Periodic Activity Report
Year 1

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ABSTRACT:

The current document is the Annual Progress Report of the project for the first year of its implementation, i.e. 01 Feb 2006 to 31 Jan. 2007.

It provides a synthetic view of the work performed by the project and it presents the main achievements of the project during the reporting period.

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List of Contributors

All WP leaders have made contributions of material regarding the status and work performed by the WP they are responsible for, have reviewed the pre-final version of the report and provided comments, which assisted in the production of the final version.

As a result the list of contributors is:

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Contents

Publishable Executive Summary

1. Summary description of project objectives

ACGT is an Integrated Project (IP) funded in the 6th Framework Program of the European Commission under the Action Line "*Integrated biomedical information for better health*". The high level objective of the Action Line is the development of methods and systems for improved medical knowledge discovery and understanding through integration of biomedical information (e.g. using modeling, visualization, data mining and grid technologies).

ACGT focuses on the domain of Cancer research, and its ultimate objective is the design, development and validation of an integrated Grid enabled technological platform in support of post-genomic, multi-centric Clinical Trials on Cancer. The driving motivation behind the project is our committed belief that the breadth and depth of information already available in the research community at large, present an enormous opportunity for improving our ability to reduce mortality from cancer, improve therapies and meet the demanding individualization of care needs.

In addition to their shear volume, the data collected using a variety of laboratory technologies and techniques are often published without the background information (method of capture, sample preparation, statistical techniques applied) that is needed to reproduce results. In fact, a typical researcher spends as much time trying to understand the origins of a dataset as actually performing new analyses. Rarely is a clinical biostatistician able to make good use of data collected on studies in which they were not directly involved with, largely due to incomplete or non-existent annotation and standardization of the information. Even within a single laboratory, researchers have difficulty integrating data from different technologies because of a lack of common standards and other technological and medico-legal and ethical issues. As a result, very few cross-site studies and clinical trials are performed and in most cases it isn't possible to seamlessly integrate multi-level data.

The ultimate objective, therefore, of the ACGT project is the development of a Semantic Grid infrastructure offering high-level tools and techniques for the distributed mining and extraction of knowledge from data repositories available on the Grid, leveraging semantic descriptions of components and data and offering knowledge discovery services in the domain of cancer research. Special emphasis is been given to the trust that needs to be embedded in the platform and relevant ethical issues, thus creating optimal conditions for its uptake.

In achieving this high level objective, the project focuses on:

- ⇨ *the development of a Master Ontology on Cancer. The ACGT Master Ontology is the corner-stone of our semantic integration architecture. The ACGT Master Ontology is meant to constitute a reference ontology for the field targeted by the ACGT project, and its objective is to enable the semantic data integration across its various sections. We plan for the ACGT master ontology to be part of the OBO Foundry, whose aim is to develop interoperable reference ontologies for the biomedical domain based on the realistic approach;*
- ⇨ *the development of* a "Mediator" to hide the complexity of query translation and data integration. While following the state of the art in the area, it proposes an innovative approach to semantic mediation. In this approach, the user performs queries against a single, "virtual" repository. This virtual repository represents the integration of several heterogeneous sources of information. This integration

process relies on a common interoperability infrastructure, based at the conceptual level on a domain ontology;

- ⇨ implementation of clinical trial management systems based on an ontology driven software development process, which should result in semantically consistent clinical trial systems in the future;
- ⇨ implementation of open, standards based data access services, thus providing uniform access to heterogeneous clinical trial, genetic as well as public biological databases;
- ⇨ implementation of a range of bioinformatics and other biomedical data analysis and visualisation tools and grid-enabled knowledge discovery tools as well as the seamless discovery, integration and management of these sharable information assets, i.e. data and tools operating on such data. As a result, the issue of metadata becomes of paramount importance for the successful achievement of the project objectives and the project is devoted substantial R&D on such metadata related tasks;
- ⇨ central to the workplan of ACGT is the notion of discovery workflows. In essence a workflow can be abstracted as a composite service, i.e. a service that is composed by other services that are orchestrated in order to perform some higher level functionality.
- ⇨ the annotation of services and workflows with semantic descriptions. An adequate and convenient way of annotating workflows with metadata is of paramount importance for their posterior discovery among repositories of useful workflows based on their purpose, internals and field of application characteristics;
- ⇨ finally, the definition of an integration architecture, which has a complex layered organization, involving security, data anonymization, GRID-distributed computing, uniform database access, etc which enables the seamless semantic publication and discovery of data, tools and services as well as their dynamic composing in e-science discovery workflows and their execution on the Grid.

2. Contractors Involved

The project's scientific coordinator is Manolis Tsiknakis from FORTH, Greece (tsiknaki@ics.forth.gr) and the network administrative coordinator is Remi Ronchaud (remi.ronchaud@ercim.org) from EEIG ERCIM, France.

The participants to the ACGT project are the following:

GEIE ERCIM, FORTH, INRIA, University of Amsterdam, Philips S.A., Institute Jules Bordet, SIB, Lunds University, University of Malaga, UPM, FhG, BIOVISTA O.E., University of Crete, University of Hannover, PSNC, Custodix, Healthgrid, Institute of Communications and Computer Systems, University of Saarland, SIVECO S.A., FUNDP, University of Hamburg, University of Oxford, Hokkaido University, and European Institute of Oncology.

3. Work performed

3.1 - User Needs

The project has selected indicative Clinical Trials on Cancer, namely breast cancer, pediatric nephroblastoma and in-silico modeling and simulation of tumor growth and response to treatment, for the initial requirements gathering activity. Since we see the requirements engineering process as a structured set of activities which will lead to the production of the final system requirements, an iterative requirements engineering process has been adopted, mainly based on scenarios and prototyping.

Explicit scenarios, presenting both user-driven stories expressing user-needs, as they are documented by representative users, as well as technology-driven description of requirements of the system under design, representing indicative functionality, as understood by experienced technological experts, have been developed. These scenarios provide a guiding thread for the development of the ACGT infrastructure by listing typical requirements and tasks that occur in clinical studies.

The project intends to continue the development of additional such scenarios, by reaching out to the wider user community that will be the future users of the ACGT technological platform, a fact already foreseen in its DoW.

3.2 - Clinical Trial design

The ACGT trials have been defined in details in terms of their objectives, design and implementation. Specifically:

- The ACGT trial on breast-cancer will investigate pre-operative chemotherapy treatment and responses in order to identify indicative individualized patients' profiles. The whole effort will rely, and enhance, the TOP-trial on breast-cancer.
- Clinical trials for Wilms´ tumor should continue to seek risk factors for further stratifying and individualizing treatment. This will improve the cure rates for high risk patients by intensifying therapy and the quality of life for children with more favorable prognosis by lowering therapy to a minimum that is required.
- The in silico oncology trial concerns the validation, adaptation and optimization of an advanced computational system, the "Oncosimulator", able to simulate within defined limits of reliability tumor growth and tumor and (to a lesser extent) normal tissue response to therapeutic schedules. The special cases of nephroblastoma and breast cancer will be addressed.

The specific questions of representative users have been defined as well as their analysis tasks in the form of "indicative scenarios". These scenarios are now the basis for the technical work of the project and the demonstrators been implemented.

Supported by "in-vitro" and preliminary "in-vivo" data, briefly summarized above, this study is designed to test prospectively the value of Topo II alpha gene amplification and protein overexpression in predicting the efficacy of anthracyclines. This study could have important practical implications in the daily clinical management of early breast cancer patients because, if the trial confirms that Topo II alpha gene amplification and/or protein overexpression are associated with high efficacy of anthracyclines, while Topo II alpha normal/deleted gene and low protein content are associated with modest efficacy, an important step forward in the direction of anthracycline "tailoring" would be accomplished.

3.3 - Ethical and Legal framework

The ethical, legal requirements have been studied extensively regarding (a) clinico-genomic research within the ACGT architecture, especially with regard to informed consent and disclosure of research results and (b) data protection and privacy. The goal to be achieved is to establish a structure where the competing aims of modern genetic research and the data protection needs of the participating patients can be met.

The general terms for ACGT, consent forms and other agreements to allow and rule the data processing within ACGT have been produced.

The required security framework has been defined in terms of procedures as well as technologies. Implementation has been initiated.

3.4 - Specification of the ACGT Architecture.

The current state of the art architectural style for building distributed applications is the so called Service Oriented Architecture (SOA) where the building block is the notion of Services. The SOA methodology has been also adopted by the Grid computing community and we currently see a convergence of Web Services and Grid Services in the context of Open Grid Service Architecture.

An architecture based on services and their interactions has therefore being defined for the development of the ACGT infrastructure, which is intended to describe the structure of a system in terms of computational components and their interactions, patterns that guide their composition and constraints on these patterns. In the general ACGT environment the workflow authoring and management tasks play a central role as a means to support the knowledge discovery process. Therefore the architecture defined supports also the publication, discovery, invocation, and management of workflows and it will be further elaborated during the course of the project.

The security layer of the architecture has been defined in detail: Access rights, security (encryption), trust buildings are issues to be addressed and solved on this layer, based on system architectural and security analysis. Implementation of domain specific security services, such as pseudo-anonymization and anonymization services, which are modelled and invoked through this layer, has also begun.

3.5 - Implementation related activities

1. The Basic Grid layer and Advanced Grid Layer of the ACGT architecture have been established in a number of sites. The Common Grid Infrastructure layer comprises the basic "Grid engine" for accessing remote resources in grid environment. It provides common interface for grid resources used by higher level services. The Advanced Grid Middleware layer comprises advanced Grid services, which operate on sets of lower level services to provide more advanced functionality. Examples of such services include the Gridge Toolkit (GRMS, GAS, Monitoring Tools, DMS, Mobile support services), the OGSA-DAI and other ACGT specific services.
2. Implementation of the Data Access Services has begun. These are services that provide seamless and interoperable data access services to the distributed data sources, including public databases and in house Clinical Trial Management databases. These are based on the OGSA-DAI specification, which is appropriately extended to deal with the types of data available in ACGT.

3. Implementation of the ACGT Business process services layer is also advancing well. This layer includes all the ACGT specific services, such as the ACGT Master Ontology, the Clinical Trial on Cancer Metadata Services, the Semantic Mediation services and the distributed and privacy preserving data mining and knowledge discovery services. Of particular importance is the release of the first edition of the ACGT Master Ontology on Cancer, due to the fact that it represents a critical path in the project's implementation plan and a number of other activities depend on its availability.
4. Development activities have also begun with regards to the User access and high level interoperability services layer. This layer allows users to realize complex biomedical applications (e.g. "in silico" experiments) as composition of basic services, which will be executed on the Grid, exploiting the resources and data provided by research centres forming different Clinical Trial Virtual Organizations. Key tools at this layer are: tools for the browsing of domain ontologies (i.e. Ontology viewer) for the search, selection, and location of resources (data access and analytical services), to be used in the composition of applications as well as workflow-based modelling (i.e. the workflow editor) and scheduling (i.e the workflow enactor) of distributed applications on the Grid.
5. Initial analysis of the domain of meta-data in biomedical informatics and clinical trials has been completed. Implementation decisions have been taken and implementation has begun. The repository for workflows and services is the central point of reference for storing, searching, and retrieving workflows and information about workflows. Each workflow has a set of metadata associated with it, like the creation date, the author, the semantic description of the inputs and outputs with reference to the master ontology and the service ontology, the application domain, and so forth. Furthermore the workflow repository is responsible for storing provenance information about a workflow's execution and its artefacts, like the data produced, profiling information, etc. All this metadata information is expressed through RDF and is searchable by means of the SPARQL query language in order to support flexibility and expressiveness.
6. Definition of integration guidelines and the selection of technologies and standards have also been completed.
7. Additional clinical trials have also been defined.
8. A concrete dissemination plan has been drafted
9. An Initial exploitation plan is also complete.

4. Results achieved

The project has made significant progress during the reporting period. Requirements have been gathered, elicited and analysed. A range of post-genomic "scenarios" have been defined. Based on such a requirement set, the initial functional architecture based on services and their interactions has being defined for the development of the ACGT infrastructure. In the general ACGT environment the workflow authoring and management tasks play a central role as a means to support the end-users knowledge discovery processes. Therefore the ACGT architecture also supports the publication, discovery, invocation, and management of scientific workflows and it will be further elaborated during the course of the project.

Key services at the various layers of the architecture have been identified and their functional requirements documented. An “inventory of the ACGT tools and services” has been compiled and assignments for implementation been made.

Crucial technical decisions, related to technologies and standards to be adopted, have been taken. One such crucial decision is related to our approach to schema integration. In ACGT, we apply a LAV (Local as View) approach to schema mediation. In this approach there pre-exists a global schema (i.e. the ACGT Master Ontology). Local schemata to be integrated are mapped to the global schema so that local schema elements are completely expressed in terms of the global schema. This requires a global schema powerful enough to cover the possible semantics in the local schemata. The advantage of this approach is the tight integration and powerful capabilities of reasoning on the integrated data, in particular across data from all different sources.

Initial implementations of key architectural components, e.g. the ACGT Master Ontology, the ACGT Mediator, the ACGT basic and advanced Grid layer, Data access services for access to certain types of biomedical data, the ACGT Portal, etc are already available.

The project is currently focusing on a limited set of “proof of concept demonstrators”. Each Demonstrator is related to one or more of scenarios developed and presented in D2.1 and subsequent Deliverables. These ACGT initial demonstrators enable us to (a) Crystallize requirements and (b) to perform early validation of our architectural, technical and scientific approaches.

5. Expected results

This project aims at improving quality of European clinical trials leveraging on latest advances in information technology and computer science. The improvement in clinical trials are going to be achieved through a fully integrated handling of patient's biomedical profile, which requires a deep semantic integration of all data sources related to the subject involved in the trial, and by making this highly integrated set of data and computational assets available to end users with compelling user interface.

Although the targeted areas chosen are focused on Paediatric oncology and Breast cancer, the infrastructure which the project is aiming to develop and deploy could be easily exploited by and extended to any other disease area, after appropriate tailoring. Ultimately, the most important beneficiaries of ACGT will be the cancer patients themselves and the public at large.

