Title: Project Exploitation and Dissemination Plan

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Identifier: D1.3.1

Type: Deliverable

Version: 1

Date: Friday, April 22, 2005

Status: Internal

Class: Confidential

Summary

The plan for using and disseminating knowledge captures the PROVENANCE partners' initial view on exploitation and dissemination of the project results. It describes the relevant target groups, it positions the project with respect to the other relevant initiatives, and it documents the exploitation and dissemination strategies and actions designed to reach these target groups in the context of competition. The plan documents knowledge ownership and the initial agreements between the partners to grant access rights to knowledge and associated pre-existing know-how. It is a working document that will be updated as the project progresses.

Members of the PROVENANCE consortium:

- IBM United Kingdom Limited United Kingdom
- University of Southampton United Kingdom
- University of Wales, Cardiff United Kingdom
- Deutsches Zentrum fur Luft- und Raumfahrt s.V. Germany
- Universitat Politecnica de Catalunya Spain
- Magyar Tudományos Akadémia Számítástechnikai és Automatizálási Kutató Intézet Hungary

Foreword

This document has been compiled by John Ibbotson (IBM) based on input from all project partners.

Table of Contents

1 Introduction

In the plan for using and disseminating the knowledge the contractors set out in a detailed and verifiable manner, the terms of use and dissemination of the knowledge arising from the project, which they own, in accordance with their interests. It is an evolving document which is regularly updated to give a cumulative overview of the project's undertaken and planned activities, and submitted at the end of each reporting period.

The final plan for using and disseminating the knowledge, as required at the end of the project, will therefore provide a complete picture of all activities undertaken and most importantly will provide information on the future route to full use (exploitation or use in further research) and dissemination of the knowledge.

This document includes the following three sections:

- Exploitable knowledge and its use

- Dissemination of knowledge

- Publishable results

1.1 Background

The concept of *Provenance* is already well understood in the study of fine art where it refers to the trusted, documented history of some work of art. Given that documented history, the object attains an authority that allows scholars to understand and appreciate its importance and context relative to other works of art. Objects that do not have a trusted, proven history may be treated with some scepticism by those that study and view them. This same concept of *Provenance* may also be applied to data and information generated within a computer system; particularly when the information is subject to regulatory control over an extended period of time.

Today's grid architectures suffer from limitations, such as lack of mechanisms to trace results and infrastructures to build up trusted networks. *Provenance* enables users to trace how a particular result has been arrived at by identifying the individual and aggregated services that produced a particular output. The overarching aim of the *Provenance* project is to design, conceive and implement an industrial-strength open provenance architecture for grid systems, and to deploy and evaluate it in complex grid applications, namely aerospace engineering and organ transplant management. This support includes a scalable and secure architecture, an open proposal for standardising the protocols and data structures, a set of tools for configuring and using the provenance architecture, an open source reference implementation, and a deployment and validation in industrial context.

The impact of this project is to provide mechanisms that allow information generated and managed within a grid infrastructure to be proven and trusted. By this we mean that the information's history, including the processes that created and modified it, are documented in a way that can be inspected, validated and reasoned about by authorised users that need to ensure information controls have not been altered, abused or tampered with.

1.2 PROVENANCE project objectives

The overarching aim of the Provenance project is:

To design, conceive and implement an industrial-strength open provenance architecture for Grid computing, and to deploy and evaluate it in complex grid applications (aerospace engineering and organ transplant management).

Specifically, the objectives of the project are:
1. To specify the contents of provenance in relation to workflow enactment.
2. To design and implement a scalable and secure distributed co-operation protocol to generate provenance data in workflow enactment.
3. To conceive and implement tools to navigate, harvest and reason over provenance data, also in a scalable and secure manner.
4. To design and engineer a scalable and secure software architecture to support provenance generation and reasoning.
5. To deploy and evaluate the provenance system in two different grid applications, namely aerospace engineering and organ transplant management.
6. To propose a draft provenance specification for input to an open standardisation process thereby contributing to the standardisation efforts in this area within the Grid and Web Services architecture domains.

2 Exploitable Knowledge and its Use

2.1 Exploitation Directions

This section will only present 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 or for creating or providing a service. It should provide an overview of how the knowledge could be exploited or used in further research (if relevant). Both past and planned future activities should be included.

