



Project Number: 032518

# QVIZ

Query and context based visualization of time-spatial cultural dynamics

Specific Targeted Research Project

Information Society Technologies

## Software validation diary and report version 1 D 7.1.1

Due date of deliverable: 31/03/2007

Actual submission date: 25/04/2007

Start date of project: 01/05/2006

Umeå University

Duration: 24 month

Revision 3

# Abstract

<b>Number and name</b>	Project Number: 032518 QVIZ, Query and context based visualization of time-spatial cultural dynamics
<b>Workpackage</b>	WP7
<b>Task</b>	T 7.1
<b>Date of delivery</b>	<b>Contractual: 31/04/2007</b> <b>Actual: 25/04/2007</b>
<b>Code name</b>	032518 <b>Version</b> draft <input type="checkbox"/> final <input checked="" type="checkbox"/>
<b>Nature</b>	Software validation report
<b>Distribution Type</b>	Final
<b>Authors (Partner)</b>	Tõnis Türna <a href="mailto:Tonis.Tyrna@ra.ee">Tonis.Tyrna@ra.ee</a> Mona Bonta Bergman <a href="mailto:mona.bontabergman@humlab.umu.se">mona.bontabergman@humlab.umu.se</a>
	Contributors: Fredrik Palm <a href="mailto:fredrik.palm@humlab.umu.se">fredrik.palm@humlab.umu.se</a> Vojtech Kupca <a href="mailto:vojtech.kupca@humlab.umu.se">vojtech.kupca@humlab.umu.se</a> Edith Seegel <a href="mailto:Edith.Seegel@ra.ee">Edith.Seegel@ra.ee</a> Kristina Teral <a href="mailto:Kristina.Teral@ra.ee">Kristina.Teral@ra.ee</a> Erik Uus <a href="mailto:Erik.Uus@ra.ee">Erik.Uus@ra.ee</a> Peder Andrés <a href="mailto:peder.andren@svar.ra.se">peder.andren@svar.ra.se</a> Paula Aucott <a href="mailto:Paula.Aucott@port.ac.uk">Paula.Aucott@port.ac.uk</a>
<b>Contact Person</b>	Mona Bonta Bergman <a href="mailto:mona.bontabergman@humlab.umu.se">mona.bontabergman@humlab.umu.se</a>
<b>Abstract</b>	Software validation diary and report version 1 for the QVIZ project, co-funded by ICT Research Framework Programme of the European Union.
<b>Keywords List</b>	Validation, Objectives, User scenario, Functional requirement, Technical specification

# Table of contents

<b>QVIZ</b> .....	<b>1</b>
<b>SOFTWARE VALIDATION DIARY AND REPORT VERSION 1 D 7.1.1</b> .....	<b>1</b>
<b>ABSTRACT</b> .....	<b>2</b>
<b>TABLE OF CONTENTS</b> .....	<b>3</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
<b>1. VALIDATION OF USER SCENARIOS</b> .....	<b>5</b>
1.1 OBJECTIVES OF VALIDATION .....	5
1.2 METHODOLOGY .....	5
1.3 RESULT .....	6
1.4 SUGGESTED ACTIONS .....	8
<b>2. VALIDATION OF REQUIREMENTS</b> .....	<b>9</b>
2.1 OBJECTIVES OF VALIDATION .....	9
2.2 METHODOLOGY .....	9
2.3 RESULT .....	9
2.4 SUGGESTED ACTIONS .....	11
<b>3. VALIDATION OF TECHNICAL SPECIFICATIONS</b> .....	<b>12</b>
3.1 OBJECTIVES OF VALIDATION .....	12
3.2 METHODOLOGY .....	12
3.3 RESULT .....	13
<i>Functionality of system components (pp 36-39)</i> .....	13
<i>Data structures: General Class diagram (p 40)</i> .....	14
<i>Structure of the Administrative Ontology (p 41)</i> .....	14
<i>Interface specifications (pp 42-47)</i> .....	14
3.4 SUGGESTED ACTIONS .....	14
<b>4. VALIDATION OF CONTENT SELECTION</b> .....	<b>16</b>
4.1 OBJECTIVES OF VALIDATION .....	16
4.2 METHODOLOGY .....	16
4.3 RESULT .....	17
<i>Annotation methods</i> .....	17
<i>QVIZ programs in archival portals</i> .....	17
<i>Content selection</i> .....	17
<i>Track-back creation</i> .....	17
<i>Problematic sections</i> .....	18
4.4 SUGGESTED ACTIONS .....	18
<i>Communication</i> .....	18
<i>Track-back creation</i> .....	20

# Executive Summary

This deliverable addresses the objectives of WP 7 task 7.1. The main aims of the validation activities of WP7 are:

1. to ensure continuous review of the project's result
2. to assess the progress towards the projects objectives
3. to assess the project's specifications and software
4. to provide feedback to research and implementation activities

During the validation, the focus was set on the project's technical specifications and the contextualisation content to be included into the QVIZ-framework.