The expected results of the ACGT project comprise:

- *The Engineering of a Master Ontology (MO) on Cancer*: In order to ensure the means of the ACGT MO quality management, we have decided to aim at incorporating our ontology into the OBO Foundry, which is a collaborative effort, involving a group of ontology developers who have agreed in advance to the adoption of a growing set of principles specifying best practices in ontology development.

- *Developing software tools and research strategies* that enable users to move away from labor-intensive case-by-case modelling of individual applications, and allow them to take full advantage of generic adaptive and self-learning solutions that need minimal supervision.

- *Improving interoperability through understanding* by enabling data descriptions at high semantic levels. To this end ACGT researchers will contribute to relevant

international standards and protocols. This meta-content may apply to data, processes, services, information or knowledge and could help to horizontal and vertical integration.

- *Workflow Management:* In a clinical trial environment there are combined processes based on previous results and materialized through a multi step stateful operation. To support automation of these kinds of processes, workflow management becomes an essential part of our architecture.

- *Developing disease models:* Accurate models can be utilized as the components of complicated simulations with the purpose to study and analyze the interrelations between patient organism types, disease factors, possible treatments, etc. Such procedures can provide critical intelligence and look-ahead on treatment possibilities or indeed any process that can be described by means of the models.

- *Creation of expressive interfaces* that will be able to effectively assist users in the exploration of complex and rich biomedical databases.

- *Spreading of expertise and excellence* through dissemination, training and industrial liaison, contribute to the distribution and uptake of the technology by relevant end-users.

6. Intentions for use and impact

Europe needs more integrated clinical trials, and therefore the end results of this project are still extremely relevant since these can have a profound impact on Europe's needs in this field. It is needed to get the research information rapidly flowing into the clinical trial design and assessment, in a coordinated way.

ACGT's vision is to become a pan-European voluntary network or grid connecting individuals and institutions to enable the sharing of data and tools, creating a European Wide Web of cancer clinical research; the ultimate goal being to speed the delivery of innovative approaches for the prevention and treatment of cancer. *ACGT* will offer the benefits of ***open access*** to a rich pool of ***interoperable*** *tools, shared data* and *standards* to the Cancer Research Community, and also the ability to participate and contribute without compromising individual innovation and creativity.

The infrastructure and tools created by ACGT also have broad utility outside the cancer community. Ultimately, the most important beneficiaries of ACGT will be the cancer patients themselves and the public at large.

1 Project Objectives and Major achievements during the reporting period

1.1 General Project Objectives

In order to achieve its goals and objectives, *ACGT* will create and test an infrastructure for cancer research by using a virtual web of trusted and interconnected organizations and individuals to leverage the combined strengths of cancer centers and investigators and enable the sharing of biomedical cancer-related data and research tools in a way that the common needs of interdisciplinary research are met and tackled.

Strategically, the *ACGT* project addresses the following needs and challenges related to biomedical, technological and scientific aspects:

- ⇨ Integration of Clinical Research Centers on Cancer with varying needs and capabilities in a common network for sharing data, applications, and technologies.
- ⇨ Development of a useable and scalable *biomedical grid* that Clinical Research Centers on Cancer will actively use for added value clinical trials.
- ⇨ Demonstration of new enabling tools for supporting multi-centric Cancer Center research.
- ⇨ Development of new component-based data analysis and *knowledge discovery* tools and modification of existing ones so as to utilise the advantages of grid computing, and enable high-performing data-mining and biomedical knowledge extraction operations.
- ⇨ Utilisation of clinical trial management systems based on *standard*s-based and *component*s-based *clinical trial management systems*, integrative cancer research applications and innovative tools to support (a) ontology-based integration and sharing of data and biomedical information and (b) advanced data mining and biomedical knowledge extraction.
- ⇨ Sharing of biomedical information and data upon common standards and utilisation of and in a manner that protects data privacy and security.
- ⇨ Fostering common usage of vocabularies, common data elements and the formation of a unifying architecture for the support of the advanced clinico-genomics clinical trials of the future.

Integration targets all levels – from molecular to the human and the population. GRID-enabled mediation functionality (realised by respective software components, tools and services) compose the mean toward a knowledge-enriched, effective and reliable integration.

1.2 Current relation to the state of the art

The following is an extract from the paper "Morris A. Swertz and Ritsert C. Jansen. Beyond standardization: dynamic software infrastructures for systems biology", published in Nature Reviews, Vol. 8, March 2007, pp. 235-243.

"…Systems biology can (and should) move from slow and expensive, almost one-at-a-time, practice to a much more cost efficient many-of-a-kind practice in which biologists can quickly obtain customized software infrastructures that meet their specific needs. What must be done to make the most of it?

A repository to share DSL models, or modules thereof, will help to keep different research groups on the same track, because they can oversee the few changes in a single DSL file much better than they can oversee many related changes that are spread throughout software code. The Online Showcase (BOX 2) demonstrates how that could work: everyone involved can find, learn, reuse and customize infrastructure variants for sequences, microarrays and systems genetics using just one simple DSL. An accompanying repository of code generators and reusable assets helps to share and evolve resources at the software level. These efforts could result in an infrastructure platform for systems biology, analogous to the R-project.

Variants from separate software families need to be 'pluggable' to allow comprehensive infrastructures that, for example, integrate data management and analysis. …….This also requires some common software standards, such as web services. The other families must bridge their incompatible reusable assets in a similar way, which could result in a 'software population'68 for systems biology in which software infrastructures from all families can work seamlessly together."

It proves, we believe, the fact that the ACGT project is focused in delivering a much-needed infrastructure. If successful the implications of the project will be enormous.

We also believe that the project is providing state-of-the-art solutions in its main sub-domains of activity. The project has evaluated the results of many relevant projects and initiatives, has selected appropriate results for adoption, whilst it proceeds the design and development of new tools and technologies that are required and specifically tailored for the domain of post-genomic clinical trials.

1.3 Recommendations from the last review

The recommendations from the last review were:

1. End-Users must be more tightly engaged in project policy and direction.
2. Dissemination and exploitation must be further addressed.
3. Legal issues must be addressed more deeply.
4. Project management must improve the quality of its work.
5. Quality and risk deliverables must be resubmitted.

All these recommendations have taken into consideration and have been acted upon. Specifically:

1. Significant efforts have been devoted by the management to increase the level of engagement of the users. Several meetings were held with all clinical users, issues

were discussed and specific areas for contribution by each end-user organization were identified.

Today, all clinical partners are fully engaged in all critical project areas, i.e. requirements elicitation, ontology development, clinical trial design and preparation, specification of additional clinical trials and/or studies, dissemination, development of project presentation material. More importantly they fully engaged in direction setting and the definition of the project strategy for exploitation.

2. During the period since the last review the project dissemination plan, has been in the focal point of project activities. As a result, it became obvious to management that there is a need to support the partners with the responsibility for dissemination in their task for formulating project messages and identifying appropriate dissemination channels. As a result, (a) an Editorial Board has been established in which end-users have a major role and (b) management has taken an increased responsibility itself. As a result, it our belief, based on initial results, that project dissemination activities are improving and that the dissemination plan formulated will enable a much more aggressive and coherent dissemination to be established.

3. The ethical and legal issues have been fully addressed from the beginning of the project. They are driving several key dimensions of the project, such as the security architecture of ACGT. The two deliverables produced by the relevant WP (WP10), in the period since the last review, lay down the required foundations for the implementation of an ethically, legally and secure technological infrastructure for the project, both in terms of the technical solutions as well as in turn of procedures and processes.

4. Project Management is also increasing the quality of its work. Regular bi-weekly conferences of the Management Board (MB) have been established. A Technical Management Committee (TMC) has been established to assist the Technical Manager in the day-to-day management of the technical aspects of the project, which also holds regular (bi-weekly meeting). SKYPE is now employed to facilitate some of the conferences of the MB and/or the TMC.

5. The Quality and Risk Assessment deliverables have been revised and re-submitted.

1.4 Summary of objectives for the reporting period, work performed, contractors involved and the main achievements in the period

The main objectives for the reporting period had been to establish the foundation of the project, from a management, legal, scientific and technological point of view. We believe that these objectives have been achieved.

- All foreseen management structures have been established and are operational supported by state of the art communication/collaboration tools. The only remaining activity is the extension of the External Advisory Committee of the project with representatives of Patient Associations. Such individuals have been identified and discussions are expected to conclude shortly.
- The legal framework for the implementation of the project has been studied, analyzed and designed. Concrete activities required have been identified for implementation in year two.

- From the scientific and technological point of view, the project has made significant progress. Crucial decisions have been taken (e.g. with respect to the grid middleware technologies, the approach for heterogeneous database integration and the design of the mediator, the design of the meta-data repository, the selection and methodological approaches

The work performed has been of a high level, and it was produced with the active involvement of all contractors. Most of the initial "problems" related to engaging all partners in a constructive way have been overcome.

1.5 Most important problems during the period including corrective actions undertaken

It is our view that the most important problems that the project faced during its first year of its implementation have been:

- The challenge to develop a common and shared understanding of the vision on which the project builds upon. Such conflicting perceptions on this important aspect has been identified as a risk element, which we have addressed through close discussions and a series of internal discussions both at the Management Board level as well as at the Consortium level.
- The challenge to create the required "common language" between the many scientific disciplines that constitute the ACGT partnership. The establishment of the project Wiki, the development of the project Glossary, as well as open discussions during the various project meetings, have today created a community with clear and shared objectives.

The Dissemination of the project has also slightly been an issue. We believe that the main reason for this is again the complex nature of the project itself. The management realized this and has taken corrective actions, i.e. created an editorial board (mainly composed by end users as well as the Exploitation WP manager) to feed the dissemination team with material, assisted the dissemination team, by working very closely with them, in preparing the initial dissemination plans and in understanding the specific aspects of dissemination that the project requires.

In addition to these, the issue of data ownership & security has also been a difficult issue to handle. For a large-scale deployment of the ACGT infrastructure, it is important to leverage security up to a trustworthy level of confidence. Secure transmission must be complemented with secure storage, higher security mechanisms that could avoid malicious users granting unauthorized access to part of the Grid to be able to decrypt and visualize personal data. Current grid security and privacy models are not adequate for deploying applications that can be certified by end users and health authorities. As a result ACGT has developed a clear, but yet complex, security framework. This has at times created internal conflicts, since the security framework (as is usually the case) constrains flexibility and freedom.

2 Workpackage progress of the period

All project WPs were active during the reporting period. An overview of the actions carried out by each WP is given in the subsequent sections.

WP 1 – Project Management

Partner Responsible: ERCIM and FORTH

Contributing partner(s): FORTH, Philips, UPM, FHG, PSNC.

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The objective of this Workpackage is to ensure a strong and coherent administrative and financial management of the project. This activity can be subdivided in two main parts:

(i) Administrative and Financial Coordination;

(ii) Scientific Coordination.

This activity is lead by ERCIM, represented by Remi Ronchaud, with the support of the ERCIM Office team.

The administrative coordination was concerned first and foremost with the implementation of the project's management architecture, including decision-making processes, and the establishment of efficient communication mechanisms for knowledge and information exchange (e.g., BSCW shared workspace, mailing lists, on-line reporting tools).

The co-ordination of the large number of activities composing the ACGT project and the validation of the quality of the produced results required a strong managerial effort.

In particular, from the scientific point of view the project activities were monitored and coordinated through several exchanges with the partners both by participating in official meetings of the project's governing boards (i.e., Management Board, Steering Committees) and by a large number of personal phone and e-mail exchanges. Much effort has also been dedicated to guaranteeing that all of the activities are performed in the scheduled time and to manage unplanned situations, such as the need for more extensive experimentation.

From the technical point of view, a Management Board was set up and established during the first days of the project; the Management Board is composed of one representative from each work package. The objective of this committee, created to favour and speed-up the test-bed development, is to discuss technological choices and agree on solutions that affect the design of multiple services. This committee is lead by Manolis Tsiknakis, FORTH, and benefits from the commitment of the Quality Manager, Norbert Graf, USAAR..

Emphasis was placed on the establishment of certain cornerstones of proper project management: quality assurance and risk management being the leading priorities. First, quality control procedures have been discussed at length to ensure that deliverables and reports achieve the standards of quality expected by the project's governing boards and to

monitor the image ACGT exposes to the external environment via dissemination activities. A *Quality Assurance Plan* was created for project participants and completed by a dedicated ACGT project handbook, serving to collect all of the project's procedures and resource structures. Risk assessment and contingency planning report was also produced to determine the general procedures to address potential issues that could affect the project. The risk assessment is a permanent activity within ACGT and the document is frequently updated by all the Management Board members.

A great deal of effort has gone into educating the consortium on both financial and reporting mechanisms under the Sixth Framework Programme, and IPs in particular. Guidelines were produced to complement the Commission's financial guidelines and project reporting documents and present them in a "readable" manner more suitable for researchers. A two-hour training session to all project participants was also accorded for the purposes of cost reporting and audit certificate production.

Regular contact was maintained with the Commission for both day-to-day issues, but also maintenance of the EC contract. In particular, the consortium has to integrate the legal name change of Partner 12 (LUH) and to integrate a specific clause to support the participation of the members composing a joint Research Unit linked to INRIA.

Progress towards objectives

The work accomplished by this Workpackage during the reporting period is reported in a next section entitled "Consortium Management".

Deviations from the project work programme, and corrective actions taken/suggested

There was no problem encountered, yet the necessity to revise the contract to integrate the INRIA Joint research Unit had to be addressed urgently, with no impact of the project management as a whole. The contract amendment has been prepared and submitted to the European Commission at the end of Year 1.

