



QVIZ

Query and context based visualization of time-spatial cultural dynamics
Specific Targeted Research Project
Information Society Technologies

Exploitation Plan D8.1

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Abstract

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Table of contents

Executive Summary	5
1. Introduction	6
2. Conditions for exploitation.....	8
2.1 The archival approach.....	8
2.2 Requirements for content providers.....	9
3. Exploitable Knowledge and its Use	10
3.1 Exploitation overview table	11
3.2 Description of the Exploitable Results	13
3.2.1 The integrated QVIZ platform.....	13
3.2.2 Separate exploitable knowledge	14
4. Intellectual Property Rights	17
5. Market Analysis	19
5.1 Actors in the Market	19
5.1.1 European Digital Library and Archival documents access services	19
5.1.2 QVIZ within the i2010 initiative and as a European Archival Library	20
5.1.3 Content Providers in the Market.....	20
5.1.4 End-users of the content provided	21
5.2 Business Models and Contacts.....	23
5.2.1 Contacts	23
5.3 Analysis of the Competition.....	26
5.3.1 Cross-institutional Access portals	26
5.3.2 Content providers of archival resources.....	27
5.3.3 Collaborative environments and tools for bookmarking.....	27
5.3.4 Competition overview table.....	29
6. Development Road Map	31
6.1 Action lines.....	31
6.2 Partners' individual exploitation interests.....	32
6.2.1 National Archives of Estonia (NAE).....	32
6.2.2 Salzburg Research (SRFG)	33
6.2.3 Telefónica (TID).....	34
6.2.4 Swedish National Archives (SNA).....	34
6.2.5 Regio	35
6.2.6 University of Portsmouth (UoP).....	36

6.2.7 Umeå University (UmU).....	37
6.3 Road Map for different exploitable knowledge	38
7. Socioeconomic Impact.....	39
8. Conclusion.....	40
APPENDIX.....	41
Appendix A: Examples of possible content providers.....	41
A1. Content providers such as archives, which have published digitalized materials and may offer an archival content for QVIZ.	41
A2. Content providers such as different digitalizing projects by universities, museums etc. Content in a wider sense.	42
A3. Content providers such as place name databases, which would be interested in gathering data using administrative units ontology, maps and knowledge of QVIZ users.	42
Appendix B: Requirements for possible content providers.....	44
B1. General Instructions.....	44
B2. Minimum Meta-data input.....	44
B3. Minimal data input – table 1a (Units).....	44
B4. Minimal data input – table 2a (Relationships).....	44
B5. Maximum Meta-data input.....	45
B6. Maximum data input – table 1b (Units).....	45
B7. Maximum data input – table 2b (Relationships).....	46
B8. Maximum data input – table 3b (vectors).....	46
B9. QVIZ input description for archival information.....	47
Appendix C: Individual partners’ exploitation interests overview	50

Executive Summary

The purpose of the exploitation plan is to outline the future of the QVIZ project and the use of the valuable knowledge resulting from the project. The key objective of the project is to enhance and facilitate the access to digital archival material. Therefore the main target group for the exploitation are the content providers, but also the national and European policy makers, researchers and developers that contribute to an enhanced accessibility in the cultural heritage sector and therefore ultimately the end-users in the general public.

The main exploitable result of the project is the integrated QVIZ-platform. The platform is more than a working proof-of-concept. It is, as far as we know, the first online platform to present the total indexed digital image content from two European national archives; the Swedish National Archives and the National Archives of Estonia.

For the period immediately after the end of the project it will be used primarily for demonstration purposes to attract new content providers and collaborators. Although the subsystems are exploitable to some extent, the added value of the software solution is depreciated by using only a part of the system out of the integrated context.

The QVIZ platform addresses the “Where-, When- Who- and What-questions” for the archival resources and also provides an environment for the ultimate “How-question”. It combines a decentralized archival content and a single access point and thereby supports research into very large and growing archival collections.

The most feasible business model for the integrated QVIZ platform is to have the content providers pay for their archives to be accessible through QVIZ. The content providers is the target group that has the most added value from the system by making the content of their archives more easily accessible to the public. It is believed that as soon as the content accessible through QVIZ reaches a critical mass, the users will follow. The system currently holds approximately 75.000 archival volumes containing more than 15 million digital images from two European national archives.

The coordinators in collaboration with the consortium are responsible for coordinating the exploitation activities.

1. Introduction

Challenges

A common dilemma for European cultural heritage institutions is that the organization and presentation of archival information are so complex that they restrict easy access to the material. Another problem is that knowledge building within communities of practice is an emerging practice not yet adopted by the archives but very much needed by the users as a tool for knowledge building in a user to user environment. Archival records and knowledge in communities of practice are commonly related to administrative units, such as parishes and municipalities. End users, however, are not often allowed to explore the material on this basis. While such access would be advantageous, it is made complex because administrative units frequently change over time and because archival systems rarely provide a rich and non-textual time-spatial context. Could this issue be solved, cultural heritage institutions could provide marketable services unavailable today; increasing the usage of archival material among local historians, the educational systems, researchers and the general public.

In many ways the archives stand out as different among the actors in the CH-sector. Traditionally, and partly presently, most archives were not institutions for public service but tools of power for authorities and corporate bodies that were and still are subject to current legislation. Where museums and libraries are concerned with IPR and DRM, the public archives primary responsibility is to guard sensitive information that threatens the integrity of individuals. Where the museums and libraries exhibit the interpretations of curators and authors the archives merely supply a knowledge base for these interpretations. The archives are therefore a main source for stories not yet told and exhibited. This means that the use of archive materials is based upon research and not on events or media consumption, irrespective of whether the user is an academic or is among the great majority of archive users that are amateur researchers devoted to a wide range of often very specialized research topics. It is to the aid of these researchers and their often tedious and time consuming efforts that the QVIZ platform has been developed.

Within the CH sector it is also mainly archival information that attract commercial interest such as “The Generations Network” (See: <http://www.tgn.com/>) and other companies that are employing thousands of people worldwide.

Key results

QVIZ will research and create a framework for visualizing and querying archival resources by a time-space interface based on maps and emergent knowledge structures. The framework also integrates social knowledge building software in order to utilize knowledge in existing and new communities of practice.

QVIZ will lead to improved information sharing and knowledge creation, easier access to information in a user-adapted context and innovative ways of exploring and visualizing materials over time, between countries and other administrative units. The common European framework for sharing and accessing archival information provided by the QVIZ project will open a considerably larger market based on archival materials as well as a richer understanding of underlying processes in the European history.

Main outcome

The QVIZ project has succeeded in producing an advanced prototype of the integrated software solution. The proof-of-concept provides new and better ways to explore the archives, and to interact with content holders and researchers of similar interests. The platform will mainly be used for demonstration purposes, to attract new potential content providers and to show the proof-of-concept to presumptive collaborators for new projects. Several archives are now working on digitalizing their material in order to enhance access and preserve the fragile content in the archives. They will benefit greatly from using the QVIZ by giving more publicity to their holdings.

The QVIZ integrated platform consists of the following software services and content:

1. A dynamic map that can display administrative units over time and a timeline that assists in the process of narrowing the search.
2. A faceted query with pre-chosen administrative unit categories that facilitates the search process.
3. A social knowledge building component which provides ways to communicate, publish and interact with peers.
4. Social book-marking tools which enables storing of archival references in a social web context
5. More than 75.000 indexed archival volumes holding 15 million digital images from the Swedish and Estonian national archives.
6. An administrative unit ontology that holds more than 71.000 administrative units and 88.000 names of units.

2. Conditions for exploitation

The overarching idea of the business models for content providers, publishers and researchers is based on the thought that they are being provided within a framework that gives easy access to archival resources and that QVIZ offers tools for users to share and communicate knowledge while using archival resources.

In the archival sector an ontology based on administrative borders that change over time is indispensable knowledge in the systematization of the major part of the holdings in State- and regional archives. In the library context on the other hand, a topographical approach in the development of easier and more intuitive user interface might be of lesser interest since it does not apply to a majority of their holdings.

2.1 *The archival approach*

A great deal of development in the European archival sector is channeled through *library approaches* such as the EDL. Therefore, the development of the most effective and eloquent user interface solutions adapted to the archival conditions has sometimes been hampered by the need to adopt library standards in order to receive funding.

QVIZ has been developed firstly for archival purposes, and this approach has produced a qualitatively different solution than the library approaches, which of course can be combined with the efforts in the library initiatives.

Although the main focus of QVIZ within the cultural heritage sector is archives, the same or similar infrastructure is relevant to libraries. There are, however, two large problems.

Firstly, that existing library *catalogues* contain less geographical information than do archival information systems. There is a body of research in book history, which mines data on place of publication, but this interests a narrow audience. However, it is far easier to create full-text transcriptions from printed library books, using Optical Character Recognition technology, than from hand-written manuscripts in archives and there is considerable research into the automated recognition of geographical names within texts. There are also special categories of library content where the existing metadata are more likely to contain geographical terms, most obviously map collections but also including, for example, the collection of recordings of bird song in the British Library's national sound archive.

Secondly, archival information is mostly about or created by administrative units, but most geographical references in books in libraries link to geographical features – mountains, rivers and so on – or to subjectively defined *places*. This limits the usefulness of the formal administrative unit ontology around which the QVIZ system is built, but our map-based visualization interface is still very relevant. Libraries house official statistics collections, and the information in these is almost all about administrative units and traditional finding aids for statistics are very poor. Further, an administrative unit ontology is relevant to information about places. QVIZ has integrated a large corpus of British travel writing into the system, tagging place-names within the texts to link them to a gazetteer of places derived algorithmically from the British administrative unit ontology by grouping together units with approximately the same location and name. While most place-

name gazetteers treat places as point locations, the geographical terms used in common speech are often larger areas – districts and regions – and the best guides to the areas they cover are often boundary polygons for administrative units with the same name.

The information in archives and libraries is, obviously, primarily textual and contains many place-names. The QVIZ approach has less relevance to other cultural heritage institutions, to museums and art galleries. However, even here geographical location may provide an important dimension through which to access and present collections. Some museum content arrived there as a result of archaeological excavations, and here content may already be geo-referenced not by place-name but conventionally, by coordinate. Also, a significant fraction of works of arts represents landscapes and cityscapes, i.e. locations, and here geo-parsing catalogue entries may again be relevant.