This report describes the assessment of:

- user scenarios and related objectives
- functional requirements
- technical specification
- content selection

The purpose of the validation of user scenarios was to assess scenarios created in task 2.2 in relation to the projects objectives as well as the ability of user scenarios to describe possible user activities in QVIZ for better retrieval of user requirements.

The objective of the validation of requirements was to check whether the functional requirements will achieve the main objectives of the QVIZ system.

The evaluation of the technical specification and content selection aims at gaining, understanding and identifying possible problems, as well as promoting a discussion between the developers and the validation team.

# 1. Validation of user scenarios

## 1.1 Objectives of validation

The objectives of the validation were to assess the correspondence of user scenarios created in task 2.2 with the projects aims and also their ability to describe possible user activities in QVIZ for better retrieval of user requirements. Validation was conducted as a walkthrough of user scenarios specified in the QVIZ project wiki page and the internal report “User Scenarios and Requirements IR 2.2” The user scenarios wiki page is an emerging on-line document that holds information about enlisted scenarios, proposals and a description of major changes of scenarios.

Validation of mock-ups and storyboards, created for visualization and better understanding of user scenarios descriptions, was conducted solely as a discussion.

## 1.2 Methodology

Validation of user scenarios was conducted as an informal walk-through. Walk-through as a method for testing is commonly used for testing design specification and use cases. It takes into account the perspective of reviewers not having the expertise in reading and understanding software engineering documents. Each QVIZ partner had the opportunity to present their user scenarios in the wiki pages, inform other partners about it (through e-mail and wiki) and call for a Skype meeting. Scenarios were discussed inside partner workgroups and then during Skype meetings between partners to receive feedback. Every partner made suggestions and corrections which were then discussed and then added or rejected. There were 18 user scenarios created altogether and 11 of them were selected to retrieve user requirements. As scenarios cover the whole vision of the QVIZ-system, it was not possible to implement them all in the first stage. Overlapping

and low-priority user scenarios were removed. The scenarios were also sorted to filter out which scenarios to focus on in the first implementation phase (10 out of 11) and which could be left to a later stage. A further grouping was made to the scenarios categorizing them into domains: QVIZ domain, Community of Practice (CoP) domain, Knowledge domain and Archive/Unit domain.

As an important part of the validation, the user scenarios were assessed to determine how far they correspond to the main objectives of QVIZ. For this purpose the following list of QVIZ general and specific objectives retrieved from project descriptions was created by validation workgroup of national Archives of Estonia:

1. Create easier access to new information.
2. Provide better ways to compare materials over time, between countries and other administrative units.
3. Access digital cultural or scientific knowledge resources.
4. Enable information sharing.
5. Focus on the community contextualisation of resources and query/visualisation.
6. Exchange of historical knowledge throughout Europe.
7. Enhance community-based access to Cultural Heritage resources.
8. Provide community building through knowledge exchange and knowledge sharing.
9. Identify different knowledge contexts.
10. Meet the needs of different user groups.
11. Enable access via paid-systems in public, semi-public and restricted communities.

Every user scenario was then validated by three people during the review meeting, by considering its correspondence to the objectives listed above.

### **1.3 Result**

The following table was created as a result of the review meeting. It demonstrates

that user scenarios sufficiently cover all the basic QVIZ objectives. Most of the objectives were met in two or three scenarios.