List of deliverables, including due date and actual/foreseen submission date

D1.1.1 Six monthly progress report – Completed

D1.2 Quality Assurance Process – Resubmitted

D1.3 Project Handbook – Completed

D1.4 Risk Assessment – Resubmitted

List of milestones, including due date and actual/foreseen achievement date

MWP1.1 Formation of boards and committees (month 2) – Completed

WP2 – User Needs Analysis and Specifications

Partner Responsible: USAAR

Contributing partner(s): FORTH, Philips, IJB, SIB, UMA, UPM, FHG, BIOVISTA, UOC, UHANN, PSNC, Custodix, ICCS, SIVECO, UoH

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The Workpackage has the following major objectives:

1) To review current guidelines for clinical trials, tools and software for the management of clinical studies
2) To define the needs for clinico-genomic integration
3) To ensure the feasibility of implementing clinical studies for cancer into ACGT by providing specific clinico-genomic scenarios

Clinical aspects are one major focus of the project. The state of art review in clinical trials is a main objective, which is necessary to develop an integrated environment for cancer research on the Grid (T2.1). Main points that have to be investigated and reviewed are:

- User needs including tools for clinicians and basic researchers to facilitate interdisciplinary research and communication by respecting legal and ethical issues (T2.2)
- Current guidelines for clinical trials (e.g. ICH and GCP)
- Tools and software for the management of clinical trials
- The needs for clinico-genomic integration, including technological, legal and ethical issues, security and quality control, was defined.
- Specific clinico-genomic scenarios have to be defined (T2.3)

It should be stressed that the user needs from the legal and ethical as well as from the technological perspective will be consolidated within the corresponding WPs and feedback will be given back to WP2

Progress towards objectives

(a) USAAR hosted the kick-off meeting of this work package at IFOMIS in April 2006. The main focus was laid on clinical aspects of the project. The state of art review in clinical trials was a main objective providing an elaborate and thorough state of the art review on all aspects which are relevant to ACGT. Task leader for T2.1 was Manolis Tsiknakis. In preparing the deliverable the following partners made contributions:

- SOA in clinical trials – USAAR – Norbert Graf
- SOA in Grid technologies and middleware – PSNC – Jarek Nabrzyski
- Data access services – Philips – Anca Bucur
- Modelling of the future clinico-genomic Electronic Health Record - Philips – Anca Bucur

- Tools for the creation and management of clinical trials – FhG/IBMT&FORTH – G Weiler/S Kiefer & M. Tsiknakis
- Data mining and knowledge discovery (DM/KDD) - Grid enabled DM/KDD – FhG – Michael May
- Bioinformatics methods and tools - Grid enabled DM/KDD – SIB & UMA & FORTH –Thierry Sengstag & O. Trelles & G. Potamias
- Biomedical (Cancer) Ontologies – IFOMIS – Anand Kumar (done both for WP2 and WP7)
- Semantic mediation – UPM - Victor Maojo
- In silico modelling and Simulation – ICCS – G Stamatakos
- Workflows Management and Enactment Systems – FORTH&FhG/IBMT – M. Tsiknakis & S. Sfakianakis & S. Kiefer
- Visualisation techniques and standards – Biovista&FORTH – A. Persidis&I. Tollis
- Legal and Ethical Guidelines – UHANN – N Forgo
- Security related issues – Custodix – Brecht Claerhout
- Evaluation Methodologies - SIB - Thierry Sengstag
- Online training platforms and standards - Siveco – O. Zelch & L. Majorescu

(b) Together with the University of Malaga (UMA) a questionnaire regarding task T2.2 was carried out, disseminated, analyzed and interpreted. The results can be found on the BSCW server (https://bscw.ercim.org/bscw/bscw.cgi/117400).

(c) Specific clinico-genomic scenarios were developed for testing the ACGT platform (T2.3). Eight major scenarios are described in D2.1

- SC1: A Complex Query Scenario for the TOP Trial
- SC2: Identification of nephroblastoma antigens
- SC3: Correlating phenotypical and genotypical profiles
- SC4: Reporting of Adverse Events and Severe Adverse Reactions
- SC5: In-silico modelling of tumor response to therapy
- SC6: Molecular apocrine breast cancer
- SC7: van 't Veer study
- SC8: Antigen Characterisation Scenario

These scenarios can be found on the BSCW server: (https://bscw.ercim.org/bscw/bscw.cgi/99048), as well as in the WIKI of the ACGT project (http://wiki.healthgrid.org/index.php/ACGT:Index).

For the Antigen scenario hospitals taking part in the ACGT Nephroblastoma trial were contacted and asked for serum of patients. Up to now (31st of January 2006) 30 sera have been sent to the laboratory performing the analysis of antigens. Phase I of the antigen scenario is finished with the experiments in the laboratory. The characterization has started.

Further scenarios will be developed including a scenario for anonymisation and pseudonymisation.

A scheme for the development of new scenarios was defined. It can be found on the WIKI (http://wiki.healthgrid.org/index.php/ACGT:Scenarios/Development)

IFOMIS collaborated with clinical partners in order to integrate user needs into the ontology. On the other hand basic aspects of ontological engineering have been disseminated among the partners defining user needs.

The review of guidelines for clinical trials, tools and software for the management of clinical studies was well done and is described in D2.1.

Biovista participated in the discussions and user needs elicitation process.

Biovista also demonstrated its literature mining technology to one of the two main user partners with which we are in collaboration on an existing medical problem of interest to them.

Deviations from the project work programme, and corrective actions taken/suggested

There was only one problem occurring during the work program. The questionnaire regarding User Needs and Requirements was started after the Management Board meeting in Budapest in May 2006. Only few partners did answer to the questionnaire. This was not increased by contacting the partners several times by UMA and USAAR. The reason for this problem is unknown. It did not cause a time delay. The questionnaire was finalized in time.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 2.1 was finished, reviewed and finalized during this period. The final version will be delivered to the commission by the 15th of September.

List of milestones, including due date and actual/foreseen achievement date

Requirements and specifications for the ACGT integrated platform (MWP2.1) as a major Milestone was achieved in time.

WP3 – Architecture and Standards

Partner Responsible: PSNC

Contributing partner(s): FORTH, UvA, Philips, LundU, UMA, UPM, FhG, BIOVISTA, Custodix, ICCS, USAAR, FUNDP, UH, UHok

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The objectives of this WP are:

1) to invent and define the reference grid architecture to support complex project collaboration and to provide a blueprint for grid implementations in this project and beyond and
2) to design the overall architecture of a grid based interoperability system for the biomedical sector and make a substantial contribution to standards.

Progress towards objectives

During several discussions, meetings and telephone conferences of the WP partners we have decided to use the following approach to achieve the goals of the WP:

- Define a common vocabulary. This task was critical, since the project involves many partners from many domains, all speaking different languages in terms of their domain (not nationality, but this is also often a problem).
- Focus on 'what' not 'how'. We decided to put emphasis on identifying the things that have to be done, rather than providing immediate answers on “how they are to be done”. The only way to achieve this was to carefully study the requirements of all the users. These requirements were coming from WP2 and the requirements defined the scope of work.
- Detect the actors: This was another important thing: to identify the actors within the project and within the future architecture of ACGT. There are many actors within ACGT infrastructure: doctors, biologists, researchers, patients, and WP3 took into consideration their respective requirements
- Define use cases: based on the requirements, but also on the project scope, while talking to users, we proceeded to define indicative use cases. Actually, this work has been done within the scope of WP2.
- Work on scenarios: We investigated and focused on the developed scenarios for all user/actors groups, usually involving more than one actor. Define general vision of work with ACGT 'system'.

Based on the steps and requirements defined above we have delivered the ACGT initial architecture. As an additional initial point we studied the proposed architectures of projects such as: caBIG, InteliGrid, myGrid, DataMinigGrid, EGEE and GridLab. Further, looking at the project objectives we hold meetings and discussions with EGEE exploring our possible cooperation with EGEE. Following these activities we have defined our own architecture. The architecture is presented in deliverable 3.1 which was delivered in time.

Deviations from the project work programme, and corrective actions taken/suggested

There were no deviations from the workplan.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 3.1: ACGT Initial Architecture, Due date: month 9, delivery date: month 9.

List of milestones, including due date and actual/foreseen achievement date

M3.1 The ACGT initial architecture (month 12)

WP4 – Biomedical Grid Technology Layer

Partner Responsible: PSNC

Contributing partner(s): FORTH, UMA, FhG, Custodix, Siveco, UHok

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

1) to provide semantic grid services that take advantage of the grid functionality, such as security, etc.
2) to provide interfaces to state-of-the art grid databases
3) to define and provide the information grid that is capable of secure, safe, semantically rich, and ontology committed information
4) to enable an ontology aware biomedical grid infrastructure into which all biomedical information, handled by sector applications is stored
5) to provide access capability to distributed computational resources, mainly relying on existing functionality of the grid toolkits, but taking into account the possible exploitation of the higher level semantics that will be built into the grid in WP7
6) The infrastructure will mostly be based on the PSNC's Gridge (aka GridSuite) bag of grid services, enriched with some other selected tools and features, depending on the need.

Progress towards objectives

We have consolidated the requirements defined in WP2, concerning the Biomedical Grid Technology Layer. Available grid middleware and toolkits were studied. The study addressed related standards and specifications. It also addressed interoperability needs for clinico-genomic trials. It identified requirements of a set of use cases for specific applications to provide a clear application data view of the data stored on the grid.

One of the initial actions that have been decided was to build an ACGT Grid testbed. The testbed is now under finalization and is serving mostly the ACGT developers as a development and testing platform, and from time to time as a demonstration platform.

The activities to prepare the testbed and the required coordination are run through the mailing list: acgt-wp4@inria.fr. So far we have installed a Globus Toolkit version 4.0.3. In addition, the following packages have been installed so far: Globus WebService Container (MDS4, WS-GRAM and RFT), GridFTP, Globus pre-ws gate-keeper.

All the systems working in the ACGT environment have been registered in a central VO Index Service. It can be viewed through :

http://moss1.man.poznan.pl:8080/webmds/

The Certification Authoruty for the project has been setup by Custodix. The Grid middleware, mostly Gridge components, has also been installed.

Deviations from the project work programme, and corrective actions taken/suggested

There were no deviations from the workplan.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 4.1: Security Infrastructure, This deliverable was merged with D11.1 and is part of this deliverable.

List of milestones, including due date and actual/foreseen achievement date

M4.1 Biomedical Grid deployment and demonstration (month 18)

WP5 – Distributed Data Access and Applications

Partner Responsible: Philips

Contributing partner(s): FORTH, IJB, LUNDU, UMA, UPM, FhG, BIOVISTA, UOC, ICCS, UdS, UOXF.BP, UHOK

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The Workpackage has the following major objectives:

1) To provide seamless and interoperable data access services to heterogeneous distributed data sources by developing a set of compatible software key modules / services based on Web Services.
2) To provide services for ontology-based ubiquitous interoperability within the integrated ACGT environment.
3) To define a generic architecture that enables distributed access to all relevant patient data (clinical, imaging, genomic/proteomic, etc.) available across the clinical trial sites.
4) To investigate architectural alternatives and design solutions to enable computationally intensive medical applications to make use of distributed (remote) resources

Tasks involved in WP5:

Task 5.1 carried out a consolidation of the user requirements analysis defined in WP2, concerning the distributed data access and applications environment.

Task 5.2 develops a set of compatible software key modules/services in order to provide seamless and interoperable data access services to the distributed data sources. These services will provide ontology-based ubiquitous interoperability among heterogeneous Information systems, i.e. Clinical, Imaging, Integrated eHealth Records, Microarray, SNP/Genotyping, etc. This approach will also support the development of the semantic mediation tools and services carried out in WP7.

Task 5.3 aims to design a generic architecture capable of enabling resource-intensive medical applications to use Grid technologies for improved performance and cost-effective access to large numbers of various resources (computational, data, information, etc.)

Task 5.4 will perform a survey of international efforts towards the standardization of the EHR in terms of content and structure, and exploiting the experiences of the *ACGT* post-genomic clinical scenarios and trials it will propose a model of an ACGT-specific EHR to include multi-level (including genomic/proteomic) information.

Task 5.5 is concerned with the development of an ontology based Clinical Data Management System and of a Trial Builder. The user requirements for an ontology based Clinical Data Management System and a Trial Builder specified in Deliverable 2.2 will be evaluated from a technical point of view. It will be decided what functionalities can be implemented in a first prototype of these tools. Technical details will be described in a conceptual specification.

In Task 5.6 a collaborative ACGT-wide work environment is being provided, to support group-to-group interactions and sharing of information.

Progress towards objectives

- Organized several WP meetings, included a 2-day kickoff meeting in Eindhoven.
- Provided WP5 presentations at various ACGT meetings, comprising progress, research directions, research issues, future work.
- Carried out preparatory work for Task 5.1 and Task 5.5 (requirements gathering):
- Workshop at IJB to collect relevant requirements with respect to data access for the TOP trial.
- Workshop at UdS to collect relevant requirements with respect to data access for the SIOP trial, and with respect to the tools for creation, management and monitoring of clinical trials.
- Spent multiple days at both institutes to get detailed insight into the clinical trials, the user needs, the data that is collected, the bio-molecular analyses that are part of the trials, etc. Subsequently, we have followed up with discussions to gather detailed information with respect to database schema and common queries for SIOP CRF database, and database views for TOP CRF database (Oracle Clinical). Also installed BASE (provided by Lund University) to obtain schema of this database. The resulting information has been documented in Deliverable 5.1.
- Supported clinical users in detailing the clinical scenarios to define and express the technical requirements.
- Close cooperation with UdS to work out Antigen scenario by an iterative process.
- Initiated the use of Wiki for collaboration within ACGT project, which involved setting up a trial wiki and presenting its capabilities. We have ensured that a suitable Wiki was set up, and created the initial content. Subsequently continued to contribute content, such as the biomedical and technical glossaries at Wiki.
- Together with UdS (Norbert Graf), prepared and organized a Requirements Engineering workshop during the consortium meeting in Crete. The workshop revolved around three topics that we had identified, where inter-workpackage discussions were needed. The topics were: querying, data access and data collection.
- Specified and analyzed the user requirements with respect to data access using a scenario-based architectural approach, CAFCR. Developed a system architecture and selected relevant technologies for implementing a solution.
- Explored relevant technologies, such as OGSA-DAI, DICOM, web services.
- Investigated web services technology using scenario SC2 from D2.1 as a case study. More specifically, we carried out Step 1 of the scenario solely by using existing web services. For this, web service clients were used that were provided by the web service provider (EBI).
- Subsequently we worked on building a web service client using a different web service toolkit. This led to the identification of significant incompatibility issues, which triggered further investigation of the current level of web service interoperability. Results are reported in Deliverable 5.1.
- Evaluated OGSA-DAI and decided on using it within ACGT as the interface for the data access services. Identified what functionality it does not (yet) support, where we therefore need to carry out further work.

