ExCAPE

Exploiting **C**ultural **A**rtefacts for **P**ersonal **E**xperiences

SMALL OR MEDIUM SCALE FOCUSED RESEARCH PROJECT
(STREP)

Strategic Objective ICT-2009.4.1: Digital Libraries and Digital Preservation

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Co-ordinator name: **Joemon Jose**
Co-ordinator organisation: **University of Glasgow**
Co-ordinator email: **jj@dcs.gla.ac.uk**
Co-ordinator fax: **+44 141 330 4913**

List of Participants:

Participant no.	Participant Name	Short Name	Country
1	University of Glasgow	UGL	UK
2	University of Amsterdam	UVA	NL
3	Aalto University School of Art and Design	AUS	FI
4	Centrum Wiskunde & Informatica	CWI	NL
5	Tilde	TLD	Latvia
6	EYE Film Institute Netherlands	EYE	NL

PROPOSAL ABSTRACT

(copied from Part A, if not in English include an English translation)

Technological developments and goals

As digital-media technologies advance, musea, art galleries and exhibition centers have access to more sophisticated means of content presentation and distribution, in their physical and digital archives. However, the encasement of artefacts behind glass and the didactic guided tours reinforces that musea can be staid and austere environments, where visitors have to passively observe artefacts, or passively listen to historical accounts of the past. At the same time, fast-paced technological developments in the domain of computing science have led to novel forms of interaction that have shaped our lives in profound ways. Recognising that social interaction and active participation can prove critical to the visitor experience and the understanding of cultural exhibitions, we seek new ways to facilitate and sustain a much deeper engagement. The vision of the ExCAPE project is to augment interaction with musea and art centres by tailoring information to individual interests of visitors (e.g., situation-sensitive information provision, personalized access to cultural collections). Using state-of-the-art technologies, ranging from customized mobile devices to affect-aware sensors, we aim to stage on-site interactive experiences that will captivate visitors' interest. Furthermore, by unobtrusively capturing the experience, retrieving related material or information, and re-living or sharing the experience with others, the museum experience will be prolonged. ExCAPE's three high-level objectives are to provide:

· high likelihood of immersion alongside depth of experience;

· on-the-fly selection of associated interesting and relevant information/media/artefacts;

· personalised presentations that preserve the "flow" of the interaction.

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1.1 CONCEPT AND OBJECTIVES

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1.1.1 Vision

As digital-media technologies advance, musea, art galleries and exhibition centers have access to more sophisticated means of content presentation and distribution, in their physical and digital archives. At the same time, they increasingly have to compete with other cultural and entertainment activities and centres, such as the extravagant experiences offered by the mainstream film industry and the ultra-easy-access to web content. The challenge is further aggravated by the general notion that musea are staid and austere environments, where visitors have to passively observe artefacts, or passively listen to historical accounts of the past. The encasement of artefacts behind glass and the didactic guided tours reinforces this view.

Recognising that social interaction and active participation can prove critical to the visitor experience and the understanding of cultural exhibitions, we seek news ways to facilitate and sustain a much deeper engagement. The vision of the ExCAPE project is to augment interaction with musea and art centres by tailoring information to individual interests of visitors (e.g., situation-sensitive information provision, personalized access to cultural collections). Using state-of-the-art technologies, ranging from customized mobile devices to affect-aware sensors, we aim to stage on-site interactive experiences that will captivate visitors' interest. Furthermore, by unobtrusively capturing and re-living the experience, retrieving related material or information, and sharing the experience with others, the museum experience will be prolonged.

However, the scope of the project is not limited only in the development of unobtrusive styles of interaction, personalized presentations, or on-the-fly selection of unseen, meaningful information/media/artefacts for the visitor (context-based narrative). Our objectives drive us towards a museum agenda that is also concerned about the educational aspects of the museum experience, as well as opportunities for new forms of learning. We intend to address these issues by enabling knowledge building in different contexts and constructing understandings of the exhibits. The latter will be achieved with the help of multi-modal and mobile technologies that can support collaborative learning activities and social interactions, in an entertaining way.

1.1.2 Current Challenges and Trends

The French philosopher Henri Bergson (1977) remarks how Robinson Crusoe (in the famous novel by Daniel Defoe), after being shipwrecked on an island located at the mouth of Orinoco river, managed to preserve his link to culture and civilization by retrieving arms, tools and utensils from the wreckage. Bergson's well-aimed observation can be easily applied to modern society, which is characterized by an augmented level of cultural and ethnic uniformity. In an attempt to restore and sustain our historical and cultural identity, modern "Robinson Crusoes" (designers, curators, museum directors,

etc.) trace, collect and store visible records of scientific, artistic and social achievements. These cultural artefacts have a pivotal role in aiding our society develop an understanding of, and reflect on, material culture and its historical significance.

Fast-paced technological developments in the domain of computing science have led to novel forms of interaction that have shaped our lives in profound ways. For example, research on affect-aware technologies has resulted in the development of methodologies and prototypes that integrate affective elements, such as physiological signal processing, facial expression and speech analysis, gesture recognition, and other. In addition, recent advancements in mobile, wireless and positioning technologies have resulted in devices and applications that can promote active and collaborative forms of learning [1], without being restrained by time or location. Smartphones, multi-touch screens and tabletop interfaces provide novel avenues for interaction and collaborative exploration, as well as new learning opportunities.

Museum spaces and galleries are becoming increasingly augmented with digital technology, in an attempt to improve the physical, affective and cognitive aspects of visitor experience. Furthermore, to promote social interaction and learning these cultural centres have been utilizing technologies that incorporate interactive and mobile aspects. There is today, among curators and museum exhibition designers, a growing recognition of the role played by interaction, collaboration and sociality in the way people interpret, understand and develop knowledge about new things and concepts. According to [2] what constitutes mobile devices suitable, compared to other technologies, for supporting such interactions is their added value of enhancing activities in physical spaces and thus enabling visitors to learn anytime and anywhere.

Musea and art galleries face an important challenge that involves distinguishing among the available interactive technologies those that fit their educative and informing character. Surprisingly, many technologically-enhanced and information rich exhibits in practice overwhelm the visitor and promote the private, individualized experience. According to [3,4], most of these technologies appear in the form of interpretation devices, electronic guides or other computer-based devices that enhance visitor's engagement with the cultural exhibits at the cost of impoverishing collaboration and co-participation. Very often it is the case that the social interactions or forms of collaboration that emerge under these circumstances are limited to one visitor assisting another in implementing a sequence of actions, while interacting with an exhibit or a computer-based device.

Interaction is the process by which the stakeholders experience the benefits of the underlying information sources. The issues in developing better interactive experiences have been studied many a field; for example, in HCI and CSCW general principles of human-computer and human-human interaction have been developed. Similarly, in Information Retrieval issues pertaining the interaction with, and personalization of, retrieval systems have been investigated and novel solutions have been provided: (i) content modeling techniques, (ii) personalized retrieval systems, (iii) information filtering and recommendation, (iii) affect-based information retrieval. However, many of these advancements have not reached the cultural archives domain. Though in recent years of research we have made significant advances in the use of ICT in the cultural domain, the interactive experiences of users have not been developed to their full potential.

Additionally, in a fast moving modern society, people are getting used to abundant use of technology for entertainment, gaming or learning. Vast knowledge resources, such as the World Wide Web and other specialized digital archives bring in tremendous

amounts of information to peoples' fingertips. At the same time, search engines, social networks and smart phones, make it possible to access, link and experience the benefits of such collections. One of the research challenges in computing science is to develop systems that facilitate situation sensitive provision of information. However, this requires further advances in many fields including information retrieval, content- and user-modeling, and adaptive interaction, to mention a few.

The goal of the proposed project is to advance the state-of-the-art in adaptive and co-participative interaction, to meet domain specific requirements and needs. The museum, like any other institution, affords certain social and cultural conventions. Part of these conventions is visitors' expectations of the various visual, auditory and entertainment aspects of the exhibitions. Recognising that active participation and social interaction can prove critical to the visitor experience and the understanding of cultural exhibitions, we seek news ways to facilitate and sustain a much deeper engagement. In Europe large amounts of exhibits and historical artefacts are archived in cultural collections, and are made available to the public. Many such distributed resources are linked or will be linked in the future. In addition, a great amount of complementary information is made available in those collections, as well as in publically accessible and free resources, such as the World Wide Web or specialized archives. Very often the visiting experience extends beyond the physical or time boundaries of the museum visit and the museum patrons construct knowledge and draw satisfaction even during the post-visit phase. For a visitor, it might be revealing to receive such complementary information in a manner that will enrich and extend the current experience of an object/artefact.

1.1.3 Exemplary Scenarios

Use case 1: Travelling Businessman

Fiona Stewart is in Amsterdam for a business meeting. Since her meeting ended earlier than expected, she has the rest of the day available to enjoy the city. Not having planned anything for her evening, she indicates this unexpected spare time on her mobile device and requests some suggestions as to what to do. Her device is aware of her interests, including that she is a big fan of Tim Burton films. As it happens, the Amsterdam film museum hosts an exhibition on Tim Burton's work. Her mobile suggests this exhibition, pointing out that it is within walking distance from her hotel. It also shows that her good friend Sarah visited the museum a few months ago and she particularly enjoyed the interactive exhibition running at that time.

When Fiona arrives at the museum the ExCAPE culture connector application, which she had previously installed during a visit at an art gallery in Glasgow, automatically opens. The application displays an interactive map of the museum and, being aware of Fiona's movie interests, suggests the film "Alice in Wonderland" (directed by Tim Burton) that is about to begin. Fiona settles down to enjoy the film. While she is watching, she is reminded about a conversation with a friend, who felt the 3D was very realistic. She is less convinced and marks the parts of the film that confirm her point of view. She loved the Red Queen and marked several of these passages, including the one with the footstool, as well. At the same time her wristwatch, which is equipped with GSR and heart-rate sensors, registers her emotional arousal and detects the parts of the film that she particularly liked or disliked. This information is transmitted wirelessly to her mobile device, which automatically updates her user profile.

After watching the film she buys a cup of coffee from the museum café and sits down at an interactive table. As she sits down, the clips she had marked or felt as interesting appear on the table one by one. The system proactively retrieves information about other films directed by Tim Burton, or with the same actors, and gradually presents

them as thumbnails. She accesses the table's virtual keyboard, and composes an email to her friend, attaching some of the clips, by dragging them to the email. At the same time her email is recorded as an annotation of the clips in the museum database. Having sent the email she removes the 3D clips she is no longer interested. The clips related to the actress who played the Red Queen then catch her attention. These have been highlighted by the ExCAPE application as items of potential interest, since her physiological readings during the film indicated high emotional arousal. Fiona is curious to know why she responded that way. After examining carefully the clips she realizes that the actress is Helena Bonham-Carter, who also played in Fight Club, and selects the corresponding thumbnail. While viewing the clip she is intrigued by the different facets of Bonham-Carter's acting.

While she is enjoying this process of browsing, a message appears on the table informing her that she has only an hour left and that she might want to go somewhere else. She decides that she should move on, and marks the "Fight Club" as a film she would like to see in the future. She then proceeds to the interactive exhibition, where she spends some time half-heartedly glancing at the posters and screens, and decides that it is perhaps already time to go (her wristwatch senses that her interest levels are dropping and she is growing tired). She is just about to leave when one of the wall-screens starts to play scenes of Helena Bonham-Carter in different roles (the system responds to her fatigue levels by offering the full media experience, which stimulates Fiona's attention). She smiles, and walks over to enjoy the full-sized images and puts on one of the headphones next to the screen.

Half an hour later her mobile device tells her that it really is time to go, so she reluctantly removes the headset and leaves the museum. Fiona flies back to Glasgow and the next evening tells her husband and son about her visit to the museum. She uses the museum application on her mobile to browse the museum's website, where she can see the lists of film clips she had collected the day before. She plays a summary of her visit, which shows snippets of the Bonham-Carter video clips she had been enjoying. She pauses the video now and then, and excitedly explains what she particularly likes about the actress. She is then reminded that she wanted to see the film Fight Club and decides to purchase a digital copy from the internet, and watch it later this week with her family.

Use Case 2: The Scholar

Tim and Annika are postgraduate students in Film Studies, at the University of Amsterdam. As part of their coursework, they have to prepare together an assay about the early days of film-making. The main aspects they have to cover are: (i) early camera techniques; (ii) the beginning of film marketing and (iii) the perception of cinematic films on the general society.

The couple decides to split the work and allocate the topics by preference. Annika decides to focus on the mechanics of the early film cameras, in her mind a rather dry topic. After researching about it online, she realises that the Amsterdam film museum has a large exhibition on the development of film making, starting with the time of silent films till recent digitally recorded films. She hopes to get a hand on experience of early camera models and decides to visit the museum. Tim chooses to investigate the social impact of films. He decides to join Annika, in an attempt to find relevant information at the museum as well.

Annika's previous research activities led to the generation of a user profile, which contains hints that she is interested in the topic. When arriving at the museum, a recommendation system she has installed on her handheld device generates a personalised museum guide. The system suggests her to visit diverse sections within the

museum that are related to her interest. Her trail within the museum is tracked by her mobile device and every exhibit she expresses interest in is registered.

Tim also receives a touchpad at the museum reception but, since he never visited the Film museum in the past, his user profile does not contain any information about his active interests. After spending some time wondering around, the profile is updated, based on the exhibits that are registered in his handheld device.

At some point the two students join up and spend some time looking at the exhibits together. For every exhibit they visit the system forwards to their handheld devices some complementary information, based on their user profiles. Since their interests are different, the information they are provided each time covers different aspects of the same exhibit. In the case of Annika, the information delivered covers the mechanical aspects, while in Tim's case it's more related to the social dimensions. This promotes fruitful discussions between the two students, who exchange information and build knowledge in a collaborative manner.

After leaving the museum, the recommender system generates digital information sheets for each visited item by gathering information from different online sources. These information sheets allow Tim and Annika to generate a slide show of the most important items they saw. Moreover, they can send this slideshow to her fellow students, who used the same system for their research. Combining all slides, the group easily generates a larger slideshow, which they finally present in their course.

Summary:

These scenarios depict the future and, at the same time, show that we are not exploiting our cultural archives to their full potential. This is partly a result of the lack of such commercial applications and technologies that would be required to implement such a scenario. The challenge is to understand the relationship museum visitors and material culture, to provide richer interactive experiences and proactively offer complementary relevant and useful information to the visitor. Such presentations can be delivered on personal devices, such as smartphones, or museum displays that are publicly accessible. More in specific, we need to develop novel techniques for developing **user models** that incorporate multiple interests and preferences; **adaptation and personalization** techniques; **adaptive retrieval recommendation** techniques; **emotion-based** and **content-based** categorization and **linking o**f information; **multimodal-interaction techniques** to interact with the environment; **story telling** interfaces; **narrative creation** techniques; **collaborative interaction** techniques; social network based modeling and interaction.

The ExCAPE project will advance state of the art in above areas and develop innovative solutions to enhance user experience in interacting with cultural collections.

1.1.4 Objectives of the project

The primary aim of musea and archives is to collect, preserve and support the study of historical, artistic and scientific artefacts. The visitors of these collections, however, wish to be confronted with connections, historical context and uncommon perspectives.

ExCAPE's three high-level objectives are to provide:

- high likelihood of immersion alongside depth of experience.
- on-the-fly selection of associated interesting and relevant information/media/artefacts.
- personalised presentations that preserve the "flow" of the interaction.

Objective 1: Immersion and quality of experience

ExCAPE's primary objective is to ensure that users maintain a high level of immersion when present at a museum, retain a memory of this immersion, and be able to share it with others later. This will be achieved through the creation of example high-quality interactive experiences and real-time sensing of user's involvement in these. Interactive exhibit provided the most favourable conditions for promoting constructive discussions between museum patrons, in terms of the criteria put forward by the socio-cognitive conflict theorists.

Objective 2: Information richness

ExCAPE's second objective is to ensure that the experiences are not merely superficial, but can lead smoothly to investigation of different aspects encountered during the immersive, interactive experiences. This will be achieved by connecting these experiences to related sources owned by the musea, and to rich information sources available on the web.

Objective 3: Personalisation and contextual narratives

ExCAPE's third objective is the on-the-fly creation of personal narratives, reflecting the sequence of experiences encountered. This will be achieved through the construction of narratives based on the example interactive experiences (objective 1), the potential wealth of related information (objective 2) and embedded system knowledge of narrative structures and their creation, navigation and communication. The stories expressed in the interactive exhibits are situated in their own historical context. The artefacts referred to, whether real-world or digital, are themselves contextualized by the stories of their creation and referencing. These provide potential “pivot points” for "escaping" from the current narrative context. Directors of, actors and characters in the stories, and locations of the stories will provide further potential pivot points.

Objective 4: Promoting social and co-participative learning experiences

This objective will involve the investigation of how multi-modal and mobile technologies can be deployed to engender social interaction among museum visitors, through interactive and co-participative experiences. It is critical to understand how visitors interact with, and within, the museum environment and study the ways social interaction can improve intellectual, social, personal and cultural development. Furthermore, we need to explore the potential of mobile technologies and their added value of technologically augmenting such activities in physical spaces.

Objective 5: Enriching the museum interaction with affective elements

Evidence from recent neurological studies underlines the importance of emotions in human cognition and perception [5]. Emotions play an essential role in social interactions [6,7,8] perform important regulatory and utilitarian functions within human body and brain, and facilitate rational decision-making and perception [9]. On the other hand, attention and decision-making can play a critical role in the observation and understanding of cultural exhibits and art. Our affective responses can be indicative of our interests, our likes and dislikes, and shift our attention accordingly. Therefore, there is an interdependency between how we feel and what we think, even within the context of a museum visit.

Izard [10] underlines that interest can be developed due to factors such as novelty and change, as in the case of arts. However, interest is only one of the many affective/cognitive states that a museum visitor can experience. Several studies such as [11, 12, 13] have highlighted the link between human emotions and creative arts, and specifically audio-visual experiences such as films. Carl Plantinga and Greg M. Smith in their book "Passionate Views" [14] explored the emotional appeal of the films and cinema. In the context of ExCAPE, the platforms used include advanced, hand-held, personal communication and media capture devices, e.g., smart phones and iPad, in addition to venue specific devices, such as tabletops and wall screens. Affect-aware technologies, such as heart-rate monitors and wearable GSR sensors will be employed, for capturing visitors' affective and cognitive engagement with the exhibitions and generating user profiles based on their recognised preferences. Furthermore, to provide the required depth of information, the interactive exhibits will be linked to repositories belonging to the cultural heritage project partners, in addition to open access data on the linked data cloud (e.g., Europeana).

Objective 6: Ethnographic study & roadmap generation

The Research and development of adaptive search and presentation requirements will be informed through a series of user-centered evaluation methodologies, such as ethnographic studies, empirical observations and analysis of the interactions that occur in the museum and cultural archives domain. The latter will occur while giving particular emphasis to the application of latest technologies. Through these, a clear road map will be developed that will act as a guiding force for future developments.

Objective 7: Demonstrators & evaluation

ExCAPE will test and evaluate adaptive and personalized search environments by defining realistic scenarios of use related in real-world museum applications; defining datasets and test procedures to be applied to the evaluation of results; integrating prototypes; carrying out and evaluating trials based on the scenarios with real users in a range of situations. These objectives will be met by furthering the state of the art in a number of areas, and in particular user and context modeling, interactive media retrieval, adaptive interaction and affective computing. In addition, state of the art tools and techniques available in the areas of semantic technologies, knowledge modeling, adaptive retrieval and recommendation will be used.