**Table 1. Correspondence of user scenarios to the QVIZ general and specific objectives**

General objectives	User scenarios
1. Create easier access to new information	<a href="#">US-010</a> : Visualization of resource collections <a href="#">US-004</a> : Editing and populating the administrative ontology within CoP <a href="#">US-007</a> : Assembling and describing material
2. Provide better ways to compare materials over time, between countries and other administrative units	<a href="#">US-008</a> : Visualization <a href="#">US-004</a> : Editing and populating the administrative ontology within CoP <a href="#">US-012</a> : Editing and populating domain ontology.
3. Access digital cultural or scientific knowledge resources	<a href="#">US-010</a> : Visualization of resource collections <a href="#">US-013</a> : Publication of knowledge
4. Enable information sharing	<a href="#">US-006</a> : Invitation to collaboration <a href="#">US-007</a> : Assembling and describing material <a href="#">US-013</a> : Publication of knowledge
5. Focus on the community contextualisation of resources and query/visualisation.	<a href="#">US-001a</a> : Community query visualization interface <a href="#">US-001c</a> : User Query activities within institutions user interfaces
6. Exchange of historical knowledge throughout Europe	<a href="#">US-001a</a> : Community query visualization interface <a href="#">US-004</a> : Editing and populating the administrative ontology within CoP <a href="#">US-013</a> : Publication of knowledge <a href="#">US-012</a> : Editing and populating domain ontology.
7. Enhance community-based access to CH resources	<a href="#">US-004</a> : Editing and populating the administrative ontology within CoP <a href="#">US-005</a> : Critique of method <a href="#">US-012</a> : Editing and populating domain ontology.
8. Provide community building through knowledge exchange and knowledge sharing	<a href="#">US-006</a> : Invitation to collaboration <a href="#">US-005</a> : Critique of method
9. Identify different knowledge contexts	<a href="#">US-006</a> : Invitation to collaboration <a href="#">US-005</a> : Critique of method

General objectives	User scenarios
10. Meet the needs of different user groups	<a href="#">US-006</a> : Invitation to collaboration <a href="#">US-007</a> : Assembling and describing material
11. Enable access via paid-systems in public, semi-public and restricted communities User scenarios	<a href="#">US-001c</a> : User Query activities within institutions user interfaces

As the project evolves, new scenarios are being enlisted and validated as well according to the rules of the walk-through methodology.

Validation of the user scenarios during the project has been helpful in order to ascertain, describe and develop the functionalities of the outcome of the project.

## 1.4 Suggested actions

From the point of view of validation it would be preferable to have more detailed written clarification on why some of the scenarios or suggested changes have been rejected.

## 2. Validation of requirements

### 2.1 Objectives of validation

The goal of this task was to test functional requirements needed for the implementation of the QVIZ system.

The objectives of the validation of requirements were to establish whether functional requirements derived from the user requirements, which are defined in the user scenarios and mock-ups, are going to achieve the system objectives,

Functional requirements are divided into domains, which are described through problems and needs and end user activities stated in different user scenarios. For each domain there is a mock-up diagram.

The purpose of this validation was not only to review the document itself, but to understand the logic of this topic, to find mistakes and correct the inaccuracies in the document.

### 2.2 Methodology

The requirements and relevant appendixes part of deliverable 4.1.2 “System Specification and Requirement Report (1st Phase)” were reviewed by four people in the Estonian National Archives.

The report was discussed in a review meeting where the review notes were taken. The review was based on the inspection methodology. Each team member read through the requirements specification and made comments about all problems that needed to be clarified. Defects were identified and afterwards resolved. Solutions were identified through discussions between team members. All the clarifications made were then entered into the review notes.

### 2.3 Result

Procedures and methods of functional requirements are explained clearly and logically, so that it helps the reader to understand the construction of this document.

In order to make the requirements analysis easier to follow user activities were divided into several domains according to their working environment. Different domains (QVIZ, Community of Practice etc) are described through user scenarios. All user scenarios are described through “problems and needs” and “end user activities”. US-010 has “background” instead of “problems and needs”. It would be easy to recast it to problems and needs. US-014 is missing “end user activity”.

For each domain there are carefully selected user scenarios and the ones which are focused on in the first implementation phase are presented in this document. In QVIZ-domain there is one scenario – US-004 described as “remaining”. It needs explanation.

The QVIZ-domain has 5 user scenarios which tackle profound tasks, but the derived functional requirements section is the shortest and thinnest compared to the other domains. The question arises of whether all tasks are covered.

In the section on knowledge domain the meaning of the knowledge worker and expert knowledge worker is not explained and it remains unclear what the background of this function is.

The diagrams illustrating the QVIZ-domain, the CoP-domain Social objects and the Archive/unit-domain are useful and explanatory, but the last one – the Cop-domain Knowledge Mgt 1 is difficult to understand.

The confusing and not clearly explained theme is paid content. A couple of times it is mentioned that users have to pay to access the content (for example in QVIZ-domain use case diagram), but there is not any comment on how this is going to work or even a comment that this theme is still under discussion.