- Also started using OGSA-DAI to build data access services for image data servers, using DICOM. For this, we have been looking into the DICOM protocol. This was also reported on in Deliverable 5.1. DICOM also provides a useful example how limitations of underlying data sources affect the wrappers for these services.
- Held a technical session in Malaga to discuss technical issues around developing an OGSA-DAI web service to access DICOM data.
- Worked on the development of prototypes of OGSA-DAI-based heterogeneous data access services.
- Developed the concept for the Clinical Trial Builder and Clinical Data Management System.
- Added Affymetrix support to BASE and performed ACGT needed modifications of BASE, such as adding web services.
- Worked on the definition of the main interactions with other WPs (WP7, WP11):
- Interface between the mediator and the data services
- Queries to be supported by the data access services, semantics, syntax
- Fulfilling privacy requirements
- Agree on security technology used.
- Produce the Deliverable 5.1 - Consolidation of user requirements with respect to distributed data access and applications.

Deviations from the project work program, and corrective actions taken/suggested

No deviations so far. However since the participating sites possess a heterogeneous collection of data management systems which may not all be accessible (due to hospital firewalls), and we cannot assume that they already have all the necessary data management systems to be able to use the ACGT integration platform, we propose to add a new task to the workpackage.

In this task we will look at the necessary database management systems that have to be deployed or (remotely) accessed by each site, and elaborate guidelines to use ACGT as an integration platform. We will investigate open source solutions and consider possible extensions when existing solutions do not fully satisfy the user's needs.

One important reason that ACGT data management systems may be needed is because hospital (clinical trial and/or laboratory) data management systems may exist, but they simply may not be accessible. E.g. images stored on a hospital PACS may simply need to be duplicated to an image storage system outside the hospital firewall in order to make them accessible within ACGT.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 5.1 was finalized. The final version was delivered to the commission on 15th of January.

List of milestones, including due date and actual/foreseen achievement date

MWP5.1 Specifications of the ACGT data access services (month 9), Part of Major Project Milestone M3 was reached in time.

MWP5.2 Grid services for heterogeneous data access (month 18), Part of Major Project Milestone M7, work is proceeding on schedule.

WP6 – Data Mining and Knowledge Discovery Tools

Partner Responsible: FhG

Contributing partner(s): FORTH, INRIA, UvA, SIB, LundU, UMA, UPM, Biovista, IEO

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The main objectives of WP6 are:

1) To adapt standard analysis modules for descriptive statistics and visualization, hypothesis tests, discriminate analysis, and survival analysis to the ACGT environment
2) To adapt advanced data mining and text-mining modules to the ACGT use cases
3) To provide an innovative and user-friendly interface to the analysis tasks

Progress towards objectives

Starting from the overall user requirements, as described in deliverable D2.1, and taking into account the additional experience of partners in the field of bioinformatics, data mining, and text mining, as well as input from other workpackages, several data-mining-specific requirements have been identified. The main requirements of D6.1 can be summarized as follows:

- The need to support standard data mining operations on the Grid infrastructure in a way that is transparent to the user (including specific data mining algorithms, but also more generic operations like validation, or parameter search)
- The need to support multiple user interfaces, which mirror the requirements of different user groups of the ACGT platform. This includes an interface from within the ACGT Portal for end-users, an interface from the workflow editor for bio-statisticians and bio-informaticians to construct new analysis workflows, and a programming-language interface in R to construct new operators.
- The need to support ontologies and meta data to assists in an automated construction, validation and execution of analysis workflows in order to avoid the need for detailed technical experience.

In addition, rather than providing an exhaustive list of necessary services and tools that need to be implemented, a list of scenarios including available data was compiled, that will serve as a guideline for the development of services. The scenarios were chosen in accordance with the overall scenarios of D2.1 and the ACGT pilot studies, such that once all the WP6 scenarios are supported by the knowledge discovery services, the platform will be ready to support the pilot studies as well. The scenarios are available inside the project's BSCW repository. All this activity culminated in the production of deliverable D6.1 (consolidated requirement analysis report for data mining, analysis and the visualization environment).

Since the completion of D6.1, the focus of the workpackage has shifted towards exploring the requirements for the creation of a metadata repository that will enable to storage and handling of semantically rich descriptions of services, workflows, data sets, and results in order to support high-level data mining operations. In addition, demonstration activities have begun to integrate existing analysis software into a grid environment and explore the combination of services.

One of the more technical achievements was the setup of a Grid test bed (in collaboration with WP4) and the deployment of initial services at the sites of different partners.

Deviations from the project work programme, and corrective actions taken/suggested

There are no deviations from the work plan at this point.

List of deliverables, including due date and actual/foreseen submission date

The deliverable D6.1, due at month 9, has been submitted to the commission.

List of milestones, including due date and actual/foreseen achievement date

None in the reporting period

WP7 – Ontologies and Semantic Mediation Tools

Partner Responsible: UPM

Contributing partner(s): FHG, USAAR, INRIA, PHILIPS, LUNDU, FORTH, BIOVISTA, SIB, IJB, UOXF, IEO

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The Workpackage has the following major objectives:

1) To provide, through the Master Ontology, a formal description of the knowledge domain of the clinical trials on cancer included in ACGT.
2) To develop a semantic mediation layer that integrates distributed and heterogeneous biomedical databases. This mediator is supported by the ACGT Master Ontology, which provides the necessary semantic background by modelling the domain.
3) To fully exploit powerful languages, such as OWL, in order to provide mediation services across a wide range of information sources, resulting in the implementation of the ACGT semantic mediation tools and services.
4) The core of the ACGT platform is formed by the semantic mediation layer. This is composed of several mediation services, and supported by the ACGT Master Ontology. The services will be provided to a number of tools developed inside the ACGT project, as well as end-users, who will get access to a query system that integrates a great number of biomedical sources concerning clinical trials on cancer
5) To, ultimately, develop the mediation technologies required for achieving a vertical integration among many different levels of granularity (molecular, cellular, tissue, organ, individual and population).

Tasks involved in WP7:

Work in WP7 includes the specification of user requirements regarding semantic mediation (T7.1). This task involves the consolidation of the requirements defined in WP2.

Ontological foundations of terminologies and ontologies from a content perspective are analysed in WP7 (T7.2). This includes the description of the ontological theory behind each relevant system and the description of the upper level of the ontology (or concept system) for each system studied.

The development of the ACGT Master Ontology (T7.3) is a central task and means the creation of a first-class ontology that covers the domain of clinical trials on cancer. It will provide a formal description of the domain of knowledge of the clinical trials included in ACGT, allowing achieving a vertical integration among many different levels of granularity (molecular, cellular, tissue, organ, individual and population).

Finally, initial semantic mediation tools and services will be designed and developed within WP7 (T7.4). These include the CRF editor, the mapping tool, the unification tool and the interfaces for end-users and analytical tools.

Progress towards objectives

The main activities, output and achievements of the WP during the reporting period were:

- Study of the state of the art on Database Integration - UPM
- Study of the state of the art on Ontologies and GRID, Images and KDD - UPM
- Partners tasks coordination - UPM
- Semantic mediation requirements analysis - UPM
- Deliverable D7.1 coordination - UPM
- Design of the first draft for the semantic mediation layer architecture - UPM
- Analysis of the integration of the Master Ontology in the architecture issues - UPM
- Design of the WP7 demonstrator - UPM
- Beginning of the implementation of the demonstrator - UPM
- Study of ontology languages, query languages and mapping format – UPM
- Creation of a Master Ontology for clinical trials in cancer - IFOMIS
- Elicitation of user needs, extracted from discussions and meetings with the Paediatric Haematology and Ontology Unit of University of the Saarland and with the Fraunhofer Institute for Biomedical Technology (IBMT) - IFOMIS
- Writing of a state-of-the-art review on “Biomedical Ontologies, Terminologies and Databases relevant to Oncology” and its subsequent uploading onto the BSCW server - IFOMIS
- Collaboration with other partners on two papers (first author: Manolis Tsiknakis) on the ACGT technical environment – IFOMIS, UPM (one paper)
- Active work on an extensive state of the art review for Deliverable 7.1 and contribution with further material and comments to that document - IFOMIS
- Assistance to quite a number of additional meetings, like the Technical Management Board Meeting, Athens, July 11-13 and the ACGT Pre-Review, Brussels, November 29-30. These contributions were important to present the basic ideas and features of the ACGT Master Ontology - IFOMIS
- Extensive work on the first draft of the ACGT Master Ontology. This work belongs to D7.2, due in month 15 of the project, and consists on ontological engineering of clinical trials and all other aspects relevant to ACGT - IFOMIS
- Research on possibilities to integrate the virtues of information models into the Master Ontology, including a meeting with Martin Doerr from Forth. on December 18th - IFOMIS
- Revision of deliverable D7.1: “D7.1 Consolidated requirements on Ontological approaches for integration of multi-level biomedical information” - IFOMIS
- Starting of the organization of a workshop on Ontologies and Information Systems for the Semantic Web for the 26th International Conferences on Conceptual Modelling (ER 2007), November 5-9, 2007, together with Martin Doerr, from Forth - IFOMIS
- Collaboration with the Haematology and Ontology Unit of Saarland University in the Master Ontology revision task – IFOMIS

- Contribution to ACGT Master Ontology through the specification of requirements and review - IBMT
- Contribution to Deliverable 7.1 “Consolidated Requirements on ontological approaches for integration of multi-level biomedical information” – IBMT
- Preparation and participation on WP7 kick off meeting (Madrid, May 2006) – IBMT
- Several local WP7 meetings in Saarland with IFOMIS – IBMT
- Study on cases of heterogeneity in mapping medical information systems to a core ontology, contribution to D7.1 – FORTH
- Collaboration with IFOMIS on introducing a generic model of scientific observation into the ACGT Master Ontology. - FORTH
- Writing of the technical report: * Haridimos Kondylakis*, * Martin Doerr*, * Dimitris Plexousakis*,/ Mapping Language for Information Integration, /2006, Technical Report 385, ICS-FORTH, December 2006
- Work focused on the development of a module for managing, querying and visualizing ontologies. The module has been applied to the Gene Ontology (G.O.). Biovista has also contributed to the ongoing discussions in this WP (Biovista)
- Understanding ontologies in ACGT context and meeting preparations and attendance. Research/knowledge mining of existing ontologies. Drafting of how BASE will use and support ACGT ontology. (LundU)

Deviations from the project work programme, and corrective actions taken/suggested

There was only one problem: the leave of Dr. Patrick Durand from Inria. Dr. Durand was the contact person for WP7, and his leave led to some organizational problems, mainly with the coordination of contributions to deliverable D7.1. However, there were no problems with the deliverable at the end.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 7.1 was finished, reviewed and finalized during this period. The final version was delivered to the commission on 15th of January.

List of milestones, including due date and actual/foreseen achievement date

MWP7.1 Initial ACGT master ontology for cancer trials (month 15) Major Project Milestone M5 is planned to be achieved in time.

WP8 – Technologies and Tools for In Silico Oncology

Partner Responsible: ICCS

Contributing partner(s): ICCS, USAAR, IJB, FORTH, INRIA, UvA, FHG-IGD

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

WP8 aims at developing the Oncosimulator, a technologically advanced and user friendly system able to spatiotemporally simulate within well defined reliability limits tumour growth and tumour and to a lesser extent normal tissue response to chemotherapy, for the cases of breast cancer and nephroblastoma (Wilm's tumour), in the patient's individualized context. The constituent simulation models are based on the novel, essentially "top-down" modelling approach developed by the In Silico Oncology Group, ICCS, National Technical University of Athens.

Pertinent clinical, imaging, histopathologic and molecular data in conjunction with the ACGT clinical trials will be exploited in order to validate the model both prospectively and retrospectively. More specifically, the in silico oncology trial will be based on the two clinical trials (nephroblastoma SIOP 2001/GPOH and breast cancer TOP trial) following their considerable enhancement in terms of data collection.

WP8 objectives for the reporting period were:

1) Construction of a detailed block diagram outline of the Oncosimulator including, among other features, the exact types of input data, the sub-modules of the main computational biology body of the system, the format of the output etc. Definition of information flow.
2) Determination of the exact type of clinical, imaging, histopathologic and molecular data necessary for the in silico oncology trial.
3) Decision on the basic components of the image processing and visualization modules of the Oncosimulator. Setting of the proper environment for the local imaging data storing and handling.
4) Initiation of the analysis, specification and planning activities of in vitro estimation of the model parameters.

Progress towards objectives

All of the above mentioned objectives (except for the in vitro sub-action which is addressed below) have been successfully implemented although there is room for minor improvements, which are expected to take place within the next 18 months' period.

A previously developed simulation code of the In Silico Oncology Group, ICCS, NTUA – concerning glioblastoma multiforme tumour response to radiotherapy - has been used by partners involved in WP8 to prepare and test their algorithms or infrastructures.

Deviations from the project work programme, and corrective actions taken/suggested

The multidimensional decisions concerning the exact type of clinical sub-cases to be addressed, along with the setup of the technical infrastructure were two sources of a slight delay in the progress of the entire WP8. Such a condition seems to be fairly reasonable if the complexity of the highly demanding orchestrated efforts were to be taken into account. Nevertheless the initial planning is not essentially violated. Therefore, not any special measure had to be taken up to now, apart from a slight further intensification of the efforts of all involved partners.

Concerning the initially proposed in vitro work to be carried out mainly by FHG, it was decided to be replaced by the development and adaptation of a specialized database-handling system to be used for the collection and trafficking of the considerably large content of inhomogeneous datasets. This deviation was judged necessary as the database infrastructure needed for WP8 proved to be of crucial importance and therefore had to be more seriously addressed. On the other hand, in vitro studies were judged unnecessary given the crystallized form of the Oncosimulator. This was due to the fact that human clinical data will be the basis for ACGT as a whole. During the first twelve months the database overall architecture was been discussed.