Objective 8: Dissemination of research achievements & prototypes

Finally ExCAPE will develop strategies for wide dissemination of the results and scenarios for their incorporation into market-oriented business services in musea by involving potential stakeholders and including the public in on-line and off-line events; identifying business models, means of monetising personalized search and interaction techniques, and market strategies.

Relevance to the call

The project mostly addresses the sub-objective (d)

Adaptive cultural experiences exploring the potential of ICT for creating personalised views of various forms of cultural expression, reflecting individual narrative tendencies (i.e. adapt to the background and cognitive context of the user) and offering meaningful guidance about the interpretation of cultural works.

The objectives and the work programme ExCAPE address all the concerns of this call. The idea is to by modeling context, multi-faceted user profiles and developing adaptive and personalized interaction schemes we can enhance user experience. We will also effectively utilize emotional and affective features for building personalized interaction techniques. 4 demonstrators are planned to show-case the development of technology.

1.2 PROGRESS BEYOND THE STATE-OF-THE-ART

Describe the state-of-the-art in the area concerned, and the advance that the proposed project would bring about. If applicable, refer to the results of any patent search you might have carried out.

1.1.1 State of the art– museum technology

During the last two decades musea spaces and galleries have become increasingly augmented with digital technology, in an attempt to improve the physical, affective and cognitive aspects of visitor experience. Tangible, mobile and interactive technologies have been an area of special research interest. Their application has been explored as a mean to create hybrid installations that aid visitors in manipulating physical and digital artefacts, and improve the overall experience within an exhibition. The research held in this domain can be categorized into: (i) mobile technologies that promote social and learning interactions, (ii) tangible and/or multi-modal interfaces, that offer enriched interactions, and (iii) robots/humanoids that act as museum tour guides.

Examples of studies from the first category can be found in [15, 16, 17, 18, 19, 20, 21, 22, 23]. These studies, in their majority, involve the use of wireless and handheld devices as a medium to enhancing the visitor learning experience and promoting more opportunities for social interactions. Examples of studies from the second category appear in [24, 25, 26, 27, 28, 29, 30]. Studies that fall in this category propose technologies that facilitate more natural interactions with tangible and technologically augmented exhibits. Some of the work presented here involves the application of multiple modalities, including gesture recognition, speech analysis, physical selection, location, and other. Finally, examples of studies from the third category are discussed in [31, 32, 33, 34, 35]. This group of studies involves the deployment of autonomous, interactive tour-guide robots in the museum environment. With the help of multimodal technologies these humanoids can interact with museum patrons, attract people to events and exhibits, and engage people's interest, while maintaining their attention to a specific exhibit.

1.1.2 Sate of the art – adaptive and expressive media systems

ExCAPE aims for personalised access to cultural artifacts in a sufficiently entertaining way that ensures that the casual passer-by will become intrigued by what they encounter, while at the same time provide depth of content for those who are willing to invest time interacting with the system.

First approaches in that direction were developed in adaptive media systems [36, 37], which represent systems that offer users freedom to navigate through a large, finite and known hyperspace. Those systems facilitate adaptation by means of purpose-driven navigation and access of the content. Those systems are tightly integrated with one specific, smaller-scope application, mainly in the domain of education, in which they operate, in the adaptation framework described by Kobsa's [38]. This set-up follows a client-server architecture, where the client runs the interaction interface of the application and the server side generates the user models from a database containing the interactions of the user with the system and the personal data/preferences that each user has given to the system. The focus of those systems lies the representation of assumptions about the knowledge, goals, plans preferences, tasks and/or abilities of the user; the clustering of relevant common characteristics of a user pertaining to specific user subgroups; and recording user behaviour

with the aim of distilling assumptions about the user from the interaction history to adapt the pre-organised content.

Other attempts towards adaptation focus on the combination of available content units into meaningful presentations that serve the user needs [39, 40, 41, 42, 43]. Here the focus lies on the capture of the current physical user context and related interaction pattern as well as resulting experiences to adapt the content into a linear meaningful manner. A particular set of applications that also apply this adaptation approach based on changes in the environment, such as changes in network connectivity, weather conditions, or direction changes are mobile tourist guides [44, 45, 46, 47].

There are a number of systems that make use of representations of user experiences without an explicit user model [48, 49, 50, 51, 52, 53]. In those systems the actual experience is culturally grounded, dynamically experienced, and to some degree constructed based on inaction and interaction. Those systems also stimulate experiences in the user or facilitate the sharing of experience representations among users. Yet they do not exploit pattern collected over longer periods of time to model the individual user as the basis of presentation generation but rather exploit emerging behavioral or sensor pattern in real time. The real-time aspect facilitates them with immersive power. In that way the represent one spectrum in the growing realm of experiential systems, where others try to establish experiences based on a wider context, in which the description of events plays the focus role. Predominant for those systems is that pervasive parameters of the current user context can be extracted, for which most systems utilize mobile devices as detectors. Here immersiveness is achieved through integrating the locality into the application [54], or through mapping the current surroundings to event models [55, 56] that combine behavioral and experiential data with particular locations.

The disadvantage of these experiential systems, being based on affect, emotion or behaviour, is their reactiveness, which does not allow for general but rather momentarily understanding of the user.

1.1.3 Improvement through ExCAPE

The shortcoming of the mentioned systems is that they assume small sets of user interactions, and fixed set of descriptions regarding user knowledge, goals, plans, preferences, and abilities. In the large multi-media knowledge spaces combined of various sources of different institutions, such a restricted behaviour set cannot be taken for granted. Instead, we see that users are attracted to cultural items based on idiosyncratic reasons, not always obvious to a system. This becomes in particular problematic in cases where the user is a rather unknown subject and modelling needs to be performed in real-time.

The aim of ExCAPE to overcome those problems is to make more efficient use of context as well as experiential data captured during the current user interaction with the cultural heritage content. The attempted approach establishes for each user a personalised presentation that takes into consideration the current physical, emotional as well knowledge context but also tries to synchronise that with the personal presentations of other users in the same physical proximity. In that way ExCAPE tries to combine user modelling with the reactiveness of experiential systems. In that way ExCAPE tries to establish a more precise model of context that goes beyond the common approaches of exploiting the mere physical context based on used hardware and established events. Our intentional as well as experience-based approach synchronises this type of ‘context’ with social network behaviour, achieving rich presentations with respect to associational depth. The aim is to

overcome the idiosyncratic representation pattern that previous systems root in, to facilitate presentations that incorporate a richer set of point-of –view.

This approach of synchronization of the users idiosyncratic profile with real-world pervasive behaviour, which allows real-time adaptation even if we know nothing or very little about a user, also facilitates the basis for distributed long-term memory structures in form of traces. In particular the actions with context defined processes, such as accessing, creating, consuming, annotating, allow for linking data to user interest. Strategies to achieve this type of adaptive interaction can be adopted from case-based reasoning (CBR) [57], in particular those strategies that trace the history of actions [57]. In that way we combine the two traditional approaches of user adaptation, as described earlier, into one framework. Though long-term memory support of adaptations is not the goal of ExCAPE we will demonstrate that this is possible with our short-term memory structures developed real-time presentation adaptation in environments where users are understood as the casual visitor.

Finally, as our approach for contextualisation covers the combination of localisation with user action and preferences the cultural heritage institutions are able to monitor visitor behaviour over various temporal distances and draw conclusions for the adaptation of the current program as well as for the design and realisation of a new complex exhibitions. The ExCAPE approach for contextualization also offers the means to establish the association of semantic annotations with media assets for the preparation of media content for adaptive use. The aim is to fragment the fundamental processes of media production [58] to support their easy placement in the overall context of production and consequently consumption.

1.1.4 Narratives & Automatic Story Creation

Artists and technologists continuously explore narrative/storytelling as means of having higher emotional, and thus cognitive, impact for the application user experience [59]. Interactive narratives – in popular use in story-based computer games like action-adventures in 2010 – often adopt the approach of branching narrative structures or (inter)action sequence interrupted linear structures. In those, a finite number of pre-scripted paths result from a choice made at a specific decision point in the story events. However, much more dynamic approach towards narrative is in demand and under research and development for further commercial use [60, 61]. The flexible narrative systems development (e.g. in the continued development of the ShapeShifting media tools originated in the nm2 EU IST FP6 project and Storytron software) looks towards enabling a far more dialogical nature to the story content by using associative narrative structures [62] that rely mainly on the development of user and system agencies, the human-human and human-computer interaction of which generates engaging, memorable narratives that may vary very much in each interactive session [63]. The early steps of the approach date back to the 80s (e.g. Carnegie Mellon and Brenda Laurel), while its early successes, for instance, in MMORPGs (Massively Multiplayer Online Roleplaying Games) like Asheron's Call, demonstrate usability in future development.

The narrative agency scheme suits very well also spatial and multimodal museum exhibition design, in which the user seeks for certain knowledge and experience, and the exhibit systems - and other visitors - can respond to and partake the user's visit. For example, the recent Crucible Studio exhibit piece Alan01 [http://mlab.taik.fi/alanonline/] engages interactive audience in dialogue with Alan Turing (1912-1954), as if his consciousness had been coded into a machine [64]. The

user can co-operatively with other users "talk" to Alan01 by a system of historically significant symbols and receive a personalised narrative of the life of the historical person in

question, while the story material can be revisited online, as well. The production brings history and digital material on Alan Turing "hands-on", as do the exploratorium-type science museum interfaces. Digital libraries and museum exhibit design have still much more to draw from the narrative experience design of multimodal experiences.

1.1.5 Adaptive and personalized search and recommendation techniques

The problem of information retrieval has traditionally been considered as one of identifying documents relevant to a query in a global sense, paying little attention to the individual needs of the user who is searching for information. However, engaging with information search is iterative in nature and this interaction can be exploited for personalization [65]. Similarly, users past interaction can be exploited for more adaptive and personalized presentation [66]. However, identifying users multifaceted needs [67, 68] and recommending pertinent information is a real challenge. Moshfeghi has demonstrated that semantic categorization can be exploited for effectibve recommendation [69].

1.1.5.1 Multi-faceted user modeling

The 'right' answer to an information request depends both on who is asking, and why they are asking: even the same person's information requirement can change rapidly, with changing circumstances or growing knowledge. User interests vary between different concepts [68]. Modelling both the user's profile and their evolving need is an important area of research in information retrieval. Information filtering systems and personal information agents (PIA) are ways of personalising the search experience by constructing representative user profiles and subsequently using them either more situation immersive relavnt information presentation.

User intentions, and hence user profiles, may be determined on the basis of either implicit or explicit feedback. One approach captures the implicit actions of users to personalise the results retrieved during subsequent sessions; the other allows users to provide exemplar documents matching their needs, to direct query formulation. Semantic profiles define users as a set of concepts derived from the relation between an external ontology, such as the Open Directory Project, and the content of documents, which define their needs [70]. Alternatively, open and editable user 'weighted-term' profiles may be constructed from defining terms extracted from documents selected in information seeking sessions.

1.1.5.2 Context Modelling

Context-aware computing applications' were first examined in detail by Schilit et al. [71] in the area of ubiquitous and mobile computing. They were defined as being "a new class of applications that are aware of the context in which they are run". Key to their operation is that they "adapt according to the location of use, the collection of nearby people, hosts, and accessible devices, as well as to changes to such things over time". Dey [72] provides a more general definition of context-aware computing which considers more than just physical contextual factors, and is more applicable in this instance: "A system is context-aware if it uses context to provide relevant information and/or services to the user, where relevancy depends on the user's task." The notion of context becomes very apparent particularly in ubiquitous computing, where the changing contexts of a mobile device strongly affect the usage and desired operation of that device.

A concise definition for the perception of context is: "Any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves." However, it should be noted that what is a characterizing feature of context for one user may not be so for another. Although anything could theoretically define context, state that the fundamental context in the domain of a

computing application can be summarised simply as the "who's, where's, when's and what's". It is from this information that it may then be possible to infer to some degree of "why" this context is occurring within the given domain. From an operational view, they note that the more important aspects of this context are "location, identity, activity and time".

Dourish [73] comments on the flawed incompatibility between the "representational" positivist ('verification of phenomena') and "interactional" phenomenological ('description of phenomena') views of context, and how many strands of computing science look at the problem purely from a positivist perspective. He remarks that current research in these areas makes some problematic underlying assumptions of context as they conveniently consider it. These issues include that context "is a form of information" itself, it is "delineable", "stable" and that most problematically "context and activity are separable".

Baldauf et al. [74] review what they consider to be the six current context modeling methods. These are "key-values models", "markup scheme models", "graphical models", "object-oriented models", "logic based models" and "ontology based models". Dumais et al. [75] comment that the majority of work in information retrieval is to facilitate information discovery (web search engines for example). Yet, the nature of knowledge work is such that it often involves finding, re-using and integrating information that has already been found and accessed.

1.1.5.3 Emotion

'Interest' in an item is the basis of access or reason for interaction. 'Interest' is regarded by Izard as one of the eight fundamental human emotions [10]. According to the affective-cognitive and emotion-pattern theories, interests can trigger and be triggered by cognition as well as emotions. In other words, emotion plays an important role in the development of interests in humans. From this perspective, the role of emotion in influencing users' interests can then be used for orgnising pertinent information and is currently neglected in the current information systems. Moshfeghi proposes to explore the role of (both reader's and writer's) emotion in characterising users' interest.

A system that provides quantitative and qualitative information about the emotional value and feelings represented in documents would be useful for a broad range of users, such as those looking for information about movies, trying to plan their vacations, searching for specific articles for or against specific subjects, or even marketing managers looking for consumers' feelings on products. Arapakis et. al demonstrated that a system that provides quantitative and qualitative information about the emotional value and feelings based on personalised user profile –consisting of concepts and emotions– will be even more useful [76].

Techniques like sentiment analysis and opinion finding tasks are developed and exploited widely and which is dedicated to extract the sentiment from documents (writer's emotions). However, emotional information contains much finer categorization and thus can enhance the effectiveness of presented information. For example, the performance of collaborative recommendation systems can be improved significantly by integrating semantic spaces [69] and also the performance of content-based recommender systems can also be improved.

In addition to emotion extracted from content the user characteristics and affective features can also be exploited effectively for adaptive retrieval of infor- mation [77]. Arapakis et. al [78] showed that emotion is an integral component of information seeking activity. Further,

such emotion captured from users through facial analysis and biometric information can also be used for adapting information retrieval tasks and also to build personalized models [79].

The progress reported above addresses fundamental research questions with respect to the use of emotions. However, much work needs to be done to exploit emotion in real-life scenarios. Moshfeghi report that the main problems in con- structing methodologies for emotion research questions are: (i) Techniques used in extracting emotion from users are very limited in both scope and variation, and still in their infancy, and (ii) extracting emotion from textual documents is an emerging field of study. Finally, (iii) experimental user-studies expose users to lab conditions. This lacks the ecological validity of a naturalistic study and might deteriorate the accuracy of emotional feedback given by users. There- fore, designing and implementing scientifically viable user studies is a major challenge.

1.1.5.4 Collaborative Recommendation Techniques

Recommendation systems (based on previous behaviour, item descriptions, and user profile) have proved very successful on websites such as Amazon.com and Netflix, but attention is only just turning to recommendation techniques on social networks. Even the most successful recommendation methods currently fail to predict ratings accurately, because they do not take semantic information into account. They miss the fact that two users may give the same rating to an item for different reasons: one may be interested in a movie because of its genre, another because of the star. Another major issue facing current recommendation algorithms is the sparsity of data. Rating data is typically sparse because users do not judge all possible items and a large number of less popular items remain un-viewed. Only very few ratings are available for a new item or new user. In general, the number of ratings that need to be predicted is large in comparison with the number of ratings already obtained. Collaborative approaches have particular problems in making recommendations for users with atypical preferences. In addition, emotion is an important factor in user interaction and particularly in retrieval scenarios.

The relationships captured in friendship data are useful for personalising recommendations [80]. Tags added by user interaction can also be used for supporting recommendations, especially when non-textual media such as video, image or music data is involved. Sample-based algorithms can be used to capture information in the neighbourhood of a user in dynamic social networks, utilizing the random walks method. The distribution of tags in the social bookmarking site del.icio.us has been studied to propose a generative model of collaborative tagging and evaluate the dynamics of collaborative recommendation. The findings prove that the dataset collected follows a power-law distribution, but do not explore the dynamics of friendships among users. Free-form tagging of items by users other than their authors/owners is a powerful technique, which has been exploited automatically to recommend tags for blogs, using similarity ranking in a manner similar to collaborative filtering. It has been argued that the tags used when performing a query exhibit intention, whereas the annotations of items describe content semantics, which may make it possible to define 'purpose' tags that extract the intent of the user to facilitate goal-oriented search in a social network. Very recent work has studied the role of social relationships and tagging in supporting recommendations, with promising experimental results [69, 80].

1.1.5.5 Improvement Through ExCAPE

ExCAPE will push the state of the arts in above mentioned fields, and basing on the already existing know-how reported above. The particular emphasis is given within cultural domains where it is important to have mature user modeling techniques. It is not clear how the multi faceted needs can be modeled in terms of visiting museums or cultural domains .

We will also develop effective and saleable techniques for context modleling. Demais et. al [75]. They speculate that one of the main failings causing low adoption rates of such systems was their “limited applicability of new technologies, each focusing on a limited conception of personal information”. Considering contextual cues could potentially manifest from many aspects of usage we need to propose a system that can support these diverse sources in order to be effective. Whilst we can’t come close to understanding the full scope of context in such a project, we can develop a framework, which provides support for future extension and development. It is important to learn important contextual patterns that affect the consumption of information provision at a point.

This concept of adaptive and personalized search is a new area that we will be exploring extensively. ExCAPE will develop collaborative recommendation methods by exploiting semantic and emotive information. We will also look into enriching the recommendations with social relationships and emotive information.