In the functional requirements section of the Archive/Unit domain the term “unit” occurs with several different meanings (Unit user, Unit Administrator, Administrative unit) and the term therefore remains a little ambiguous. Maybe there should be a more distinct terminology to differentiate between archival resources and administrative units. Furthermore, the administrative unit ontology issues do not seem to be sufficiently covered within the functional requirements.

## **2.4 Suggested actions**

The suggestions given in the results of validation (2.3) should be considered and necessary corrections made.

Some paragraphs need more detailed description and some terms must be used more precisely.

There are topics which are mentioned without explanation, more attention should be paid to clarifying these issues.

## 3. Validation of technical specifications

### 3.1 Objectives of validation

The validation of technical specifications was based on the review of the technical section of D 4.1.2 “System Specification and Requirement Report (1st Phase)” (pages 34-49 and appendix D). The reviewed document gives a detailed description of the functional requirements as well as an overview of the technical systems architecture specified in the QVIZ solution.

The viewpoint of the validation was not primarily to review the document itself but to review the technical architecture of QVIZ as it is described in the document.

The objectives of the validation were:

1. gain understanding
2. find defects
3. promote discussion and give feedback

Although the review was based on that one single document one question was immediately raised. Given the focus on the technical architecture, many assumptions, otherwise expected in the document (or other documents) had to be made. In order to be able to deliver qualitative input to the development process, henceforth more information is needed.

### 3.2 Methodology

The technical section of D 4.1.2 was reviewed by four people at Umeå University supplemented by a review meeting where the discussion was held and review notes were taken.

The validation was based on the software review methodology. A software review is a meeting during which a software product is examined by project personnel, managers, users, customers, user representatives, or other interested parties for comment or approval. There were 4 software testing experts selected as testers for this review meeting.

The review followed the static testing principles with focus on finding defects instead of executing the software under test. The following methods and judgements were exercised:

1. to review and make automated static analysis of document
2. not to run test cases
3. stress on the general quality assessments
4. find all detectable defects and variables
5. find out what was missing or described insufficiently

A meeting was then held where the viewpoints were delivered to the QVIZ project to clear up any misunderstandings and to present the results of the review. These clarifications were then inserted into the review notes.

After delivering the validation remarks to the technical developers, relevant adjustments and corrections were made and integrated into the new version of D 4.1.2.

### **3.3 Result**

As a result of the validation, the following evaluation was given, variances and defects were pointed out and suggestions were made.

#### ***Functionality of system components (pp 36-39)***

The diagram is well accompanied by the descriptive text, but it cannot stand on its own.

It is somewhat difficult to understand which components are to be developed or used. It would be better to differentiate clearly between the components using a GUI and those that are services.

***Data structures: General Class diagram (p 40)***

The purpose of the diagram is not as clear as would be needed. The diagram defines several data storages, but these are not defined in the report. Moreover, there is a large gap between what is drawn in the diagram and what is described in the report, specifically concerning data repositories. It has to be decided which components are to be rewritten, which reused as they are and which are to be created from scratch.

***Structure of the Administrative Ontology (p 41)***

The Administrative Unit Ontology (AUO) structure is not described sufficiently, more context is needed. It was difficult associating the chosen data model with the rest of the document, thus difficult to say very much about it. That said, it looks like the data model is a mix of metadata and data (that is also indicated in the text alongside the model). If that is the case, some explanation/motivation is required, because such models normally will not scale well, and may have poor referential integrity etc. Many questions have been raised about the AUO. Is the flexibility of the current AUO data model really needed? Are there other database structures not depicted? A description of which data model is to be used by which service would be very helpful.

***Interface specifications (pp 42-47)***

The description of the interfaces at this level is a little shallow, this must be described more thoroughly.

It remains unclear what is meant with the term “internal browser”.

### **3.4 Suggested actions**

A more thorough description of the layers in the system would be useful. This

could include

- The high-level view, e.g. browser-layer, middleware-layer and data-layer
- In which environment executes each layer , e.g. browser, servlet container
- Which protocol is used between layers, e.g. HTTP, Java RMI

Sequence diagrams, describing the system and user interaction would also be useful.

The use of the term Portal is a bit vague and should be exemplified.

Some terms, which otherwise are standard, are used with inconsistency. The term component is used, sometimes in reference to a service, sometimes a GUI, sometimes to an agent.

An area which is only briefly mentioned is authentication and user management. Given the apparent complexity of the architecture, this will be an area where QVIZ might encounter some difficulty.