2.2 Requirements for content providers

QVIZ can be used by content providers that are digitalizing archival document and providing internet portals to access the digital documents

In order to make use of QVIZ-framework, content providers need to support the following content and software services:

- Provide an index of archival references connected to administrative unit (time and space)
- Provide initial knowledge of relevant administrative ontology content (when new areas are being involved)
- Provide services for social bookmarking of archival resources (such as resource information services and redirect services).
- Accept an integration of the QVIZ social bookmarking toolkit within their web portal
- Provide synchronizing of provided content into QVIZ-system

The precondition for the new content providers to join QVIZ is the existence of a table that makes the connections of the same kind as described above. That is the work, which has to be initiated before joining the QVIZ system and also maintained continuously as long as the content holder wishes to present material within the QVIZ-system.

The other assumption is the pre-existence of a detailed administrative ontology for every single European country in order to start assigning the administrative units to the resources when content provider wishes to join.

The detailed requirements for adding more Content providers to QVIZ are being drafted in Appendix B.

3. Exploitable Knowledge and its Use

The objective of the exploitation plan is to ensure the future of the projects valuable results. Partners participating in the project consortium need to obtain their return-on-investments (ROI) so that QVIZ outcomes can be exploited also throughout the rest of Europe. It proposes a reliable exploitation procedure based on studies focused on the interest of institutions and users to contribute to the development of a common portal to European cultural heritage information as a part of a model for good governance.

The main exploitable result of the project is the integrated software solution. The exploitability of the subsystems is largely dependent on further development or novel combinations with other software solutions. It will therefore be more difficult to exploit them as separate products. The integrated QVIZ-platform and its integral parts are described in further detail below.

3.1 Exploitation overview table

This section presents exploitable results, defined as knowledge having a potential for industrial or commercial application, in research activities or for developing, creating or marketing a product or process as well as for creating or providing a service. The exploitable results are described in further detail in section 3.2.

Exploitation Knowledge	Exploitation product(s) or measure(s)	Sector(s) of application	Timetable for use	Type of result	Patents or other IPR protection	Owner & other partner(s) involved
Software service solution for seem-less use of the integral parts of the system	QVIZ integrated platform	Integrated portal for digital library services	1-3 years	Software		QVIZ partners
Dynamic user interfaces for discovery of archival resources	Dynamic query portal to search archival resources. (Server in Tartu, Estonia)	Digital library services for participating and future archives	By the end of the project	Software	Mostly open source but some licensing needed for others to use	QVIZ partners
Social Bookmarking tools for social knowledge building based on archival resources	Collaborative environment for knowledge building (Server in Salzburg and Sweden)	Digital library end-user	By the end of the project	Software	Mostly open source but some licensing needed for others to use	QVIZ partners

Exploitation Knowledge	Exploitation product(s) or measure(s)	Sector(s) of application	Timetable for commercial use	Type of result	Patents or other IPR protection	Owner & other partner(s) involved
European Administrative Ontology	Ontology that can handle the evolving admin units across nations over time	Foundation for portal query mechanisms to archival resources but also a content itself	By the end of the project	Partner content	Dependent on contributing content provider	QVIZ partners, also other content providers
Domain Ontology for different user communities	Ontology to store knowledge and concept over archival resources in collaborative environment	Semantic knowledge building environments with digital library content	By the end of the project	User content	Open source ontology is preferred	QVIZ-partners, end-users
Time-spatial indexes of archival resources	Administrative unit indexes connection resources references	Digital library services	By the end of the project	Partner content	Content providers own their indexes.	QVIZ partners, especially content providers

3.2 Description of the Exploitable Results

3.2.1 The integrated QVIZ platform

The QVIZ-platform provides a *dynamic map and a faceted query* that can perform searches in the archives from simple clicks on the map or the faceted browser. The faceted query arranges different types of data associated with archival resources into logical groups. The data used is both the administrative context but also user activities over archival resources. As a natural part of the faceted query a timeline also serves the opportunity to find specific information of a particular point in time. By simply clicking on a map and moving the timeline it is possible to receive information about that particular area and what archival resources are available, and most importantly the user is given a way to access the documents within the archival portal that holds the content. This is possible by the *Archival Redirect function*.

Social bookmarking is a tool that facilitates linking into and within the archives. An archive client tool has been developed and will be provided to the archives when signing up for the system. By doing this the users can have their need for access to digital archival material met and can better document and organize their work. This is possible by archival *metadata lookup* functions at the archival portals so that correct resource reference description is presented with the social bookmark of the archival resource.

The social knowledge building component functions through its users and integrates archival social bookmarks and resource descriptions from the social bookmarking tool; the collaborative knowledge building is the means to further enhance access to archive resources by enabling users and communities to contextualize and interrelate their references to archive resources to other user generated materials. Users will join or create Communities of Practice (CoPs) and through these, work can be performed to build a semantic network of relationships between archival resources and users' collaborative documents, their communities, events, tags, discussions, and other resource types defined by an ontology. To advance their research interests, community members can interrelate work of others or discuss a collaborative document directly, within communities or the user's home page. Visualizing relationships among resources provides feedback to all site users about how resources interrelate, thereby provide a means of enhancing access to archive resources and promoting research activities.

The QVIZ system allows users to create different kinds of content such as a social bookmark of archival resources via the bookmarking application. Users can also to further enhance these bookmarks, interrelate them to other resources, to create their own reference collections in user or community workspaces. A social bookmark is an important means for creating a particular context, it enables those who do not own a resource to describe it and relate it to other resources or classifications.

The main types of content provided by the partners (existing and future) are:

- Archival social bookmarks
- Archive resource descriptions
- Collaborative documents and relevant subtypes
- Relevant named entities (such as event types, persons)

- Tag related resources to build a site wide concept-collection based on SKOs (Simple Knowledge Organisation) for subject and primary subject classification of resources.

The description of archival resources contains much metadata agreed upon by the archives that can be useful for a variety of archive users; most importantly the connection between the archival resource at the archive portal and the administrative unit. These indexes of archival resources held within QVIZ-system provide the administrative unit context to archival portal resources and descriptions.

The information about changes of the administrative units over time is being collected from the archives and other organizations, such as universities, that normally hold such information. The information is compiled by administrative unit experts into a single administrative unit ontology.

Users can create content themselves but must also work together in so called Communities of Practice (CoPs). These resources created by users are an essential part of the QVIZ-system. It forms a knowledge base by linking the research results derived from the faceted browser and archives to the archival resource references.

By providing this instrument for collaborative knowledge-building dependent on archival resources, the QVIZ-system can promote archive materials in new contexts and enhance access to them via the community process. Consequently, we seek to increase the interest in archival information and increase the interaction between people with similar interests, as well as to promote a closer interaction with content holders.

3.2.2 Separate exploitable knowledge

3.2.2.1 Dynamic user interfaces for discovery of archival resources

This result is mainly an interface service that is a part of the integrated platform. However, the browsing mechanism using time-spatial and contextual attributes could be used as tools to make other types of search engines. The time-spatial representation is innovative since it is being combined with textual information and interactive functions. It is an interactive query based visualization of changes over time and space. This approach could be used for further research involving different kinds of content related to administrative units in time and space. The application component is not designed as the simple GIS-search engines. It provides added value by also using the domain knowledge of the administrative units and the knowledge about the archival resources.

3.2.2.2 Social bookmarking of archival resources within archival portals

This tool is an interface where users can store their references to archival resources. It is also an application that is able to connect to different services within the QVIZ-system and outside the QVIZ-system. It uses a Single sign on function for authentication and communication of user information to other integrated QVIZ components and it gathers metadata from archival description services. Furthermore it stores the bookmarks with the resources description within the QVIZ collaborative environment. This component is very central to the QVIZ-system. It has been developed, following the specifications from the consortium members. It is dependent on the service from archival portals and services from the Collaborative environment.

The component can currently only be used within the QVIZ-context, which of course includes future archival portals. Other forms of use would require a redesign of the component. The social bookmarking of archival resources is different from simple web-bookmarking tools like Delicious etc. QVIZ includes the specific knowledge related to the archival resources in a more systematic way.

3.2.2.3 Environment for social knowledge building based on archival resources

The aim of the Collaborative Environment Tools (CET) is to enhance the access to archival resources by providing the means to inter-relate them in new contexts and discover resources in new or different contexts than presently available in the archival portals. While creating new collaborative resources in the CET it is expected that the users will reference archive resources directly or indirectly, for example by inserting bookmarks into articles or publications perhaps as citations or links, discussions or forums, associating them with CoPs or with collections. QVIZ stores the archive resource metadata, which includes collections and administrative unit data. Therefore, the semantic web or network of associations can even link to administrative units, archive collection resource codes, etc.

Exploring the Query Visualization Environment that includes the administrative unit map and ontology coupled with the faceted query tool is the probable first entry-point for most users. There the users may find interesting archival resources based on social bookmarks with the option to view the archival resources in a specific Archival Portal and to bookmark them. The bookmarks created by the users will be stored in the CET and associated with the users' personal workspaces and available for use by the QVIZ community selected by the user, and retrievable by other QVIZ communities. After finishing the searching and bookmarking activity, the user may enter the collaboration environment to add new knowledge on archival resources and to create own articles and publications within their communities. The content of this component is specified collaboratively by the consortium members. It is dependent on the functionality of the social bookmarking tools and the Domain ontology for different user communities.

This application is tailor-made to fit the QVIZ-requirement and its targeted end-users. The environment is also essential for building the knowledge and content from the user communities. However, it also builds up a generic platform that can be adapted and licensed for other purposes.

3.2.2.4 European administrative ontology

The QVIZ Administrative Ontology combines two very different approaches to organizing information about administrative units: An archival tradition which treats the administrative units primarily as corporate bodies, and a Geographical Information Systems approach which treats them primarily as geometric shapes, more specifically as polygons. The data model is based on treating the administrative units primarily as entities in a hierarchy, but the performance of the system is very restricted unless we also have geographical information about each unit.