The PROVENANCE results may include:
1. Requirements – User and Software
2. Functional prototypes of the reference architecture
3. Demonstrations
4. Best practice examples
5. Evaluation of PROVENANCE technology
6. Tutorials
7. Framework / architecture
8. Dissemination materials (papers, presentations, film, etc.)
9. Web site
10. Standardisation

The strategies for exploitation will differ with respect to the different nature of these results. Five kinds of exploitation can be categorised:

1. Think tank: Several organisations, including the partners, will make use of the PROVENANCE results as a think tank with a direct influence on their business (strategies, consensus building, standards, etc.).
2. Publishing: For partners from research and academia, publishing scientific results represents their mode of exploitation.
3. New projects: PROVENANCE is expected to give rise to new research projects, and support the preparation of high-quality educational material (courses, text books, etc.).
4. Standardisation: Standardisation organisations such as W3C, OASIS and GGF are suitable organisations for disseminating standards proposals. The aim is to enable interoperability between components using standardised interfaces.
5. Commercialisation: The industrial partners in PROVENANCE will be privileged in respect to the products and standards of PROVENANCE, as they get ownership of IP and influence on and early access to designs and prototypes. It is however expected that industry will generally benefit from those developments. The consortium would encourage the use of some prototypes as the basis for commercial products or product-like open source software, but uniformly achieving this level of quality is not a goal of PROVENANCE.

2.2 Partner Specific Exploitation Plans

The following section contains statements from individual partners about their current exploitation plans for PROVENANCE.

2.2.1   IBM United Kingdom Limited

IBM is actively monitoring the PROVENANCE project and where appropriate may incorporate technology into its products and services.

2.2.2   University of Southampton

The University of Southampton is investigating the exploitation of PROVENANCE technology and concepts in the following ways.

In teaching, a new syllabus on Advanced Topics on Web Services was approved on 20/4/2005. This syllabus includes an explicit topic on PROVENANCE . Teaching of this course will begin in October 2005; in a first instance, it will be offered to fourth year Computer Science and Software Engineering MEng students, i.e. a cohort of about 20 students; at a later stage, the course may be offered to third year Computer Science and Computer Engineering students, i.e. a cohort of about 130 students.

In research, the UK funded Pasoa project will study opportunities to leverage the outputs of PROVENANCE and feed them into the applications it studies. Specifically, the Southampton Pasoa team studies PROVENANCE in the context of a bioinformatics application and of the Large Hadron Collider Atlas experiment.

As part of the e-Science community in the UK, Southampton is in contact with a number of e-Science projects; RealityGrid and Combechem have shown strong interests for PROVENANCE technologies, and we are in the process of building bridges with these projects.

Southampton is also leading the "SOCA- Southampton Chicago Activity", an EPSRC project with Ian Foster's Distributed Systems Lab at Argonne Labs and University of Chicago. In this context, we will study the possibility of software integration with GriPhyN outputs.

We will keep a watch on national funding schemes to pursue the work and deploy solutions in new contexts. Three different kinds of schemes are of interest: the various research councils (including EPSRC, BBSRC) tend to support blue sky research, the Department of trade Industry DTI through its Technology Program support development of technologies to a near commercial-grade quality, and HEFCE JISC (Joint Committee for Support of Research) offers support for studies and practical deployments in the higher educational contexts.

2.2.3   University of Wales, Cardiff

The University of Wales, Cardiff (UWC) is currently investigating the use of PROVENANCE in the GridOneD project -- based on the Triana workflow engine. GridOneD is a UK funded project exploring the analysis of Gravitational Wave data from laser interferometers. A very large quantity of data can be generated, and looking through this for a particular template signal can require significant computational power. The PROVENANCE issues being investigated include understanding the effect of using different analysis services in the overall process of detecting such template signals. As a repeat of a particular computation can be expensive, understanding why or how a particular result has been generated can help in the planning of future experiments. The data generated at the end of the analysis process is very much dependent on the accuracy of intermediate results. Therefore recording a trace of execution provides useful insight to a physicist in understanding whether the result that has been produced is likely to be of value.

A related project is FAEHIM (Federated Environment for Heterogeneous Intelligent Mining), which allows composition of Web Services to support distributed data analysis. The toolkit is currently being evaluated by the Earth Sciences community at Cardiff, to support the analysis of data from oil and gas reservoirs. A presentation has also been made to the coordinator of the EU DataMining Grid project, and it is expectedthat some collaboration with this project on PROVENANCE issues will be

forthcoming. The key PROVENANCE issues in this context relate to attributing intellectual property rights, based on how a particular result has been arrived at.

The Grid Enabled Numerical and Symbolic Services (GENSS), in which UWC is also involved, has already provided requirements as part of the User Requirements capture process.