List of deliverables, including due date and actual/foreseen submission date

D8.1 Consolidated requirements (including information flows) of the in silico simulation models (due date: month 9, actual submission data: 15.01. 2007)

List of milestones, including due date and actual/foreseen achievement date

There were no milestones within the reporting period.

WP9 – The Integrated ACGT Environment

Partner Responsible: FORTH

Contributing partner(s): UvA, Philips, IJB, SIB, LundU, UPM, FHG, BIOVISTA, PSNC, Custodix, ICCS, UHok

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The main objectives of WP9 are:

1) To demonstrate large scale system integration within the ACGT environment
2) To implement the workflow layer for achieving composability of applications and services
3) To investigate the evolution of the ACGT integrated platform proposing enhancements to all levels with respect to functionality and performance

   During the first 12 months of the project emphasis was given to the following two areas:

4) The investigation of the different levels and kinds of integration and the elicitation of the integration needs so as to be compliant with the architectural design of the ACGT platform
5) The survey of the different workflow management systems and an initial evaluation of their features, their compliance to the standards, and their relevance to the ACGT needs and goals.

Progress towards objectives

With respect to the integration requirements for ACGT an initial document, prepared by FhG, has been circulated among the consortium that aroused several discussions on the way the integration and interoperability requirements will be fulfilled. The conclusions of most of these discussions will be included in the first deliverable (D9.1) of this work package.

The survey of the different workflow management systems has been started as part of the work package's contribution to the state of the art review of WP2. The tools that have been mostly investigated are the Taverna Workbench and Triana, and additionally, ActiveBPEL, which is another workflow editor and engine with roots in the Business Workflows. We have identified a number of problems related to the level of integration with the Grid infrastructure, mainly the handling of the Grid security and the ability to accommodate WSRF services in workflows. Furthermore the lack of standardization in workflow description languages for scientific workflows leads to the consideration of adopting BPEL and its compliant tools even if they are mostly business oriented. The final decision on what ACGT will be based on will be taken in the short future after discussing the pros and cons of the different tools.

Deviations from the project work programme, and corrective actions taken/suggested

The decisions on the workflow management system have taken more time than expected. This is due to the number of the available systems and (de facto or other) standards and to

the time needed for the familiarization with the ACGT scope and needs. Moreover the specification of the interoperability and integration requirements needed a lot of input and discussion with the other technical work packages because it accommodates issues regarding the architecture, security, protocols and standards, requirements of tools, etc.
For alleviating these issues collaborative work has been promoted through the ACGT wiki and a number of technical discussions have been scheduled and performed both in face to face meetings and by means of teleconferences.

List of deliverables, including due date and actual/foreseen submission date

The deliverable D9.1 has been prepared and will be finalized and delivered for review by the end of March.

List of milestones, including due date and actual/foreseen achievement date

None in the reporting period

WP10 – Ethical, legal and QA issues

Partner Responsible: UHANN

Contributing partner(s): FUNDP, UH, Custodix, USAAR, FORTH

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The objective of this WP is to ensure that no barriers regarding data protection (legislation) are in the way of accomplishing this *ACGT* goal. Legal requirements regarding patient data management for the *ACGT* applications will thus be studied in a European context. Technical solutions to these problems will be identified for a Grid environment and a number of solutions will be presented. Focus will lie on the development (and integration) of a number of utilities for Personal Data Management (relying on Privacy Enhancing Techniques - PETs) which are considered essential for the *ACGT* environment.

Progress towards objectives

- ⇨ A kick-off meeting was organized, prepared and held in the Institute for Legal Informatics of the University of Hanover on 3rd of May 2006 (FUNDP, UH, Custodix, USAAR, FORTH).
- ⇨ Definitions of important legal terminology were developed and sent out (FUNDP).
- ⇨ The data flows within the clinical studies and in ACGT were identified, especially within the Nephroblastoma study carried out by USAAR (FUNDP, Custodix, USAAR, FORTH, UHANN)
- ⇨ The quality of the data within ACGT was analyzed. Especially it was examined whether personal data has to be processed within ACGT or whether pseudonymized or anonymized data can be used for ACGT (FUNDP, UHANN).
- ⇨ An ACGT Data Protection Framework was examined and developed. It was described in detail in Deliverable 10.2 (see below) (FUNDP, UH, Custodix, UHANN).
- ⇨ The Legal Aspects of informed consents were examined and explained in Deliverable 10.1 (“Production of informed consents”). Therefore:
  - The requirements of an informed consent was examined and explained.
  - The scope of an informed consent was analyzed.
  - Special attention was paid to the questions, who has to consent to the data processing (only the patient itself or also it’s relatives?), how long a consent is valid and the right to withdraw and erasure (FUNDP, UH, Custodix, UHANN).
- ⇨ The Legal Requirements of ACGT and solutions for data protection issues were examined and explained in Deliverable 10.2 (“The ACGT ethical and legal requirements”). Therefore:
  - An analysis whether pseudonymous data can be seen as anonymous data was carried out.
  - Definition for additional knowledge that is attributable to the data controller was examined and developed.

- An analysis of the role of a trusted third party in the process of aliasing was carried out.
- An analysis whether the local physician can act as a trusted third party was carried out.
- The establishment of a Data Protection Board was examined.
- A Data Protection Framework was created for ACGT (FUNDP, UH, Custodix, UHANN).

Deviations from the project work programme, and corrective actions taken/suggested

No Deviations from the project work programme and no corrective actions taken.

List of deliverables, including due date and actual/foreseen submission date

D10.1 Production of inform-consent form in compliance with the clinical trials, post-genomic research and genetic data handling requirements, due on T0+12 months, actual submission date T0+12

D10.2 The initial ACGT ethical and legal requirements, due on T0+12 months, actual submission date T0+12.

List of milestones, including due date and actual/foreseen achievement date

M4 The initial ACGT ethical and legal requirements, due on T0+12 months, actual submission date T0+12

WP11 – Trust & Security

Partner Responsible: Custodix

Contributing partner(s): UMA, UPM, Fraunhofer, UHANN, PNSZ, Custodix, FUNDP, UH

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The objective of work package 11 is to define and incorporate the necessary security and data protection infrastructure into the ACGT project that has minimal impact on the use of the infrastructure and data. A security (authorization) infrastructure is to be built to allow transparent and uniform access to resources while complying with all legal requirements. Next to basic security mechanisms such as access control and authorization an extra focus is to be places on data protection services.

Specific objectives mentioned in the ACGT DOW for WP11 are deliverable D11.1 (M6) and milestone MWP11.1 (M18)

Progress towards objectives

(a) Completion of "T11.1 Consolidation of Requirements analysis"

Task 11.1 aimed to consolidate the requirements defined in WP2, concerning trust and security issues. An ACGT Data Protection Framework has been developed on top of the basic GRID security infrastructure in order to comply with the legal and ethical requirements. This Data protection Framework (joint work with WP10) was described in detail in deliverable D11.1 and D10.2. The data protection framework defines:

- The role of the healthcare organisation
- The need and role of the ACGT data protection board
- The role of end users
- The role of the Trusted Third Parties
- The interactions and contracts between all players
- The (data protection) tools and services required

The main result of the completion of T11.1 is the finalisation of deliverable "D11.1 Consolidation of security requirements of ACGT and initial security architecture", which contains an elaboration of the ACGT GRID security modules and the proposed Data Protection Framework.

(b) Development of the initial Security Architecture

- A PKI infrastructure has been setup an tested for use in the context of ACGT (high level of security, PKI using a Hardware Security Module)

- An initial version of the GAS Authorization service has been installed and work has been started to integrate it with the existing Globus installations.

(c) Implementation of the Data Protection Framework

- Early contact has been made with data providers in order to make anonymized data available according to the rules defined in WP11 and WP10 to the rest of ACGT while the Data Protection Framework is not fully in place yet.
- Development of anonymization tools for the ACGT healthcare organisations was started.

Deviations from the project work programme, and corrective actions taken/suggested

According to the ACGT DOW, WP11 was planned to start in M7. However WP11 has started work earlier during the first 6 months of the project. This has not affected the foreseen budget.

List of deliverables, including due date and actual/foreseen submission date

D11.1: Consolidation of security requirements of ACGT and initial security architecture, due date T0+9, submission date T0+11

Note that (D4.1) Report on security infrastructure has been integrated into (D11.1) Consolidation of security requirements of ACGT and initial security architecture because of their obvious overlap.

List of milestones, including due date and actual/foreseen achievement date

N/A, the first milestone of WP11 (MWP11.1): The ACGT core security services is due in project year 2 (M18).

WP12 – Clinical Trials

Partner Responsible: Institute Jules Bordet & FORTH – IMBB

Contributing partner(s): University of Hanover, University of Hamburg, University of Saarland, Biovista, European Institute of Oncology, University of Oxford, University of Crete, Swiss Bioinformatics Institute, Custodix, University of Namur, University of Lund.

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The objectives of the WP during the reporting period were to:

a) Select of advanced clinico-genomic studies including post-genomic research activities collecting multi-level, heterogeneous data.

b) Satisfy ethical, regulatory and technical specifications, requirements and provisions for the implementation of the trials within ACGT.

c) Develop workflow scenarios that integrate cross-site and interrogate cross-platform genomic data and image data.

Progress towards objectives

(a) The selection of ACGT clinical trials were based on the following criteria: a) They should not involve experimental therapeutics that could raise concerns about the health of the patients (i.e. drugs under development etc), b) they should address or include an advanced post-genomic research question (i.e. identification or validation of a molecular marker or signature), and c) they should be in an advanced preparation state, possibly already adopted by local ethical or regulatory committees (in order to avoid delays in their implementation within ACGT). On this basis the TOP trial on breast cancer and SIOP trial on nephroblastoma trials were selected during the kick-off meeting in Nice (February 27 – March 1, 2006). Further detailed discussions were launched among the clinical partners, the clinicians and researchers involved (surgeons, oncologist, pathologists, molecular biologists in UoC, EIO, UoOx) about the number of patient cases to be included, about details of clinical practice, and about additional research questions and analyses that could be included etc.

(b) During the common meeting with WP2 partners in Saarbrücken (April 7, 2006) it was agreed that a set of scenarios should be written in order to describe in detail the technological needs, to resolve the granularity of the clinical trial protocols and thus to produce the specifications of the ACGT infrastructure. Scenarios should present briefly the purpose of the research activity and should describe in detail the format of the collected data, the information systems that are used for storage and management, the processes and tools that are used for analysis and their output. The basic scenarios are included in the Deliverable 2.1 but should continue to be released and improved through out the duration of the project.

(c) The collection and processing of personal and sensitive health data, the analysis of clinical biospecimens in order to obtain extensive genetic information is subject to legal and bioethical requirements. These had been discussed in the common meeting with WP10 in Hanover (May 5, 2006) and the obligations related to data flow and exchange were examined. Particular tasks were launched to ensure the compliance with national and European legislation and guidelines during the implementation of the clinical studies.

Main Activities & Tasks worked on

- T12.1 Preparing multi-centric, advanced clinico-genomic trials/studies
- T12.1.0 Development of the clinical scenarios, definition of ACGT clinical studies and submission for approval to monitoring committee (in collaboration with WP2).
- T12.1.1 Compliance with bioethical, regulatory and technical requirements. Data protection requirements and technical requirements ensuring clinical data privacy and security will be adopted (in collaboration with WP10 and 11)
- T12.1.2 Establishment of Bio-banks. Tissue and blood samples will be maintained according to the guidelines for bio-banks and high quality criteria will be implemented for banking practices depending on each type of material (DNA, RNA, tissue)
- T12.1.3 Requirements for cross-platform post-genomic analysis: How to use different populations and platform technologies in order to perform validation/standardization study. The objective is to identify requirements for cross-platform data integration.

Major Achievements towards planned objectives:

- Identification of the main partners involved in the work of the WP and definition of their detailed role and contributions in the WP.
- Identification, evaluation and selection of clinical trials to be implemented within ACGT (Institute Jules Bordet & FORTH – IMBB, University of Saarland, University of Crete).
- Preparation of the first (model) scenarios illustrating the technological needs of the clinical research activities to be included in the D 2.1 (FORTH, University of Saarland, Biovista, Swiss Bioinformatics Institute, Custodix, University of Lund).
- Overview of the legal and bioethical considerations in relation to the clinical and genetic data (University of Hanover, University of Hamburg, University of Saarland, Custodix, University of Namur).
- We made contact also with WP10 and WP11 in order to make anonymized data available according to the rules defined in WP11 and WP10 to the rest of ACGT while the Data Protection Framework is not fully in place yet.
- Initial presentation of the state of the art of cross-platform genomic analyses during the plenary meeting in January and open discussion to identify: 1/ the main areas we should focus on in D12.3; and 2/ the partners willing to actively participate in this task (FORTH, LundU, SIB, UoOX, UoC, UdS).

Deviations from the project work programme, and corrective actions taken/suggested:

Although the evaluation and selection of clinical trials fulfilling the set criteria had been achieved within the first months of the project, their adoption by the ACGT clinical partners requires detailed examination by all involved clinicians and researchers. Feasibility questions, particular difficulties in the implementation, and possible extension of the protocol in order to include side or additional research activities, such as the in silico study or the genotype profiling, have caused significant delay in the final detailed description and delivery of the D12.1. In order to avoid subsequent delays on other depending tasks activities it has been agreed that the production and development of clinicogenomic scenarios should proceed independently of the final definition of the clinical trials.

Also, the issue of the establishment of Biobanks is also creating some delays, in the sense that it proves to be a much more demanding task, mainly form the ethical, legal and security aspects. Therefore a task is been introduced in the new DoW to address this issues during year two of the project.

Finally, the production of D12.2 and D12.4 is being delayed to mid April 2007.

12.2 - Bio bank protocols and regulations: this deliverable is almost complete, yet in order to cover this international issue extensively, additional work was necessary in particular to attend leading conferences in the field, such as ESFRI and the European Bio banking and Bio molecular Resources.

12.4 - Report on the definition and status of implementation of the ACGT validation trial: this deliverable has been slightly delayed by WP12 focus on bio banks. It will be delivered mid April 2007, based on the work carried out to produced D12.1 Definition of the ACGT clinical studies according to the clinical scenarios.