1.3 S/T METHODOLOGY AND ASSOCIATED WORK PLAN

1.3.1 Overall strategy of the work plan

ExCAPE's 36-month work programme is structured into 7 Work Packages. WP1 ***Consortium Management*** *is a 'wrapper' activity that holds together all other work packages. It will support the smooth and effective conduct of ExCAPE. WP2 is a 'foundational' work package, which defines scenarios of use, roadmap the use of innovative ICT in museum domains, develops domain specific conceptual design solutions and establishes the methodology for evaluation. WP6 is the 'integration' work package, assembling results of the work carried out in the core RTD Work Packages 3 – 5, testing and evaluating it under realistic conditions. WP7 on* ***Dissemination and Exploitation Planning*** *links the outcomes of all the activities and aims at making the project results visible to the outside world and preparing the partners to grasp commercialization opportunities. More details about these activities may be found in section B2 of this document and the corresponding work-package tables in section 1.3.3.*

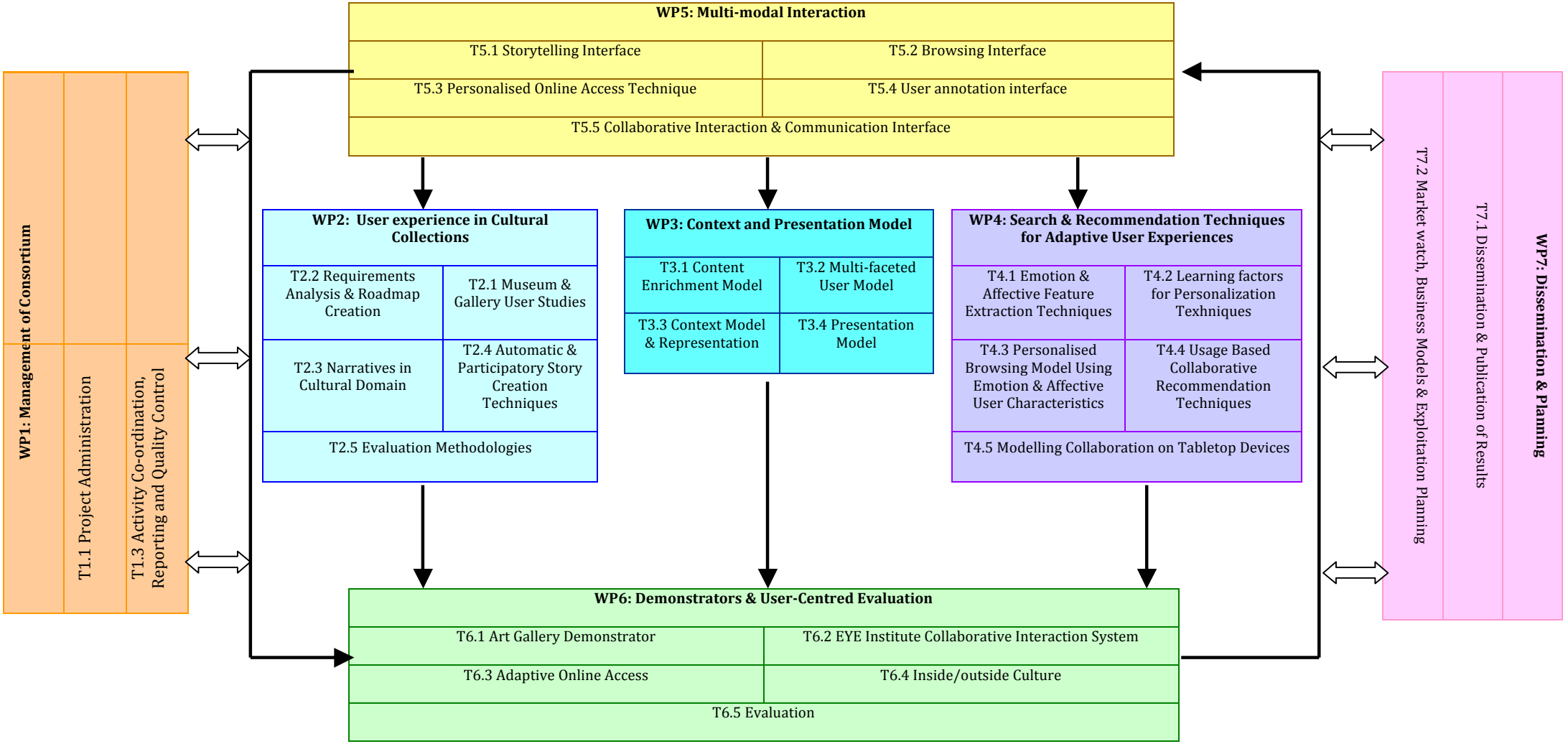
Many of the research tasks are complex and inter-related: in order to structure the work and minimise risks and critical dependencies, the 36-month work plan is organized into three Phases. Within each Phase marks a major milestone or control point related to Deliverables at M12, 24 and 36. There are also two interim minor milestones at M6 and M18 and M27. The Phases are:

- *Phase 1, Proof of Concepts, from start M1 to end M12*
- *Phase 2, Advanced Prototypes, from M13 to M24*
- *Phase 3, Demonstrator Evaluation, from M25 to M36*

In the following, we give details regarding the work that is planned for each work-package. A concise description of work-packages including task breakdown, deliverables, milestones and partner involvement is given in the corresponding tables of section 1.3.3.

Show the timing of the different WPs and their components (Gantt chart or similar).

1.3.2 GANT Chart/Pert Diagram



1.3.3 Description of the Work-packages

The work-plan has been split up into six work-packages (WP), which are used to group the tasks to be performed. These work-packages described in detail below. The WPs can be grouped in two classes: WP-1 to WP5, which all start at the very beginning of the project, and WP6 and WP7, which will start after month 9. The parallelism of the different WPs and related tasks facilitates us to best exchange the gained results and gained insights among the partners.

WP1 Management of Consortium (M1-M36; Leader UGL)

This WP deals with all project management activities and will run throughout the project and is crucial for the successful execution of all the activities. The main goal is to manage the overall operation of the project including technical, administrative and financial aspects, ensuring that the EU officers are informed regularly of the project progress. WP1 is also responsible for ensuring that all the milestones of the project are achieved on schedule and all deliverables are delivered timely.

The Project coordinator will be in charge of the scientific leadership of ExCAPE and with supervising all the critical management decisions. It will also be responsible for the day-to-day management of the project - which will be run by a **project office**, set-up as explained in section 2.1. The project office will be the operational hub of project management and administrative activities, and the link between the members of the consortium, its external stakeholders, and the European Commission. The appropriate boards, as explained in section 2, will be set-up by the project office.

This WP consists of three tasks including all activities related to administration, contractual, financial and project assessment issues. It also handles risk management, legal and ethical aspects. As a consequence, this WP will also devise a contingency plan, identify any risks or deviations from the work plan and take appropriate measures when needed. Finally, it will provide support to handle legal and ethical issues arising from project activities.

WP1.T1 Project Coordination (M1-M36; Leader: UGL)

UGL will propose and with partner agreement establish the management and decision-making structure. We will introduce the management structure at the first meeting and fully be formalised with the voting-in and appointment of the members of the Boards. All the members of the different bodies in the Management Structure will be included in the D1.1 Project Handbook and Quality Plan. The Task includes the prevention of conflicts within the consortium, and their mediation if any arise; organisation and follow-up of consortium meetings; and setting up and management of communication systems, which will also be included in D1.1.

WP1.T2 Financial management (Leader: UGL)

Financial management covers all areas of financial planning, budgeting, accounting and audit certification. It includes the submission of Cost Statements, receipt of funds from the Commission and financial transfers between the coordinator and partners, the handling of income and expenditure for any items that are centrally managed on behalf of the group as a whole, and liaison with the Commission about the operation of the withholding fund.

WP1.T3 Activity Co-ordination, Reporting & Quality Control (M1-M36; Leader: UGL, all)

This activity covers the oversight of the constituent activities and preparation of internal management progress reports; day-to-day communications between the project and the Commission; and the delivery of contractually required periodic and final progress reports. It includes the preparation of any modifications to the Description of Work required by changes to the project as a result of annual reviews, partnership changes or external factors. It includes all the issues related to Quality Assurance, Risk Management, and Self-Assessment.

As a research project there will be always uncertainties inherent to the envisaged new technology development. This task will conduct activities aiming at accounting for such risk in a number of ways. Initial contingency guidelines are elaborated in section B2.1.7. A more comprehensive contingency plan will be produced by the coordinator in close interaction with the Steering Board during the first month of the project and just after the project kick-off meeting.

WP1.T4 IPR Management (M1-M36; Leader: UGL)

UGL will lead the task of IPR co-ordination to reflect the interests of all the partners. This task will ensure agreement of which knowledge or inventions are placed in the public domain, and which should be patented or otherwise protected, either as the basis of commercial products or defensively to prevent third parties from restricting the use of knowledge.

WP2 User Experience in Cultural Collections (M1-M24; Leader: AUS)

This WP contains the fundamental prerequisites for the successful completion of the ExCAPE's goals. The first objective is to analyse the key user requirements within musea and cultural domain. However, it is well known that users will not be able to provide their requirements with respect to future or emerging technology. So in this task, we will study user requirements from current technological scenario to futuristic scenarios. We will also keep a technological watch and develop for a roadmap for the creation of adaptive and personalised user experiences in interacting and mediating with cultural archives.

WP2.T1 Requirements Analysis & Roadmap Creation (M1-M24; Leader: EYE, UGL, AUS, TLD)

In this task, we will investigate the presentation and interaction requirements in cultural domain specifically within the EYE institute and the Hunterian Art Gallery and Musuem of Glasgow University. The focus here lies on the point of view of the institutions. In here we investigate the needs of the institutions mainly with respect to use of artefacts, exhibition goals, relations between institutions of customers and institutions, etc. The main technique for data gathering will be structured interviews and work space observations [94]. Subsequently a set of use scenarios featuring the needs of the institutions will be developed for guiding the development of demonstrators. In addition, we will develop a roadmap for this domain and the project demonstrators in particular.

WP2.T2 Museum & Gallery User Studies (M1-M24; Leader: AUS, EYE)

We will conduct ethnographic studies and investigate the role of evolving techniques in such domains. We will follow the triangulation strategy [1], as this allows us to combine

structured interviews, questionnaires as well as observations of visitor behaviour in the locations of the cultural heritage partners. We will re-use methodologies from our own past experiences (e.g., the Multimatch project (Glasgow), Multimedia (UVA, CWI), Alan01 (Aalto)) in developing an appropriate requirement analysis. The main challenge is to capturing user response to evolving technological concepts, extract requirement and align those with the results from WP2.T1.

WP2.T3 Narratives in Cultural Domain (M1-M24; Leader: AUS, UVA)

We will investigate already existing spatial and participatory narrative techniques in the cultural domain. Design techniques can be drawn, for example, from the spatial drama of the medieval (Mummers' Plays, 'Every Man', 'tableau vivant'), renaissance (Commedia dell Arte) and 1980s in-house interactive murder mysteries (like 'Clue') for small audiences, as well as from contemporary role-playing games (like MMORPGs). Also, the embedded narratives in the demonstrators' archive content (biographies, political/social schemes, love stories etc.) will be investigated as models for the interactive user point of views to material as well as for the user agency within the exhibit piece. The developed story structures will inform the work of WP2.T4.

WP2.T4 Automatic & Participatory Story Creation Techniques (M1-M24; Leader: AUS, CWI)

The user and culture oriented tasks above will contribute to the user agency centred design of techniques by which the archive material can be arranged interactively and spatiotemporally for the user, considering both the human-human and machine-human interaction within exhibit space.

WP2.T5 Evaluation Methodologies (M1-M24; Leader: UGL, AUS, TLD, EYE)

Evaluating the ExCAPE interaction technologies is not straightforward. Tests and data collections designed for video databases, such as the TREC Video Retrieval Evaluation (trec.nist.gov) are inappropriate to the interactive, context sensitive techniques needed for adaptive and personalized interaction in musea domain. In this task we will investigate the development of evaluation methodologies for cultural domain and in particular for measuring user experiences. Current methodologies in HCI and IR domains will be analysed and suitable techniques will be developed so that our demonstrators can be evaluated in user setting.

This requires three steps. The first is to develop suitable data sets that can be generalised. The second step is to abstract the access and interaction needs of users and generate a range of queries and also the corresponding relevant sets. This is not straightforward and needs further research. It is also important to come up with a strategy to judge the relevance of the items for each query. The third step is to revisit and generate suitable evaluation measures. There are a number of measures proposed in information retrieval, which we will adapt.

With respect to human-centred test and evaluations, we will describe in this task the studies to be performed during the design process in labs, but also the probes, logging methods and interview texts to be used during the field try as explained in WP6.T4. We also describe the spatial and human resources required for the field trials. This includes the identification of

specific locations, field contacts/controllers, individual users, and logistical issues, preparation of briefing materials, evaluation pro-forma, hold workshops/training sessions for users, etc.. The specific contents will include field trial dates, field trial team roles (implementation team, field trial manager, user (citizens) representative, field trial assessor), field trial contacts, potential field trial problems and fallback strategies. Etc.

WP3 Context and Presentation Model (M1-M32; Leader: CWI)

This work-package starts at month 1 of the project and will follow an iterative development process, depending on the developments in WP2, WP4 and WP5.

In this WP we develop the required representation structures that facilitate user adaptive creation, modification, search and sharing by retrieving and delivering information in a socially networked environment, as investigated in WP2. The key representations are an individual user model and a model of collaboration, a context model, a domain knowledge modelling, and representations that facilitate presentations in narrative forms. All these models are used by the processed described in WP4, WP5 and WP6.

WP3.T1 Content Enrichment Model (M1-M32; Leader: CWI, UVA)

This task develops the **content enrichment and representation model** of the cultural archives data. This task develops the content representation and enrichment module of the cultural archives data. The current metadata is provided by the content providers is typically sparse, idiosyncratic and aimed at internal use by film experts. This task will enrich the existing metadata to make it suitable for end users as part of their experience. The task will focus on two steps: **denotative and connotative enrichment**. In the first step, we will match the sparse but objective existing metadata to a wide range of additional material found on the Web. This can be directly or indirectly related textual information (e.g. from Wikipedia or IMDB) but also audiovisual information (e.g. from Europeana or EUscreens), compound information (e.g. alternative edit decision lists that change the structure of a movie) or user-contributed content and annotations. In the second step we will take into account more subjective information about the current user's history and preferences, the outcome of the emotional and affective features computed in WP4 to narrow down this wide-range of related information to a much smaller set that fits the current user experience.

WP3.T2 Multi-faceted User Model (M1-M32; Leader: UVA, UGL)

This task investigates the development of a distributed user model of an individual user. Though this model will contain static elements, such as id, birth date, connections to social networks, such as Flickr, Facebook, Twitter, etc, the focus will be put on the development of structures that evolve over time, such as knowledge development and localized and task-related history units, our approach towards an individualized long-term memory of the interaction patterns for every user in a particular context. It also captures the multi-faceted interests of the user in the model. The model of the long-term representation of an individual user profile aims to detect changes in the profile based on the experiences currently made in relation to trends already established in the past.

WP3.T3 Context Model & Representation (M1-M32; Leader: CWI, UVA)

The aims of this task are for the development of the **context model**, which describes the present status of the environment with respect to resident users, active devices and the interactions between them. Crucial aspects here are the development of personal, spatial and temporal representations that capture the interest level against content and the user perspective on the content and the relations between users.

WP3.T4 Presentation Model (M1-M32; Leader: CWI, UVA)

This task investigates a **presentation model** that facilitates the combination of content, knowledge and user profiling into semantically ordered linear presentation structures. This model will be event-based and in this way anticipating the interaction between user and content.

WP3.T5 Modelling collaboration on Tabletop Devices (CWI, UGL)

In this task, we will investigate synchronous collaborative search techniques on devices like Tabletop interfaces. We will investigate role of various communication techniques for modelling collaboration. We will also develop suitable synchronous collaborative interaction strategies so that better interaction can be implemented for devices like tabletop interaction.

WP4 Search & Recommendation Techniques for Adaptive User Experiences (M1-M32; Leader UGL)

This work-package starts at month 1 of the project and will follow an iterative development process, depending on the developments in WP2, WP3 and WP5.

WP4.T1 Emotion and Affective Feature Extraction Techniques (M1-M32; Leader: UGL)

In this module we will develop emotion extraction techniques form content. For text, we will adapt the OCC model of emotion extraction module. For video and images we will develop suitable techniques to capture the aesthetics and affective content features. Emotional content of speech or audio information will also be extracted.

WP4.T2 Learning Factors for Personalization Techniques (M1-M32; Leader: UGL, UVA)

The objective is to improve the user experience through better adaptation and personalization techniques. In this task, we will implement adaptation and personalization techniques as outlined in WP2. The focus of the implementation will be to get a better understanding of the role of various contextual factors (user, document, task, deice etc.) for adapting the interaction and presentation of material in a real-time interactive environment.

WP4.T23 Personalised Browsing Model Using Emotion & Affective User Characteristics (M1-M32; Leader: UGL, CWI)

In this task we will extract emotional features from content using linguistic approaches (T1) and from users using biometric and facial expression capture modules. The objective is to understand the role of emotional features for building adaptive browsing paradigms in a real-time interactive environment.

WP4.T4 Usage Based Collaborative Recommendation Techniques (M1-M32; Leader: UGL, UVA)

In this task we will investigate the development of recommendation techniques based on similar user interests and social networks. Similar user interests will be mined from previous interaction patterns and will be used for recommendation. The multi-faceted user model developed in WP3.T3 will help to tune the recommendation to that of users. Similarly we will exploit the social relationships and build adaptive recommendation techniques.

WP4.T5 Modelling Collaboration on Tabletop Devices (M1-M32; Leader: UGL, CWI)

In this task, we will investigate synchronous collaborative search techniques on devices like Tabletop interfaces. We will investigate role of various communication techniques for modelling collaboration. We will also develop suitable synchronous collaborative interaction strategies so that better interaction can be implemented for devices like tabletop interaction.

WP5 Multimodal Interaction (M1-M32; Leader: UVA)

This Work-package starts at month X of the project and will follow an iterative development process, depending on the developments inWP2, WP3, WP4 and WP6.

WP5.T1 Storytelling Interface (M1-M32; Leader: AUS, UVA)

This task addresses the development of a storytelling interface that facilitates the institution to establish high-level story paths that allow thematic access to the current presented artefacts and related data. This interface makes use of the content representation module and presentation module defined in WP3.

WP5.T2 Browsing Interface (M1-M32; Leader: CWI)

This task deals with the development of user interface for browsing the current presented artefacts. The interaction is based on touch and natural language input and will use the narrative flow structures provide by the themes defined by the institution (see WP5.T1). Access to the user model will allow to adaptation based on mechanisms as described in WP 4.

WP5.T3 Personalised Online Access Technique (M1-M32; Leader: UGL, UVA, TLD)

This task develops an interface that allows the user to access the content of the institution in a free manner. The impact here lies on the provision on highly personalised access, by making use of the user model as described in WP3 and the adaptive browsing and recommendation techniques developed In WP4. In addition the ExCAPE system makes use of the context model, see WP3.T3, to aim for semantic synchronisation between the content of users who freely explore in the closer proximity. In this way we aim for stimulated consecutiveness through association.

WP5.T4 User Annotation Interface (M1-M32; Leader: UVA, UGL)

This task aims for the development of the user annotation interface that facilitates users to provide additional metadata to the currently investigated artefact. This interface makes use of the content representation module and presentation module defined in WP3. Input can be provided in different modalities, we will focus on text, image and gesture, and will make use of the content representation module described in WP3.

WP5.T5 Collaborative Interaction and Communication Interface (M1-M32; Leader: UVA, UGL)

This task will develop an interface where users can communicate idiosyncratic experiences that they wish to share with other users. This interface allows providing an experience as well as accessing experiences in various modalities, where we focus on text, image gesture and biometric data. Structures used are those of the content representation module, context module and collaboration model described in WP3 and the visualization techniques of the social and experiential aura of the space (see WP 4).

WP6 Demonstrators & User-Centred Evaluation (M9-M36; Leader TLD)

The overall objective of this work package is to apply the scientific solutions found in WP3 to WP5 to real-world scenarios, as defined in WP2.T1, and evaluate whether the scientific solutions support the real-world scenarios in a commercially applicable manner. Four different areas will be evaluated in this working package, namely situation awareness (WP6.T1), collaboration (WP6.T2), adaptation based on narration (WP6.T3), and a socio-politics approach towards presentation adaptation (WP6.T4).

WP6.T1 Art Gallery Demonstrator (M9-M36; Leader: TLD, UGL)

In this task we will design and develop a situation-sensitive cultural information presentation demonstrator, which can guide based on contextual data through an environment (WP3.T3). As contextualisation also requests the use of user data, the results of WP3 and WP4 will be used as well, only the focus lies on context in this feasibility study.

WP6.T2 EYE Institute Collaborative Interaction System (M9-M36; Leader: EYE, UGL, UVA)

In this task, we will design and develop collaborative interaction system on tabletop devices. This will show case synchronous collaboration strategies, user engagement through collaborative interaction, and community user modelling strategies as mainly established in WP4.

WP6. T3 Adaptive Online access (M9-M36; Leader: TLD, UGL)

The Objective of this task is to develop an adaptive online interaction system. It will feature a story telling interface based on user models and user interaction information. It will also make use of social relationship between users for adapting the presentation of information, both developed in WP3 and WP4.