2.2.4   Deutsches Zentrum fur Luft- und Raumfahrt s.V.

DLR are evaluating the opportunities for exploiting PROVENANCE technology with their TENT system for distributed simulation of aerospace components.

Currently, various data sources are queried to gather information on the current state of a simulatoin or computation. The data is handled in various ways depending on the source (e.g.logging data, session file generation, data management service). A PROVENANCE service would present a single and central interface for information colletion and retrieval. It would be developed as a separate instance handling the collection of data and the queries on this data. It would be designed using the standards for Grid Services making it as flexible as possible and provide the full security of Grid Services to the user.

Additionally, DLR would provide an interface or export feature to the persistent data management system DataFinder. This would give a complete integration for all data involved within scientific computational processes handled via the simulation environment TENT.

This open, flexible, and integrated approach is the key feature for use in our DLR internal and external deployments. A PROVENANCE service would give a homogeneous view on all available data within complex simulation workflows.

2.2.5   Universitat Politecnica de Catalunya

UPC's is evaluating the opportunities for exploitation of PROVENANCE technology in three primary areas:

1. Integration and use in the Carrel Organ Transplant Management system developed jointly with Hospital St. Pau in Barcelona, Spain. The Carrel system is being developed as a trial for the Catalan Organ Transplant Management Coordination Authority (OCATT) with the long term aim of live deployment. Integration of PROVENANCE components in prototypes via WP8 therefore provides a channel for potential real deployment should the trials be successful.
2. Integration and use in the openNet initiative (http://x-opennet.org) which is aiming to build a on line test bed for service oriented computing technologies which draws on Agent, Web Services,   Semantic Web and grid technologies. Deployment of PROVENANCE services here could provide experimental access for third parties to try out the technology.
3. In teaching: PROVENANCE examples and solutions will be used provide source material for classes in advanced computer science classes including Artificial Intelligence, Distributed Systems and Agent technology.

2.2.6   SZTAKI

SZTAKI is already using PROVENANCE concepts in the Sintagma national project. Sintagma stands for "Semantic INtegration Technology Applied in Grid-based, Model-driven Architectures". The Sintagma project started in Januray 2005. The main goal of the project is the development and experimental application of a novel information integration technology which includes conceptual level integration and is based on virtual database management in distributed and grid architectures.

The new technology will support uniform and unified management of different types of information, and, therefore, will ensure efficient communication among IT applications and their users in a way which is free from semantic errors. The project aims at demonstrating the wide applicability of the technology to be developed in two, significantly differing application environments: firstly, by improving the IT services linked to the Hungarian cultural heritage (building on the National Digital Repository), secondly, by solving specific problems of SMEs in data integration and electronic business/commerce (related to the so-called Enterprise Information Integration market trend). SZTAKI will integrate PROVENANCE techniques into the Sintagma architecture in order to enable the determination of the origin of the data in the integrated virtual databases of distributed applications.

SZTAKI also has plans to submit project proposals for introducing PROVENANCE services in the national grid system. The national grid system is based on the previous Hungarian Grid projects: DemoGrid, ClusterGrid, SuperGrid, Chemistry Grid, Hungarian Grid, SuperClusterGrid, etc.

3 Dissemination of Knowledge

3.1 Overview

Dissemination of results is key to raise the project visibility and to demonstrate the need of privacy friendly Identity Management. This effort comprises publishing results, making presentations and demonstrations. Dissemination actions will address Europe and beyond. These efforts will contribute to position the project results in the society and market.

The promotion strategy as stated later in this document will be applied. Broad support and commitment from the stakeholders about PROVENANCE is required. Therefore PROVENANCE concepts have to be clarified and the benefits of the proposed architecure have to be explained. This could for instance be achieved by the following means and strategies:

- o *Public web site*: Web pages are available from the project public web site http://www.gridPROVENANCE .org/ to ensure timely access to the project published results, including public deliverables, and to enable the interested communities to provide early feedback and to raise public debate on PROVENANCE progress and prospects;

- o *Promotion material*: The PROVENANCE consortium will design promotion material on printed media as well as on new interactive products and services. This material will continue to be broadly distributed, in particular at dissemination events that the Partners attend or on demand;

- o *Dissemination events*: PROVENANCE Partners will continue to submit papers to major conferences and journals, and give demonstrations and speeches at international fairs, open house and commercial events, whenever possible. Upon achievement of major results, reports and press releases will be issued, and dedicated dissemination events will be organised;

- o *Lectures*: selected project partners, who have qualification tasks at Universities and Research Centres, will perform lectures and research transfer. They will transfer know-how on methodology, technology and business evaluation to their students.