The QVIZ administrative ontology is efficiently modeling the administrative units across the globe. It has been designed to handle the dynamics in the administrative history. The administrative units are closely related to the governance of people. One example could be church or taxations districts. Church districts could have the function to keep track of births, deaths, migration, holy communions, etc. A taxation district could handle records of how much tax the inhabitants within an area need to pay. However these administrative units do change over time. They

can change their name, territory and its relations to other units. This dynamics is a reflection of the changes in the structure of governance.

The use of administrative unit ontology in QVIZ is very closely related to the principle of logically storing archival resources. Therefore the QVIZ uses the administrative ontology to explore and find archival resources.

This ontology is a generic model that also can be used for better understanding of local history, demography research etc.

3.2.2.5 Domain ontology

The QVIZ-domain model aims to support that the users can create content in the QVIZ-system and support to build semantic networks interrelating references to archive resources. To create new contexts of archive resources and thereby enhance access to archive resources, it is not enough to gather and report archival social bookmarks and archive resource data. Typed content such as articles, tutorials, posts, tags, events, etc are needed to support the visualization of resources in this semantic network, especially to support research interests using archive materials. Various usage scenarios for different target groups helped to understand the ontology required for users of archive resources.

3.2.2.6 Time-spatial indexes of archival resources

This is basically the archival content that will be explorable in QVIZ. The content provider must build such an index step by step. The index is designed to have a limited set of information in order not to store data redundantly. The data provided has a very close relationship to the administrative ontology and its relations to the creator of the archival documents. QVIZ has designed the system to focus on digital archival documents. These indexes are built and maintained by the archival institutions.

This index is a common index for all participating archives and it is being used by the Query and visualization environment (Dynamic user interfaces to discover archival resources). This result can also be used internally by the archival portals.

4. Intellectual Property Rights

This section describes what IPR the partners have on the knowledge resulting from the project and their respective pre-existing know-how. The rights of use and license agreements needed to lay out the framework of requirements that will have to be taken into account while identifying feasible business models.

All partners have agreed to the general principles on which IPR will be allocated, in line with the expected contracts covering the provision of EU support. The partners entered into a binding Consortium Agreement (CA) before the start of the project. QVIZ has taken advice from a legal expert, connected to Umeå University, on matters regarding legal and intellectual property rights.

In general, Intellectual Property (IP) will be divided into three categories:

Commercial:

IP developed with the expressed intention for commercial activities on the part of one or more partners. Examples of this include the middleware components developed IP of this kind will generally remain the property of the partner(s) that developed it.

Standards/Open Source:

IP developed with the intention to fit into one or more standards efforts, or to be released to the community at large in order to support further development efforts in the field of overlay networking. Examples of this include the policy language and engine, and the trust engine. IP of this kind will be released into the public domain.

Preexisting know-how:

Pre-existing know-how will always remain the property of the contractor who has brought it into the project. Access rights shall however be granted to other contractors if it is necessary for carrying out the project.

As a first step towards finding a suitable continuance model for the project a questionnaire has been sent to the partners. It enquires about the IPR-conditions and actual costs incurred for each partner to run the integrated QVIZ platform as a non-commercial demonstration service for two additional years. The answers to the questionnaires were collected in month 20 and were used as a basis for the steering group decisions on the continuance model.

In month 20 the Steering group decided on a continuance model for the project. This model means that all partners will do everything in their best effort to maintain and keep the integrated QVIZ platform running for two years, in the general shape and performance it has on the last day of the project. The necessary contract has been drafted and actions have been taken to ensure that the IPR and knowledge protection are adequate for protecting the project results during the extension period. The coordination aims at consolidating the Steering group decision with the partners' management regarding their commitment during the two years after the project. The intention is to have a demo system available in order to easier identify forms of uptake such as new projects, building of collaboration networks etc.

Overview of knowledge and IPR-ownership

Identifiable knowledge	Lead partner(s)	IPR-owners
Single integrated service	UMU	All
Dynamic map and query interface software	UMU, REGIO	UMU, REGIO, UoP, SNA, NAE
Social bookmarking tool	UMU, TID	UMU, SNA, NAE
Tools for social knowledge building, collaborative environment	SRFG	SRFG
Administrative ontology	UoP	UoP, SNA; NAE, UMU
Time-spatial index of archival resources	UMU	UMU, SNA, NAE

5. Market Analysis

The most obvious market where QVIZ is operating is the market for information services. More specifically it is part of a market where content providers are offering access to documents kept in public archives. Such services can consist of:

- Intuitive search facilities
- Access and distribution of archival documents
- Advisory and research services
- Information services about administrative history.

In the current market it is very common that search facilities go hand in hand with the access and distribution of the analogue or digital documents. However there is a substantial diversity across Europe, some information services are built on national level but in many cases they can be very regional or even local. The traditional model of advisory and research services is based on on-site assistance, mainly about helping persons to find the document a user is searching for. Other traditional services are recommending documents related to specific research topics, either based on what other persons have used or based on the knowledge about the context of different archives. In most information services one important base of knowledge is the administrative history.

Market research has been conducted in parallel with the pilot and field trials, to identify target market segments among cultural heritage institutions and to create a Development Road Map based on the needs in the target segments. The market research can also be the basis for developing a launch plan and business models and associated marketing material to prepare for a larger scale implementation.

5.1 Actors in the Market

The main target groups have different requirements on an archive portal. QVIZ has therefore investigated the different needs of the target groups.

A detailed description of what the requirements are for content providers to join the QVIZ system has been drafted in order to facilitate the recruitment of new content providers to the system.

5.1.1 European Digital Library and Archival documents access services

The motivation for the European Digital Library is to provide Europe's cultural and scientific heritage material online. Once the material is digitized, it will be used by a wide group of users, and mainly affect practically all sectors in society.

For Archival institutions there are also specific reasons to join this initiative. The establishment and maintenance of an Internet portal for documents and archives in Europe is one of the recent priorities of the European Commission¹. The provision, through the national archives services of the Member States and the archives services of the institutions of the Union, of an Internet portal which would give easier and cross-border access to documents and archives of the Member States and institutions of the Union. This Internet portal could be hosted

¹http://europa.eu.int/eur-lex/lex/LexUriServ/site/en/oj/2005/l_312/l_31220051129en00550056.pdf

either on one of the European Union computer servers or by the national archives service of a Member State;

The i2010 digital library initiative will be responsible for reaching the interoperability of the content from European museums, archives and libraries in the context of The European Library.

5.1.2 QVIZ within the i2010 initiative and as a European Archival Library

The aim of providing easy access to the resources is not only reached by having the digital material available online. Appropriate services, which allow the user to explore and use the resources, are also required. In relation to this, QVIZ pursues the same targets. The user searches with the map, faceted browser, and a time component supplied by the integrated QVIZ platform, which links the location with a period of time. As result of this discovery process, easy precise searches in the space and time context can be carried out.

The joint effort of the organizations within i2010 is not meant to just create a single site. Although the digital collections are stored in a distributed system the users should be able to connect through one single entry point. These ideas are implemented by the participation of many European projects from FP5 and FP6, which are focused on different purposes. Some of the needs that are involved in the i2010 initiative are described below.

The accessible material will be composed by heterogeneous resources, and will contain different sorts of material, such as books, magazines, journals, etc., not only from libraries also from archives and museums. In the case of QVIZ, the resources come from the Estonian and Swedish archives and future potential archives. The i2010 initiative identifies the necessity of achieving effective ways of sharing and transferring knowledge. Furthermore, it is creating a new Infrastructure and data layers at the European level.

For these last issues, QVIZ has developed an administrative unit ontology, whose structure includes the GIS data of the administrative units, and handles the changes of their borders over time. This is a structure that connects very well to a user-friendly approach as well as the archival institutions ways of organizing archival documents.

QVIZ integrates a social bookmarking tool, which enables the user to store a reference when exploring a resource and also collects the description and annotations of the resource, so that when the social bookmark is being re-used users can see all this information. The user is able to organize his or her social bookmarks in different collections and to create articles and publications. These features cover the social services for sharing the knowledge, and become a useful tool to make searches.

5.1.3 Content Providers in the Market

On a general level it is useful to divide the archives into groups on the bases of content and possible user groups. An attempt to type archival portals could be as follows:

1. *Exhibition portals*; are sites that publish limited content that exemplify some kind of significance such as political or administrative highlights, artistic skill, distinguished historic events or the publication of edited explanatory content on (national) circumstances of historic conditions.

2. *Search aide portals*; are sites that systematically publish large indexes of total repositories in institutions, administrations or organizations.

3. *Content portals*; are sites that apart from complete indexes also to a greater or lesser degree publish text- /database transcriptions, phonograms, or digital images etc. of the indexed content.

Of course many portals contain elements from all three types but usually one type is predominant. For the QVIZ system to work its full potential it should principally be applied to the *Content portals* group where the search aids are connected to a fairly extensive collection of primary archival matter irrespective of whether it contains digital images, text- /database transcriptions, audio or even moving images even though the exploitation efforts at this stage should be concentrated to archives that publish foremost textual content.

QVIZ has initiated contact with several National archives and other content providers to identify possible new content providers to the system. A list of some possible content providers has been compiled and can be found in Appendix A.

The initial screening has identified the National Archives of the Nordic countries as content providers whose archival systems already meet these criteria today. A short product presentation has been drafted and a detailed description of the requirements on the content providers systems has been established. A draft of the detailed criteria for the content providers systems can be found in Appendix B.

5.1.4 End-users of the content provided

Although all the different archives all over the Europe have their comparatively different user groups according to the specific profile of every archive, it is yet possible to highlight some of the most common target groups of the archives:

1. *Genealogists* – is the most numerous user group of the archives. They often work from an interest of one particular person or family described in archival resources. They crosscheck the correctness of data across different archival resources and relate different sources to family history descriptions. They often publish their research results in the form of databases, registers, and tables and in existing software locally or on the web. These users are enthusiasts who often belong to some research network or community. Most of the family researchers have certain types of resources they are used to working with, but they are always eager to collect new knowledge. They expect the archives to provide different finding aids, databases and digital images of archives material related to individuals.