WP6.T4 Inside/outside Culture (M9-M36; Leader: AUS)

This demonstrator deals with the questions of who are a part of or have access to culture, whether as our surrounding cultural circumstance or archives, knowledge and art. It starts with experiments on interactive and narrative physical exhibition space installation and will be iteratively developed as the project evolves, in order to integrate developing knowledge, techniques and tools from various work packages, and may evolve to other platforms (e.g. mobile, Internet) as well. The two content approaches function as test-beds for cultural narratives and automatic/participatory story techniques (WP2): how to juxtapose an individual and culture and cultural politics in the exhibition of digital libraries and archives by

multimodal interactive design? The two investigations will be based on existing prototypes at AALTO Media Lab Helsinki, so the project can have a heads-on start in practical application of knowledge, while redefining and completing the research work in the course of the project.

WP6.T5 Test and Evaluation(M24-M36, Leader: AUS, UGL, CWI, TLD, EYE)

The Evaluation of the 3 demonstrators will follow the methodologies and protocols defined in WP2.T5 and will be performed in real-word settings at the end of the project. In between tests in mere lab settings will be performed over the whole duration of the project.

Performance results will be evaluated and compared to the objectives and criteria associated with the scenarios. The evaluation is both generic to the task, to evaluate whether the scientific solutions work and are practically deployable, and specific to deployment and feasibility criteria for each domain. The evaluation will also be conducted in a user immersed setting and the objective will be to measure the quality of user experience in interacting with cultural artefacts and collections.

On the usability level, ExCAPE will employ a variety of methods. Traditional user-based evaluation methods employ questionnaires, interviews and usability tests. Inspection-based evaluation does not directly involve users but is based on expert evaluators inspecting an interface design, and model-based evaluation predicts usability measures by calculation or simulation. As computers have moved out from laboratory to real-life settings, it is no longer enough to measure interactions in terms of performance. People are content generators and consumers, who make technologies their own. They also use technologies in their daily lives for activities in which productivity is not the main concern.

WP7 Dissemination and Exploitation Planning (M9-M36, Leader: EYE)

The Dissemination and exploitation Planning Work Package is designed to make the bridge between the RTD work and the external world. As described later in section 3.2, ExCAPE will follow a plan to maximise the outcomes of the project. The universities will create new knowledge in context modelling, user modelling, automatic narrative creation, semantic interaction, and adaptive and personalised search techniques. The University and research partners in ExCAPE will publish results and papers, and be the basis of further research in the fields of information retrieval, semantic interaction, context modelling, automatic story telling, interfaces.

WP7.T1 Dissemination and Publication of Results (M9-M36, Leader: EYE, UGL, UVA, AUS, CWI**)**

The partners will disseminate the project results to and the research world, through meetings, presentation of papers at relevant conferences, dedicated ‘showcase’ events, on line, and through the project website. The channels and methods will be chosen to play to the strengths and meet the needs of the different partners: given the focus of the proposal, we will make a particularly vigorous use of on-line media.

WP7.T2 Market Watch, Business Models & Exploitation Planning (M9-M36, Leader: TLD)

This task will develop the plans for exploitation and use of knowledge. The partners will keep abreast of technical and commercial developments in the relevant market sectors. This information will be taken into account in production of the business and exploitation planning for the project's results.

In the academic community, researchers continually monitor developments in their technology fields in a way that is beyond the resources of most commercial companies. ExCAPE will track and report on emerging research outside the project that may be relevant, both within the ICT and Intelligent Content

Table 1.3a: Workpackage List

Work package list

Work-package No[1]	Workpackage title	Type of Activity	Lead Partic No[2]	Lead Partic Short Name	Person Months	Start Month	End Month
1	Consortium Management	MGT	1	UGL	25	1	36
2	User Experience in Cultural Collections	RTD	3	AUS	72	1	24
3	Context and Presentation Model	RTD	5	CWI	68	1	32
4	Search & Recommendation Techniques for Adaptive User Experiences	RTD	1	UGL	59	1	32
5	Multi-modal Interaction	RTD	2	UVA	67	1	32
6	Demonstrators & Evaluation	RTD	4	TLD	84	9	36
7	Dissemination and Planning	RTD	6	EYE	20	9	36
	TOTAL				395		

[2] Number of the contractor leading the work in this workpackage.

Table 1.3b – Deliverables List

List of Deliverables

Del. No	Deliverable Name	WP. No	Nature	Dissemination Level	Delivery Date (Proj month)
D1.1	Project Handbook and Quality Plan (R, CO, M2).	1	R	CO	M2
D1.2	Self-assessment Plan (R, CO, M6)	1	R	CO	M6
D2.1	Requirement analysis document (M12, R, EYE)	2	R	PU	M12
D2.2	User studies, cultural narratives and narrative user scenarios (M24, R, AUS)	2	R	PU	M24
D2.3	Automatic and participatory story creation techniques (M24, R, AUS)	2	R	PU	M24
D3.1	Meta-data extraction and content representation techniques (M12, R, CWI)	3	R	PU	M12
D3.2	User modelling techniques (M12, R, UA)	3	R	PU	M12
D3.3	Context Modelling techniques (M24, R, UA)	3	R	PU	M24
D3.4	Presentation modelling techniques (M36, R, AUS)	3	R	PU	M36
D3.5	Synchronous Collaborative system (M36, P, CWI)	3	P	PU	M36
D4.1	Emotion extraction Modules (M12, P, UGL)	4	P	PU	M12
D4.2	Report Personalization factors (M12, R, UGL)	4	R	PU	M12

D4.3	Personalized browsing using emotional features (M24, P, CWI)	4	P	PU	M24
D4.4	Modelling Usage based Collaborative Recommendation Techniques (M24, R, UGL)	4	R	PU	M24
D5.1	Synchronous Collaborative interaction system (M36, P, UGL)	4	P	PU	M36
D5.2	Story Telling & Browsing Interface Techniques (R, M12, UA)	5	R	PU	M12
D5.3	Personalised Online Access Methods (P, M24, UGL)	5	P	PU	M24
D5.4	Adaptive Interaction Interfaces (P, M36, CWI)	5	P	PU	M36
D6.1	Design of the Demonstrators (M12, R, Tilde)	6	R	PU	M12
D6.2	Initial Implementation of demonstrators (M24, P, Tilde)	6	P	PU	M24
D6.3	D6.3 Evaluation of Demonstrators (M36, R, EYE)	6	R	PU	M36
D7.1	Fact-sheet and presentation (EYE, PU, M1)	7	R	PU	M1
D7.2	Project website (UGL, PU+CO, M2)	7	R	PU+CO	M2
D7.3	Initial Operational Plan (UGL, R, CO, M6)	7	R	CO	M6
D7.4	Showcase seminars (EYE, O, PU, M27-36)	7	O	PU	M27-36

D7.5	Initial Exploitation plan based on market knowledge (TLD, R, CO, M18)	7	R	CO	M18
D7.6	Commercial applications study of cultural domain search (TLD, R, PU, 30)	7	R	PU	M30

Table 1.3c – List of Milestones

Milestones

Milestone number	Milestone Name	Work package(s) involved	Expected date
M1.1	Kick-Off Meeting	1	M1
M1.2	Monitoring first year reports	1	M9
M1.3	Monitoring second year reports	1	M21
M1.4	Monitoring third year reports	1	M32
M2.1	Initial draft of roadmap	2	M9
M2.2	User study results	2	M18
M2.3	Investigation of narratives in cultural domain	2	M18
M2.4	Automatic and participatory story creation techniques – first draft	2	M21
M2.4	Evaluation methodology [reported and applied D6.3]	2	M21
M3.1	Meta-data extraction module	3	M9
M3.2	Initial draft of the User and Context model	3	M18
M3.3	Initial implementation of presentation model	3	M27

M4.1	Emotion extractors and integration	4	M9
M4.2	Personalised Browsing using emotional features	4	M24
M4.3	Implementation of the collaborative Interactive system	4	M27
M5.1	Initial Interface Design	5	M9
M5.2	Initial Implementation of T1, 2, T3	5	M18
M5.3	Implementation of all interfaces	5	M30
M6.1	1 First draft of the design document	6	M9
M6.2	Initial Implementation of Demonstrators	6	M18
M6.3	Prototype demonstrator of Inside/Outside illustrating D2.2	6	M22
M6.4	Prototype demonstrator of Inside/Outside 2 illustrating D2.3	6	M24
M6.5	Completion of evaluation	6	M32

Table 1.3d – Work package description

Work package Description

Work package Number	WP1	State date or start event:		M1		
Work package Title	Management of Consortium					
Activity Type	MGT					
Participant Number	1	2	3	4	5	6
Participant Short name	**UGL**	UVA	AUS	CWI	TLD	EYE
Person-months per participant	**20**	**1**	**1**	**1**	**1**	**1**

Objectives

This Workpackage covers the management and coordination of the project to achieve:

- Successful completion of the project's scientific and technical objectives;
- Completion of the project within the agreed time schedule and budget;
- Management of the Intellectual Property created in the project
- The production of results and Deliverables that meet defined quality standards;

Description of Work (possibly broken down into tasks) and role of partners

This work-package will be carried out throughout the lifespan of the project. Coordinator partner will be responsible for the day-to-day management of the project and will set-up a project office. Management meetings are scheduled every six months, to provide a progress check.

WP1.T1 Project Coordination (M1-M36; Leader: UGL) covers the formal, legal relationship between the Partners and the various constituent components of the Consortium. It includes the maintenance and enactment of the provisions of the Consortium Agreement, the creation and maintenance of the various operational structures and Boards, and setting up the structure for prevention of conflict and resolution of disputes.

WP1.T2 Financial management (Leader: UGL) covers all areas of financial planning, budgeting, accounting, auditing, submission of Cost Statements, receipt of funds from the Commission and financial transfers between the coordinator and partners, and the handling of income and expenditure for any items that are centrally managed on behalf of the group as a whole.

WP1.T3 Activity Co-ordination, Reporting & Quality Control (M1-M36; Leader: UGL, all) covers the oversight of the constituent Activities and preparation of internal management progress reports; day-to-day communications between the project and the Commission; and the delivery of contractually required periodic and final Progress reports. It includes the

preparation of any modifications to the Description of Work required by changes to the project as a result of annual reviews, partnership changes or external factors. It includes all the issues related to Quality Assurance, Risk Management, and Self-Assessment.

WP1.T4 IPR Management (M1-M36; Leader: UGL) will ensure agreement of which knowledge or inventions are placed in the public domain, and which should be patented or otherwise protected, either as the basis of commercial products or defensively to prevent third parties from restricting the use of knowledge.

Deliverables (brief description) and month of delivery

Deliverables

D1.1 Project Handbook and Quality Plan (UGL; R, CO, M2).

D1.2 Self-assessment Plan (UGL; R, CO, M6)

Periodic and Final Reports and Financial Reports are not listed as Deliverables, although they will be produced as contractual requirements within WP1 and will be the responsibility of the coordinator (UGL)

Milestones

M1.1 Kick-Off Meeting (M1)

M1.2 Monitoring first year reports (M9)

M1.3 Monitoring second year reports (M21)

M1.4 Monitoring third year reports (M32)

Work package Description

Work package Number	WP2	State date or start event:	M1
Work package Title	User experience in Cultural Collections		
Activity Type	RTD		

Participant Number	1	2	3	4	5	6
Participant Short name	UGL	UVA	**AUS**	CWI	TLD	EYE
Person-months per participant	**18**	**3**	**27**	**6**	**3**	**15**

Objectives

The objective of this work package is to:

To investigate and roadmap the use of adaptive search and presentation requirements within the context of cultural archives by ethnographically studying the user engagement and user experience while interacting with cultural archives/displays; developing and describing user-centred evaluation methodologies; futuristic study of evolving interaction technologies in the museum domain.

To test and evaluate adaptive and personalized search environments by defining realistic scenarios of use related in real-world museum applications; defining datasets and test procedures to be applied to the evaluation of results; integrating prototypes; carrying out and evaluating trials based on the scenarios with real users in a range of situations.

Description of Work (possibly broken down into tasks) and role of partners

WP2.T1 Requirements Analysis & Roadmap Creation (M1-M24; Leader: EYE, UGL, AUS, TLD) In this task, we will investigate the user requirements in cultural domain specifically within the EYE institute and an art gallery/exhibition setting. We will develop a roadmap for this domain and the project demonstrators in particular.

WP2.T2 Museum & Gallery User Studies (M1-M24; Leader: AUS, EYE) We will conduct ethnographic studies and investigate the role of evolving techniques in such domains. Scenario-based design techniques, in particular, are developed and used to describe the various users and their needs considering the demonstrators' case studies.

WP2.T3 Narratives in Cultural Domain (M1-M24; Leader: AUS, UVA) We will investigate already existing spatial and participatory narrative techniques in cultural domain. Design

techniques can be drawn, for example, from the spatial drama of the medieval (Mummers' Plays, 'Every Man', 'tableau vivant'), renaissance (Commedia dell Arte) and 1980s in-house interactive murder mysteries (like 'Clue') for small audiences, as well as from contemporary role-playing games (like MMORPGs). Also, the embedded narratives in the demonstrators' archive content (biographies, political/social schemes, love stories etc.) will be investigated as models for the interactive user point of views to material as well as for the user agency with(in) the exhibit piece.

WP2.T4 Automatic & Participatory Story Creation Techniques (M1-M24; Leader: AUS, CWI) The user and culture oriented tasks above will contribute to the user agency centred design of techniques by which the archive material can be arranged interactively and spatiotemporally for the user, considering both the human-human and machine-human interaction within exhibit space.

WP2.T5 Evaluation Methodologies (M1-M24; Leader: UGL, AUS, TLD, EYE) In this task we will investigate the development of evaluation methodologies for cultural domain and in particular for measuring user experiences. Current methodologies in HCI and IR domains will be analysed and suitable techniques will be developed so that our demonstrators can be evaluated in user setting.

Deliverables (brief description) and month of delivery

Deliverables

D2.1 Requirement analysis document (M12, R, EYE)

D2.2 User studies, cultural narratives and narrative user scenarios (M24, AUS)

D2.3 Automatic and participatory story creation techniques (M24, AUS)

Milestones

M2.1 Initial draft of roadmap (M9, EYE)

M2.2 User study results (M18, AUS)

M2.3 Automatic and participatory story creation techniques – first draft (M21, AUS)

M2.4 Evaluation methodology (M21, UGL)

Work package Description

Work package Number	WP3	State date or start event:		M1		
Work package Title	Context and Presentation Modelling					
Activity Type	RTD					
Participant Number	1	2	3	4	5	6
Participant Short name	UGL	UVA	AUS	**CWI**	TLD	EYE
Person-months per participant	**8**	**18**	**8**	**33**	**0**	**1**

Objectives

In this WP we develop the required representation structures that facilitate user adaptive creation, modification, search and sharing by retrieving and delivering information in a socially networked environment, as investigated in WP2. The key representations are an individual user model and a model of collaboration, a context model, a domain knowledge modelling, and representations that facilitate presentations in narrative forms. All these models are used by the processed described in WP4, WP5 and WP6.

Description of Work (possibly broken down into tasks) and role of partners

This work-package starts at month 1 of the project and will follow an iterative development process, depending on the developments in WP4 and WP4.

WP3.T1 Content Enrichment Model (M1-M32; Leader: CWI, UVA) This task develops the **content representation module** of the cultural archives data. The representations will build on the existing metadata structures but extend them to facilitate denotative as well as connotative metadata provided by users, in any data format they wish (e.g. audio, text, image).

WP3.T2 Multi-faceted User Model (M1-M32; Leader: UVA, UGL) This task investigates the development of a distributed **user model** of an individual user. Though this model will contain static elements, such as id, birth date, connections to social networks, such as Flickr, Facebook, Twitter, etc, the focus will be put on the development of structures that evolve over time, such as knowledge development and localized and task-related history units, our approach towards an individualized long-term memory of the interaction patterns for every user in a particular context. It also captures the multi-faceted interests of the user in the model. The model of the long-term representation of an individual user profile aims to detect changes in the profile based on the experiences currently made in relation to trends already established in the past.

WP3.T3 Context Model & Representation (M1-M32; Leader: CWI, UVA) The aims of this task are for the development of the **context model**, which describes the current (present)

status of the environment with respect to resident users, active devices and the interactions between them. Crucial aspects here are the development of personal, spatial and temporal representations that capture the interest level against content and the user perspective on the content and the relations between users.

WP3.T4 Presentation Model (M1-M32; Leader: CWI, UVA) This task investigates a **presentation model** that facilitates the combination of content, knowledge and user profiling into semantically ordered linear presentation structures. This model will be event-based and in this way anticipating the interaction between user and content.

WP3.T5 Modelling collaboration on Tabletop Devices (CWI, UGL) In this task, we will investigate synchronous collaborative search techniques on devices like Table-top interfaces. We will investigate role of various communication techniques for modelling collaboration. We will also develop suitable synchronous collaborative interaction strategies so that better interaction can be implemented for devices like tabletop interaction.

Deliverables (brief description) and month of delivery

Deliverables

D3.1 Meta-data extraction and content representation techniques (M12, R, CWI)

D3.2 User modelling techniques (M12, R, UA)

D3.3 Context Modelling techniques (M24, R, UA)

D3.4 Presentation modelling techniques (M36, R, AUS)

D.3.5 Synchronous Collaborative system (M36, P, CWI)

Milestones

M3.1 Meta-data extraction module (M9)

M3.2 Initial draft of the User and Context model (M18)

M3.3 Initial implementation of presentation model (M27)

Work package Description

Work package Number	WP4	State date or start event:		M1		
Work package Title	Search & Recommendation Techniques for adaptive user experiences					
Activity Type	RTD					
Participant Number	1	2	3	4	5	6
Participant Short name	**UGL**	UVA	AUS	CWI	TLD	EYE
Person-months per participant	**47**	**3**	**0**	**6**	**0**	**3**

Objectives

In this work package we develop personalised search and recommendation techniques. We will model social relationships from social networks and exploit them for retrieval and recommendation. We will model emotion extraction techniques from content for facilitating adaptive presentation techniques. Based on emotional and user characteristics, we will develop personalised browsing models.

Description of Work (possibly broken down into tasks) and role of partners

WP4.T1 Emotion and Affective Feature Extraction Techniques (M1-M32; Leader: UGL) In this module we will develop emotion extraction techniques form content. For text, we will adapt the OCC model of emotion extraction module. For video and images we will develop suitable techniques to capture the aesthetics and affective content features. Emotional content of speech or audio information will also be extracted.

WP4.T2 Learning Factors for Personalization Techniques (M1-M32; Leader: UGL, UVA) The objective is to improve the user experience through better adaptation and personalization techniques. In this task, we will develop a technique to lean important contextual factors for personalization. We will investigate the role of various contextual factors (user, document, task, deice etc.) for adapting the interaction and presentation of materials.

WP4.T23 Personalised Browsing Model Using Emotion & Affective User Characteristics (M1-M32; Leader: UGL, CWI) In this task we will extract emotional features from content using linguistic approaches (T1) and from users using biometric and facial expression capture modules. The objective is to understand the role of emotional features for building adaptive browsing paradigms.

WP4.T4 Usage Based Collaborative Recommendation Techniques (M1-M32; Leader: UGL,

UVA) In this task we will investigate the development of recommendation techniques based on similar user interests and social networks. Similar user interests will be mined from previous interaction patterns and will be used for recommendation. The multi-faceted user model developed in WP3.T3 will help to tune the recommendation to that of users. Similarly we will exploit the social relationships and build adaptive recommendation techniques.

WP4.T5 Modelling Collaboration on Tabletop Devices (M1-M32; Leader: UGL, CWI) In this task, we will investigate synchronous collaborative search techniques on devices like Table top interfaces. We will investigate role of various communication techniques for modelling collaboration. We will also develop suitable synchronous collaborative interaction strategies so that better interaction can be implemented for devices like tabletop interaction.