- o *Networking activities*: the project has established co-operation links with other initiatives interested in the research and application of a PROVENANCE architecture;

- o *Workshops and visits*: Organising workshops and giving presentations are valuable tools in the promotion of PROVENANCE , but might attract only those that already are convinced of the application of PROVENANCE . Hence, also personal high-level visits to those people that still have to be convinced are the most effective way to achieve support and commitment. A visit plan has to be developed;

- o *Bridge heads*: With the support of PROVENANCE participants other stakeholders can be visited and as a result a dedicated groups of PROVENANCE friends can be set up as bridge head promoting PROVENANCE regularly and keeping the stakeholders awake. Press releases about PROVENANCE should be translated and issued by these bridge heads. The visits will also reveal what obstacles have to be removed and what approaches are most successful;

- o *Knowledge base*: The construction, population and maintenance of a comprehensive knowledge base are pivotal to sustaining the off-line and on-line activities of PROVENANCE . It will provide members, as well as external interested parties, with added value access to information, contacts and activities. This knowledge base will ensure excellence by having

links to the most up-to-date information available concerning PROVENANCE management. It will contain the findings of PROVENANCE , in the technical, legal, social and economic field. It can be used to keep all stakeholders informed and to convince them about the relevance and importance of PROVENANCE .

Success resulting from the PROVENANCE dissemination actions could be scored according to the aggregate number of visits to the project web site, the requests received for information on project results and prospects, the aggregate participation in the PROVENANCE events such as workshops, presentations, lectures, and demonstrations – whether initiated by the project or from invitation by external organisations. Later in the project, the numbers of users downloading and using the reference PROVENANCE implementation and tool set.

3.2 Publishable Results

This section lists global results from the PROVENANCE project. Each result is briefly described in terms of its main purpose, its content, its benefits, and its potential use.

1. Requirements – User and Software

Purpose and content: Being developed as workpackage 2, the requirements guide the project throughout its lifetime and deliver valuable information for exploitation. They capture the User requirements and a derived set of Software requirments.

Benefits and use: This material is designed for everybody interested in PROVENANCE . The requirements provide a reference from which other PROVENANCE deliverables such as architecture and reference implementation can be evaluated.

Availability: This result is available in the form of two deliverables, referenced D2.1.1 (User Requirements) and D2.2.1 (Software Requirements). They are public and will be accessible from the public web site.

2. Functional prototypes of the reference architecture

Purpose and content: Functional prototypes of the reference architecture will be developed and tested by the application partners as part of the PROVENANCE project. The final version of the functional prototype is meant to demonstrate the results of PROVENANCE at the end of the project. Application prototypes will be developed in the context of selected application scenarios and will be subjected to small-scale, supervised trials with partners. The prototypes are not public materials but will be publicly demonstrated.

Benefits and use: The prototypes show the functionality of the PROVENANCE architecture. They aim to validate the project results and provide evidence that these results are suitable for exploitation from a legal, usability, technical and commercial point of view.

Availability: The functional prototypes are available from month 12 of the project and are subject to a revision every six months. The pre-prototype (D9.1.1) and first functional prototype releases are restricted to partners only. These are available in months 6 and 12 respectively. Later versions at months 18 and 24 (D9.3.1 and D9.3.2) are available to the wider community.

3. Demonstrations

Purpose and content: The demonstrations are designed to provide intuitive and informative education in the use of the PROVENANCE architecture. They may also illustrate the conceptual models used to develop the PROVENANCE architecture and its deployment. The demonstrations are not public material as such but can be used by project partners for presentation purposes.

Benefits and use: The demonstrations form a basis for illustrating the PROVENANCE architecture and implementation.

Availability: Demonstration material is not scheduled within the project plan but will be available on an as-is basis.

4. Best Practice Examples

Purpose and content: Best practice examples will be produced to show how the PROVENANCE architecture can be deployed in either newly designed or existing systems.

Benefits and use: The guidelines are developed and tested by the use of the demonstrations.

Availability: This result is as part of the final project documentation (D1.2.1). The guidelines will be publicly accessible at the public web site.

5. Evaluation of PROVENANCE Technology

Purpose and content: The evaluation reports the assessment of PROVENANCE technology at different levels of prototype and test application maturity. The evaluation is performed from the legal, social, economic and user viewpoints. It is based on the requirements gathered in workpackage 2.

Benefits and use: Steady evaluation is necessary in the iterative process of design and implementation to improve the concepts and prototypes and to ensure the compliance with the requirements. Additionally it serves as a trust-building method, especially as the material on evaluation is public.