## 4. Validation of content selection

### 4.1 Objectives of validation

The validation of content selection was conducted on the basis of the deliverable 3.1 “Content Selection and Access Strategies”. The general aim of validation was to ascertain that the work in the field of content selection and access specification follow the initial direction of the main objectives of QVIZ. The most important question asked during the validation process was as following: Has the D 3.1. achieved a solution in interaction between QVIZ and the archives which is universal, simple and admissible to the all archives? On the other hand, the validation team made several corrections and suggestions besides evaluating the work which has been done already.

### 4.2 Methodology

The validation of content selection and access strategies took place in both the National Archives of Estonia and in the National Archives of Sweden.

The Estonian validation team consisted of two people and the Swedish group of three people. The team members were technical experts of archives as well as archival content specialists.

In Sweden, the individual walk-throughs were followed by a joint meeting where two senior executives were also present for the discussion in addition to the three reviewers. After the meeting a collaborative write-up and check were conducted.

The individual walkthrough methodology was also used in Estonia, and the validation remarks were written after that meeting.

## 4.3 Result

### *Annotation methods*

Annotations can be saved in a QVIZ database, and the content of this database will be used in the processes of thesaurus/ontology building.

Track-back metadata to content from archival repositories/databases in the form of unique IDs will then be saved in the QVIZ system/database.

### *QVIZ programs in archival portals*

It is very likely not possible to “plant” QVIZ programs within the systems of archival portals even though presentations of, and links to the QVIZ portal should be added to the archive portals that provide content to the QVIZ system, possibly by a web browser plug-in.

### *Content selection*

It should be made clear that selection of content from content providers/archives is done for the development process and the production of prototypes only. For the QVIZ project to be successful there cannot be any limits to the content presented in the QVIZ portal. This would give the users a distorted impression of the content in the archive repositories and limit potential success in the exploitation phase.

### *Track-back creation*

The National Archives of Estonia maintains two kinds of web resources: (1) a central archival information system and (2) thematic webpages designed for specific communities of practice.

There are two kinds of problems associated with this concept that compromise tracking back from the QVIZ portal to the archival portal.

(1) Because of data replication between the central archival information system and thematic webpages, one and the same archival resource can be found within different web resources.

Therefore, the archival resource identifier is not enough to track back from the QVIZ to the archival portal. A full uniform resource locator (URL) is needed.

(2) Contrary to the central archival information system that has a very stable structure with unchanging URLs, thematic webpages are under constant development so that URLs can change. Mobile URLs will compromise tracking back from the QVIZ portal to the archival portal.

### ***Problematic sections***

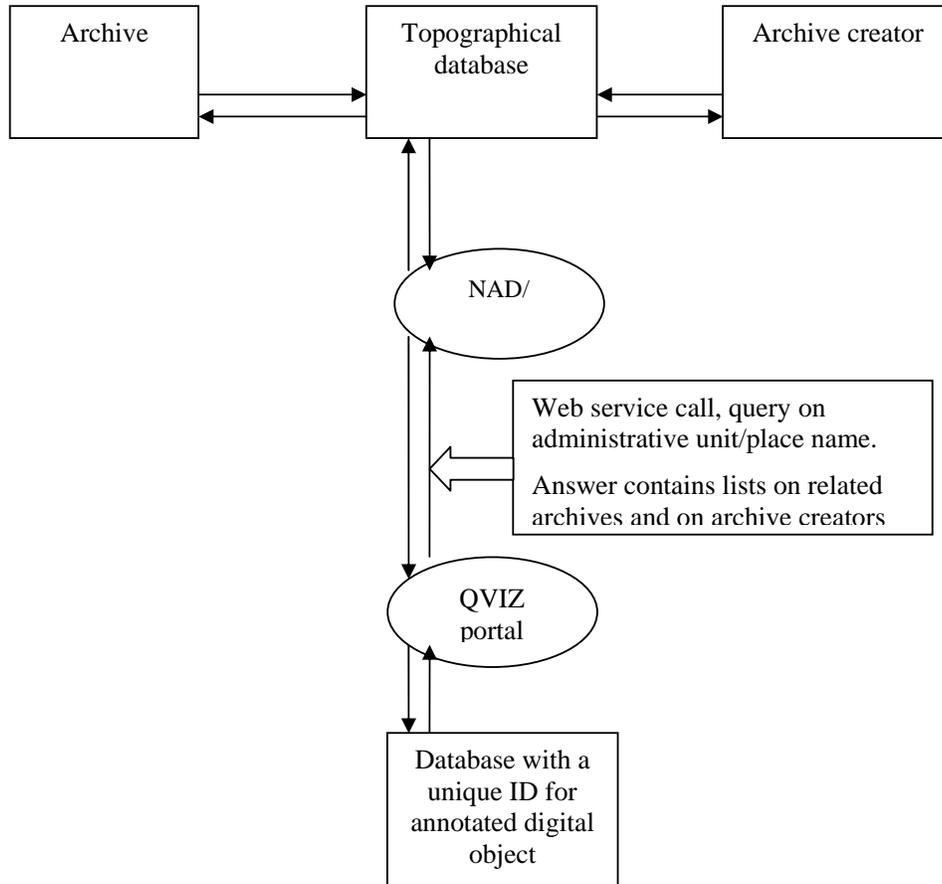
- Strategies for embedding QVIZ-complementary accessibility-tools in Archive portals (p 14). This section is a little bit shallow. The diagram is not explained enough.
- Accessible resource types within Content Portals (p 16) .  
The meaning of the term "collection" is not clearly explained and can be confusing. Is a collection merely a part of an archival portal? Or is a collection a part of the archival descriptions?
- NAE Overview of archive descriptions and digital object data structures (p 18). The purpose of the diagram is not clear in this context. It is not described enough and it is hard to understand how it relates to a given subject (Accessible resource types within Content Portals).