Deliverables (brief description) and month of delivery

Deliverables

D4.1 Emotion extraction Software (M12, P, UGL)

D4.2 Report Personalization factors (M12, R, UGL)

D4.3 Personalized browsing using emotional features (M24, P, CWI)

D4.4 Modelling Usage based Collaborative Recommendation Techniques (M24, R, UGL)

D4.5 Synchronous Collaborative interaction system (M36, P, UGL)

Milestones

M4.1 Emotion extractors and integration (M9)

M4.2 Personalised Browsing using emotional features (M24)

M4.3 Implementation of the collaborative Interactive system (M27)

Work package Description

Work package Number	WP5	State date or start event:		M1		
Work package Title	Multi-modal Interaction					
Activity Type	RTD					
Participant Number	1	2	3	4	5	6
Participant Short name	UGL	UVA	AUS	**CWI**	TLD	EYE
Person-months per participant	**16**	**18**	**8**	**20**	**3**	**2**

Objectives

This WP establishes the adequate interaction technologies to allow users to access of information for the creation, modification, search and sharing information in real time. The interaction with the content as well as interaction between users will be constraint to visual (text, image, video) and audible modalities. Touch will be considered in form of pointing and simple application of a firm set of gestures. The interaction modes are related to the representation structures developed in WP3 and the Personalised Retrieval & Recommendation mechanisms covered in WP 4. We also develop a story development interface that allows the institution to set up presentation outlines, for the swift development of tours.

Description of Work (possibly broken down into tasks) and role of partners

This work package starts at month X of the project and will follow an iterative development process, depending on the developments in WP3 and WP4 and WP6.

WP5.T1 Storytelling Interface (M1-M32; Leader: AUS, UVA) This task addresses the development of a storytelling interface that facilitates the institution to establish high-level story paths that allow thematic access to the current presented artefacts and related data. This interface makes use of the content representation module and presentation module defined in WP3.

WP5.T2 Browsing Interface (M1-M32; Leader: CWI) This task deals with the development of user interface for browsing the current presented artefacts. The interaction is based on touch and natural language input and will use the narrative flow structures provide by the themes defined by the institution (see WP5.T1). Access to the user model will allow to adaptation based on mechanisms as described in WP 4.

WP5.T3 Personalised Online Access Technique (M1-M32; Leader: UGL)

This task develops an interface that allows the user to access the content of the institution in a free manner. The impact here lies on the provision on highly personalised access, by making use of the user model as described in WP3 and the adaptive browsing and recommendation techniques developed In WP4. In addition the ExCAPE system makes use of the context model, see WP3.T2, to aim for semantic synchronisation between the content of users who freely explore in the closer proximity. In this way we aim for stimulated consecutiveness through association.

WP5.T4 User Annotation Interface (M1-M32; Leader: UVA) This task aims for the development of the user annotation interface that facilitates users to provide additional metadata to the currently investigated artefact. This interface makes use of the content representation module and presentation module defined in WP3. Input can be provided in different modalities and will make use of the content representation module described in WP3.

WP5.T5 Collaborative Interaction and Communication Interface (M1-M32; Leader: UVA) This task will develop an interface where users can communicate idiosyncratic experiences that they wish to share with other users. This interface allows providing an experience as well as accessing experiences in various modalities. Structures used are those of the content representation module, context module and collaboration model described in WP3 and the visualization techniques of the social and experiential aura of the space (see WP 4).

Deliverables (brief description) and month of delivery

Deliverables

D5.1 Story Telling & Browsing Interface Techniques (R, M12, UA)

D5.2 Personalised Online Access Methods (P, M24, UGL)

D5.3 Adaptive Interaction Interfaces (P, M36, CWI)

Milestones

M5.1 Initial Interface Design (M9)

M5.2 Initial Implementation of T1, 2, T3 (M18)

M5.3 Implementation of all interfaces (M30)

Work package Description

Work package Number	WP6	State date or start event:		M1	
Work package Title	Demonstrators & Evaluation				
Activity Type					
Participant Number	1	2	3	4	5	6
Participant Short name	UGL	UVA	AUS	CWI	**TLD**	EYE
Person-months per participant	**20**	**3**	**16**	**6**	**25**	**14**

Objectives

The objective of this work package is to **test and evaluate adaptive and personalized information environments** *by defining realistic scenarios of use related in real-world museum applications; integrating prototypes; carrying out and evaluating trials based on the scenarios with real users in a range of situations*

Description of Work (possibly broken down into tasks) and role of partners

WP6.T1 Art Gallery Demonstrator (M9-M36; Leader: TLD, UGL) In this task we will design and develop a situation sensitive cultural information presentation demonstrator, which can guide and adaptively present the information based on user models. Such presentation of the information will be based on users multiple interests (as modelled in user model WP3.T?) and the adaptation will depend on user situation and needs.

WP6.T2 EYE Institute Collaborative Interaction System (M9-M36; Leader: EYE, UGL, UVA) In this task, we will develop collaborative interaction system on table-top devices. This will show case synchronous collaboration strategies, user engagement through collaborative interaction, and community user modelling strategies.

WP6. T3 Adaptive Online access (M9-M36; Leader: TLD) The Objective of this task is to develop an adaptive online interaction system. It will feature a story telling interface based on user models and user interaction information. It will also make use of social relationship between users for adapting the presentation of information.

WP6.T4 Inside/outside Culture (M9-M36; Leader: AUS) The This demonstrator deals with the questions of who are a part of or have access to culture, whether as our surrounding cultural circumstance or archives, knowledge and art. It starts with experiments on interactive and narrative physical exhibition space installation and will be iteratively developed as the project evolves, in order to integrate developing knowledge, techniques and tools from various work packages, and may evolve to other platforms (e.g. mobile,

Internet) as well. The two content approaches function as test-beds for cultural narratives and automatic/participatory story techniques (WP2): how to juxtapose an individual and culture and cultural politics in the exhibition of digital libraries and archives by multimodal interactive design? The two investigations will be based on existing prototypes at AALTO Media Lab Helsinki, so the project can have a heads-on start in practical application of knowledge, while redefining and completing the research work in the course of the project

WP6.T5 Test and Evaluation (M24-M32, Leader AUS) In this task, we will evaluate the 4 demonstrators based on the methodology developed in WP2.T4. The evaluation will be conducted in a user immersed setting and the objective will be measure the quality of user experience in interacting with cultural artefacts and collections.

Deliverables (brief description) and month of delivery

Deliverables

D6.1 Design of the Demonstrators (M12, R, Tilde)

D 6.2 Initial Implementation of demonstrators (M24, P, Tilde)

D6.3 Evaluation of Demonstrators (M36, R, EYE)

Milestones

M6.1 First draft of the design document (Month 9)

M6.2 Initial Implementation of Demonstrators (M18)

M6.3 Completion of evaluation (M32)

Work package Description

Work package Number	WP7	State date or start event:		M9		
Work package Title	Standardization, dissemination and exploitation					
Activity Type	OTHER					
Participant Number	1	2	3	4	5	6
Participant Short name	UGL	UVA	AUS	CWI	TLD	**EYE**
Person-months per participant	**2**	**2**	**4**	**3**	**6**	**3**

Objectives

To develop strategies for wide dissemination of the results and scenarios for their

- incorporation into market-oriented personalized search specifically in cultural domains by involvement of stakeholders, including the public, in on-line and off-line events;
- identifying business models, means of monetising the research outputs, and market strategies.

Description of Work (possibly broken down into tasks) and role of partners

The Dissemination and exploitation Planning Work Package is designed to make the bridge between the RTD work and the external world.

WP7.T1 Dissemination and publication of results (M9-M24, Leader **EYE)**
This will disseminate the project results to the relevant industry and the research world, through meetings, presentation of papers at relevant conferences, dedicated 'showcase' events, on line, and through the project website. The activities group into five strands:
- Self-publishing, through fliers, a poster, a high quality Website, blogs, twitter, and wikis and YouTube videos.
- Conferences and their proceedings and in reviewed journals. International conferences dealing with information retrieval such as ACM SIGIR, ACM CHI, ACM MM, IEEE/ACM JCDL, CVPR.

WP7.T2 Market watch, business models and exploitation planning **(M9-M24, Leader TLD)**

This will develop the plans for exploitation and use of knowledge, based on market watch and a study of new business models. The partners will keep abreast of technical and commercial developments and opportunities in cultural domain. This information will be

taken into account in production of the business and exploitation planning for the project's results. At the end of the project the findings of this task will be published. Exploitation Planning will build on the market awareness data and apply it to construct a coherent approach to the exploitation of project results. We will create a plan based on a comprehensive picture of the future trends and emerging market sectors.

Deliverables (brief description) and month of delivery

D7.1 Fact-sheet and presentation (EYE, PU, M1) describing the partnership, project rationale and objectives; advances expected, intermediate and final outputs; intended target groups and application domains.

D7.2 Project website (UGL, PU+CO, M2) a multimedia public website. There will also be a 'members only' section of the site using a Wiki, to be used as the project archive for results, and for inter-partner communications.

D7.3 Initial Operational Plan (UGL, R, CO, M6) for dissemination activities, the Use of Knowledge and IPR

D7.4 Showcase seminars (EYE, O, PU, M27-36)

D7.5 Initial Exploitation plan based on market knowledge (TLD, R, CO, M18)

D7.6 Commercial applications study of cultural domain search (TLD, R, PU, 30)

D7.7 Final Exploitation plan based on market knowledge (TLD, R,CO, M36)

D7.8 Final Inside/Outside exhibition; intended for an international conference/festival, like ISEA/Ars Electronica/ACM Multimedia, if not accepeted, exhibited at Media Centre Lume Helsinki (AUS, M36)

Table 1.3e – Summary of Effort

Summary of Effort

A summary of the effort is useful for the evaluators. Please indicate in the table number of person

months over the whole duration of the planned work, for each work package by each participant.

Identify the work-package leader for each WP by showing the relevant person-month figure **in bold**.

Prac. No	Prac. Short Name	WP1	WP2	WP3	WP4	WP5	WP6	WP7	Total Person months
1	UGL	20	18	8	47	16	20	2	131
2	UVA	1	3	18	3	18	3	2	48
3	AUS	1	27	8	0	8	16	4	64
4	CWI	1	6	33	6	20	6	3	75
5	TLD	1	3	0	0	3	25	6	38
6	EYE	1	15	1	3	2	14	3	39
Total		25	72	68	59	67	84	20	395

2: IMPLEMENTATION

2.1: MANAGEMENT STRUCTURE AND PROCEDURES

ExCAPE is an ambitious project, which requires expertise from research, business, and industrial areas. Here, a profound need is necessary for direction, management, control and communication. The goal of project management within ExCAPE is to provide a focused, lean, but effective framework to support the whole consortium in achieving the objectives of the project.

The project management is responsible for the following tasks:

- Keeps the project on track with designed time, high quality, and budgeted cost by managing partners and resources to reach the general objectives and goals of the project.
- Ensure a management level understanding of user, technical, and exploitation issues (including IPR)
- Monitor and mitigate risks
- Provide mechanisms for the prevention of conflicts and resolution of disputes.

This management structure will be formed to assign the full responsibility of: all deliverables and milestones; ensure the accomplishment of all directives stated in the Consortium Agreement; Initiate a policy for the overall quality of the project and deliverables; follow the EC rules and be the contact point (interface) with the Commission. In addition, the management structure will: (I) provide internetworking tools for effective communication between partners; (II) provide a plan for knowledge management, IPRs, and exploitation of results; (III) solve problems and risky situations through a contingency plan. The management structure will be flexible and effective so as to deal with unforeseen circumstances.

2.1.1 Management structure and roles

The management structure is designed to ensure the involvement of all contractors in the direction of the project while encouraging efficient decision-making. UGL as the coordinating contractor will be responsible for the consortium management and technical coordination. UGL will provide legal and financial administration; drawing on its experience of coordinating collaborative projects at national and European levels to provide the '*project office*', which manages ExCAPE activities and supports the Coordinator.

In ExCAPE, the coordination activities are supported by three boards representing the consortium partners and the relevant research and business community:

Project Supervisory Board (SB): SB will be the collective decision-making body of the Consortium and in charge of all Consortium Management decisions. The SB will be responsible for policies, progress control, and communications with the Commission, and for making any modifications to the Work Programme or budgetary allocations. It will monitor the performance of the Consortium Agreement in which IPR, confidentiality and exploitation issues, conflict resolution, decision-making procedures, agreements mechanisms, and voting rights, etc. are formally established. One essential function of the SB will make decisions regarding the **protection and management of intellectual property**. The members will be

the delegated representatives of the Consortium partners. Each company, institute and university. which is a member of the Contract, is entitled to one seat on the Supervisory Board with voting rights. The members of the SB will have sufficient seniority to make binding decisions without referring back to higher authority at their employing organisation. Each Partner's representative will be responsible for the internal coordination of ExCAPE activities in their institution and act as a Local Project Manager for that Partner. The SB will normally meet every six months, but may call additional meetings to deal with problems. When urgent decisions are required between meetings, these may be made following electronic discussion, and ratified by the next physical Board meeting. The Project Coordinator will chair the SB.

Technical Management Board (TMB): To ensure the co-ordination of the research tasks, and liaison with the SB, the Project Coordinator will chair the TMB, which will comprise the work-package leaders (WPL). It will also keep plan on the standardization activities. It will normally meet four times a year, back-to-back with the SB every six months and with intermediate quarterly meetings, to supervise the technical conduct of the research on the ground.

Project Advisory Board (AB): AB is composed of senior researchers, entrepreneurs and decision makers with a high reputation in the project domain and project research fields. The designated representatives bring to the project their considerable experience in the conduction and coordination of innovative research projects, but are not directly involved in the project. The AB will be informed on the project results and progress at regular intervals and will meet twice in the course of the project duration to provide suggestions with respect to the project strategic orientations, project research challenges, business and exploitation direction and project support of user needs.

Project User Group (UG): UG is, though not part of the project, the final component of the management structure, which will be established and operate within WP7 *Dissemination and Exploitation Planning*. The Group will be chaired by UGL, with representatives from institutions in cultural domains like museums, art galleries etc. and also academic user experts. It will be responsible for liaison with the relevant groups, and making representations to them, disseminating results and building relations with a wider group of stakeholders representing potential customers for and users of the ExCAPE results.

2.1.1.1 Management Roles

The **Project Coordinator (PC):** The mandate of the PC is to represent the project and the consortium, report to the Commission, monitor overall project performance, administer project resources and promote project visibility. He also chairs the Project Steering Board (SB) meetings and is responsible for the project formal communication with the Commission and other stakeholders. PC also audits the R&D performance of the project and ensures accomplishment of the technical & business objectives. The PC is also responsible for resolving technical and implementation problems. The designated coordinator is Prof Joemon Jose of Department of Computing Science, University of Glasgow.

The **WP Leaders (WPL)**: WPL are responsible for the contents and timely consignment of the deliverables of their work packages, as defined in the global project work plan. They will be responsible for the performance of the work packages and will guarantee the accomplishment of the technical objectives. They will provide regular reports, control the quality and the schedule of the work, and participate actively in meetings.

The **Project Office (PO): PO** will be the operational hub of the administrative activities. It will help the Project Coordinator with financial reporting and communication between the partners, arrange meetings, and generally provide the 'back office' services required. It will liaise with the partner Work-package teams, receive financial and management reports, track the performance of tasks; and help the Project Coordinator to manage risks and take corrective actions as necessary. A designated Project Manager will be appointed to run the Secretariat and project administration, in liaison with the Coordinator. The Secretariat will act as the clearing-house for information on the Technical Management, which is carried out primarily at the level of the Work Package and Task.

The following diagram shows the relation between the different components of the management structure and their relationship to the operational project groups in other WPs.

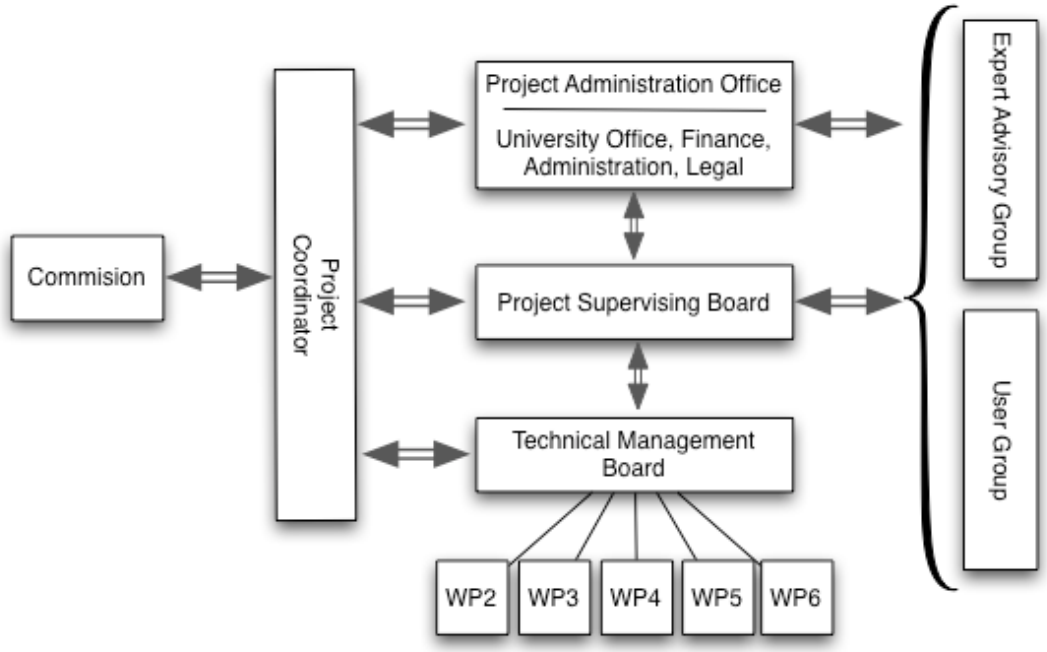


Figure 2.1.2 Organization Diagram

Communication flows and information management

The Project Coordinator will be responsible for managing communication within the Consortium. The procedures will be set out in the Quality Plan deliverable, which will define electronic document formats and software packages to be used; timescales and procedures for the delivery of administrative data (notification of meetings, minutes, working papers, management reports, periodic reports, cost statements et cetera) between the partners and the Project Coordinator.

The majority of day-to-day information (both administrative and technical) will be transferred electronically by e-mail and an on-line document repository maintained by UGL. This will also provide secure workspaces, on a web based document management tool, for the project and project subgroups. Public Deliverables and reports, together with short public summaries of the most significant CO and RE Deliverables, will be made available on the project Web site.

Reporting

The Project Coordinator will ensure regular project reporting and according to EC rules. There are two different reports, the Quarterly Progress Report and the Yearly Report:

- Quarterly Progress Report: The WP Leaders will create the Quarterly Internal Report at the end of each reporting period, based on the feedback from the people working in it. The Technical Coordinator will create an overall report, which will be approved by the Project Coordinator.
- Yearly Report: At the end of each term period, the WP Leader will create an accumulated Report, describing the status of the WP, the work done, the deliverables released, and so on. This must be a summary of all the work carried out in the work package, the deliverables made, the problems found, and how were they solved. The Technical Coordinator will create an overall report, which will be approved by the Project Coordinator.

Submission and management of reports will be done through the Document Management Tool.

Quality assurance, deliverable production and risk management

Quality Assurance procedures will be applied to all activities, and will be the joint responsibility of all partners until complete discharge of their obligations under the EC contract. The main goals of the Quality Assurance procedures are:

- To establish documentation, reporting and communication procedures
- To produce high-quality Deliverables on time, within budget, and to specification
- To identify technical and commercial risks, or deviations at an early stage
- To take any necessary remedial actions as soon as possible.