Availability: This result is available as a restricted deliverable from each of the two test application workpackages (D7.2.1 and D8.2.1). Its access is restricted to the project partners and European Commission.

6. Tutorials

Purpose and content: The tutorial materials will be designed to help the users of the prototypes to understand the concept of PROVENANCE , as well as to build a common knowledge base among all partners in PROVENANCE and beyond. To achieve this, the tutorials will contain material from all the different disciplines represented by the PROVENANCE partners.

Benefits and use: There will be tutorials for different target groups, especially for end-users, for developers, for service providers and for application designers. The material aims at increasing awareness for the problems which privacy-enhancing IDM tries to solve and educates the target groups in concepts and solutions. The material may be used for academic teaching.

Availability: Tutorials have not been scheduled as explicit deliverables from the PROVENANCE project. They will however, form part of the Collaboration workpackage 10.

7. Framework / Architecture

Purpose and content: The PROVENANCE architecture aims to establish the basis for the widespread deployment by providing a detailed "map" of PROVENANCE management. The PROVENANCE Architecture is part of the framework and specifically focuses on how to organise the relationships and the interactions between the various mechanisms so that they work in synergy and achieve the desired results.

Benefits and use: The first internal strawman of the architecture will be on the public web site. Like the requirements materials the architecture points out the context and the principles of PROVENANCE management. The PROVENANCE Architecture is expected to serve as a reference for positioning existing and future market offerings.

Availability: The contracted architecture deliverable (D3.1.1) is not scheduled until month 18. The project will however, make earlier drafts available publicly on the web site.

8.   Dissemination Materials (Papers / Presentations etc.)

Purpose and content: This result is intended to raise the visibility of the project and facilitate dissemination and exploitation. Promotion material includes documents – press releases, newsletters, brochures, posters, articles, and presentations and demonstrations of general interest – that introduce the problem area addressed by the PROVENANCE project, and that describe from various angles the project vision, goals, approach, expected results and benefits, status, and membership of the PROVENANCE consortium. Promotion material also includes mock-ups, demonstrations, and video clips.

Benefits and use: This material is designed for non-specialists. Eligible for broad distribution in the context of dissemination of the project results, it prepares and facilitates exploitation of results.

Availability: These will be provided on an as-is basis as part of the collaboration workpackage 10.

9.   Web Site

Purpose and content: The PROVENANCE public web site represents a major vehicle for raising broad and timely visibility of the project vision, goals, approach, expected results, and the membership of the PROVENANCE consortium. It provides a means to immediately inform interested audiences on progress achieved as well as events and links related to the project, to establish contacts with interested parties, and to publish project key results.

Benefits and use: The PROVENANCE web site serves as a library of PROVENANCE public information – including deliverables, public reports, press releases, newsletters, papers, lectures, and presentations –, accessible by interested parties.

Availability: The web site is currently being reconstructed and will be available by May 2005..

10. Standardisation

Purpose and content: Open standards are important for interoperability with other systems. Therefore PROVENANCE   will monitor relevant standardisation activities. The project will produce a standardisation proposal (D3.2.1) at month 24 that may betaken to a suitable standards organisation

Benefits and use: PROVENANCE partners who are members of standardisation bodies can use the generated documents to put forward the standardisation supporting PROVENANCE   and its objectives.

Availability: A standardisation proposal will be prepared at the end of the project.

3.3   Project Dissemination Activities

This section identifies the dissemination activities carried out by project partners since the beginning of the project.

Date	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
12/12/04	Dissemination Meeting, Hospital de St. Pau, Barcelona, Spain	Organ transplant unit representatives (medical doctors and administrators) + technical staff	1	10 persons	UPC
17/01/05	Press Release available at http://www.ecs.soton.ac.uk/news/671				UoS
Various	Presentation to internal R&D groups	IT Research and Development	4	Varied	IBM
31/01/05	Presentation to the British Library	Preservation experts and Head of Strategy	1	3	UoS

3.4   *Future Dissemination Activities*

This section identifies future opportunities for disseminating project information.

3.4.1   Invited Talks

ARW 2005
Edinburgh, Scotland
The 12th Workshop on Automated Reasoning
Bridging the gap between theory and practice
29th and 30th July 2005
http://www.inf.ed.ac.uk/events/conferences/arw-05

GridCoord   Workshop:
"The use of open middlewares for the Grids" at
Grids @ work: Middleware, Components, Users,
10-14 October 2005
ETSI Headquarters, Sophia Antipolis (France)
http://www.etsi.org/plugtests/GRID.htm

4 Project Promotion Strategy

4.1 Overview

Since the project start, a number of individual dissemination actions have taken place based on the Partners' experience in previous projects and the various promotion opportunities that emerged. While all these actions contributed to raising visibility of the project, they stemmed more from intuition than from an explicit and reasoned promotion strategy. A promotion strategy is required that guides selection of the most appropriate dissemination actions for raising project visibility and preparing exploitation of the project end results.