## **4.4 Suggested actions**

### ***Communication***

Suggested solutions to the communication between the QVIZ portal and content provider portals:

- Communication starts with a call from QVIZ to the topographical database via web server
- Topographical content is mirrored to QVIZ administrative units database and kept updated at intervals



**Figure 1 – Suggested solution to the communication between QVIZ and content providers by the validation team of SNA**

Example: Place name/administrative unit

1. Browse topographic database /map
2. Select an area

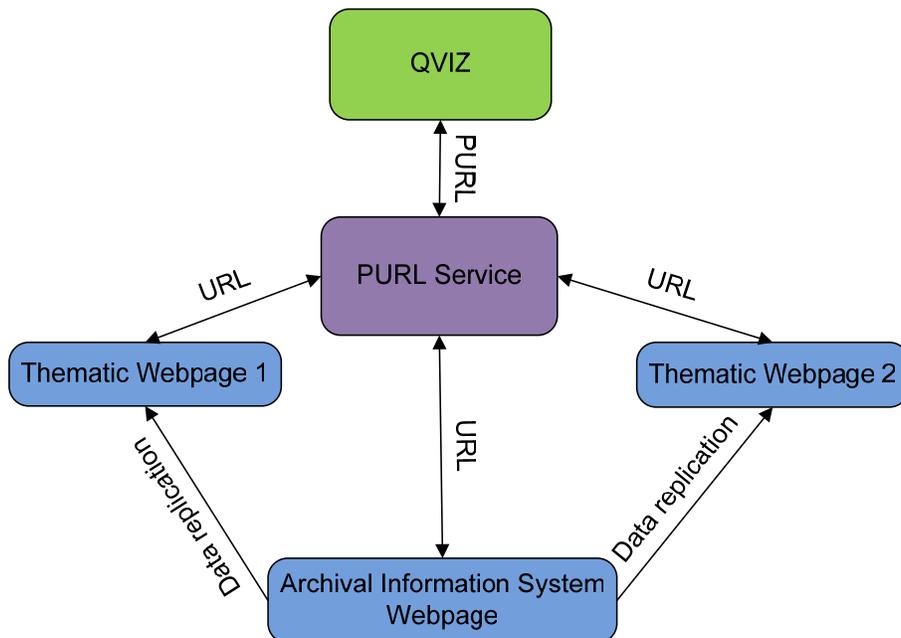
3. Send query

Example: Archive creator:

1. Query received
2. Find archival units and creators
3. Return list of relations
4. User chose an object
5. The object is displayed in its context

### ***Track-back creation***

The general solution to this problem is the development of a persistent URL (PURL) service. Instead of pointing directly to the location of an Internet resource, a PURL points to an intermediate resolution service. The PURL resolution service associates the PURL with the actual URL and returns that URL to the client. The client can then complete the URL transaction in the normal fashion. In Web parlance, this is a standard HTTP "redirect".



**Figure 2 – Suggested solution to development of persistent URL system**