The Project Coordinator will be responsible for producing the Quality Plan (QP) in month 2 of the project. QA documentation will be maintained during the project lifetime and will be accessible for the partners through the project communications platform. In preparing and overseeing the performance of the QA procedures, the project office will work with the Quality Evaluation Group.

In the case of Deliverables, the first level of Quality Control will be exercised by the WP Leader, who will establish a Deliverable Development Plan showing the deliverable coordinator, contributors, and development procedure and evaluation process. The WP Leader and Coordinator will identify a suitable technical expert (from within the partner group but not involved in the production of the Deliverable) who will conduct an internal peer review with a short report as soon as the Deliverable is finished. The deliverable will also be circulated among partners for review and comment. Final deliverable will be produced by the designated partner based on the comments and suggestions.

Project self-assessment is an important task throughout the project, monitoring and reporting on the achievement of the project objectives. The testing and evaluation of

prototypes is the principle means of measuring the technical quality of the outcomes, and is the subject of a specific Work Package.

We will make an initial Risk Assessment and Contingency Plan at the outset of the project (updating and if necessary adding to the risks identified in this proposal), which will feed into the Quality Plan. The office will report on risk issues to the SB at its six-monthly meetings, and will issue updated Risk Assessment and Contingency Plan with each Periodic Activity Report if there are any significant changes. At Work-package level, a second table, the Issue Log, that identifies potential or current shortcomings and dangers will be maintained and supervised by the PO. All issues will be analysed by the PO and fed into the Risk Issue Log if they become sufficiently serious to need management action. The Secretariat will be responsible for ensuring its implementation, collating the logs and reports, and advising the Project Coordinator of any developing situations that require action.

Conflict management and resolution of disputes

Conflicts will be resolved by a procedure detailed in the Consortium Agreement, which follows the principles that conflicts need to be resolved as speedily as possible and as close as possible to the point of occurrence. Potential conflicts should be identified and brought to the immediate attention of the Project Coordinator by the appropriate Local Project Manager. The Coordinator will first try to resolve this by discussion or by calling an ad hoc meeting. If that fails, the Coordinator will seek a decision by majority vote of the SB. As a last resort, the conflict may be referred to an arbitration procedure based on the procedures of the International Chamber of Commerce, with an initial conciliation process before a designated neutral (under the ICC ADR Rules) followed if necessary by binding arbitration under the Rules of Arbitration of the ICC.

Consortium agreement and IPR management

The **Consortium Agreement**, signed before the Contract comes into force, will be based on the DESCA model and set out the rules for all aspects of the STReP operation that are not completely specified in the Contract. It will fill in the details of the responsibilities of the Project Coordinator, the composition and conduct of the Secretariat; the operating procedures for the Management Boards and Executive Committees, including decision-making and voting mechanisms; conflict resolution; IPR management, confidentiality and exploitation issues, procedures for dealing with defaulting partners and settlement of disputes which cannot be agreed within the SB.

All the companies and universities have IPR management procedures and specialist professional advisors. However, IPR co-ordination is an essential part of the project management work: the project must balance the requirements for ensuring that the results are exploitable with those of publishing scholarly knowledge, and contributing to the development of open standards. SB will set-up a set of procedures for dealing with IPR issues and the consortium agreement will clarify in what cases an outcome of the project is considered suitable for a knowledge protection (patent), and will respect the pre-existing know-how of the partners. The Confidentiality and IPR rules will accord with the ICT regulations and the principles set out in section 3.2. IP policy, protection and licensing issues will be managed within a specific Task (WP1.T4) of the Management of Consortium work-package.

University of Glasgow (UGL)

The University of Glasgow (UGL, UK,) dates from 1451. Modelled on the University of Bologna, Glasgow was, and has remained, a University in the European tradition and is the fourth oldest university in the English- speaking world. University of Glasgow is one of the top 100 universities in the world with an international reputation for its research and teaching. Glasgow is a member of the prestigious Russell Group of 20 leading UK research universities, is a founder member of Universitas 21, an international grouping of universities dedicated to setting worldwide standards for higher education and is a member of IRUN (International Research Universities Network).

The Department of Computing Science (DCS) has 32 full-time academic staff and in the recent research assessment exercise, 80% of DCS researchers are categorized as internationally leading. The Information Retrieval Group is one of its 7 research laboratories and has six senior academics, led by Professor Keith van Rijsbergen, six post-doctoral research fellows and fifteen PhD students. The group has a long and substantial research history in a wide area of information retrieval research from theoretical modeling of the retrieval process to large-scale text retrieval systems building and to the interactive evaluation of multimedia and multimodal information retrieval systems.

Joemon M. Jose is a Professor at the DCS. He is a fellow of the BCS, IET and a chartered information technology professional (CITP), member of the ACM and IEEE. He has a well-established reputation in research on multimedia information retrieval, developing advanced retrieval models, studying the role of emotion in search, personalization and adaptive retrieval. He has published over 110 journal and conference articles and leads a team of 6 PhD students and 3 post-doctoral researchers. He recently completed 3 major EU funded projects on multimedia retrieval and multi-modal interaction (SALERO, MIAUCE, SEMEDIA). He was also involved in the K-SPACE and IP-RACINE projects. He was the recipient of a short-term research fellowship (STRF 2003) from BT Exact Laboratories on adaptive retrieval. He is a co-chair of the ECDL 2010 conference, and had organised numerous conferences and events including AIR 2008, SSMS 2007, AIR 2006, AMR 2005, IRiX 2005 & IRFEST 2005. He was a guest editor for the Information Processing and Management on Adaptive Retrieval and a Key note speaker for the RIAO 2010 conference.

Dr. Matthew Chalmers is a Reader in Computer Science at the University of Glasgow, UK. Most of his research is in ubiquitous computing, as leader of the social/ubiquitous/mobile (SUM) group that works on theory, infrastructure and applications, and work in museum visiting, cultural tourism, mobile multiplayer games, health and fitness, and football crowds. He has served on the committees of ACM CHI, ACM UIST, ACM CSCW, Ubicomp, Pervasive, PerCom and other conferences, and is an associate editor of Pervasive and Mobile Computing. His work in museums has led to papers at ACM CHI, ACM DIS, HCI Intl., Museums and the Web, Intl. Cultural Heritage Informatics Meeting, Intl. Conf. of Museology and several invited book chapters, and bridged from mixed reality systems for museums, to theoretical work on exploiting the limits and weaknesses of new media in 'seamful design'.

Hunterian Museum and Art Gallery

The University of Glasgow's Hunterian Museum and Art Gallery houses one of the top UK University collections and is one of the pre-eminent public collections in Scotland. Numbering over one million objects, the collection as a whole was recently judged of National Significance. The holdings cover art, geology, natural history, numismatics, anatomy, and ethnography. The collection's roots are historic, founded on the bequest of the leading medical figure, William Hunter (1718–1783). The first Hunterian Museum opened in 1807 making it Scotland's oldest public museum. One of the outstanding strengths of the art collections is its holding of the work of the Scottish architect Charles Rennie Mackintosh (1868–1928). This comprises an unrivalled and comprehensive collections of designs, objects and furniture, based on the architect's Estate and including the interiors from his Glasgow house.

Pamela Robertson is Professor of Mackintosh Studies and Senior Curator in the University of Glasgow's Hunterian Art Gallery. She is an acknowledged expert on the work of Charles Rennie Mackintosh. Her publications include editions of Mackintosh's letters and architectural writings, studies of his watercolours and interior design, and catalogue raisonnés of the work of Mackintosh's contemporaries, Margaret and Frances Macdonald and James Herbert McNair. She has curated many exhibitions including the award-winning retrospective organised by Glasgow Museums in 1996 which subsequently toured to the Metropolitan Museum, New York, the Art Institute of Chicago and Los Angeles County Museum. She is an active participant in Glasgow's wider Mackintosh heritage, and a past Chair of the Mackintosh Heritage Liaison Group and the Charles Rennie Mackintosh Society. From 2004 – 2006, she led the planning and delivery of Glasgow's award-winning first city-wide Mackintosh Festival. She is currently a Governor of the Glasgow School of Art, and a member of the UK Government's Reviewing Committee on the Export of Works of Art. Her current research is focused on Mackintosh's architecture for which she received a major AHRC grant in 2009.

Jim Devine is Head of Multimedia at the Hunterian Museum and Art Gallery. He is a graduate of the University of Glasgow where he took joint honours in Archaeology and Classical Civilisation. Over the past 12 years he has been combining his interests in cultural heritage, with his interest in the potential for new technology to present e-learning opportunities in an interactive way to a global audience. He has participated in fieldwork projects in Scotland, Italy, and Greece. Since 1994, he has initiated a series of collaborative projects which has led to a wide variety of innovative multimedia projects focused around the Hunterian collections, and those of other cultural and medical heritage organisations. The pioneering efforts of this work has led to a skills-sharing partnership with the Center for Scientific Imaging and Photography at the Smithsonian Institution, http://www.nmnh.si.edu which has proven highly beneficial to both partners. He has co-authored the Glasgow Science Centre's IT Strategy Study, and has been a member of the Scottish Museums Council's ICT Strategy Group , and Access and Learning Strategy Group , which have authored reports on these issues for the Scottish Executive.

Universiteit van Amsterdam (UVA – NL)

The University of Amsterdam is one of the oldest and largest universities in the Netherlands. The Intelligent Systems Lab Amsterdam (ISLA), part of the Institute of Informatics, is one of the largest labs of its kind in the world. Its three groups are the 'Intelligent Autonomous Systems' group, researching systems that perceive their environment through sensors for goal-directed actions even in dynamic situations; the 'Information and Language Processing Systems' group, working on systems that analyze text using the structure of documents to discover and track actionable meaning; and the 'Intelligent Sensory Information Systems' group, researching systems that create access to the content of digital images and video. ISLA is funded by NWO, EU-grants, companies, as well as large public-private grants enhancing the cooperation between universities and companies.

UVA has extensive experience in research on the way people engage with each other via the experience of digital content and the way in which new technologies can enhance this interaction. One of the research directions is the investigation of adaptive interaction systems based on the representation and exploitation of experiences within distributed audio-visual environments. UVA will lead WP3 and WP5 by contributing to the design of the necessary knowledge structures as well as presentation techniques. UVA will also contribute to WP 6 in through implementation and by designing evaluation test for those components.

Dr. Frank Nack is tenure assistant professor at the Information and Language Processing Systems group (ILPS) of ISLA, at the University of Amsterdam (UVA). The main thrust of his research is on representation and adaptation of experiences; representation, retrieval and reuse of media in interactive systems; context and process aware media knowledge spaces, and interactive storytelling. He has published more than 100 papers on these topics in conferences and journals, including ACM Multimedia, ICME, CHI, ICIDS. IEEE Multimedia, Multimedia Systems journal, and Multimedia Tools and Applications. He serves as associated editor in chief for IEEE multimedia and is on the board of IEEE Transactions on Computational Intelligence and AI in Games. He is member of the ACM, ACM SIGMM, ACM SIGCHI and ACM SIGWEB.

Dr. Vanessa Evers is a tenure assistant professor at the 'Intelligent Autonomous Systems' group of ISLA, at the University of Amsterdam. Her research focuses on cultural aspects of Human Computer Interaction and Human Interaction with Autonomous Agents such as robots or systems that learn. She investigates in particular social and emotional aspects of such interactions, such as affection, social behaviour, and collaborative interaction pattern. A special focus is put on the establishment of long-lasting social relations between human and system. She is active in the HRI, CSCW and CHI communities and teaches Human Computer Interaction, Computer Mediated Communication, Global Work, Multimedia and Research methods courses.

Aalto University (AUS)

Aalto University consists of three Schools: the School of Economics, the School of Art and Design and the School of Science and Technology. Interdisciplinary research is one of AALTO's main strategic focus areas. Aalto University School of Art and Design (formerly known as University of Art and Design Helsinki) has been a leader in art and design education and research for over 138 years. The Media Lab Helsinki, a unit at the School's Department of Media has 34 full time staff members and over 200 MA and PhD level students. It provides education and research frameworks for studying digital media products, contents and technologies, their design, development and the effect they have on society. Media Lab is described by international expert evaluators as "Excellent in reputation and excellent in fact" (Academy of Finland report 04/09).

The research group **Crucible Studio** at AALTO Media Lab, studies and develops narration of the digital, non-linear and interactive media. Its goal is to achieve deeper emotional experiences in the interactive media and to create production methods to develop content and technology simultaneously in the multi-talented teams of artists, designers, scientists and technology experts. Major international collaborative EU FP6 IST projects include SALERO (2006–2009), and NM2 – New Media for the New Millennium (2004–2007). Another of the AALTO Media Lab research groups, **Systems of Representation (SysRep)** conducts research into the representation of knowledge in the digital dimension. Notable research projects in the area of cultural heritage include the award winning digital facsimile of the Map of Mexico 1550; CIPHER EU FP5 IST (2002–2005), and the Virtual Reality Installation of the Finnish Pavilion at the 1900 World Fair in Paris (TEKES 2006–2009). Research topics include: Transfer of culture heritage materials into the virtual domain; 3D user interface design; Activity theory.

Prof. Lily Díaz is the research director of the Department of Media at the Aalto University School of Art and Design, as well as Professor of Systems of Representation and Digital Cultural Heritage at the Media Lab, since 2004. Professor Díaz is leader of the Media Lab Doctor of Arts program. Professor Díaz' research focuses on investigating application of virtual reality technology and three dimensional user interfaces in tasks related with industrial design, animation and machinery design. The activities of her research group SysRep include multimodal museum design and digital archiving.

Mika "Lumi" Tuomola, the director of Crucible Studio – the research group for storytelling and narrative – is an internationally awarded concept designer, dramaturge and director for interactive digital media. Tuomola is in the editorial advisory board of Digital Creativity Journal and he gives keynotes at international conferences, e.g. ISEA2009 in Belfast and CREATE10 in Edinburgh. His publications include "Drama in the digital domain: Commedia dell'Arte, characterisation, collaboration and computers" in: Beardon, Colin & Malmborg, Lone (editors). Digital Creativity, A Reader - Innovations in Art and Design. Swets & Zeitlinger (2002).

Centrum Wiskunde & Informatica (CWI)

CWI is the Dutch national research institute for Mathematics and Computer Science, a private, non-profit organisation founded in 1946 (as Mathematisch Centrum). CWI aims at fostering mathematics and computer science research in The Netherlands. CWI has always been very successful in European research programs (e.g., ESPRIT, ACTS, TELEMATICS, BRITE, TMR, IST) and has extensive experience in managing these international collaborative research efforts. Annually CWI hosts some 200 visiting scientists from abroad. CWI has a staff of 210 FTE, 160 of whom are scientific staff. CWI operates on an annual budget of 13M Euros.

The Interactive Information Access group researches user interaction with semantically annotated media repositories. Research topics have dealt with data heterogeneity, exploiting formal and semi-formal background knowledge, media-specific annotations and end-user evaluations of novel interaction methods supporting complex information needs. Example results include the semantic search demonstrator that won the 2006 International Semantic Web Challenge (Schreiber et al., Semantic Annotation and Search Of Cultural-Heritage Collections: The MultimediaN E-Culture Demonstrator, Journal of Web Semantics), the COMM multimedia ontology (Arndt, Troncy, Staab, Hardman and Vacura: COMM: Designing a Well-Founded Multimedia Ontology for the Web, ISWC 2007), end-user search requirements analysis (Amin, Van Ossenbruggen, Hardman, and Van Nispen: Understanding Cultural Heritage Experts' Information Seeking Needs, JCDL 2008). Members of the group played key roles in national and European projects, including the K-Space European Network of Excellence, the Vitalas FP6 project and EuropeanaConnect. They have a strong track record in disseminating research results through publically available demonstrators, open source software and active participation in W3C working groups.

Prof. Lynda Hardman received her PhD from the University of Amsterdam in 1998. From the eighties, Hardman has worked on user interfaces for hypertext, multimedia and hypermedia browsing and authoring systems. Her current research focusses on improving design methods for human interaction for emerging technologies, with specific projects in annotated media repositories. She is part-time professor at the University of Amsterdam.

Prof. Arjen P. de Vries's research interests include structured document retrieval and entity ranking, multimedia information retrieval, the application of information retrieval theory to recommendation systems and social media, the integration of information retrieval and database technology, and the evaluation methodologies needed in these novel information retrieval application areas. Prof. De Vries coordinated the TREC Enterprise Track and initiated the entity ranking track at INEX. He is part-time professor at Delft University of Technology.

Dr. Jacco van Ossenbruggen received his PhD from the VU University, Amsterdam in 2001. He has worked on structured hypermedia documents on the Web and intelligent user interfaces for heterogeneously annotated media repositories. He is an expert in integrating large cultural heritage data sets and played a key role in developing the award-winning MultimediaN E-Culture Demonstrator. He is currently active in the EuropeanaConnect project, where he works on the semantic layer for the cultural heritage search engine. He is part-time assistant professor at the VU University.

TILDE (TLD)

Established in 1991, **TILDE** is the Baltic leading-edge IT company specializing in language technologies, multilingual and Internet software, and localization.

Language technologies. TILDE provides intelligent language technologies for the languages of the Baltic countries that are equivalent to the support available for major world's languages, using a combination of statistical and knowledge driven approaches. TILDE's experience resulted in excellence covering three main areas: **translation tools, speech technologies; information search and retrieval.**

Digital content. TILDE creates new possibilities for the cultural riches and terminology content in the digital world. Tilde has launched the first Baltic encyclopedia – a reference and dictionary Web service called letonika.lv, providing local Latvian content. All resources are united by a powerful search engine that enables finding information in all resources – **texts, images and multimedia objects** simultaneously.

Terminology services. As a member of the EuroTermBank Consortium, TILDE develops and hosts the **multilingual terminology** portal www.eurotermbank.com, providing a consolidated interface to over 1.5 million terms in various European languages. Accessible for human and machine users, this rich content resides in the central database as well as external interlinked terminology banks. Its innovative entry compounding technology enables establishing new links across terminology collections and languages.

Audiovisual content processing. TILDE offers multimedia content preparation, processing, storage and delivery, multimedia content search solutions, unique content data base management. Various cutting edge technologies are used for data delivery.

Localization services. TILDE covers localization needs of customers for all three languages of the Baltic countries. Localization team consists of skilful and experienced in-house translators, terminologists, linguists, QA specialists and technicians, providing services for such companies as IBM, Microsoft, Nokia.

Research and development. As a highly innovative **SME**, TILDE participates in European research projects financed by European Commission. These activities cover the areas of terminology, language technologies, information retrieval, e-learning, cultural heritage, internet and multimedia.

Andrejs Vasiljevs, graduated from the University of Latvia in 1992. In 1996, he received Master‟s Degree in Computer Science and in 2008 finished PhD studies. In 1991 Andrejs Vasiljevs was one of the founders of the Baltic software company Tilde, where he is a Chairman of the Board. As a member of the Commission of the State Language of Latvia, he is responsible for development of human language technologies (HLT). Andrejs is author of number of papers on terminology management, HLT and the use of new technologies for language and culture development. He was coordinator of EU eContent Programme project EuroTermBank and has participated as the leader in several EU and locally financed technology development projects in Tilde.

Raivis Skadiņš graduated from the University of Latvia in 1994 and received Master‟s Degree in Computer Science in 2001. Raivis Skadiņš has worked on development of electronic dictionaries, developed Latvian spellchecker, thesaurus and hyphenator, led development of English-Latvian and Latvian-Russian Machine Translation systems and other language and information retrieval and delivery related tools. R. Skadiņš participated in EC Fifth Framework Programme project Clarity, Sixth Framework Programme projects Tripod and MIAUCE, eContent Programme Project EuroTermBank and is participating in Eurostars programme project SOLIM.