2. *Local historians* – are people with the interest in history of geographical places and areas. In practice, many of the genealogists go on to become amateur local historians. Their interests have evolved into an interest of geographical places and administrative units. Their path towards becoming local historians leads them through the history of manors (villages) onto the history of parishes. In general their expectations on a search system are consultancy, good descriptions and training tools. They often need initial assistance in order to be able to perform successful searches.

3. *Academic researchers (historians)* – this target group is usually very familiar with the feature of archival information and therefore need foremost fast and correct service in finding the materials, using the databases and digitalized images, submitting the orders and ordering copies of documents. They expect the archives

to improve the finding aids and digitalize a wider range of records apart from the genealogical sources.

4. *Educational sector - students, lecturers, teachers.* Students will visit the archives during an intense period while writing essays or when they collect information as the basis for a thesis and their presence is often decided upon by a tutor. Their interests, like the interests of the academic researchers, lie in geographical places, administrative units, interaction between authorities and subjects, social stratification and mobility, changes over time, motifs and mechanisms in the spread of ideologies, ideas and patterns. The topics are varied, but with specified requests however there is a trend to research newer material from the late 18th century and later. Students often need the guidance and knowledge how to use archival materials. Teachers/lecturers desire to have instruments to educate, engage and assist students. They are very much interested in online availability and the pedagogic aspects of the material.

5. *Professionals/authorities* –are users with very different background having specific questions depending on their work (for instance journalists, architects, lawyers, land survey officials etc). Normally these users engage the archivist to assist in the search. This target group needs fast and correct service. They would value a database that could help them to speed up their search in the archives.

6. *Citizens who need to prove their rights and transactions* – the archives make references to answer inquiries as well as to issue references and verified copies of archival documents to individuals and institutions. These people need to find the relevant archives easily, ways of submitting the inquiries and getting the information quickly.

5.2 Business Models and Contacts

Generally most archive portals that are owned and administered by public institutions offer some kind of paid services such as copying or commissioned research and could therefore to a minor extent be called commercial, as for the expensive process of database building and digital publishing a few commercial and non commercial strategies can be distinguished. There are also a number of organizations and privately owned companies that obtain copies of archival material for web publication.

Exhibition portals and search aide portals are mostly without charge for the spectator but many do charge customers for copies or the download of high-resolution images. In the case of this type of portals the publication of the web exhibitions often is a result of externally financed projects.

There are also a number of purely commercial portals run by organizations and privately owned companies that obtain copies of archival materials for web publication. Most of those portals are exploiting the most industrialized domain of the cultural heritage sector, namely family history.

The most feasible business model for the integrated QVIZ platform is to have the content providers pay for their archives to be accessible through QVIZ. The content providers make up the target group that has the most added value from the system by making the content of their archives more easily accessible to the public. The consortium has also looked into the possibility of using *Creative Commons* [CC] as an alternative business model that could possibly meet the needs for all partners. It provides a means to protect different parts of the system to different degrees i.e. some parts could be distributed as open source while still reserving the rights for different parts.

It is deemed to be difficult to ask the end-users to pay for using the QVIZ-portal. If it is cheaper to go directly to the archival source, very few users will use QVIZ even though it facilitates and improves their search for archival resources. It is believed that as soon as the content accessible through QVIZ reaches a critical mass, the users will follow.

5.2.1 Contacts

In the beginning the QVIZ consortium initiated contact with the national archives of Scotland and Finland. Communication has also been taken up with all major Baltic and Nordic archives and the communication has also been expanded towards several other European national archives and networks such as:

- Hungarian National Archives October 2007
- Bundesarkiv, Berlin November 2007
- Netherlands Nationaal Archief March 2008
- Europeana/EDLnet March 2008
- EPA/Apenet April 2008
- DLM forum
- Regional and national archives in Spain

During a consortium meeting in Budapest the QVIZ-team met with the deputy manager of the Hungarian national archives. They were shared interested in collaboration, but they were still in the progress of building a national archival system and saw QVIZ as the next step after such construction. They were invited as speakers to QVIZ symposium but could not attend.

In November 2007, QVIZ met with the management of the Bundesarkiv in Berlin. Possibilities of combining QVIZ with finding aids were discussed. The result was a continued discussion about further cooperation, but not in spring 2008. QVIZ also met representatives from Bundesarkiv in Hague 2008, and they expressed interest in QVIZ as good entry point to European archives.

Representatives from the Netherlands archives also meet QVIZ representatives in Hague 2008. They were impressed by the responsiveness and the necessary prioritization QVIZ had made regarding the content and functionalities of the prototype. This meeting took place when QVIZ was doing a mini-workshop for the EDL-net project.

The intended result of the EDLnet project is a prototype for an extensive "all inclusive" cultural heritage portal named Europeana. Even though the Europeana effort basically has a library approach the project has the ambition to be a platform for the publication of European archival content as well. Since the EDLnet and the future Europeana portal will be one major actor in the field of accessibility to European cultural heritage the need to disseminate the QVIZ project results in this context is obvious. Therefore QVIZ was invited to a mini workshop at the EDLnet WP2 meeting in Hague 17-18 of March for a presentation of the QVIZ system and a discussion on the exploitation of the QVIZ results. This dissemination activity has led to a deeper understanding within the EDLnet consortium for the obstacles and possibilities in a joint user interface between library and archival content and thereby contributed to the success rate of the Europeana project as well as to ensure that the QVIZ project results will be part of the future development process.

EPA/Apenet is a joint effort between twelve European National Archives and the EDLnet to promote the European archival sectors participation in the building of Europeana. This participation is proposed to be executed through the EPA/Apenet project, which is a Network of Excellence project within the Seventh Framework Program, currently under negotiation with the European Commission. In the EPA/Apenet proposal the QVIZ project is repeatedly referred to and a representative for the QVIZ project will through the Swedish National Archives attend the first EPA/Apenet meeting in Ljubljana the 9th of April for dissemination purposes.

The National Archives of Estonia is a member of DLM Forum, which is a community of Public Archives and interested parties in archive, records and information management throughout the EU. A representative from NAE is a member of the executive committee of DLM Forum and has recommended this forum as a really good medium for the QVIZ dissemination.

QVIZ has made contacts, with institutions within the cultural heritage context in Spain, at different levels: national, regional and local; in order to cover as many targeted groups interested in enhancing the accessibility of Archives, Libraries and Museums resources, and preserving the cultural heritage. These contacts include the directors from the Provincial Historical Archive of Segovia, the General Archive of Castilla y León, the General Archive of Simancas, the General Archive of the Administration, the Historical State Archive, as well as the director from the

National Library of Spain. In this context, QVIZ share the same targets and interests for improving access to the cultural heritage and achieving standardization with these institutions.

In a wider perspective, QVIZ has found that the most representative list of possible contacts would be from the list of members of the European branch of the ICA, the **EURBICA**.

QVIZ also plans to use the well-established contacts at the European Board of National Archivists (**EBNA**) and plans to disseminate the idea of joining the QVIZ during the next EBNA meeting.

In May 2008, there will be an annual meeting of the administration of Baltic National Archives in Latvia. Indrek Kuuben, the director of the Estonian Historical Archives has promised to do QVIZ dissemination work there and set the concrete contacts.

In autumn 2008, the NAE are planning to organize a QVIZ dissemination seminar for the other memory institutions in Estonia (apart from NAE).

5.3 Analysis of the Competition

No one solution exists that offers all the integrated features of the QVIZ platform.

This section therefore outlines the competition for solutions where the end-users can use a combination of software that constitutes a feasible alternative to QVIZ. It includes a short description of some of the features the competitors provide. The main focus of the discussion is about overcoming the threshold for the end-users to leave the software solutions and forums they use today for QVIZ.

5.3.1 Cross-institutional Access portals

The most obvious competition regarding single access point to archival documents are Finding aid approaches. These approaches are based on classification schemas of archival documents as well as a classification of the archival creator. Finding aids are quite often used among archival institutions following the Digital library approaches. Finding aids are based on textual descriptions, which are searchable and browsable by the users. However finding aids cannot be language and cultural neutral. Translating search terms into different languages would most likely be misleading since the context of search terms are hidden, the translation cannot handle that missing information.

There are some examples of cross-institutional searching over EAD. Finding aids, such as the Online Archive of California (OAC), which is part of California Digital Library.

<http://www.oac.cdlib.org/search.findingaid.html>

QVIZ is competing with Finding Aid approaches, especially since the Finding Aid approach has a Google-like search approach. However the textual search does require conditional knowledge of what search term to use to find archival documents. Textual searches are efficient in the context of Library collections, where titles have good descriptions of the documents. In the archival sector the descriptions of the type of document cannot always be so helpful. If the user would know the type of document he/she needs, it might not be enough to correctly locate the archival document. QVIZ approaches are focus on the time-spatial knowledge needed to locate the archival documents. QVIZ holds the important information about the changing territories over time and space. From the time-spatial context, selecting the relevant archival document is an easy task.

There are some large time-spatial indexes of books and references to archival resources. One of the key players in building an international library of archival documents is the Family History Library Catalog, run by The Church of Jesus Christ of Latter-day Saints. This catalogue enables place names searching of references to archival document across the world. They have a focus on archival documents that describes persons, which can be found in a variety of archival resources.

The Generations Network (See: <http://www.tgn.com/>), which contain portals like:

<http://www.familysearch.org/>

http://www.familysearch.org/Eng/Library/FHLC/frameset_fhlc.asp

A federated digital repository of Archival document is to be found at Footnote. Footnote is a subscription-based website that features searchable, original documents that provide users with a view of the events, places and people that shaped the American nation and the world. The site contains over 27 million digital images in March 2008. In relation to QVIZ they do offer a very competitive

approach. They have provided a single access point to different content providers. Furthermore they allow the community members to add very efficient tagging of the archival documents. The footnote approach does however require the content provider to *outsource* the access interface of the digital images. Expanding Footnote to involve a large number of content providers could make it difficult to handle updates and the quality control of the enormous amounts of descriptions and digital resources. Many archival institutions are still reluctant to leave their content to third party service providers.

5.3.2 Content providers of archival resources

As described by the Footnote example there are market initiatives that compete with public archival institutions documents. Companies can make digital copies of the paper documents and then sell and distribute these collections. In Sweden there are at least 2-3 companies offering digital copies of archival documents. These digital documents are provided on CD but also in distributed software for viewing the images online.