List of deliverables, including due date and actual/foreseen submission date

- D12.1 Definition of the ACGT clinical trials (due on month 4/delivered on month 9)
- D12.2 Bio-bank protocols and regulations (due on month 9/ - delayed)
- D12.3 Report on requirements for cross platform data exchange (due on month 12/ delivered on month 13)
- D12.4 Report on the definition and status of implementation of the ACGT validation trial (due on month 12 - delayed)

List of milestones, including due date and actual/foreseen achievement date

Definition of the ACGT clinical trials (due on month 4/forseen on month 9)

WP13 – Evaluation and Validation

Partner Responsible: SIB

Contributing partner(s): FORTH, UvA, IJB, UMA, UOC, ICCS, UdS, UOXF.BP, IEO

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The aim of WP13 is to formulate evaluation criteria, validation procedures and feedback report guidelines, to coordinate local validation activities and feedback reports and to write a final evaluation report. WP13 was due to start on Month 9. Preparatory work included a survey of the QC standards for software development (ISO and IEEE), review of formal evaluation procedures and assessment of their suitability in the context of ACGT. Strategies to modularize the testing of ACGT were to be considered.

Objectives are twofold:

1) provide a template for software QC and
2) define procedures and verification criteria for testing of the ACGT infrastructure by end-users.

The evaluation procedures and criteria will be iteratively refined during the whole duration of the project.

Progress towards objectives

SIB proposed a set of scenarios, based on published data, which are available for testing while in the period during which ACGT clinical data are unavailable. A poll was conducted among ACGT partners to survey current QC practice in their home institution. Based on this and a literature survey, a template of a form for software QC considering ISO and IEEE recommendations was proposed for evaluation to representatives of technical work packages. A list of potential scenarios to be used for evaluation by end users was proposed. A template for a form to be actually used in evaluation procedures was also issued. Both documents are available on the wiki site of ACGT.

Deviations from the project work programme, and corrective actions taken/suggested

WP13 started with some delay as a consequence of the delay in the issue of T0+9 deliverables describing scenarios on which evaluation will be based.

List of deliverables, including due date and actual/foreseen submission date

D13.1, collecting the QC form for software developed in technical WPs and the end-user-scenarios based validation criteria is due on Month 18.

This deliverable depends critically on the existence of actual software to be tested. It should be anticipated that delays occurring in the delivery of software by technical WPs will be propagated in the delivery of D13.1.

List of milestones, including due date and actual/foreseen achievement date

None was foreseen during the reporting period

WP14 - Training

Partner Responsible: SIVECO

Contributing partner(s): FORTH, INRIA, IJB, UPM, FHG, UOC, UHANN, Custodix, HealthGrid, ICCS, USAAR, FUNDP, IEO

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

There where 2 objectives of the WP14 covered by the first 12 months of the project:

1) Consolidation of user requirements for the development of the *ACGT* Portal to provide a grid-enabled integrated, customisable, multi-lingual, and user-friendly interface to end-users.
2) Development of a prototype of the ACGT Portal (based on the Gridsphere platform)

Progress towards objectives

The main activities worked on in this reporting period are:

(a) T14.1 Consolidation of requirements analysis for *ACGT* portal (and feedback to WP2).

(b) T14.2 Development of a prototype of the *ACGT* Portal (based on the GridSphere platform)

The "Functional & technical specification of the *ACGT* portal" document was completed at the end of Month 6. The document includes the consolidation of user requirements under the form of specific portal use scenarios. The document is subject to continuous update during the next project months, such that to be correlated with the consolidation of user requirements that has to be produced by other WPs. The task was completed by SIVECO and other partners, especially FORTH and HealthGrid.

With the portal usage scenarios, the work to the next task – prototyping the ACGT Portal – was started.

For the ACGT portal prototype, a list of features was chosen to be demonstrated:

- Integration in the general GRID architecture
- Partial implementation of the system of privileges and roles
- Credential-based user authentication
- General and private content
- Partial customization of the content
- Uploading, viewing, modification and deletion of the content based on the roles scheme
- Job execution.

The scope of the ACGT Portal prototype, as it was designed, is to:

- Allow for an early deployment of the ACGT Portal in order to:
  - Familiarize the users with the portal
  - Gather feedback from specific users and improve the initial specifications of the portal
- Provide a base for the integration of ACGT services into the portal.

The task was completed by SIVECO, but an important contribution was brought by PSNC and UMA, two of the partners that are not officially involved in WP14. PSNC brought the initial know-how for grid portal setup, while UMA made an earlier stage design of a portal for a series of grid services.

Deviations from the project work programme, and corrective actions taken/suggested

There were no deviations from the project work programme for this WP.

List of deliverables, including due date and actual/foreseen submission date

For the reporting period, two deliverables were produced and submitted. Namely:

(a) D14.1 Functional & technical specification of the ACGT portal, due and submitted on month 6.

(b) D14.2 Visual prototype and Report of the ACGT Portal, due and submitted on month 12.

List of milestones, including due date and actual/foreseen achievement date

This WP does not include its own milestones, but is involved in the Major Projrct Milestone M7 which is due to Month 18.

WP15 - Dissemination

Partner Responsible: HealthGrid

Contributing partners: ERCIM, FORTH, INRIA, UvA, Philips, IJB, SIB, LundU, UMA, UPM, FHG, BIOVISTA, UOC, UHANN, PSNC, Custodix, ICCS, USAAR, SIVECO, FUNDP, UH, UOXF, UHok, IEO

Reporting Period: 01/02/2006 – 31/01/2007

Major objectives for the WP15

The Technical Annex identified the main objectives of WP15 as follows:

1) To raise awareness of the benefits of ACGT to new user communities ensuring an appropriate message is delivered to each of them;
2) To ensure new user communities know where and how to get involved in the project so they can be converted to real users;
3) To ensure the information tools needed for each target audience are available and support the growth of many, varied, individual user communities;
4) To identify and target new user community audiences and applications. The challenge is to reach new communities, such as new research disciplines, new industrial and commercial groups and branches of government. WP15 will need the assistance of ALL activities to help identify new user communities (see audiences for more detail).

Progress towards objectives

The tasks for WP15, as described in the DoW, and their status is presented below.

Task n°	Short description	Status
15.1	**External website**	Done. It is currently been updated to better adapt to the end user point of view
15.2	**Collaborative communication & notification tools**	Done
15.3	**Events organisation, participation and presentation**	Done
15.4	**Partnership Programmes**	Partly done.
15.5	**Project conferences**	Planning has been initiated

Task n°	Short description	Status
15.6	**Publications production & dissemination**	Done. Obviously additional dissemination materials will have to be produced. Some are currently in production.
15.7	**Internal website**	Done. It will evolve for external web site maintenance and dissemination reporting tools.

Definition of our dissemination strategy

It is our belief that in order to define and execute an effective dissemination strategy and plan one must:

(a) Identify the messages that need to be conveyed
(b) Identify the target audiences to which the messages needs to be conveyed and
(c) Deliver the messages through appropriate and effective channels, taking into consideration the resources allocated to such an activity.

The WP has devoted substantial efforts in discussing these three pillars of our dissemination activities. The overall dissemination strategy has been defined and reported in the D15.3 Deliverable.

In brief the WP has:

(a) identified the key messages of the project. These are to be continuously updated and refined as the project matures and tangible outputs are produced.

(b) identified the following major categories of target audiences:
- Medical professionals and researchers involved in translational research
- Patients and patient organisations
- Bioinformaticians and other IT system developers
- Pharmaceutical Companies and other industry
- Relevant national or international initiatives
- Regulatory Bodies
- General Public

It is evident that each of these target audiences requires quite specific and different in nature information with respect to the project. As a result the main messages will have to be adapted to the specific role and expectations of each of these target groups.

(c) Selected a range of dissemination channels, as reported in detail in D15.2

Deviations from the project work programme, and corrective actions taken/suggested

The interdisciplinary nature of the project has created some initial difficulties in the formulation and effective execution of a coherent dissemination strategy and has delayed the production of dissemination material.

The management decision to (a) establish an editorial board and (b) its active participation in the production of D15.2 – Initial Dissemination Plan, which includes the key messages to the various target audiences of the project and (c) the involvement of all WP leaders in the production of content for the project Web site and the other dissemination tools of the project have rectified the situation.

List of deliverables, including due date and actual/foreseen submission date

The status of the Deliverables is as follows:

Deliverable n°	***Reference***	***Name***	***Date***	***Status***
2	D 15.1	Project website	T0+3	Pending EC Review
17	D 15.2	Initial Dissemination Plan	T0+9	Submitted

List of milestones, including due date and actual/foreseen achievement date

No milestones were foreseen for the WP.

WP16 – Market Investigation & Exploitation

Partner Responsible: BIOVISTA

Contributing partner(s): ERCIM, Philips, UPM, FHG, SIVECO, FUNDP

Reporting Period: 01/02/2006 – 31/01/2007

Workpackage objectives and starting point of work at beginning of reporting period

The Workpackage has the following major objectives:

1) To define the exploitation plan for the ACGT environment and its clinical applications
2) To initiate a market investigation strategy that will define the market orientation of ACGT
3) To provide guidelines for identifying patient subpopulation for trials

While we did not expect to have many concrete exploitable results during the reporting period, it was felt that a plan should be in place so as to promote any results as they come on-line, sooner rather than later.

The open source nature of the project imposes on the plan unique requirements, especially given the fact that a number of commercial organizations are involved in the consortium. Nevertheless it was felt that 'exploitation' was possible and so a major goal was to define how the consortium should understand 'exploitation' in a way that is not restrictive and yet honours the open source objective, protects IP of partners and offers commercial exploitation opportunities for those who are interested in them.

A second goal of the exploitation plan was to identify major stake holder groups in the wider clinical trials context since ultimately all actions, services and project results should be addressed at specific users.

Progress towards objectives

The first action was to identify the contact points within each of the 7 partners that had MMs allocated to WP16. An immediate observation was that the WP was 'under-staffed' and so it was agreed that for RP2 more partners should be allocated MMs.

Work on exploitation started in moth 4 of the project, one of the first aims being to 'educate' the consortium in terms of what might be considered an 'exploitable result' and how to promote that in the framework of an open source project.

A project internal technical report was prepared *ACGT-TR-16.1-1-BVA-v1* "ACGT Exploitation: Issues and Models" and is available on the BSCW server https://bscw.ercim.org/bscw/bscw.cgi/d185914/ACGT-TR-16.1-1-BVA-v1%20"ACGT%

The report has served as a basis for creating the Exploitation plan D16.1.

Finally first contact was made with a Patient Advocacy Group (EuropaDonna) in January 2007, the goal being to introduce ACGT to them. We were referred to the Hellenic chapter with which we are currently pursuing further contact.

Deviations from the project work programme, and corrective actions taken/suggested

There is no deviation from the plan. It is felt however that the WP is under-resourced and for this reason more partners were asked to allocate PMs for period 2. As a result total allocated PM effort for WP16 has more than doubled for Period 2 to a total of 36 PMs, up from 15 PMs for Period 1. This will allow partners to contribute to the exploitation materials that are planned to be prepared during period 2.

List of deliverables, including due date and actual/foreseen submission date

Deliverable 16.1 was prepared, reviewed and finalized during this period. The final version was uploaded to the BSCW Server on March 27th and can be accessed by the EC and the reviewers.

List of milestones, including due date and actual/foreseen achievement date

A project Milestone was originally foreseen for Month 6. The TR was delivered on month 9 and helped catalyze activity needed for the preparation of D16.1.

3 Consortium Management

3.1 Main tasks completed or started in the reporting period

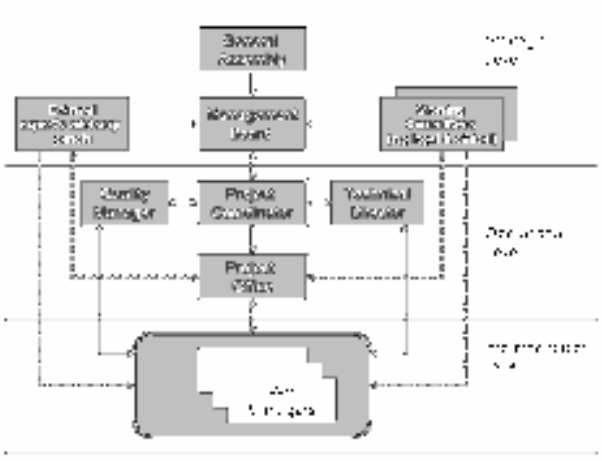
The main tasks accomplished by the project Management were:

- ✓ Implementation of the project's general organization and of the management architecture;
- ✓ Assistance and support to Scientific Management;
- ✓ Preparation of the internal working documents (templates);
- ✓ Definition of procedures and guidelines (reimbursement, costs claims, votes and communication protocol);
- ✓ Validation of partners financial figures and coordinates;
- ✓ Reception and transfer to all partners of the advance payment;
- ✓ Validation and monitoring of partners efforts and contributions to the project
- ✓ Implementation of the ACGT partner database;
- ✓ Realization of custom designed cooperative platform for the production of internal periodic reports;
- ✓ Integration and delivery of the bi-monthly activity reports
- ✓ Preparation of the Six monthly activity Report. Regular efforts were devoted to the collection of every partner's contribution to the periodic report (work description and effort figures in person-months).
- ✓ Definition of the dissemination strategy
- ✓ Preparation of dissemination material: ACGT poster, leaflet and give away material
- ✓ Supervision of the information flow within the project and support of collaborative tool (BSCW)
- ✓ Interaction with related initiatives to lay a grounds for cooperation (e.g EGEE, caBIG, Cancer Grid, @nurist FP6 project, etc)

3.2 Project Organisation and Scientific Management

Among the first priorities was the implementation of the Integrated Project's general organisation and governing boards, whose roles and responsibilities were defined in the consortium agreement.