EYE Film Institute Netherlands (EYE)

EYE is the institute for film in the Netherlands. EYE combines an extensive, world-famous film collection with valuable expertise in restoration and research and with educational programmes and international promotion.

EYE promotes film culture, debate, reflection and innovation through adventurous film programming, distribution, research and experimentation.

Edith van Dasler coordinates the catalogue department. Her main focus is metadata and information management within the film institute. We participate at this moment in the project European Film Gateway.

2.3: CONSORTIUM AS A WHOLE

B2.3.1 Consortium building and proposal genesis

The original ideas of ExCAPE consortium generated from the interaction between 3 core partners (UGL, UVA and CWI). UGL experts and UVA experts worked on past proposal ideas on automatic story creation back in early 2000. In the recent past UGL and CWI worked on semantic interaction within the K-Space project (20062007). During SSMS 2007 in Glasgow, we had a preliminary discussion on applying semantic interaction and adaptive retrieval on museum domain. This interaction was then continued between CWI and UVA.

The discussion was then evolved and was around on generating a personalised user experience during museum interaction. UGL researchers were investigating the ideas of situation sensitive provision of information ideas and CWI researchers were addressing the challenges semantic interaction. These ideas together with the formation of automatic story creation formed the foundation of this proposal.

The consortium was then carefully enlarged inviting TLD to join as an SME. TLD have considerable work within cultural archives domain. UVA researchers and EYE were co investigating many issues related to museum domains. EYE keenness in using modern research results within their institute led to their involvement in this proposal.

AUS is an expert in narrative generation and museum based design solutions. This led to the joining of AUS and is due to the successful collaboration between these institutions in the past on interactive Alan online exhibition leading to a joint publication in prestigious conferences like ACM MM 2009. In addition, AUS has its own museum settings and will lead to in-house exploration of ExCAPE concepts.

UGL's 2 institutes within UGL collaborated continuously on multimedia technology deployment in museum and art gallery setting. In addition, UGL's in house museum and art gallery setting provided a good avenue for testing many of the demonstrators. This led to their involvement in shaping ExCAPE ideas.

B2.3.2 Consortium composition and complementarities

ExCAPE consortium is constituted with six partners with complementary skills and expertise to meet the objectives of this ambitious and groundbreaking project. It is spread over 4 different European countries and has partners from user organizations (UGL-Hunterian art gallery and museum) and EYE Film Institute (EYE), SME (Tilde) and from prominent European Universities (UGL, UVA, AUS) and institutes (CWI). The involvements of user organizations provide an opportunity to study and analyze user engagement within their settings. This in addition facilitates the deployment and user-centered testing of developed techniques.

Four reputed research institutes experts in their areas of research bring complementary research skills. University of Glasgow researchers are well world renowned for information retrieval research. One of the largest IR groups in the world, they investigate issues pertaining to theory, development, deployment and evaluation of IR applications. The IR

group researchers bring experience in managing and participating in large and medium EU projects. Specifically their knowledge in adaptive and personalized retrieval, building collaborative search systems and exploiting emotions in information seeking will be exploited in this project. Similar to IR group, the HCI group at UGL is world renowned and one of the largest in the world. Dr Chalmers brings in expertise in deploying latest technology in museum domains and also specializes in ubiquitous computing. In addition to these, UGL brings in expertise from museum and art gallery domain. The researchers involved are experts both in academic and practitioner research. This gives us a forum for studying the access and also designing, deploying and testing state of the art research ideas (art Gallery demonstrator).

The CWI researchers have worked closely with cultural heritage experts, in particular from the Rijksmuseum Amsterdam and the Netherlands Institute for Cultural Heritage (ICN), in developing applications to enhance expert end-user access to multiple sources of cultural heritage resources. The prototypes produced were seen as a real step forward in the type of support that could be provided. In addition, members of the CWI team contributed to the Thought lab within the Europeana project, and have close contacts with the Dutch national audio visual archive Beeld en Geluid (Sound & Vision). In addition to these valuable contacts in the cultural heritage community, the scientific research is grounded in both the human computer interaction field as well as the semantic web field. To date most of the research in semantic web technologies has been directed at improving the underlying infrastructure. CWI, however, investigates how the rich underlying structures within and among data sets can be used to enhance both functional aspects and interaction experience of different types of information seeking tasks. Past work, co-supervised with Nack, now at the UVA, included the modeling of human communication processes, in particular argumentation structures, using semantic web technologies. This makes CWI an ideal partner for communicating with cultural heritage partners, understanding the different types of communication that should take place with an audience, and creating the necessary technologies to support this.

UVA researcher from the Intelligent Systems Lab Amsterdam (ISLA) at the University of Amsterdam, one of the largest labs of its kind in the world, are best known for their work on autonomous systems, language processing and image and video processing. The HCI research at UVA is grounded in social aspects of adaptive systems as well as in the application of multi-modal media semantics to facilitate capturing, representing, processing, managing, repurposing, and personalizing media. Most of the work with respect to the media production chain has been directed towards the representation and adaptation of experiences through multi-modal interfaces; representation, retrieval and reuse of media in interactive systems; context and process aware media knowledge spaces, and interactive storytelling. Research at ISLA is oriented towards the study of hard scientific problems from real data with real applications. In this context ISLA has established close relationships with cultural heritage institutions, such as the Dutch national audio visual archive Beeld en Geluid, V2_ the Institute for the Instable Media, De Waag Society, or EYE (unites the Filmbank, Holland Film, the Nederlands Instituut voor Filmeducatie and the Filmmuseum). Based on UVA's research background in HCI, media adaptation and its understanding of the needs of media-centric cultural heritage institutions, UVA is an ideal partner for helping to achieve ExCAPE's goals.

The Media Lab Helsinki is an internationally recognized digital media education, R&D and

experimental production unit at Aalto University School of Art and Design (AUS) Department of Media (DOM). “Excellent in reputation and excellent in fact,” according to the international expert review for the Academy of Finland report April 2009. Lily Díaz, the research director of DOM, as well as professor of Systems of Representation and Digital Cultural Heritage, leads the department's doctoral program. Her research focuses on investigating application of virtual reality technology and three dimensional user interfaces in tasks related to cultural heritage and memory institutions such as museums and archives. The activities of her research group SysRep include multimodal museum design and digital archiving. Mika “Lumi” Tuomola, the artistic director of Crucible Studio – the storytelling research group of DOM – is an internationally awarded concept designer, dramaturge and director for interactive digital media. His contributions to the development of narrative design and its artistic research in digital media are recognized internationally by major forums like ISEA, CREATE and MIT Press, in addition to his experimental productions and research articles, like "Drama in the digital domain: Commedia dell’Arte, characterisation, collaboration and computers” in Beardon, Colin & Malmborg, Lone (editors). Digital Creativity, A Reader - Innovations in Art and Design. Swets & Zeitlinger (2002).

The involvement of Tilde, an SME, with business interests in cultural domain and participatory experience in international and EU funded projects gave us a fantastic opportunity for

Partner	**Profile**	**Role, Contributions to the Project**
UGL	University Teaching and research centre Renowned Information Retrieval experts from text and multimedia; Experts in deploying the latest technology in museum domain and subsequent HCI studies(Matthew Chalmers); Art Gallery and Museum Curators of art gallery & museum	Leader of WP1 on consortium management. They also lead the WP4 on adaptation and search personalization techniques. They are expert in exploiting emotion for information seeking and will develop state of the art research solutions. They also exploit their expertise in developing state of the art collaborative search systems. They also contribute to the design, development and evaluation of the demonstrators
UVA	University of Amsterdam Representation and adaptation of experiences; Representation, retrieval and reuse of media in interactive systems; Context and process aware media knowledge spaces Interactive storytelling, social aspects of adaptive systems	Leader of WP5 on Multimodal Interaction Uva contributes to the development of new narrative techniques in the cultural domain as well as for automatic & participatory story creation techniques. They contribute to the development of context and presentation models (content enrichment, user and context model). Being experts on user studies they also contribute to the testing and evaluation of the demonstrators.

AUS	Aalto University School of Art and Design is higher education and research institution with an international standing. The Media Lab Helsinki, a unit at the School's Department of Media, provides education and research frameworks for studying digital media products, contents and technologies, their design, development and the effect they have on society, for instance, via New Media narratives and representation of culture and history. New Media Culture and Design Systems of representation and Interface Design Game Design and Production Procedural storytelling Transfer of culture heritage materials into the virtual domain 3D representation, design and virtual environments	Leader of WP2 on User Experience in Cultural Collections. Also major work in WP7 and WP6 on Demonstrators, as they are the practical test-beds of WP2. Evaluation and testing of applications, milestones in other WPs. Expert in scenario-based and narrative design for interactive exhibit/installation design and new media productions.
CWI	Research Institute	Leader of WP3 and bring expertise in semantic interaction, semantic modeling
TLD	Research based SME specializing in software for language technology, content management and audio visual processing.	Leader of WP6 on Demonstrators and Evaluation. Task leader of market watch and exploitation strategy. It will contribute in design and development of research prototypes, demonstrating in the wild and their evaluation.
EYE	A Film museum in the heart of Amsterdam; Curators of film exhibitions	Leader of WP7 on Dissemination and exploitation; task leader of Requirement analysis and roadmap creation (WP2.T1);

2.3.3 Previous Cooperation and Summary of partners unique contributions to ExCAPE

AUS and UGL have an intense four year collaboration background 2006-9 within the SALERO (Semantic AudiovisuaL Entertainment Reusable Objects) EU IST FP6 programme. AUS and UA have maintained research results exchange and discussion over interactive narrative,

generative systems and exhibit installation design via ACM (Association for Computing Machinery) Multimedia Interactive Art Track 2009-10 paper and demo presentation.

CWI and UVA are closely associated research partners. Prof. Lynda Hardman is a part-time Professor at UVA. They had collaborated for years and are involved in a number of collaborative projects, such as the national projects Multimedia or on European level, as in the Passepartout project.

UGL, CWI and UVA have strong collaborative activities for many years. Recently CWI and UGL were partners in much successful K-Space network of excellence project. They had research exchanges and scientific collaboration resulting in collaborative papers (e.g. joint CIVR 2009 paper). CWI and UGL are associated partners of the EU funded Petamedia project.

UVA and UGL have worked together since 2005, on a range of issues related to information retrieval. Joint work on formal models for expertise retrieval has proved to be extremely influential; entity oriented retrieval models derived from this work form the basis for the expert retrieval models. Joint work on simulated queries for the evaluation of information access systems is giving rise to new simulation-based evaluation initiatives. In 2006, UVA and UGL jointly set up and launched the TREC Blog track at TREC, which is aimed at assessing the effectiveness of retrieval and discovery methods for user generated content. In 2006, Leif Azzopardi left the UVA group to join UGL as a staff member.

TLD and UGL were partners in an FP6 funded MIAUCE project (MIAUCE - Multi modal Interaction Analysis and exploration of Users within a Controlled Environment and TRIPOD-TRI-Partite multimedia Object Description).

2.3.4 Subcontracting

All of the major skills and knowledge for this project are present within the member organisations of the consortium, and we do not envisage any subcontracting of RTD activities.

(i). Sub-contracting: if any part of the work is to be sub-contracted by the participant responsible for it, describe the work involved and explain why a sub-contract approach has been chosen for it.

2.3.5 Other countries

All of the participants are based in EU Member States and Associates.

(ii) Other countries: if a one or more of the participants requesting EU funding is based outside of the EU Member states, Associated countries and the list of International Cooperation Partner Countries, explain in terms of the project's objectives why such funding would be essential.

(iii) Additional partners: if there are as-yet-unidentified participants will not be counted in the minimum number of participants for the eligibility of the proposal).

(No maximum length for Section 2.3 – depends on the size and complexity of the consortium)

2.3.6 SME involvement

Tilde established in 1991, TILDE is the Baltic leading-edge IT company specializing in language technologies, multilingual and Internet software, and localization. As a highly innovative SME, TILDE participates in European research projects financed by European Commission. These activities cover the areas of terminology, language technologies, information retrieval, e-learning, cultural heritage, internet and multimedia. TILDE's profile in the EU funded projects varies from a content provider eTEN (project eRMIONE – E-Learning Resource Management Service for Interoperability Networks in the European Cultural Heritage Domain) to a research partner FP5 (CLARITY -Cross language information retrieval and organization of text and audio documents), FP6 (MIAUCE - Multi modal Interaction Analysis and exploration of Users within a Controlled Environment and TRIPOD-TRI-Partite multimedia Object Description) and a project coordinator in eContent (EuroTermBank – Collection of Pan-European Terminology Resources through Cooperation of Terminology Institutions). Currently number of new FP7 and ICT PSP projects have been lunched.

2.4: RESOURCES TO BE COMMITTED

Describe how the totality of the necessary will be mobilised, including any resources that will complement the EC contribution. Show how the resources will be integrated in a coherent way, and show how the overall financial plan for the project is adequate.

In addition to the costs indicated on form A3 of the proposal, and the effort in section 1.3 above, please identify any other major costs (e.g. equipment). Ensure that the figures stated in Part B are consistent with these.

(Maximum length for Section 2.4 – two pages)

The following tables show the summary breakdown of total costs per category of expenditure.

Cost category	Total	%	Comments
Personnel costs	2,007,834	55	
Durable equipment	56,000	.015	
Consumables	26000	.007	
Travel & subsistence	160000	.04	
Subcontracting & Audit	26000	.007	
Other specific costs			Spread among partners, primarily for workshop events and meeting hosting
Protection of knowledge			
Indirect (overhead) costs	1,373,224	37	
Total Costs	3,649,058	100.0%	

Grant Request

Division of resources between activity types	RTDI	Demo	C-Mgt
By Effort	93.67%	0	6.33%
By Cost	92.8%	0	7.2%
By Grant Request	90.6%	0	9.4%

ExCAPE proposes to apply a substantial resource to a major research challenge, with an allocation of 395 p-ms for the 36-month project. The tables above show that almost 94% of the effort and 91% of the grant request are allocated to RTDI activities, with the balance to Consortium Management: there are no Demonstration activities, the Test-beds, Trials and Evaluation being research activities. UGL provides the management team and project office, from its very experienced team of professional managers. The allocation of time for Consortium Management and administration (20 p-ms for UGL and 1 p-m for each of the

Partners) follows established practice, From the precedent of numerous successful projects, like SEMEDIA, MIAUCE, we know that this is the level of resource needed to manage a STReP of this size. As usual, in accordance with FP7 rules, technical management time is accounted as RTDI effort and included in the RTDI work package allocations.

The average cost per person-month is €9238, including all overheads, travel, materials and equipment, which represent excellent value for money given the quality of the research institutions and companies. The additional cash investment provided by the partners is €0.846 million, which represents a substantial commitment to the project.

Analysis of the detailed figures provided by the Partners (using the usual research project budgetary headings) shows this is a very cost-effective proposal. 92% of the budget is allocated to labour and associated overheads, and durable equipment is limited to servers and devices like biometrics, smart devices, table top deices required by researchers for demonstrating, deploying and evaluating in real-life setting.

Turning to the RTD labour allocation at each Partner, UG's request is for 111 p-ms, or just over three full-time equivalent researchers, spread across three groups in HCI and IR groups at the Department of Computing Science and also that of the Hunterian art gallery and museums. (responsible for requirement capture and within museum evaluation of art gallery demonstrator) . This is an efficient resource allocation that is accurately mapped onto the task needs.

CWI allocate 3 senior researcher times and UvA that of 2 people. AUS has contributions from 4 different experienced and senior artists and researchers. TILDE's involvement is for exploitation and demonstrator development. They have assigned 2 research-oriented team members. EYE institute allocates time from 2 researchers who is responsible for curation and exhibition activities.

3: IMPACT

3.1: EXPECTED IMPACTS LISTED IN THE WORK PROGRAMME

The impact of the ExCAPE project will be manifold.

Increasing wider access to cultural archives

An important factor for the musea is how to make their material available. Here ExCAPE will impact developments through the provision of an infrastructure offering generic, integrated semantic services on media content, metadata, and ontological knowledge that allow domain experts the swift creation of highly qualitative and reliable multimedia-based information, and thus facilitate instant distribution to the global consumer. This will not only improve the work of researches in cultural heritage institutions but for all institutions that work with knowledge represented in different media formats.

Reinforcing Europe's cultural archives with increased user experiences

The ExCAPE technological innovation is aimed at developing better user experiences by establishing new adaptive and personalized interaction techniques. Such developments are based on research efforts in many fields, such as semantic interaction, automatic story telling methods, information retrieval, filtering and recommendation techniques and multimodal interaction. Such innovative and integrated approach will lead to effective user experiences in interacting with cultural artefacts and collections. This will lead to wider and frequent forms of access.

Healthy competition with entertainment industries & wider uptake of Europe's cultural resources

The general notion that musea are staid and austere environments, where visitors have to passively observe artefacts, or passively listen to historical accounts of the past, is affecting the uptake of the cultural resources. The encasement of artefacts behind glass and the didactic guided tours reinforces this view. Visitors should be able to uptake such materials for entertainment, learning and for self-indulgence. However, the stereotypical view of museum artefacts a s boring and dead material is negatively affecting the involvement of Europe's population with the culture in their daily lives.

ExCAPE will facilitate musea to establish presentation forms of all their artefacts that can increase their competitiveness against popular entertainment industries. In that way ExCAPE provides means to establish new revenue for musea, as they attract audiences that are currently out of reach. These audiences, mainly people born after 1980, are used to experience knowledge through the web, being confronted with connection, context, and uncommon perspectives. In addition, these audiences are experience-hungry and desires to see knowledge being communicated in a compelling and enjoyable manner, accessible on an individual level, which includes the connection to experiences already made at other exhibitions. Solution provided by ExCAPE turn a visit into an event that can be experienced as a continuous, flexible, and networked exchange of ideas. The revenue will not only be measurable in direct increase of tickets sold but also indirectly, through an increase of profits made by on- and offline shops. In addition the personalization approach followed in ExCAPE offers musea to better

evaluate their services to customers, as they now have a detailed data set that allows them to establish better evaluation metrics of customer satisfaction. This, in return, allows them the application of closer relationships with customers on an individual level, thus establish brand bonding.

Generation of business models and revenue generation mechanisms

ExCAPE will provide added community value by allowing more insight into valuable resources on hardly ever seen art items, where the exploration of 'intertextuality' offered by digital media, i.e. through creating new formats and new possibilities of cross reference and analysis. ExCAPE technology facilitates the step into a new qualitative way of studying cultural heritage artefacts, where scientists, scholars but also the general public from all over Europe will be provided with multimedia-based tools allowing them to better discuss, annotate, study and advise on culture artefacts. Thus ExCAPE benefits Europe by creating innovative multimedia tools, which will also be generically usable in other scientific communities wishing to collaborate using electronic channels beyond today's means. Thus in terms of both content and method, we believe that ExCAPE will make a contribution to European cultural heritage on the one hand, and to European competitiveness on the other hand, i.e. the technology of the evolving information society, will help to keep Europe up to date in the fast-moving area of electronic media-based information applications.

From a mere computational point of view ExCAPE will provide a better understanding of essential problems, such as representations of events, disambiguation of events, interpretation of domain and context for adaptation of user information and presentation needs, information retrieval in incoherent and changing environments, etc. This will inform the development of control and support of location-base experience systems, which are still in their infancy regarding those aspects. In that way ExCAPE will provide the basis of support for event-based (temporal) reasoning, where reasoning is based on symbols (rather than just signals) and thus is applicable to various domains, as the inclusion of domain semantics in a modular fashion is achieved.