See www.genline.se and www.arkivdigital.se.

These two examples have focused on the most marketable content, i.e. the content for family historians. They also offer the functionality to include references to online images, with user software but also with genealogy software. These content service providers also offer simple search facilities to locate resources.

5.3.3 Collaborative environments and tools for bookmarking

QVIZ software can address the need of archival researchers very well, but users also have a tradition of using other tools, primarily forum tools. There are many different tools for communication and social interactions. QVIZ collaborative environment has a focus on knowledge and content building as a means to build “connections” for interrelating archive materials in new contexts, where resources are not just discussed, but are contextualized by the acts of knowledge and content building within and among Communities. Users might associate archival sources as a part of the knowledge process with the collaborative creation of articles, publications, or tutorials and other forms of knowledge sharing infrastructures, such as growing site-wide simple vocabularies for events, persons, tag concepts or symbols. To complement these forum solutions, the users can now gain new tools for growing a community-based semantic network of resources and classifications relating to archival materials to support resource discovery, including the visualization of contextualized resources of archive materials and community-generated resources. Consequently, the community approach to interrelating archival and new knowledge can facilitate research collaboration.

Users of archival resources tend to use Forums to discuss and share knowledge and tips with each other. As an interesting example one can see that in Swedish forums most discussions are related to different places. A very common question seems to be: “I am looking for a person in a village called Betssele, does anyone know in which parish I could locate these documents?”

<http://aforum.genealogi.se/discus/>

It provides a simple tool in combination with a strong community. The challenge for QVIZ is to complement their existing activities and in the long run offer better services so that the community members feel confident with sharing knowledge using the tools provided in the QVIZ-platform.

The collaborative environment for knowledge building that QVIZ offers has added value to archive users. Bookmarking of archival resources into the collaborative context provides both rich contextual information that extends any existing archival classification systems and grows a semantic network relating archival materials among community knowledge and content. The primary objective is to enhance access to archive resources – here we complement what the archive portals and the QVIZ query visualization components provide. The key issue is that we should complement existing predominating forum tools without trying to replace them. Discussions can be made on resources in QVIZ that might complement discussions elsewhere, but more importantly, one can discover resources in new contexts, perhaps to discover what cannot be found directly in traditional archive portals because the archive materials are in an appropriate context for the researcher.

The critical factors are usage and relating of materials with archival materials in new contexts – but the most important factor is that communities are dependent on users, who like “gardeners”, seed the collaborative environment with archival social bookmarks and accompanying archival resource descriptions. The community approach is one means to create new contexts, seeded by the QVIZ archival social bookmarking. Current social bookmarking tools could not provide the context created by archive portals; instead the QVIZ archival social bookmarking tool delivers both the user context of the resource, represented by the user’s social bookmark, as well as the archive’s “context” described in QVIZ as an Archival Resource Description. This description provides relevant metadata for the resource and collection metadata, and provides user access to new archive portal services created for QVIZ – services for retrieving metadata, identifying archive collection information, and accessing digital resources. It is important to understand that we also complement the archive services and do not attempt to extract and duplicate all archival data – as the archives provide new services in QVIZ, users can further explore archival material at the archive portals using these archive services created during the QVIZ project.

Overall, not just any collaborative environment can support archive users – most are general tools that serve the general needs; forum tools might be perfectly adequate for certain needs. Enhancing the access to archival materials is really the goal of these general tools. However, the QVIZ tools are directed to archive users and with these tools the next exploitation steps will be considered to further port features and customizations to other tools.

5.3.4 Competition overview table

Exploitable result	Preferred product	Business model	Competition
Single integrated product	European archival access portal and knowledge sharing environment Software license in some cases (REGIO) Hosting (REGIO etc)	Running the services to support a network of cooperating archival institutions. Fee-based services. Workload most heavy on Archival institutions group. QVIZ-partners sell services, configurations and knowledge	European digital <i>library</i> approaches
Dynamic map and query interface	Software components	Sell installation services or /and licenses to individual content providers	Other map and query components, such as flamenco, longhorn, in combination with map component and integration toolkits
Social bookmarking tool	Software component	Installation, development, services by individual	Basic bookmarking function within archival portals and bookmarking websites
Social knowledge building tools, collaborative environment	Software components, porting, knowledge transfer	Knowledge transfer services, especially the potential to port features to other tools, such as collaborative tools or browser plug-ins	Combination of other semantic and wiki-tools. In most cases good Forum tools are standalone tools

Exploitable result	Preferred product	Business model	Competition
Administrative ontology	Content and structure	Use in different applications, such as local history, educational and historic research information portals Content providers may want to sell access rights for using the contents of the ontology	Other more simple Gazetteers, offering just limited functionality and not scaleable and efficient handling of Administrative dynamics over time.
Time-spatial index of archival resources	Content and structure	Used internally or in other websites offering time-spatial access to archival resources	Other competing Content providers, i.e. other archival resellers of the same archival documents

6. Development Road Map

The QVIZ-system is actually more than a proof of concept. It presents an actual working model where the full digital production from two National Archives is published in the same interface. The system is not only about offering trans-national accessibility, a visual interface and social knowledge building tools, but it also offers possibilities for the archival expertise to monitor and interact, publish and tutor.

Technology development and content requirements are complementary to making the result easier to exploit. Therefore, the most likely outcome is that technical partners and content providers exploit this service to other culture heritage institutions and provide resources for maintaining service as well as the necessary further development. The combination of archival resources and administrative ontology ensures good competitiveness to other technical solutions

This exploitation plan has focused its efforts on consolidating a feasible solution for the integrated QVIZ-platform. However, the separate results that a single partner or a part of the consortium envisions to exploit outside of the QVIZ scope e.g. by combining with another technology/interface and future plans for the IPR of the partners has also been collected and are presented in section 6.2 below.

The Road Map is focused at finding a feasible Continuance model for the project based on the business model identified in section 5.2. Aside from the actual exploitation of the projects results QVIZ also strives to promote standards of best practice for the building of national or regional administrative ontologies.

6.1 Action lines

The actions towards the exploitation of QVIZ are presently focused on finding a suitable continuance model for the two years immediately after the project ends. This period is meant to be an exploitation and recruitment phase where the integrated QVIZ platform is kept running as a non-commercial demonstration service. As a first step towards settling the conditions for this model a questionnaire was sent to the partners. It enquired about the IPR-conditions and actual costs incurred for each partner to run and maintain the platform for two additional years. The answers to the questionnaires were collected in month 20 and were used as a basis for the steering group decisions on the continuance model.

On December 20, 2007, a unanimous Steering group decided on a continuance model for the project. This model means that all partners will do everything in their best effort to maintain and keep the integrated QVIZ platform running for two years, in the general shape and performance it has on the last day of the project. The necessary contract has been drafted and actions have been taken to ensure that the IPR and knowledge protection are adequate for protecting the project results during the extension period. In order to coordinate the issues of the IPR regarding the content developed in the project a new person has been recruited to the project from within the organization at NAE.

The following steps are foreseeable in the Development Road Map as possible collaborative, implementation and development measures to be considered during the continuance period and onwards.

These steps are not to be seen in a hierarchic order of magnitude and neither measure is excluding another.

- The integration of the QVIZ project result in an “all European” context such as the EPA/Apenet portal project and/or within the Europeana concept.
- Developing the QVIZ platform as a stand-alone system for European Archives by adding new single national content providers or conglomerates of national providers.
- To promote further development and implementation of the QVIZ result in new projects involving new research topics in new partner constellations.
- To reuse the QVIZ project results by offering one or more QVIZ developed features to national or regional content providers in their portal development process.
- To offer the know-how developed by partners in the project as a resource to portal building content providers, projects and/or commercial actors.

During month 22 the partners have declared what exploitation interests they as individual partners have on the results emanating from the project. Their individual exploitation interests are presented in the next section and an overview is available in the table presented in Appendix C.

The possible business models and identification of agreements needed regarding Access rights, Rights of Use and licenses are ongoing and will be agreed upon by the partners involved.

6.2 Partners' individual exploitation interests

An overview of the partners' individual exploitation interest is presented in Appendix C.

6.2.1 National Archives of Estonia (NAE)

For the Estonian National Archives, the most important individual interests in participating the QVIZ project are to enable easier access to our collections, to enhance our e-services and to increase the number of our users. The amount of the digital archival content available online is growing rapidly and lot of researchers from all over the world are using actively our portals and web interfaces. QVIZ will enable a quick and easy access to the digitalized materials and provide a lot of new information from different content holders from several countries. This will be in great interest to our clients. NAE sees QVIZ as a valuable tool to find the historical documents easily and quickly without needing to know the complexity of the structures and hierarchies of the archival descriptions. On the other hand, the QVIZ collaborative environment enables us to make the contacts and cooperation with our main target groups more efficient. For those reasons, the NAE is interested in guaranteeing the maintenance of the QVIZ platform for a very long time.

Apart from enhancing the access to our materials by the means of QVIZ, the NAE is especially interested in further exploitation of some components and features developed during the QVIZ project. We would like to exploit the technology, know-how and software connected to the time-spatial indexing of the archival resources (the faceted browsing of resources and presenting the result in the map) in the future development process of our internal systems. We would also like to continue working on the complementing and developing Estonian historical

administrative ontology. Enabling the administrative ontology based access to the archival resources will remain very important future task for the NAE.

6.2.2 Salzburg Research (SRFG)

Salzburg Research is a non-university research organization specializing in the sector of advanced information systems. Its role in collaborative research is to provide IT-related research services to partners who have innovative business ideas in specific sectors. The major product of Salzburg Research is hence, RTD services for applied research in the form of feasibility studies, system designs and prototype implementations. In return, through collaborative research, we extend, both our technical expertise and our understanding of application domains.

In QVIZ, Salzburg Research contributed four types of expertise to create new knowledge:

- Cultural heritage and archival content management
- Semantics-based collaboration tools - called *Social knowledge building* in QVIZ
- An exchange format for QVIZ archival resources based on the notion of knowledge content objects
- Actual ontology-building expertise to create the domain ontology for QVIZ

In turn, QVIZ contributed to the development of Salzburg Research's expertise in two ways: firstly, it extended our experience with technical solutions in the cultural heritage sector by addressing the specific needs of archives which need to and wish to, open their archival resources to public use with the help of information technology. Secondly, QVIZ provided a framework in which we were able to further develop initial prototypes of so-called *Semantic Wikis*. These are collaborative web-based environments which use declarative knowledge expressed in ontologies to enable a process called "social knowledge building".