The Scientific Management of ACGT is composed of several yet complementing bodies: Management Board, General Assembly, Workpackage Steering Committees and the Advisory Board. This report presents the people involved and composing managerial organ:



Management Board

The Management Board is the ACGT executive and coordinating body. The MB is comprised of the Technical Director; Administrative and Financial Coordinator; Quality Manager; and the Workpackage Leaders. In order, these roles are currently occupied by:

- Rémi Ronchaud, ERCIM – Project Coordinator
- Manolis Tsiknakis, FORTH – Technical Director
- Norbert Graf, Uds – Quality Manager and WP2 Leader
- Jarek Nabrzyski, WP3 & 4 Leader
- Anca Bucur, WP5 leader
- Stefan Rüping, WP6 Leader
- Luis Martín, WP7 Leader
- Georgios Stamatakos, WP8 Leader
- Stelios Sfakianakis, WP9 Leader
- Nikolaus Forgo, WP10 Leader
- Brecht Claerhout, WP11 Leader
- Christine Desmedt and Dimitris Kafetzopouls, WP12 Leaders
- Thierry Sengstag, WP13 Leader
- Radu Gramatovic, WP14 Leader
- Yannick Legre, WP15 Leader
- Andreas Persidis, WP16 Leader

Steering Committees

The Executive Committees are the ACGT technical workpackage coordination bodies. Headed by their respective WP leaders, each Executive Committee pilots and monitors the activities in their Workpackages. Involving all the WP actors and sub-tasks leaders, the steering committees drive WP activities and monitor progress, achievements and the quality of work delivered.

The Steering Committee chairs are the workpackage leaders, listed in the following table:

WPn	WP Name	WP Leaders	Institute
WP1	Project Management	Remi Ronchaud	ERCIM
WP2	User Needs Analysis & Specifications	Norbert Graf	UdS
WP3	Architecture and Standards	Jarek Nabrzyski	PSNC
WP4	Biomedical GRID technology Layer	Jarek Nabrzyski	PSNC
WP5	Distributed Data Access, Tools and Applications	Anca Bucur	Philips
WP6	Knowledge Management & Discovery Tools	Stefan Rüping	FhG
WP7	Ontologies and Semantic Mediation Tools	Luis Martin	UPM
WP8	Technologies and Tools for in-silico Oncology	Georgios Stamatakos	ICCS
WP9	The Integrated *ACGT* Environment	Stelios Sfakianakis	FORTH
WP10	Ethical, Legal and QA Issues	Nikolaus Forgo	LUH
WP11	Trust and Security	Brecht Claerhout	Custodix
WP12	Clinical Trials	Christine Desmedt & Dimitris Kafetzopoulos	IJB
WP13	Evaluation and Validation	Thierry Sengstag	SIB
WP14	Training	Radu Gramatovici	Siveco
WP15	Dissemination	Yannick Legre	Healthgrid
WP16	Market Investigation & Exploitation	Andreas Persidis	Biovista

In addition to these managerial bodies, additional organs have been established to address particular aspects of the project coordination, in particular:

- Editorial Board: Headed by the WP15 Leader, Yannick Legré, this board is in charge of gathering the information and elements that will fuel the ACGT dissemination effort.

- Technical Management Committee: Headed by WP6 Leader, Stephan Rüping, this committee is in charge of assisting the technical Director by ensuring a close monitoring of all technical achievements and of all interoperability issues across Workpackages.

External Advisory Board

The ACGT Management Board has the authority to establish panels to advise it and support it in the proper management of and co-ordination of the project. These panels have an advisory role only. The Panels will be responsible for the exchange of technical views on the development of the components between industry partners, providing advice to the work packages.

At this stage, the ACGT overall Advisory Board has been implemented and is composed of:

1. Prof. Dr. Dr. h.c. Spiros Simitis
   Institute of Labour Law
   University of Frankfurt
   Senckenberganlage 31
   D – 60054 Frankfurt/Main
   Tel: (+49) 69 79 82 21 87

2. Thomas S. Deisboeck, M.D.
   Principal Investigator, CViT
   Assistant Professor of Radiology (HMS, MGH, HST),
   Director, Complex Biosystems Modeling Laboratory, Harvard-MIT (HST)
   Athinoula A. Martinos Center for Biomedical Imaging
   Massachusetts General Hospital-East Bldg. 149, 13th Street Charlestown, MA 02129
   http://biosystems.mit.edu/
   and
   Director of the Center for the development of a Virtual Tumor
   http://www.cvit.org

3. Niilo Saranummi
   Research Professor
   VTT Techical Research center of Finland
   Pervasive Health Technologies
   Tampere, FINLAND
   and
   Editor-In-Chief, IEEE Transactions on Information Technology in Biomedicine (TITB)
   TITB web site: http://www.vtt.fi/virtual/proj2/titb/
   TITB paper submission: http://embs-ieee.manuscriptcentral.com/,
   Chairman, HL7 Finland: http://www.hl7.fi

4. Dr. Peter Maccallum,
   Department of Oncology
   University of Cambridge,
   Wilberforce Road, Cambridge, CB3 0WA
   and
   CancerGrid Project Manager

Mailing lists

In addition, dedicated mailing lists were created to support each managerial body and for intra-project communication purposes. The Sympa software was chosen for managing the mailing lists, which currently include:

acgt@inria.fr	All partners
acgt-mb@inria.fr	Management board
acgt-tmc@inria.fr	Technical Management Committee
acgt-eb@inria.fr	Editorial Board
acgt-qa@inria.fr	Quality Assurance
acgt- eab@inria.fr	External Advisory Board
acgt-reporting@inria.fr	ACGT reporting
acgt-wp1@inria.fr	acgtWP1
acgt-wp2@inria.fr	acgtWP2
acgt-wp3@inria.fr	acgtWP3
acgt-wp4@inria.fr	acgtWP4

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acgt-wp16@inria.fr	acgtWP16

Following the kick-off meeting that was organized in Juan les Pins; an electronic directory illustrating the project was established on the private section of the project's web site, allowing partners to get the office and mobile phones of other ACGT Partners, in particular members of the Management Board, as well as the key individuals (e.g., work package leaders).

BSCW server

Opened during the negotiation phase of the project, this virtual workspace is used to store both working documents and archives. Several folders have been created, ranking from templates to dedicated section for every workpackage.

In addition, a Wiki has been implemented to allow the fast exchange of information and views on on-going work across Work packages.

Meetings and Audio conferencing

The Management has been preparing and organising the plenary project meetings during the reporting period. Additional Management board and technical meetings have also been organised to support the scientific coordination effort across disseminated teams and workpackages.

The two ACGT Plenary meetings are detailed hereafter:

- ACGT Kick off Meeting in Juan les Pins, France, 27-28 February and 1rst of March 2006

- ACGT Plenary and Technical Meeting in Malaga, Spain, 23 to 26 January 2007

In addition, a periodic audio conferencing services has been implemented to support monthly exchanges among ACGT Participants. Audio conferences are jointly chaired by the Project coordinator and the Technical Director. If necessary to address a particular issue, additional audio conferences can be organised. Specific agenda and actions are defined for every audio conference, hence avoiding other costly and time consuming meetings.

Monitoring of the Report Management Procedure

Every deliverable undergoes a rigorous control process in which the report is first submitted to assigned "reviewers" (partner institutes with the relevant technical/managerial expertise) and then must be validated by the Management Board before submission to the Commission by the Coordinator.

This has been further detailed in D1.2 Quality Assurance Plan.

Definition of financial procedures and guidelines

Prior to the internal education and training of the different ACGT teams, guidelines on project reporting in FP6 were produced by the Coordinator to present the Commission's financial guidelines and project reporting documents in a more "readable" manner. The kick off meeting and the plenary meeting in Malaga has both dedicated sessions to present project researchers and administrative contacts the European Commission's rules and the periodic reporting procedures.

Preparation of internal six-monthly progress reports (M6) and Periodic Management Report (M12)

Six monthly progress reports:

The first six monthly report has been produced to present the activities and achievements of every workpackage.

Moreover, the report also presents every partners' efforts in terms of person-months during the first six months. This is essential to keep a clear monitoring of partner effort and commitment in the project, and proves a valuable asset to measure the quality of work against the effort spent by every team.

An online reporting tool was created to facilitate the collection of reporting contributions.

In addition, internal ACGT reporting is being conducted in-house through short statement of the WP leaders to present their activities and identify any potential issue.

Periodic Management Report and Periodic Activity Report:

All necessary documentation was uploaded on the BSCW server in order to help ACGT Partners proceed with this annual reporting comprising multiple documents:

Pre-filled Appendices and Forms C, templates for the audit certificate, ERCIM and European Commission Guidelines, Commission check-list, FAQs, guidelines for the PAR, Preparation of summary report on distribution of funding, financial report and consolidated Appendices.

Production of a Project Handbook, Quality Assurance Plan and Risk Assessment

An ACGT Project "handbook", was prepared to guide the ACGT project participants through all aspects of the project's management. It is to serve as a reference tool as it brings together all of the procedures and policies that have been agreed upon since the beginning of the project by the project managers, the dissemination work package participants and the Executive Committee. Some of the items are strategically important in nature, while others answer to day-to-day complications that have arisen during the first reporting period.

In addition, the Management has produced a Quality Assurance Plan to outline the main managerial procedure to ensure the overall project quality in terms of Technical deliverables, respect of timing and monitoring of the project resources (effort and budget).

Finally, a detailed Risk Assessment scheme has been defined. It includes proposed contingency planning for every potential threat identified, be it technical, financial or administrative.

Contractual Modifications

It is also the responsibility of the Management to address all contractual matters. In particular, the coordination has requested the following amendments to the contract

- Integration of Special clause for the Joint research Unit of INRIA
- Change of Legal name for Partner 12 - LUH

The Coordination is already preparing for the next contract amendments, which are affiliated to the preparation of the next detailed implementation plan.

Preparation of the next Detailed Implementation Plan

The Project Coordinator and the Technical Director have invited all Workpackage Leaders to prepare the work plan of their workpackage activities over the next 18 months, including information about deliverables, effort dispatch among partners and describing the main subtasks their WP encompasses.

The activity is still under preparation and the new workplan will be submitted to the European Commission before the first Annual Review.

Financial Coordination

The first advance payment (4 000 000 €) of the Community financial contribution (78% of the projected eligibility for the first 18 months) was received by the Coordinator. The full amount was distributed to the contractors immediately.

In the preparation of the financial statement composing the PMR, the coordination has prepared detailed guidelines and checklist to help all the partner prepare the budget claims. ERCIM has carried out a permanent and final validation of each financial statement produced by the partners.

Monitoring of Partners efforts

The Project Coordinator will collect every six months the actual consumption of **person-months** of every partner institute across the different Workpackages. The person months tables are presented in a dedicated section of the **six-monthly reports**. These figures are analyzed and **compared against the expected (planned) person-months** declared in the work plan. The Project coordinator and the Technical Director will assess the relevance of the person months declared against the work done during the corresponding reporting period. The Management Board is informed of any major discrepancy between planned and declared effort allocation, which must systematically be justified by the partners and for every Workpackage concerned.

Follow up and validation of deliverables to be submitted at M12

The ACGT project Management will ensure a continuous watch and monitoring of Deliverable preparation, to make sure that their submission are not delayed and that the contractual engagement of the project vis-à-vis the European Commission are respected.

Deliverables in Chronological Order

Deliverable No	Deliverable	Deliverable title	Delivery date	Status
1	D1.2	Definition and guidelines for Quality Assurance Process	T0+3	Done
2	D15.1	Project website (internal and external)	T0+3	Done
3	D12.1	Definition of the ACGT clinical studies according to the clinical scenarios	T0+4	Done
4	D1.1.1	Six-Monthly Progress Reports	T0+6	Done
5	D1.3	Publication of a Project Handbook for *ACGT*	T0+6	Done
6	D1.4	Risk Analysis of ACGT	T0+6	Done
7	D2.1	User Requirements and Specification of the ACGT internal clinical trials	T0+6	Done
8	D14.1	Functional & technical specification of the *ACGT* portal	T0+6	Done
9	D3.1	The ACGT initial architecture	T0+9	Done

10	D4.1	Report on security infrastructure	T0+9	Done
11	D5.1	Consolidated requirements and specifications for data access	T0+9	Done
12	D6.1	Consolidated requirements analysis report for data mining, analysis and the visualization environment	T0+9	Done
13	D7.1	Consolidated requirements on Ontological approaches for integration of multi-level biomedical information	T0+9	Done
14	D8.1	Consolidated Requirements (including information flows) of the in silico simulation models	T0+9	Done
15	D11.1	Consolidation of security requirements of ACGT and initial security architecture	T0+9	Done
16	D12.2	Bio-bank protocols and regulations	T0+9	Delayed
17	D15.2	Initial Dissemination plan	T0+9	Done
18	D1.1.2	Six-Monthly Progress Reports	T0+12	Done
19	D9.1	Integration requirements and guidelines	T0+12	Done
20	D10.1	Production of inform-consent form in compliance with the clinical trials, post-genomic research and genetic data handling requirements	T0+12	Done
21	D10.2	The ACGT ethical and legal requirements	T0+12	Done
22	D12.3	Report on requirements for cross platform data exchange	T0+12	Done
23	D12.4	Report on the definition and status of implementation of the ACGT validation trial	T0+12	Delayed
24	D14.2	Visual prototype and report of the ACGT Portal	T0+12	Done
25	D16.1	The ACGT Initial exploitation plan	T0+12	Done

3.3 Project Meetings (including WP technical meetings)

Regular meetings, either at a consortium level, or focus technical meetings and requirement gathering meetings were held regularly. This, we believe, has helped in creating the required "team spirit" for the successful implementation of the project. The table below shows the meetings held, their scope and a summary of results achieved.