Innovations in personalization techniques

the new interaction methods, developed towards immersion alongside depth of experience, for accessing interesting information/media/artefacts will provide insights for human computer interaction beyond the domain of cultural heritage. In particular the situation awareness within the ExCAPE interaction methods, namely the perception of environmental elements within a volume of time and space in combination with comprehension of their meaning, will have an influence on the quickly growing market of mobile experience-based systems. Through the coupling of experience-base communication-oriented interaction and knowledge ExCAPE will not only inform related domains, such as mobile education, but also more entertainment oriented domains, such as gaming and tourism, In those domains the need of context awareness is currently addressed through virtual 3D overlays, which are non-interactive. Here EXAPE will enhance developments. Thus, the impact of ExCAPE on the developments of adaptive interaction will be substantial.

3.1.2 The need for a European rather than a national or local approach

Given the international scope of the cultural market, the complexity and variety of the technologies concerned, the dominance of American companies in web-based information searching, and the pre-eminence of the US computer industry, it is clear that no single European country or manufacturer can compete alone in the field of networked media search, access, and manipulation.

European companies and researchers have pioneered the development of digital media technologies and information retrieval, but they will have to present a new generation of innovations that catch the market's imagination if they are to maintain their position as digital processes become pervasive and the international industry adopts new technologies and procedures: the partners in ExCAPE have played leading roles in this process. The company members and research centres are recognised as international leaders in social media mining, media metadata and semantics, information retrieval and search engines. To assemble the skills required for the project, and create the necessary critical mass, has required us to build a partnership with members from UK, Netherlands, and Finland. The range of countries also enables the Consortium to address culturally-weighted aspects of social media search: the benefits on the results will be genuinely European.

The relationship to other European and national research activities

Project description	Relation to ExCAPE technology	ExCAPE progress beyond state-of-the-art
SMARTMUSEUM developed a platform for on-line personalized access to digital content of cultural heritage, through adaptive and privacy preserving user profiling.	✓ Search and retrieval ✓ User-based access to digital content ✓ Re-use of personal experiences for interest groups ✓ Cultural relevance of content	✓ Application of mobile technologies for facilitation of social and co-participative interactions ✓ Affective feedback ✓ Personalised search and recommendation systems
BRICKS aims at integrating existing digital resources into a common and shared digital library. The scope of the project covers digital museums, digital archives, as well as other digital memory systems.	✓ Mining of complementary digital collections ✓ Networked system of heterogeneous collections of digital multimedia items	✓ User-generated content ✓ Application of mobile technologies for facilitation of social and co-participative interactions ✓ Multimodal analysis
IMAGINATION aimed at promoting knowledge gained from digital cultural and scientific resources by enabling navigation through images and their context.	✓ Browsing and navigation in distributed digital collections ✓ Media categorization, summarization and clustering	✓ Multimodal analysis ✓ Affective feedback ✓ Personalised search and recommendation systems ✓ User-generated content
MultiMATCH built a multilingual search engine to enable users to explore and interact with online accessible cultural heritage content, across media types and languages.	✓ Multimodal analysis ✓ Cultural relevance of content ✓ Semantic classification and clustering of multimedia data ✓ Online access to relevant content	✓ Affective feedback ✓ Personalised search and recommendation systems ✓ Application of mobile technologies for facilitation of social and co-participative interactions
PAPYRUS developed a	✓ Knowledge-driven	✓ Application of mobile

cross-discipline digital library that allows drawing content from one domain and making it available and understandable to the users of another domain.	analysis for semantic summarization and categorisation ✓ Search and retrieval ✓ Content-based relevance feedback	technologies for facilitation of social and co-participative interactions ✓ Affective feedback ✓ Personalised search and recommendation systems

3.2: DISSEMINATION AND/OR EXPLOITATION OF PROJECT RESULTS AND MANAGEMENT OF INTELLECTUAL PROPERTY

DISSEMINATION AND EXPLOITATION OF PROJECT RESULTS

Dissemination

ExCAPE will disseminate project results, through a programme of showcases, trade fair and conference attendance, publication and the Web. The channels and methods will be chosen to play to the strengths and meet the needs of the different partners: given the focus of the proposal, we will make a particularly vigorous use of on-line media and cultural exhibitions.

At the project level, dissemination activities will be based on the creation of a project brand to reinforce the message of dissemination activities. This will involve the coherent promotional use of the logo, webskin and templates. The ExCAPE website will showcase the technologies and their use, and follow the example of past successful SEMEDIA project in posting on-line demonstrators. ExCAPE will employ a range of on-line and social media such as blogs, twitter, and wikis and YouTube videos. The project will also establish a web presence with CMS and RSS feeds.

The academic and research centre partners will disseminate results to the research community in their normal ways, via web sites, publications and presentations in journals and at conferences. Relevant conferences for ExCAPE include ACM SIGIR (Special Interest Group on Information Retrieval), ACM Multimedia, ACM International Conference on Image and Video Retrieval, IIiX conference series, ACM CHI, Mobile HCI, International World Wide Web Conference (WWW), Next Web Conference, Web 2.0 Conference, the Web 2.0 summit, International Conference on Knowledge Management and Knowledge Technologies (I-KNOW), International Conference on Semantic Systems (I-SEMANTICS), or the International Conference on Interactive Digital Storytelling (ICIDS).

In addition to presenting papers, ExCAPE will organise special sessions and workshops at research conferences. In this context the project will take advantage of opportunities provided by UGL, UVA, CWI and AUS as world leaders in their domains. These groups continuously organize international conferences (CIKM 2011, ECDL 2010), or workshops (AIR and CIRSE series) or training events (SSMS, ESSIR series). The organization of the conference will provide the opportunity to disseminate information on ExCAPE and specialised workshops in related research areas. UGL is a frequent organiser of IR events, and was responsible for the Second International Workshop on Adaptive Information Retrieval AIR 2008.

The Project User group is formed with the idea of getting more effective feedback from stakeholders. We will form a project user group (as stated in section B2.1) and will be

based on a cluster of 3 in-house experiences: UGL institute of Hunaterian art gallery and museums; Amsterdam based user group organized by EYE; and in-house museum group of AUS. Based on three clusters, we will form brain storming sections, feedback sections and dissemination activities. These clusters will also be our avenues for showcasing our technology.

Exploitation planning

Exploiting cultural archives for new business models is one of Europe's ongoing ambitions. In fact, millions Euro are hidden in such valuable and enjoyable resources. ExCAPE demonstrators, market watch will lead to better business models and better exploitation opportunities. TLD, a research based SME, is in charge of these activities. They will employ our research results in their tools and will generate exploitation plans. In ExCAPE's approach, there is not just a single project result exploitation, but a set of exploitation routes that reflect the different profiles of the partners and their economic interests

As an academic institution UvA will first of all exploit the results of ExCAPE in the form of publication at international top rated conferences (CHI, Mobile HCI, ACM Multimedia, ICME) , workshops and scientific journals (ACM TOMCCAP, IEEE MM, HCI) and in university-level teaching (AI as well as Information Master courses on Knowledge-based Media Systems, Interactive Information Systems, Human-Centred Multimedia). UvA shares close relationship with several Cultural Heritage and Interactive Media Institutions in the Netherlands. Here we will communicate the ExCAPE results and raise awareness. In that context UvA will present the results at the ICTDelta (http://www.ictdelta2010.nl/ICTD/ICTDelta_2010_wordt_een_festival.html) and PICNIC conferences (http: //www.picnicnetwork.org/page/64823). UvA will make use of ICOM (http://icom.museum/) events in the Benelux to promote ExCAPE results, such as the annual Museums day, where public presentations can be place. UvA will also reuse of the developed technologies (software, interfaces, etc.) for other projects and products. In the latter case UvA will make use of the University's Knowledge Transfer Office.

Aalto University (AUS) is a higher education and research institution with an international standing. AALTO School of Art and Design (formerly known as University of Art and Design Helsinki) has been a leader in art and design education and research for over 138 years. The Media Lab Helsinki, a unit at the School's Department of Media has 34 full time staff members and over 200 MA and PhD level students. It provides education and research frameworks for studying digital media products, contents and technologies, their design, development and the effect they have on society. AALTO will exploit the ExCAPE research base and results in its Master and Doctoral Programme of New Media via teaching and seminars, as well as via the bi-annual Media Lab Demo Day, participated internationally by New Media and related fields, like museum and games industry, researchers and patricians. The results will also be disseminated through top rated academic conferences and art festivals (e.g. ACM Multimedia, ISEA, Ars Electronica) and journals (e.g. Digital Creativity, ACM Transactions). AALTO has a dedicated company spin-off office and has generated a number of start-up companies (like Cube Entertainment Ltd for museum installations, Virtual Air Guitar Company, Sankari Productions). Additionally, the numerous exhibition forums open to AALTO (e.g. Media Centre Lume, Kiasma Museum of Contemporary Art, Design Museum) will be exploited to showcase the project results, while the forums may become potential customers for the ExCAPE demonstrators, concepts and inventions.

CWI performs fundamental scientific research and transfers the acquired knowledge to society and industry. The results of the ExCAPE project will be exploited primarily through

academic publications in top international conferences (WWW, ISWC, SAMT, ACM MM, SIGIR, Museums and the Web) and journals (e.g., IJHCS, JWS, ACM TOMCCAP). In addition, the results of the project will be collected and offered as a tutorial at conferences aimed at the museum community, Museums and the Web. CWI has strong ties with members of the Dutch cultural heritage community, developed through previous national projects (MultimediaN, CHIME, CHIP) and will transfer project results to these communities through their national annual meetings (e.g., DEN http://www.den.nl/). CWI, as well as the UvA, will also present project results at the national ICT event bringing Dutch industry and academia together, ICTDelta (http://www.ictdelta2010.nl/).

University of Glasgow is a public higher education institution with an international standing. Participating institute, Department of Computing Science (DCS), is one among top 8 research led departments in UK. It is also top rated for its teaching and is part of many international academic networks (like IRUN). UGL will exploit the research results from ExCAPE in different ways. UGL being a research led University exploit the research base and results of ExCAPE in its advanced masters courses (for example, Advanced Masters degree in Computing Science) and also in PhD training. Two IR group trained PhD students, both named ExCAPE researchers, were awarded the BCS distinguished dissertation prizes showcasing our research quality. In addition, DCS collaborate closely with the HATII (Humanities Advanced Technology & Information Institute in delivering combined degrees and the results ExCAPE will be exploited accordingly. The DCS academics are recognized and categorized as internationally excellent in the last RAE exercise and ExCAPE results will contribute to such success. Most of the results (non confidential) will be disseminated through top rated academic conferences (ACM SIGIR, ACM MM, ACM CHI) and journals. University of Glasgow has a dedicated technology transfer office and has generated a number of spin-offs (e.g.,, Kelvin connect from DCS)and open source solutions (e.g., Terrier from DCS). ExCAPE research results will also be exploited through such means. In addition, Scottish executive supports commercialization activities through Proof of Concept funding and this means will also be explored for future commercialization. University of Glasgow has a dedicated research arm to exploit research results and also has tie up with an innovation Partnership team (a tie up with a venture capitalist firm) for commercializing its research base. UGL- Hunterian Art Gallery and Museum will use the results to exhibit and demonstrate new and innovative user access technologies in museum domain. This unit is already in the fore front of exploiting technologically relevant results through their collaboration with department of Computing science.

EYE will first of all make use of the demonstrator developed in ExCAPE in its own environment, namely the Filmmuseum in Amsterdam, where the installed system will become a essential part of EYE's connection to visitors. In addition EYE will lobby among the other European film institutes to promote mainly the context and presentation model with the aim to establish a European wide standard, which helps to achieve a better integration of the various European film collections. For that EYE will make use of Europe wide programs, such as the EU Media program (http://ec.europa.eu/information_society/media/index_en.htm).

As a highly innovative SME, experienced both in language technologies and digital content services, TILDE is looking forward to exploit the results of ExCAPE projects in several fields and business models. During the project developed demonstrators foresee various ways in co-reacting and integration with other web applications and projects. Tilde as a holder of a reference and dictionary Web service letonika.lv (www.letonika.lv) gains opportunities to create new possibilities for the cultural rich content in the digital

world. TILDE has a working relationship with over 750 public libraries in Latvia, major high schools and others involved in school sector, who are active users of our web content. Tilde has a partnership with the National Library of Latvia, delivering its valuable collections through letonika.lv to users.

Following the dynamic development and change of user habits and needs as well as business promotion considerations, Tilde sees the possibilities for new, customer needs-oriented web platforms and services. Delivering personalized cultural content and summarization of it, content based on users' behavior and interest, providing users with a free and convenient and well-considered cultural content management tool using the solution developed within the ExCAPE project are the ideas to be developed and exploited depending on the scientific results of the project. We believe that Tilde's competences are appropriate for grasping the best ideas from demonstrators built within the ExCAPE project.

Intellectual property protection and management

ExCAPE will work on the principle that inventions should be protected and the IP regime will be governed by the Consortium Agreement along the following lines:

- Ownership of background know-how is unaffected by the Project
- Each Party owns the resulting IPR generated by it under the Project.
- Any jointly generated knowledge will be jointly owned by the Parties in proportion to their inventive contribution; they will agree which shall be responsible for protection and maintenance of rights.
- Should research results be patentable, the Party who developed them will either deposit the patents or transfer the ownership and patent responsibility to another member of the Consortium under agreed license, exploitation and use terms.
- Each Party will grant the others a non-exclusive royalty-free license to any of its background know-how needed for and limited to the exploitation of knowledge resulting from ExCAPE. Any other use of existing background will be subject to separate negotiation, agreement and (if appropriate) payment.
- Confidentiality will be maintained for all information gained from partners through deliverables or by other means while carrying out the project, if this information is not already in the public domain and can reasonably be regarded as confidentiality. The confidentiality period will be five years from the end of the Project.
- If any of the partners wants to publish partial or final results they will seek prior clearance from the other partner.
- Each partner will identify any items of relevant background IPR ('know-how') that are freely available to the other Partners for access and/or for use; and any are subject to commercial restrictions or payment of licence fees.
- Researchers will have the right to publish research results, subject to the terms of the Collaboration Agreement, with a reasonable period of notification of publication. Copies of all conference papers, articles, chapters and books will be provided to both Partners by the researchers.
- Any knowledge created and protected by one partner in the course of the project work programme will be made freely available to the others insofar as is necessary for the exploitation of the results of the project. Any other use will be subject to agreement and separate licence.

- The duty to maintain IPR and Confidentiality arrangements will persist after the project is completed.

IPR will be managed at the Consortium level under WP1T4, as previously described.

4: ETHICAL ISSUES

Work performed in ExCAPE as well as the publication of results found in ExCAPE will follow the precautionary principle.

4.1: ETHICS

As ExCAPE facilitates tracking the location or observation of people, work in ExCAPE adheres to the rules set up by the Data protection and privacy ethical guidelines (ftp://ftp.cordis.europa.eu/pub/fp7/docs/privacy.doc). ExCAPE will also comply with *Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 (on the protection of individuals with regard to the processing of personal data and on the free movement of such data), and with Directive 58/2002/EC of the European Parliament and of the Council of 12 July 2002 (concerning the processing of personal data and the protection of privacy in the electronic telecommunications sector).* In order to facilitate content processing according to user preferences and context of use, usage research teams will need to keep user data with the related metadata. For testing of developed techniques in realistic scenarios the user model will keep a history of use for individual users and automatically learn the personal preferences from this. This could raise privacy issues. Individual data stored in digital format, even if anonymous, are subject to privacy regulations (e.g. make sure that users are aware of what kind of measurements are performed on them or about them and thus provide consent in form of a legal contract that they agree with the type of experiment and the resulting use of data. In principle, this implies that data storage is to be restricted to what is necessary, that users have to be notified of this fact, that users have a right to inspect what is stored about them, and that their data is not to be transmitted to third parties and used for purposes other than those covered by the relationship the user has entered to the owner of the data. In this context ExCAPE will observe European legal regulations concerning privacy. This is at a policy level, and will be monitored and reinforced by the legal departments of the participating institutions. At the technical level reasonable technical measures concerning data security of personal data will be applied. For instance transmission of personal data over open communication channels will be done in encrypted form only. In addition ExCAPE will ensure that during all user tests that a) users are aware what kind of measurements are performed on them or about them and will provide contractual means that participants agree beforehand that this data will be used for research purposes only.

4.2: TRUST

As ExCAPE works with cultural heritage information, it has to address the issue of trustworthiness during the whole value chain of content creation, management, processing, distribution, and consumption, as well as accessibility. ExCAPE will deal with the policy aspects of trust, and it will recommend and apply existing technology to achieve and ensure security and trustworthiness.

4.3: ACCESSIBILITY

ExCAPE partners are also very aware of accessibility issues generated when new technologies are introduced and therefore special care must be taken to avoid the creation of barriers that put people off the new technologies. For this reason one of the main dissemination goals of the project is to allow the non-specialist citizen access to the outputs of the technology that is being developed. The reason for this is to establish

at an early stage what is interesting to the user, what is helpful to the user, e.g. with different literacy kills and languages, and conversely what may be technologically interesting but either confusing or not addressing features that user, i.e. viewer, listener, or traveller needs. This will provide feedback on the targeted user centred research and the tools and techniques that are given attention. If this can be achieved it will contribute the success of the research and have wide societal implications.

The accessibility issue is not only about serving the community of differently-abled users, but also applies more generally to "abled" users in a "disabled" environment, for example driving an automobile makes a user "partially sighted". Including knowledge about the expressivity of different modalities in which information is and can be expressed will contribute to enabling creating output presentations appropriate for different users - whether abled or disabled. Many proposals have been made for minimum standards for access, and many organisations encourage content creators to follow these standards. Additionally, ExCAPE activities will give special attention to accessibility and usability problems, mainly for people with different levels of disability. Whenever new developments will not be compatible with existing standards and recommendations, ExCAPE will engage in overcoming specific problems and difficulties aiming at guaranteeing equivalent levels of accessibility and usability. These efforts to ensure accessibility to physically impaired people will aim at facilitating accessibility problems and reducing impact of physical disabilities on accessing the technologies produced by ExCAPE.

4.4: ETHICAL ISSUES TABLE

	YES	PAGE
Informed Consent		
• **Does the proposal involve children**		
• **Does the proposal involve patients or persons not able to give consent?**		
• **Does the proposal involve adult healthy volunteers?**		
• **Does the proposal involve Human Genetic Material?**		
• **Does the proposal involve Human biological samples?**		
• **Does the proposal involve Human data collection?**		
Research on Human embryou/foetus		
• **Does the proposal involve Human Embryos**		
• **Does the proposal involve Human Foetal Tissue/Cells?** •		
• **Does the proposal involve Human Embryonic Stem Cells?**		
Privacy		
• **Does the proposal involve processing of genetic information or personal data (eg. Health, sexual lifestyle, ethnicity, political opinion, religious, or philosophical conviction)**		
• **Does the proposal involve tracking the location or observation of people?**		
Research on Animals		
• **Does the proposal involve research on animals?**		
• **Are those animals transgenic small laboratory animals?**		
• **Are those animals transgenic farm animals?**		
• **Are those animals cloned farm animals**		
• **Are those animals non-human primates?**		
Research Involving Developing Countries		
• **Use of local resources (genetic, animal, plant, etc)**		
• **Impact on local community**		
Dual Use		
• **Research having direct military application**		
• **Research having the potential for terrorist abuse**		
ICT Implant		
• **Does the proposal involve clinical trials of ICT implants?**		
I CONFIRM THAT NON OF THE ABOVE ISSUES APPY TO MY PROPOSAL		

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