As a result, Salzburg Research will seek to valorize its exploitation potential from QVIZ in four areas, beyond the lifetime of the QVIZ project:

- Dissemination of results (including demos) at national and regional level, so as to make Austrian archives and other stakeholders in cultural heritage, aware of the achievements and the opportunities arising from semantic social software in this sector. This includes the possibility of consultancy in cases where commercial offers of system-related consultancy fall short of customer requirements. Salzburg Research is able to combine policy requirements at European and national level with technical requirements and very advanced semantic applications. For example, there are currently contract negotiations about an eContent-Plus project, which is likely to benefit from input provided by the results of QVIZ.
- Further development/refactoring of software results. We have interest in further reuse or refactoring of results, especially in the area of plug-in components for providing specific features for other tools..
- Further development of domain ontologies - Having developed the domain ontology for QVIZ gives us a possibility to relate this work to other semantization work conducted in the sector of cultural heritage. There is already informal collaboration with researchers using CIDOC-CRM. One such collaboration is using ikewiki and CIDOC-CRM as the ontological basis. This could be merged with the QVIZ domain ontology

thus establishing social knowledge building on the basis of a growing underlying knowledge model.

- Further use of knowledge content objects - it is one of the known problems of social software that no mechanism is available for intelligent merging of content created in different wikis, blogs etc. QVIZ has developed at least a minimal semantic exchange format, which can be reused by other tools. QVIZ results are also used as input to a new EU FP7 research project (KIWI) in the area of social semantic software. Also, KCOs are increasingly seen as a means for the standardization of semantic content.

6.2.3 Telefónica (TID)

Telefónica's interest in QVIZ project:

- Get to improve the products and services of Telefónica.
- Convert TID in leader of these new technologies and get experience in them.
- Convert TID is a lab of ideas for European research that will become in innovation.
- Get result from the final objective of the project and study it.
- Get result from each task. Have step-by-step results.
- Motivate innovation in Spanish commercial market regarding to new research strategies according to European interests.
- Development of Spanish Information Society based in new technologies guided by our Government.
- Telefónica, as an innovation company, continue being the only Spanish enterprise in the lists of the 30 European entities that participate in European Projects.

Telefónica, which is focused in business analysis, envisages these ways to exploit the QVIZ results:

- Search for Business Models, which can be suitable to business based on contents. As there is an enormous potential for improving the access European cultural content, QVIZ results can provide technical solutions in this area.
- Search for potential Users that should interact with these content based services and will be interested in use them. Many organizations may take advantage of using the QVIZ framework, or QVIZ tools.

6.2.4 Swedish National Archives (SNA)

The SNA exploitation interest is foremost to be able to explore the possibilities for an implementation of the project results on a national level and also as means for further collaboration and development on an EU - regional (e.g. the Nordic/Baltic countries) and/or on a Union level.

Since the SNA is planning the development and implementation of an integrated National Archival Portal the QVIZ results could, dependent of IPR, costs and the willingness of further cooperation among the partners in the QVIZ consortium, form some of the cornerstones in this development process.

As a part of this development and dependent of *terms of use* there is also an interest from the SNA to perform pilot studies on the system with, for example,

designed CoPs in the CE, in cooperation with some of our user groups, e.g. the Swedish universities.

Through the QVIZ results we see a possibility to enhance the service level towards our clients in quite a number of ways, not only by offering trans-national accessibility, a visual interface and social knowledge building tools, but the system also offer possibilities for the archival expertise to monitor and interact, publish and tutor.

A working QVIZ system can also serve as a concrete basis for practical cooperation among Union archives, a laboratory and test bed for e.g. quality issues, authorities, standards and digitization priorities.

The SNA hopes for a good working agreement among the partners in the consortium so that the QVIZ results can be implemented and further developed during the continuance period and beyond.

6.2.5 Regio

The company's focus is on development of technology for user-friendly interfaces for handling geospatial data in web browser environment. Regio also offers 24/7 support for telco-grade customers and is hosting the map server. Regio is the owner of a map database of the Baltic States and creates various (digital map) products based on this database. In the QVIZ project Regio has acted as one of the technological partners and has been involved in software functional and technical analysis, implementation of time-spatial tools (map and time-bar components).

Regio's interest in QVIZ project

- Improve our Web Mapping services and products, especially MapCat product family - improved documentation and software code.
- Documentation and demo application can serve as prototypes, which help in designing Regio's own commercial products.
- Improve our competencies in historical GIS and Time-Spatial data models etc. Share knowledge with the technological partners.
- Explore new technologies and frameworks for building web applications - AJAX, Flash, OGC standards, advanced visualization, thematic mapping and map animation. Both web map animation and thematic mapping have been in our technological roadmap - QVIZ project supports its goals.
- We hope to learn from partners in the field of advanced search engines.
- We hope to use advantages of QVIZ consortium for reaching to new customers and business partners in Europe.
- Motivate innovation and R&D activities in Estonian commercial market regarding to new research strategies according to European interests.
- At least one succeeding or parallel R&D project with the same consortium partners in future.
- Combine and absorb the results of different R&D projects in order to achieve synergetic effect.

Regio's exploitation intentions with the QVIZ results

- Regio focuses on software and services as well as business models based on Web Mapping Technologies.

- Widen the target audience of Web Mapping products - cultural heritage sector, collaborative environment, Web2.0. Search for new innovative markets.
- Prove the capabilities and preparedness for developing advanced information systems in the field of (Web)GIS.

6.2.6 University of Portsmouth (UoP):

The University of Portsmouth's capacity to sustain the work of the QVIZ project depends mainly on further funding for the GB Historical GIS team; the university's core funding from the Higher Education Funding Council for England (HEFCE) cannot be drawn on for this purpose. However, short-term prospects for maintaining activities and medium-term prospects for sustaining resources are good, through current earmarked funding from HEFCE for the team: all Portsmouth staff who have worked on QVIZ have funding to the end of March 2009 from the HEFCE-funded 'Historic Boundaries of Britain' project, and the university has a contractual obligation to HEFCE to sustain the *Vision of Britain* site and its contents to the end of March 2014. Just as the system built for QVIZ was a superset of the existing GB Historical GIS, with large extensions for Estonia, Sweden and the states of Europe, the system for HEFCE is a superset of the QVIZ system. We can justify this to HEFCE because the extended QVIZ architecture enables us to include Ireland, and therefore finally cover the whole of the UK; but this also helps maintain the potential core of a European historical GIS. Further funding for the team is being sought, and we point out that since the GB Historical GIS team was created in October 1994 there have only been 2 months in 2000 and 5 months in 2005/6 when there have been no externally-funded staff.

Our clearest commitment to sustain QVIZ-related work after the end of funding is the new Administrative Unit Ontology (AUO) editing system. We hope to have a demonstration version of this system ready by the end of funding, but expect to continue work with HEFCE funding. We can say this partly because the editing system is being developed to integrate into our own system, which has necessitated the use of JSP and Java rather than PHP, which NAE would have preferred. However, by taking this approach we should be able to continue collaborating with NAE after the end of funding. Integrating a web-based editing interface into the new on-line system being created with HEFCE funding means that NAE and the Swedish archives would be able to log-in to the system and edit their content; but as discussed below this is only a very limited solution to long-term maintenance of the data resource.

Including Swedish and Estonian content within our new public site has been discussed in outline with the two archives and would enable us to continue exploring alternative business models for the AUO, other than as an access mechanism for archival resources. We are hoping to include advertising material within the new version of our web site; the current version is receiving around 75,000 unique users per month, and this should rise with extended geographical coverage. We are also exploring the potential for using a web interface based on the AUO to co-market historical publications and especially reproductions of old maps. Lastly, we are also interested in developing purely academic use of the AUO, especially as a framework for historical statistics. Our involvement with QVIZ resulted from links with Umeå's Demographic Database (DDB) and we are exploring future collaborations. We have also been involved in meetings sponsored by the European Science Foundation in 2000 and 2007 exploring

collaboration in historical GIS, and the potential construction of a European historical GIS system. At the December 2007 ESF meeting in Barcelona we presented the QVIZ AUO as a prototype for that potential system, and emphasized its ability to make good use of whatever materials already existed from different countries, as well as the need for academic projects to build links with the archives sector.

QVIZ work at Portsmouth has exemplified that collaboration, our team integrating resources supplied by two national archives. In principle, we are keen to continue developing the AUO. However, adding further countries, or major updates to the Swedish or Estonian content, requires new funding. The QVIZ project has discussed but has never had the resources to develop a true distributed AUO, where the Estonian archives could update their copy and the Swedes could update theirs, and the changes would automatically be replicated across all copies. Without such a mechanism, there must be a risk that the two copies of the overall resource, at Portsmouth and Regio, will diverge, and that updates to the national gazetteers created by the two archival partners will not be copied into the integrated resource.

6.2.7 Umeå University (UmU)

Umeå University has a prioritized interest in ICT-research, especially applied ICT-research. QVIZ is an important part of this research area. Umeå University, and more specifically HUMlab want to explore added values combining technology enhanced with “humanistic content”. The result will be used beyond this consortium, in similar research activities in different forms.

Scholarly research will use QVIZ as instrument to evaluate pedagogical added values in using and collaborating over digital archival resources. We will also continue building networks of competence within and outside the university, for example continued dialogue and collaboration with archival partners such as NAE and SNA. These collaborations will lead both to shared knowledge and will complement our competences on an informal and formal basis.

Umeå University will take a particular responsibility ensuring that an integrated solution with searching and visualization, bookmarking and collaboration is better than the integral parts themselves.

Exploitation intentions of QVIZ results in UmU's environment

- With this project we want to show that we are scientifically competitive with the development of services within the field of cultural heritage.
- Sell competitive research services within visualization and advanced data modeling.
- We want to generate new humanistic research that leads to solutions through a network of users in an international context.
- The material of the national registration in Sweden is unique within Europe. With the QVIZ solution we will give European scholars access to work with and develop the use of the material in collaboration with SNA and also NAE.

