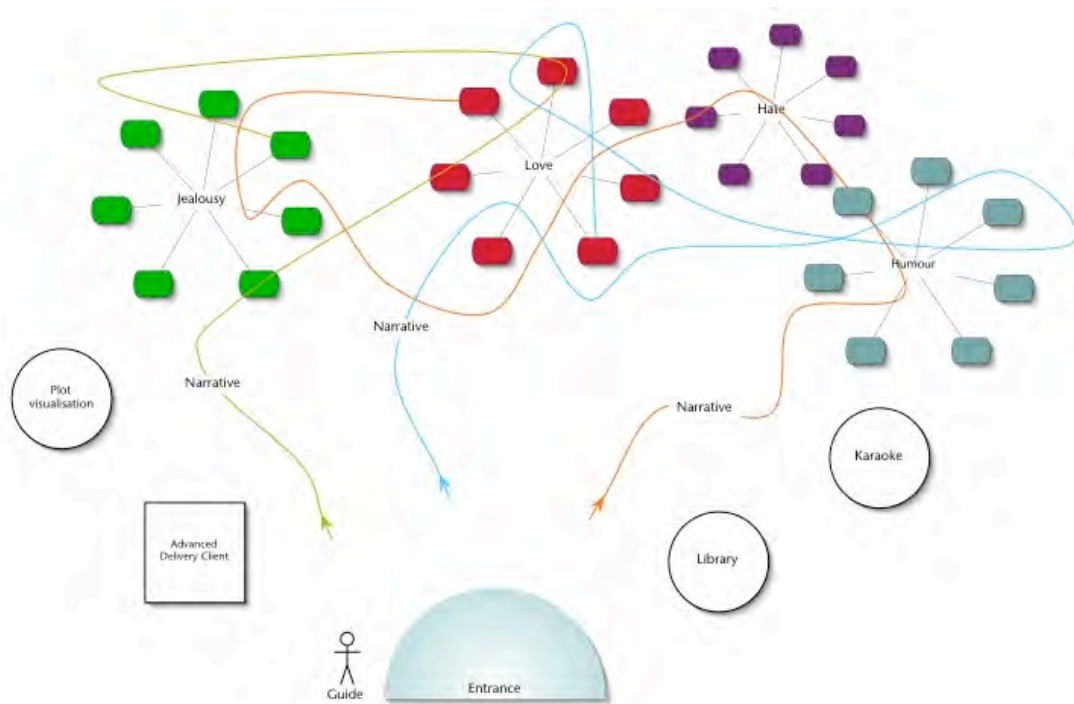
Figure 5, Memory palace, © Graham Howard, System Simulation, and Sarah Beecham,
Art of Memory, 2003

Narratives

This browsing approach is not the only one needed to cope with the range of possible scenarios. For some a more narrative approach is desirable, drawing the person deeper into the ideas of the opera by characterising the opera in different ways. For instance the use of striking tabloid style headlines to suggest the significance of the actions of the opera.

These sorts of narratives are designed to appeal to a younger new audience and as such form an important part of building new audiences for opera. They are however very time intensive to create. Typically they will relate to the opera in general, which means that by creating only a small number, introductions can be formed to a significant section of the opera canon. They will naturally refer to specific productions but this will add to their introductory quality.

Figure 6, Narrative tabloid, © Janine Huizenga and Andrew Bullen, 2003

Searching

Either within the metaphor of the memory palace or externally searching can be available at all times. This approach is more likely to appeal to those who are looking for very specific information about an opera. Such searching will give access to both the specific content created for the system and to the wider information available over networks using any of the appropriate protocols and standards, like Z39.50 or OAI.

Advanced delivery client

In many ways the advanced delivery client is the heart of the delivery system. Here it is possible to watch sections of the opera with the score and the libretto and access the

tagged information, as well as links to other sections and to the annotations. It is designed to give optimal access at all times. It is centred upon the time based delivery of the key content. It is therefore the prime way in which the multi-channel videos of the operas are to be seen. Because it is delivering many different streams of information, which must remain in synch, it is the most complex part of the delivery system both from a software engineering and from an interaction and interface design point of view. Screen space is at a premium when endeavouring to deliver a large number of sequences to the customer at once. A fully customer controlled personalisable system is the ultimate goal. However within the OpenDrama project only a few steps can be taken in this direction.

Karaoke

The OpenDrama system will also deliver karaoke of a particular kind. By carrying out the recordings in the manner described, it possible for a singer to watch a whole performance and then turn off the voice of the singer whose part they are taking and sing with the rest of the performers. The score and libretto, the conductor, as well as other performers remain in view to enable the singer to fit as closely as possible to the original performance. This aspect especially appeals to singers.

Satellite

The whole OpenDrama system is designed to be delivered over broadband satellite. It will use the facilities of Europe Online to do this. This will enable high quality video to be downloaded and give the ability to interact fully with the system.

What is to be done

The OpenDrama project is not yet complete. There are a number of things still to be done. Currently in production is a handbook which describes all of the methods and approaches that have been used and gives advice as to how such things as recording and content

development would need to be done in future for the production of OpenDrama operas. This includes the description of workflows.

After the system is built in final prototype form it will be tested both with novices and with professionals in the opera field, to discover as much as possible about its successes and failures but most importantly of all to discover those areas which should be developed in the future. Some of these can be envisaged already, like the development of suitable authoring tools, which would make it comparatively easy to tag up time based content. Such an authoring tool could be used for all time based content from film and animation to video and sound, provided it was in suitable digital form.

Further to this there is work to be done on building the business case for the OpenDrama system and how it might fit into the market of the opera house and the consumer.

Conclusions

The aim of the OpenDram project has been to open up the world of opera to new digital access and research and develop the ways in which this can be done. The approach has been to develop a system, which provides browsing, searching, narratives, participation and communicating. These five modalities combined with dynamic access to large networked datasets provide OpenDrama with its key differentials with respect to DVD. It demonstrates the way in which the early lessons of interactive multimedia combined with the dynamic and evolving net can deliver new and richer experiences, which in turn form the basis for new communication and learning in the context of time based media.

References

Coyne, M. & Howard, G. & Mallen, G. (2003), Projecting a digital future, British Film Institute

Howard, G., (1986) Art and Design: Al and Its Consequences, in K. Gill (Ed.) AI for Society, Wiley, Chichester, 1986

Howard, G., (1991a) Multimedia by Design. In EUC proceedings, Apple, 1991
Howard, G., (1991b) Shakespeare's Twelfth Night or What You Will CDROM, Apple Computer/Xploratorium: 1991

Laurel, Brenda, (1991) Computers as Theater, Reading, Massachusetts, Addison-Wesley, 1991

Manovich, Lev, (2001) The Language of New Media, Cambridge, Massachusetts, MIT Press, 2001

Presto (2002), European Union, IST-1999-20013

Yates, F. (1969) The Art of Memory, Penguin, London, 1969