This document attempts to respond to this need by defining a common view on the motivations and goals pursued in promoting the project, on the target audiences to reach, on the material to disseminate, and on the dissemination opportunities that the consortium considers important to promote the project. It also outlines an initial plan for scheduling selected dissemination actions.

The first section states the motivations of the consortium in promoting the project results and the goals that any dissemination action should support. The second section identifies the target audiences that should be addressed accordingly. The third section captures the types of promotion material and their intended target audiences. The fourth section reviews the set of possible dissemination channels that the project can use, including those offered by the media, the conference and exhibition organisers, the standardisation committees, the PROVENANCE Partners, and the European Commission. The fifth section outlines an initial promotion plan.

4.2 Motivation and Goals

PROVENANCE is becoming a necessary component in the Grid community as distributed collaboration between research groups becomes a natural way of working. The management of experimental and computational results becomes important as the data and generated information are shared between partners and disseminated to other stakeholders. In industry, the need for compliance and regulation also drives the need for a PROVENANCE solution. Highly regulated industries such as healthcare, life sciences and finance require systems that can ensure legally defined processes are complied with. The potential impact of the technology being delivered by the PROVENANCE project will have a major impact in these application areas.

For the projects' visibility among various target groups it is necessary to perform outreach actions to exploit the PROVENANCE results. Its goal is to raise awareness about the goals, methodology and results of the project. It seeks synergies with other initiatives and will establish co-operation links with them.

The goal of PROVENANCE in providing real-world solutions demands information exchange with all stakeholders and the participation in standardisation processes.

4.3 Target Audiences

The ultimate success of the PROVENANCE project as measured by its objectives and beyond will primarily rely on the capacity of its participating experts to establish credibility, to interact and exchange information about the vision of PROVENANCE , its approach, progress and results. In order to support these objectives, the identification of the key actors and the creation of a wider permanent community of stakeholders is crucial.

The following initial list of stakeholders can be identified. This list is not exhaustive and more work will be required to further define their characteristics:

- *Individuals*, that are impacted by the regulation of industries such as healthcare and financial services.PROVENANCE technology may provide a framework for additional protection for users of these industry serices.
- *User and consumer associations* on national and European level whose role is to protect and support groups if individual users of industry services.
- *Policy makers and parliamentarians*, nationally and on a European level. They are representatives of the citizens as potential users and data subjects and should protect the regulatory interests and rights of them. They also have the possibility to promote PROVENANCE -based solutions by for example creating legal rules for industrial regulatory frameworks that may be verified for compliance using PROVENANCE technology.
- *Research communities* (governmental and commercial) dealing with regulatory compliance issues, technology assessment organisations on national and European level, like European Parliamentary Technology Assessment Association (EPTA), departments and faculties of universities that focus on collaborative research issues. They should be stimulated to co-operate with PROVENANCE partners in a scientific discussion and research on data and information lifecycle management solutions.
- *Standardisation organisations* on national and on international level like the Global Grid Forum (GGF), European Committee for Standardization (CEN), World Wide Web Consortium (W3C), and the Organization for the Advancement of Structured Information Standards (OASIS). Their co-operation will be important for the transfer of PROVENANCE results into standardisation to ensure interoperability with existing systems and concepts.
- *System developers, system designers, suppliers of ICT products and services* should be motivated to see PROVENANCE as a business enabler and to integrate its concepts and solutions into their systems and products.
- *Law enforcement authorities* on national level and international bodies like Eurojust, Europol and Interpol. Their representatives should participate in discussions with PROVENANCE partners and advice them about legitimate law enforcement interests such as the collection of evidence that could be supported by PROVENANCE -based solutions and that are an appropriate balance with the privacy rights of users.

4.4 Promotion Material

The promotion material concerns the content that should reach the target audiences. Because all of these audiences need initial understanding of PROVENANCE , the promotion material must consist of a basic set that can be accessible to any of the target audiences. This basic set should present PROVENANCE in terms of its vision, paradigm, objectives, results (both expected and achieved) and their benefits, as well as the consortium members. It must be written to inform the target group in non-technical terms.