6.3 Road Map for different exploitable knowledge

Exploitable result	Business model	Lead partner(s)	Content owners
Single integrated service	Running the services to support a network of cooperating archival institutions. Fee-based services. Workload most heavy on Archival institutions group. QVIZ-partners sell services, configurations and knowledge	UMU	All
Dynamic map and query interface software	Sell installation services or /and licenses to individual content providers	UMU, REGIO	UoP, SNA, NAE
Social bookmarking tool	Installation, development, services by individual partners	UMU, TID	SNA, NAE
Tools for social knowledge building, collaborative environment	Demonstrations to interested parties or institutions. Software component knowledge transfer. Exploitation potential to port features to other tools - collaborative tools or browser plug-ins	SRFG	
Administrative ontology	Use in different applications, such as local history, educational and historic research information portals. Content providers may want to sell access rights for using the contents of the ontology	UoP	UoP, SNA, NAE
Time-spatial index of archival resources	Used internally or in other websites offering time-spatial access to archival resources	UMU	SNA, NAE

7. Socioeconomic Impact

The European history is the story of complex power structures moving over time and tracts of land. The subcontinent is also fragmented by a manifold of languages, religions and ethnicities. This fragmentation has led to a fragmentation also within the sources to our history. Today many of these sources are spread over many countries.

Administrative affiliations make up nations and regions, over time creating conglomerates of identities. For example many sources to the Hungarian history are found in Austrian archives, Finnish sources in Swedish archives, Norwegian in Denmark etc. The many layers of administrative affiliation in Europe have created a fragmentation of the historical sources, noted in the European archival holdings.

In the first step, QVIZ will aim at creating a shared European knowledge space for usage of archival information, promoting an international, cross-institutional access to the written cultural heritage. This knowledge space includes a common European user interface as a means for the prioritizing of national digital content.

The project gives a hand to utilize the new learning strategies (for example problem based learning) and reach results in a collaborative way. Apart from the discipline or school subject QVIZ can be used in a new way for studying facts, contexts, the background to actual trends, and the borders of different traditions.

Furthermore it provides a tool that has the potential to result in historical consciousness towards the EU countries. The QVIZ platform opens the door to comparisons of new archival resources for everybody irrespective of earlier knowledge-level through a simple way of searching and communicating.

The portal also helps make use of the competence in internet usage and provides an attractive learning process trough new context, knowledge building and communication.

8. Conclusion

This exploitation plan has provided an important description of the most plausible exploitable results of the project. The most obvious exploitable result is the integrated QVIZ-platform. Although the subsystems might be exploitable to some extent, the added value of the software solution is greatly depreciated by using only a part of the system out of the integrated context. The service is mainly targeting the content providers of archival resources.

QVIZ is offering valuable access services, which enables searching of archival resources on a pan-European level that in some ways bypass language barriers and national borders. It provides an efficient and elegant use of the knowledge of the administrative context to explore and discover archival document in their historical context. QVIZ is also providing a scalable single point of access to different archival institutions across Europe and possibly beyond. QVIZ furthermore provides tools to integrate the user activities in the accessibility and applied use of archival documents. QVIZ technological innovation lies in the rich representation of the contextual knowledge around archival resources, enriching the accessibility as well the use of the resources.

The QVIZ proof-of-concept requires the building of time-spatial indexes as well as detailed models of the administrative units. This is probably more cost effective than building a classification system for the archival resources. QVIZ will have a short-term impact for the institutions that have information and knowledge about the archival document as well as about the administrative history. For content providers with a small amount of indexed resources, QVIZ will have impact in a longer perspective.

QVIZ roadmap also aims at using the i2010 agenda to better support the cross-language accessibility, interpretation and use of the valuable digitalized CH-resources in the knowledge society.

APPENDIX

Appendix A: Examples of possible content providers

A1. Content providers such as archives, which have published digitalized materials and may offer an archival content for QVIZ.

Most general

http://www.uidaho.edu/special-collections/Other_Repositories.html

A key portal to the world of archival sites. Overview of over 5000 websites describing holdings of manuscripts, archives, rare books, historical photographs, and other primary sources for the research scholar. The directory lists by country a variety of public and private archives and libraries that have a site on the Web. The website is posted by the University of Idaho.

Finland

http://digi.narc.fi/digi/index.ka?lang=en_US

Searching the contents of the digital archive is performed by free word search. You can search either with proper nouns (e.g. a district) or with common nouns in the Finnish language. It is not necessary to give full words. In the search results page you can see all the record creators, fonds, series and archival units that are accessible via digital archives. You get to the descriptions from the link called Index, which you can find in connection with such archival units. You can get to see the pages of records also from the index pages by clicking the numbers of the digitized sections.

Norway

<http://www.riksarkivet.no/>

<http://www.digitalarkivet.no/>

Digitalarkivet (Digital Archives) is the Norwegian National Archives' channel for publication of digitalized archive material in the form of images, transcribed texts and databases. The publication includes archive material both from electronic sources and traditional paper sources that are either digitalized from an original or a microfilm. The digitalized material is processed in the National Archives (Riksarkivet), the regional state archives (statsarkivene) or in our digitalizing units. Some of the material is also produced through external co-operation. The Regional State Archives of Bergen is responsible for the daily management of Digitalarkivet, as well as being chief editor of the internet site. Digitalarkivet and Digitalpensjonatet are funded on the ideology that the archives' users are best served with one internet site for archival source material, presented with one common search engine and user face.

Denmark

<http://www.arkivalieronline.dk/English/default.aspx>

The Danish State Archives Filming Centre digitalizes parish registers and population censuses in order to make them accessible via the Internet. The digitalization project is primarily accomplished through scanning of microfiches and microfilms. The parish registers and population censuses will be displayed as pictures of the original records. No registers have been compiled in which to search for personal names, occupations, addresses etc. Accessing

www.arkivalieronline.dk is free of charge, and so are user registration and searches in the archival material. Some websites of East European Archives

Poland

<http://www.archiwa.gov.pl/?CIDA=378>

The Programme for the Registration of Records from Parish and Public (civil) Registers PRADZIAD The database entitled The Programme for the Registration of Records from Parish and Civil Registration Offices – PRADZIAD (the present version of the data base was completed in 2005) comprises data on parish and civil registers preserved in all State Archives, from the holdings of the Stanisław Staszic Pomeranian Library in Szczecin, of the Archdiocesan Archive in Łódź, of the Archdiocesan Archive in Poznań, from the holdings of the Diocesan Archive in Drohiczyn, of the Diocesan Archive in Włocławek, Archdiocesan Archive in Wrocław and on Jewish and Roman Catholic parish registers preserved at the Civil Registration Office for the capital city of Warsaw - Archive, the so called "Zabużańskie" Archive (of the region beyond the Bug river); but does not contain lists of names nor information on specific persons.

Hungary

http://www.mol.gov.hu/index.php?akt_menu=524

An overview of databases and finding aids of the National Archives of Hungary, which includes Parish registers.

Czech Republic

<http://www.mvcr.cz/archivnictvi/index.html>

National Collection Register (Archival Fonds [Archive Groups] in the Czech Republic Database made by Ministry of the Interior.

A2. Content providers such as different digitalizing projects by universities, museums etc. Content in a wider sense.

Finland

<http://www.virtuaaliyliopisto.fi/maakirjakartat/index.html>

Maps from 1600-1700 are digitalized.

Norway

<http://www.dokpro.uio.no/engelsk/>

At the four Universities in Norway there are many museums and collections that contain information on a wide range of aspects of Norwegian language and culture. The Viking Ship Museum at Bygdøy, Oslo, and the historical museums and the museums of natural history in Bergen, Oslo, Trondheim, and Tromsø are well known. However, there are other, less well-known collections that are comprehensive and important. Some of these are: Norsk Folkemminnesamling (the Norwegian Collection of Folklore), Norsk folkemusikksamling (the Norwegian Collection of Folk Music), Myntkabinettet (the Collection of Coins and Medals), Runearkivet (The Runes Archives), and large collections of place names and other aspects of the Norwegian language.

A3. Content providers such as place name databases, which would be interested in gathering data using administrative units ontology, maps and knowledge of QVIZ users.

Estonia

<http://www.eki.ee/knab/knab.htm>

http://www.eki.ee/knab/kb_yld2.htm (introduction in English)

Place names database of Institute of the Estonian Language. The Place Names Database (KNAB) is a systematic computerized collection of data on geographical names from both Estonia and abroad that is being developed at the Institute of Estonian Language. Its purpose is to facilitate the study and standardization of geographical names by providing data on their history and modern use. It has been planned as a linguistically oriented database, to enable to compile and prepare different gazetteers and dictionaries.

Appendix B: Requirements for possible content providers

B1. General Instructions

Data must be provided in access/excel file format.

Text in **bold face** denotes mandatory material.

Text in ***bold italics*** denotes mandatory material if related material is being input.

Please identify if any national coding of units exist as a new “name status” will need to be created in the form *C_xxx*.

Please note which, if any, simultaneously existing units have the same preferred names and the same type.

Each unit **must** have:

- Unit name
- Unit type
- Relationship “Is-Part-Of”
- Authority

Location is not required but is highly desirable, and can be recorded either as a point location or, preferably, a boundary polygon; see below.

B2. Minimum Meta-data input

- **A list of all different unit types (in national language) with a language defining the name and an equivalent English name**
- **A category for each unit type** (e.g. civil, ecclesiastical, judicial, military)
- **A unit type level assignment for each unit type** (e.g. state = 4, county = 7, parish = 11)
- **A list of legal relationships (from defined list above) between different unit types**
- **A list of recognized authorities** (if they do not exist the National Archives supplying the data will be used). **These must include name, type, title and creator.**

B3. Minimal data input – table 1a (Units)

- **Preferred Unit name**
- **Language of preferred name** (if unknown will automatically be put into national language)
- **Authority of preferred name** (if unknown will automatically be assigned to the National Archives providing the data)
- **Unit type**
- **Authority for unit** (if unknown will automatically be assigned to the National Archives providing the data)

B4. Minimal data input – table 2a (Relationships)

- **Unit Preferred name**
- **Unit type**
- **Relationship type:** all units must have at least one “IsPartOf” relationship
- **Name of Unit related to**
- **Unit type of Unit related to**

- **Authority of relationship** (if unknown will automatically be assigned to the National Archives providing the data)

B5. Maximum Meta-data input

- **A list of all different unit types (in national language) with a defined language and an equivalent English name**
- A list of all plurals for different unit types (in national language)
- A short description of each different unit type (in national language) and translation into English
- A full description of each different unit type (in national language) and translation into English
- **A category for each unit type (e.g. civil, ecclesiastical, judicial, military)**
- **A unit type level assignment for each unit type** (e.g. state = 4, county = 7, parish = 11)
- **A list of legal relationships between different unit types**
- An order of priority for unit types to dictate their appearance in mapping applications. Order defined by importance and modern, then more historical. Civil, Judicial, Ecclesiastical, Military, Statistical, Health, Educational
- A list of all different status types (in national language) with a defined language and an equivalent English name
- A list of all plurals for different unit statuses (in national language)
- A short description of each different unit status (in national language) and translation into English
- A full description of each different unit status (in national language) and translation into English
- **A list of recognized authorities** (if they do not exist, the National Archives supplying the data will be used). **These must include name, type, title and creator.** Further details can be added if available.
- Start dates for unit types = a year, a full date or a text string
- End dates for unit types = a year, a full date or a text string

B6. Maximum data input – table 1b (Units)

- **Preferred Unit name**
- **Language of preferred name** (if unknown will automatically be put into national language)
- Start Date preferred name officially came into use
- **Authority of preferred name** (if unknown will automatically be assigned to the National Archives providing the data)
- **Official Unit Names** repeat as many times as necessary
- **Language of Official name**
- **Official Name status**
- Start date for Official name
- **End date for Official name**
- **Authority for Official name**
- **Alternate Unit Names** repeat as many times as necessary
- **Language of Alternate name**
- **Alternate Name status**
- Start date for Alternate name
- End date for Alternate name

- ***Authority for Alternate name***
- Notes on unit names
- **Unit type**
- Start date for unit
- End date for unit
- **Authority for unit** (if unknown will automatically be assigned to the National Archives providing the data)
- Notes on the unit
- **Unit Status** (if it exists)
- Start date for status
- End date for status
- **Authority for status**
- Notes on status
- **Point** = derived central point/building location/aggregated central point from vectors
- **Point source** = the source of the co-ordinate data
- Place name connecting the admin unit to a generic name given to the place

B7. Maximum data input – table 2b (Relationships)

- **Unit Preferred name**
- **Unit type**
- **Relationship type:** all units must have at least one “IsPartOf” relationship
- **Name of Unit related to**
- Unit type of Unit related to
- Start date for relationship
- End date for relationship (unless single event like boundary change)
- Was the unit only partly within higher level unit: Yes/No
- **Authority of relationship** (if unknown will automatically be assigned to the National Archives providing the data)
- Any notes on relationship

B8. Maximum data input – table 3b (vectors)

Can also be provided as a shape file.

Must include specification of which projection was used to create vectors

- ***Unit Preferred name***
- ***Unit type***
- ***Vector co-ordinates***
- Start Date of vectors
- End Date of vectors
- ***Authority of vectors***

B9. QVIZ input description for archival information (DRAFT VERSION)

Block of elements	Data element name	Definition	Example	Status	ISAD(G)	EAD version 2002	Social bookmarking metadata schema/Property names CET
Archival unit information	Archival fonds title	Title of archival fonds or collection, describing the top level of a particular fonds or collection		Mandatory	3.1.2	<archdesc> <did> <unittitle/> </did> </archdesc>	archiveCollectionDescriptionUnitTitle + archiveCollectionLevel
	Sub-level titles	Titles of possible sub-levels such as sub-fonds, series, sub-series. Could be provided for better understanding of archival unit		Recommended	3.1.2	<c> <did> <unittitle/> </did> </c>	archiveCollectionDescriptionUnitTitle + archiveCollectionLevel
	Digitalized archival unit title	Title (or mark, number) of actual item, file or other archival material unit with direct reference to digital resource. If the item lacks a title, the lowest entitled level in archival description should be used. Should be the most detailed level at which the digitized representation of archival material could be presented in an on-line database. This does not refer to the actual digitized resource, rather it		Mandatory		<c[n]> <did> <unittitle/> </did> </c[n]>	archiveCollectionDescriptionUnitTitle + archiveCollectionLevel

		refers to the archival unit which is digitalized					
	Digitalized archival unit identifier	Unique identifier for digitized archival unit, which is automated and unchangeable, contains no other information than the identification provides	Globally Unique Identifier	Mandatory			archiveCollectionDescriptionUnitID
	Digitized archival unit Reference code	A unique identifier used for references to the precise archival unit that is digitized. May be changeable and contain other information than provided for identification. May be used for manual references in literature or requisitions at archival repository		Recommended	3.1.1	<unitid> [completed with superior level ID:s]	archiveCollectionDescriptionUnitID
	Dates of time for digitalized archival unit	Start and end year of creation of (digitalized) archival unit. Not the time of digitalization		Recommended	3.1.3	<unitdate>	archiveCollectionDescriptionUnitID
Reference information	Logical storage unit reference ID	If needed, an identifier of the logical storage unit/ for digital resource, which can be used by a web-service to present the images of the archival unit. This identifier must be linked to the archival unit to connect the digital material from the archival unit	Batch, catalogue	Optional			
	Repository name	May be coded within the QUIZ		Mandatory			institutionCode

	Country of repository	ISO 3166 codes may be used		Mandatory			
	Administrative unit reference: identifier	Unique and unchangeable identifier for reference to Administrative unit	Globally Unique Identifier	Mandatory			
	Path	To local www resource. In case a web-service is used, this is not needed	URL	Optional			archiveCollectionDescriptionLookupService
Statistics	Number of archival units related to an AU	Number of archival units, digital or analogue, connected directly to an AU. Indirect references via present archival units or related authority records may be included. These figures should view the total sum of archival units connected to an AU		Recommended			

Appendix C: Individual partners' exploitation interests overview

Partner	Exploitation Product	Continued collaboration with consortium	Distribute Open Source	Sell product	Support services	Support know-how
UMU	Software service solution	Provide QVIZ query and time-spatial environment as visible as possible, showing the research conducted.	Not completely, since it is not yet stable enough for such release. It also contains specific configurations to different systems which create security problems	No, only sell services	Yes, on paid basis	Yes, on paid basis.
	Dynamic user interfaces	High visibility, attract new collaboration with and without QVIZ-consortium	No	No	Yes	Yes
	Tools for social knowledge building	Only the bookmarking application and integration tools to	No	No	Yes	Yes

		archival portals, CET and Map-search				
	European administrative ontology	-	-	-	Yes	Yes
	Domain ontology	-	-	-	No	No
	Time-spatial indexes for A.R.	-	-	-	-	Yes
SRFG	Software service solution	-	-	-	-	-
	Dynamic user interfaces	-	-	-	-	-
	Tools for social knowledge building	Available for demonstration efforts. Continued interest to further refactor tools and plug-ins for other tools.	Not currently, but possible with refactored tools or follow-up tools and plug-ins.	-	-	Knowledge transfer
	European administrative ontology	-	-	-	-	-
	Domain ontology	Continued interest in collaboration.	An open source license is likely but not yet chosen.	-	-	Knowledge transfer
	Time-spatial indexes for A.R.	-	-	-	-	-

REGIO	Software service solution	Continued interest in collaboration.	-	Agree	-	Agree
	Dynamic user interfaces	Available for demonstration efforts. Continued interest in further refactoring	Disagree to distribute map, map vector server and time-bar components as open source	Agree to sell map component under our MapCat license – á €2500.	Hosting of map server and geospatial database, second line support and maintenance	Agree
	Tools for social knowledge building	Continued interest in collaboration.	-	-	No objections	-
	European administrative ontology	Continued interest in collaboration.	-	-	Geospatial data processing on demand	Agree
	Domain ontology	-	-	-	-	-
	Time-spatial indexes for A.R.	Continued interest in collaboration.	-	-	-	Agree
UoP	Software service solution	-	-	-	-	-

	Dynamic user interfaces	-	-	-	-	-
	Tools for social knowledge building	-	-	-	-	-
	European administrative ontology	Yes, definitely over next 12 months, and then subject to funding	Problematic due to numbers of organizations holding rights.	Some parts, not funded by QVIZ, already licensed.	Yes, on paid basis	Yes, on paid basis, or with research collaborators
	Domain ontology	-	-	-	-	-
	Time-spatial indexes for A.R.	Will continue to work hard to sell the idea, and very happy to do this with QVIZ partners.	Not sure this is about either software or a specific body of data, so probably N/A	N/A as a product, but will continue to work hard to sell the idea.	Yes, on paid basis or via web services from our own web site	Yes, on paid basis
TID	Software service solution	-	Agree to distribute open source as well as the individual possible results.	Agree to sell QVIZ as a commercial product.	Agree to provide services that could be suitable as solutions, based on	Agree to support know how.

					the results achieved.	
	Dynamic user interfaces	-	-	Agree	-	Agree
	Tools for social knowledge building	-	-	Agree	-	Agree
	European administrative ontology	-	-	Agree	-	Agree
	Domain ontology	-	-	Agree	-	Agree
	Time-spatial indexes for A.R.	-	-	Agree	-	Agree
SNA	Software service solution	Yes	-	-	-	Yes
	Dynamic user interfaces	Yes	-	-	-	Yes
	Tools for social knowledge building	Yes	-	-	-	-
	European administrative ontology	Yes	-	-	-	Yes
	Domain ontology	Yes	-	-	-	-
	Time-spatial indexes for A.R.	Yes	-	-	-	Yes
NAE	Software service solution	-	-	-	Yes	-
	Dynamic user interfaces	-	-	-	-	-
	Tools for social knowledge building	-	-	-	-	-

	European administrative ontology	-	-	-	-	Yes
	Domain ontology	-	-	-	-	-
	Time-spatial indexes for A.R.	Yes	-	-	-	Yes