However, while this basic set can draw attention to the project, it is insufficient for further interaction with the target audiences. A more advanced, more specific set must be available for distribution to the interested parties. This advanced set conveys the actual results obtained by the project, including the requirements (like legal, soc., economics, prototypes), integrated prototypes / application prototypes, assurance methods, HCI guidance, evaluation of PROVENANCE technology, tutorials and framework / architecture. The advanced set comprises mock-ups, demonstrations, public deliverables, technical papers and presentations and standardisation efforts.

The elements of promotion material needed are listed in the following table, together with an indication of their intended audience and available access to these audiences. Most of this material is already available or planned to become available over the project lifetime. It includes the public web pages (they must point to all public documents available), the project brochure and flyer, the newsletter, the press releases, papers and presentations, and public and internal deliverables released according to the project work plan. However, part of the material mentioned below may have to be designed for specific purposes, for example a series of presentations to the Interest Group, a demonstration at an exhibition or conference, and the experimental service.

Table 1 - Reaching Target Audiences through PromotionalMaterial

Promotion material			Potential users and customers	Organisations and Third Parties	Media	Standardisation committees	Research community	PROVENANCE Partners	European Commission
Basic set		Public web pages							
		Project flyer							
		Newsletter issues							
		Press releases		All target audiences					
		Press interviews							
		Slide shows							
		Video shows							
		Posters							
Advanced set		Mock-ups							
		CD-ROMs							
		Demonstrations							
		Public deliverables				√	√	√	
		Technical papers and presentations				√	√	√	
		Contributions to standardisation				√	√	√	
		Internal deliverables						√	
		Prototypes						√	

√	Target audience		Potential access	▨	No public access

4.5   Communication channels

4.5.1   Reaching the target audiences

The target audiences can be informed and react through a number of channels, either permanent channels like the media, public events and technical publications, or PROVENANCE -specific channels like public and internal web sites, the events organised by the consortium or those with limited access proposed by the PROVENANCE Partners and the European Commission.

Permanent channels

These channels have significant power for raising awareness of the project and (for several of them) collecting first-hand reactions on the project directions and results.

- The *media*: whether on-line or traditional, they represent major channels that can reach all audiences, including the media themselves. However, these channels are mostly event-driven and unidirectional. Almost no feedback is returned; as a result, it is difficult to estimate the impact on the target audiences. The media should be used for draw attention on information of broad interest;

- *Public events*: they include conferences, workshops, lectures, fairs, and exhibitions. They have more limited coverage than the media although they can also reach all audiences. The superiority of public events over the media lies in their capacity of supporting bi-directional communications (for collecting feedback), and of conveying deeper technical information;

- *The Partners' own channels*: the Partners have privileged contacts with the media, their customers, their suppliers, their business and research partners, and obviously with their employees. These contacts occur through:

  - The Partners' public and (most often) internal web site. These sites may be complemented by a press communications department for announcing specific events to the external world;

  - The internal and external publications that maintain links with their employees and their customers, respectively;

  - In-house events, like customer briefings, internal seminars and workshops;

  - Briefing and demonstration centres where the Partners' customers and business/research partners are kept informed on the latest market offerings and developments;

- *Technical publications*: they comprise technical journals and books. They are mainly reaching the research and development community, including the PROVENANCE Partners and the European Commission. They are mostly unidirectional channels.

Table 2 - Reaching audiences through communications channels

Communication channels		Target audiences						
		Potential **users** and **customers**	Organisation / Third parties	Media	Standardisation committees	Research community	PROVENANCE Partners	European Commission
Permanent	Media	√	√	√	√	√	√	√
	Public events	√	√	√		√	√	√
	Partners' own channels	√	√	√	√	√	√	
	Technical publications					√	√	√
PROVENANCE -specific	Public web site	√	√	√	√	√	√	√
	Networking activities					√		
	PROVENANCE -specific events	√	√	√		√	√	√
	Internal web site	▨	▨	▨	▨	▨	√	▨

√	Likely		Possible	▨	Not applicable

PROVENANCE -specific channels

Except for the PROVENANCE internal Twiki at the University of Southampton, reserved for the project use, PROVENANCE -specific channels have high potential to directly reach any target audience, but on a limited scope. However, the efficiency of PROVENANCE -specific channels highly depends on the permanent channels previously mentioned. The availability of the PROVENANCE -specific channels must be advertised through the permanent channels:

o The *PROVENANCE public web site* (http://www.gridPROVENANCE .org/): provides access to any type of public information on the project with the possibility to collect feedback, and to establish direct contact between the project and its audiences;

o *Networking activities*: they represent an opportunity for interchange, mainly technical, with other PROVENANCE -related initiatives and research centres. They take the form of cluster meetings, seminars and workshops, and visiting scientists. They essentially reach the research and development community;

o *PROVENANCE -specific events*: they should be designed to reach and collect feedback from all audiences, primarily focusing on a PROVENANCE target group. Announcement of PROVENANCE -specific events should reach the members of the PROVENANCE interest group, the media, and the European Commission; and,

o The *PROVENANCE internal Twiki site* at Southampton University: primarily designed for the needs of the project, it however represents a major channel to disseminate all types of (technical and non-technical) information within the Partners' organisation, to collect feedback, and to motivate the Partners to pursue their efforts on exploitation of the project results. Each Partner should ensure appropriate PROVENANCE publicity within their organisation, especially in relation with the marketing and development departments.

4.5.2   Conveying promotion material

Some specific channels are more suitable or optimal for conveying certain types of promotion material, as illustrated by Table 3 of this section, and discussed below:

- o The *media*: they can distribute press releases, conduct interviews, report on demonstrations, or reference the public web site and promotion material.

- o Public events and PROVENANCE -specific events: project team members who participate to such events or activities must distribute promotion elements of the basic set, for example the project brochure, the latest press release as appropriate. Other public material from the advanced set may also be distributed or referenced (in particular the Internet address of the public web site). When possible, the latest version of the mock-ups, etc. should be shown. Slide and video shows, demonstrations and posters will have to be designed for fairs, exhibitions, in-house events or any appropriate meeting with potential users and customers.

- o The public web site must provide access to all public project information as soon as it becomes available. Authors of the elements of promotion material (papers, presentations, slide show, video show, mock-up, etc.), once agreed by the consortium for publication, must send their material without delay to the web site administrator for publication on the project public web site.

- o The Partners' own channels, both internal and external, should be used as much as possible to distribute the promotion material to and collect feedback from the interested parties, their customers and business/research partners:

  - o The Partners' internal and external web sites should link the PROVENANCE public web site;

  - o The Partners should distribute the public material available, both internally and externally: the project brochure, the newsletter issues, the press releases, the press interviews, CD-ROMs, and papers as appropriate.

  - o The Partners are encouraged to write articles on the project and publish them in their internal and external publications.

  - o The Partners that have representation in standardisation committees should be invited to submit contributions to the standardisation work items relevant to PROVENANCE and co-ordinate them with PROVENANCE own efforts.

  - o The Partners that have demonstration facilities should display the project posters, and run slide shows, video shows, mock-ups and demonstrations as these become available.

Table 3 — Promotion material conveyed by the communication channels

Promotion material		Communication channels							
		Permanent				PROVENANCE - specific			
		Media	Public events	Partners' own channels	Technical publications	Public web site	Networking activities	PROVENANCE E-specific events	Internal web site
Basic set	Public web pages	√		√	√	√			√
	Project flyer	▨	√	√	▨	√	√	√	√
	Newsletter issues		√	√	▨	√	√	√	√
	Press releases	√	√	√		√	√	√	√
	Press interviews	√		√		√	√	√	√
	Slide shows	▨	√	√	▨	√	√	√	√
	Video shows	▨	√	√	▨	√	√	√	√
	Posters / Exhibition material	▨	√	√	▨	√	√	√	√
Advanced set	Mock-ups	▨	√	√	▨	√	√	√	√
	CD-ROMs	▨	√	√	▨	▨	√	√	√
	Demonstrations	√	√	√	▨	▨	√	√	√
	Public deliverables	▨		√		√			√
	Technical papers and presentations	▨	√	√	√	√	√	√	√
	Contributions to standardisation	▨		√	▨	√	√		√
	Internal deliverables	▨	▨	▨	▨	▨	▨	▨	√
	Prototypes	▨	▨	▨	▨	▨	▨	▨	√

√ Desirable	Possible	▨ Not applicable

23

5   Market Analysis

In the PROVENANCE Technical Annexe the project partners identified market analysis as part of the project exploitation plan. In particular, this would include:

1. A definition of the *PROVENANCE* end product or result
2. A preliminary market analysis
3. Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis

Subsequent versions of the project exploutation plan would be augmented with other sections such as:

1. Business and Licence models
2. Target market segments
3. Concrete exploitation strategies and channels
4. Return on Investment

The first six months of the PROVENANCE project has concentrated on technical requirements and specification of an architecture. It is expected that the architecture will be defined and frozen by month 12 of the project. With this architectural definition, it becomes possible to perform the kinds of market analysis described in the technical annexe.