Title	Place and Date	Main conclusions
Kick off Meeting of ACGT	Juan-les-Pins, France, 26th Feb. – 2nd March 2006	The kick-off meeting laid down the foundation for project implementation in various dimensions.
Kick-Off Meeting WP2	Saarbrücken, 7th April 2006	The time schedule for actions to be taken was fixed. It was stated that a common language between the different groups of participants is important. A glossary has to be made. The definition of scenario was clarified. The workflow of data has to be clearly outlined in each scenario. There should be as much scenarios as possible. Legal and ethical requirements have to be respected. https://bscw.ercim.org/bscw/bscw.cgi/d112599/ACGT%20WP2.meeting.07042006%20UdS%20v1%20rev0.doc
Meetings of UdS/IFOMIS, FhG/IBMT, UdS/Pediatric Oncology	Homburg, 13th March 2006	Cooperation of UdS/IFOMIS, FhG/IBMT and UdS/Pediatric Oncology
	Homburg, 21st March	Logistics of ACGT (clinical user needs)
	Homburg, 11th April 2006	Inquiry of clinical trial software (clinical user needs)
	Homburg, 14th June 2006	Discussion about clinical trial software (clinical user needs)
	Saarbrücken, 28th June 2006	Ontology for the nephroblastoma trial (clinical user needs)
	Saarbrücken, 7th July 2006	Ontology for the nephroblastoma trial (clinical user needs)
	Homburg, 3rd August 2006	Ontology for clinical trials (clinical user needs)

	St. Ingbert (FhG/IBMT), 1st September 2006	CRF Creator / Trial Builder (clinical user needs)
	Homburg, 12th September 2006 (only IFOMIS and Pediatric Oncology	Ontology for Radiotherapy (clinical user needs)
	Homburg, 8th February 2006	Trial Builder (clinical user needs)
WP2, 10,11,12 meeting	Hannover, 3rd May 2006	- Identification of data flows for the Nephroblastoma trial. - Legal aspects regarding Anonymity of genetic data and possible technical solutions
WP5 Kick-off Meeting	Eindhoven, 15th May 2006	Elicitation of available User Scenarios and discussion on the requirements for data access service. Identification of required end-user applications The required interaction with other ACGT workpackages was specified. Planning of the work of the WP Planning for the production of the WP deliverable
WP3/4 technical meeting (kick-off)	16-17 May 2006 Eindhoven	- Forming the technical board - Decision on building the ACGT Grid testbed - Decision on cooperation with other WP, especially WP2, 5, 6, 7, 9, 10.
Management Board Meeting	Budapest, 28 – 31 May 2006	
ACGT TMB meeting,	Athens, 11-13 Jun 2006	First technical meeting of the project. Discussed several of the scientific-technical domains of the project and initial, tentative, decisions were taken.
WP6 technical meeting (kick-off)	15 June 2006, Madrid	User needs were presented and analysed and the scope of the WP was clarified. The initial planning for all the work of the WP6 has taken place during this meeting.

WP6 & WP3 technical meeting	16 June 2006, Madrid	Presenting the initial design of the ACGT architecture. Taking input/requirements from WP6.
Requirements Collection meeting	Brussels, 26–28 June 2006	Requirements collection meeting at IJB in Brussels
WP15 Working meeting	Sophia Antipolis, France, 31 July – 1 August 2006	First web site design
WP8 kick-off meeting	Athens, 10th July 2006	The relevant expertise and infrastructure of each participating institution as well as the work already done within the frame of WP8 was presented. The next WP8 steps were scheduled. The required interaction with other ACGT workpackages was specified.
WP7 Kick-off Meeting	Madrid, 12th July 2006	Elaboration on the requirements for semantic integration of heterogeneous data. Identification of required end-user needs. The required interaction with other ACGT workpackages was specified. Planning of the work of the WP Planning for the production of the WP deliverable
Consortium meeting and Management board meeting	26 – 28 Sept. 2006	The project status was analysed and important planning decisions were taken.
WP9 kick-off meeting	Crete, 29th September 2006	The Wp had its kick-off meeting. It laid down the foundation for implementation of its tasks and provided the design for the Deliverable production.
Requirements collection meeting at UdS	Homburg, 5-6 October 2006	End user requirement collection and elicitation meeting.
Requirements collection meeting at IJB	Brussels, 27-10-2006	End user requirement collection and elicitation meeting.
Management board meeting	Crete, 26-28 Sep. 2006	The second plenary meeting was held in Crete. Important technical issues were addressed, WP status was monitored and strategic decisions regarding the direction of the project were taken.

WP10 meeting	Crete, 29th Sep. 2006	Data flows in the Data Protection Framework of ACGT
WP11 meeting	Merelbeke, 16th Oct. 2006	- Necessary content of Patient consent forms, contractual agreements and general terms - Need for a Data Protection Board
Meeting for the preparation of the Informal Review	Brussels, 29-30 November 2006	Preparation of the forthcoming informal review.
WP11 – WP3 meeting	Poznan, 4th December 2006	Features of GAS and integration with security infrastructure
Globus and Gridge training workshop	Poznan, 5-6 December 2006	Training workshop of the CT4 and Gridge technologies
WP12 meeting	Milano, 15 Dec. 2006	Setting up the details of the IEO participation and role
WP12 meeting	Oxford, 17 Dec. 2006	The WP12 co-coordinator had a bilater meeting with Prof. Harris and his staff to finalize the details of Oxford's involvement in the ACGT clinical trials
WP7 meeting focusing on the ACGT Master Ontology	Saarbrucken, 18 December 2006	Meeting focus on the methodology for maintenance of the ACGT Master Ontology
QGSA-DAI training meeting	Malaga, Spain, 23 January 2007	Training workshop on OGSA-DAI
WP10 and 11 meeting	Malaga, 24th Jan 2007	Data Protection Framework Alignment of technical and legal aspects of the ACGT Data Protection Framework
Plenary ACGT meeting, and Technical Management Meeting	Malaga, Spain 24/01/07 – 26/01/07	The third plenary meeting was organised. Project status was reviewed; technical issues were discussed and agreed upon. The initial architecture was discussed and agreed upon and a number of technical decisions were taken. A detailed planning for the forthcoming annual review was drafted.

3.4 Project Timetable and status

Although, there has been an initial delay in the start of the project of approximately 1-2 months, we can safely say that overall the project is running as scheduled. The management has asked for many activities to start even earlier than planned (provided there was adequate input from the activities they depend on). This has allowed the project to "catch-up". Today the only noticeable "problem" is the fact that we are pressed time-wise for the production, and internal review, of some Deliverables. An additional 1 month would enable us to increase even more the quality of our output. We will try to rectify this in the new DoW for the period T0+12 to T0+30.

As a general remark, we observe that quite a few activities are ahead of schedule (e.g. the biomedical grid layer, Ontology development, etc). On the other hand some other activities are slightly behind schedule, mainly in the timely production of the Deliverables rather than performing the work itself.

The following barchart represents the project timetable, with indications of tasks running ahead of schedule and tasks behind schedule.

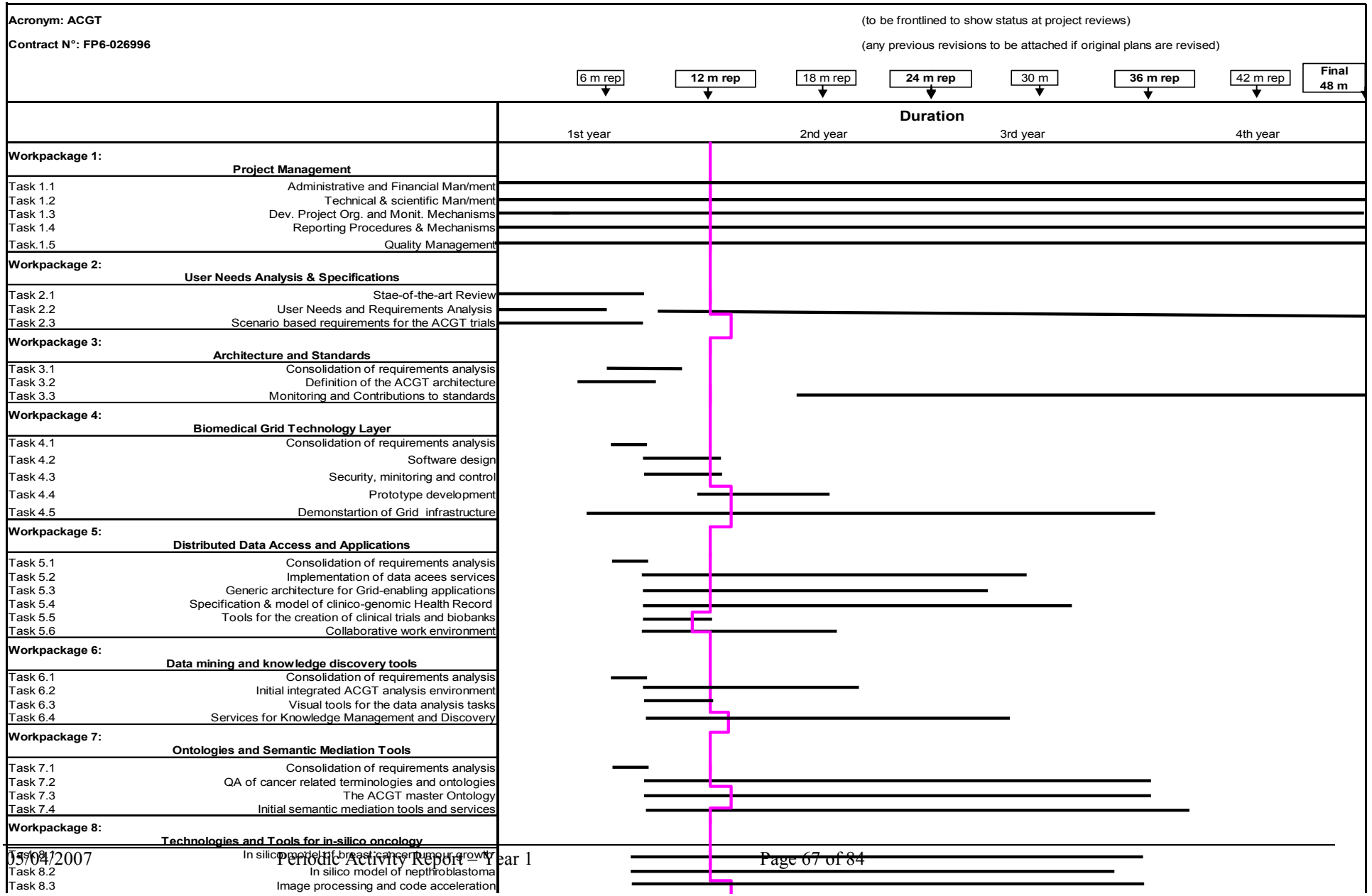
PROJECT BARCHART and STATUS

Acronym: ACGT

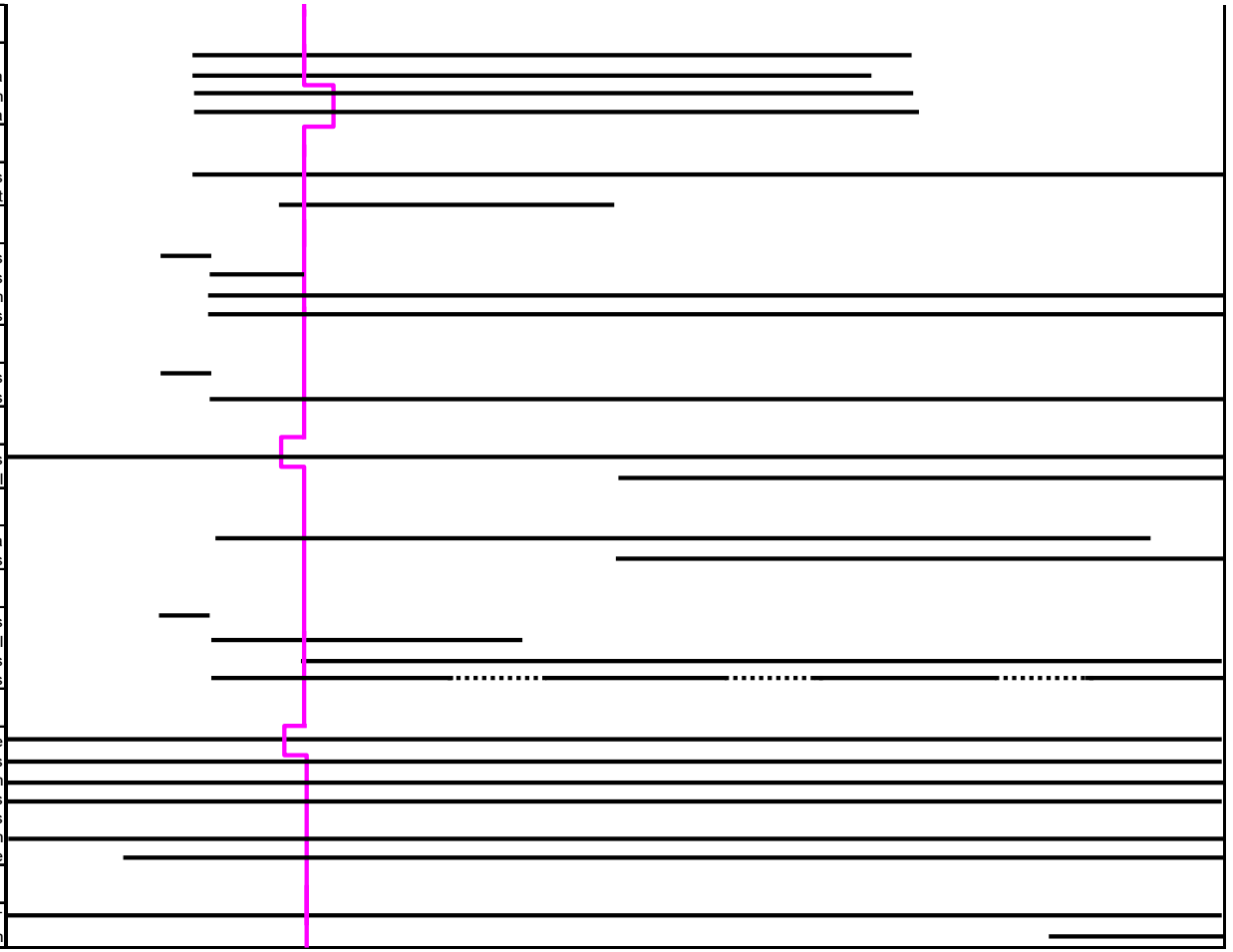
Contract N°: FP6-026996

(to be frontlined to show status at project reviews)

(any previous revisions to be attached if original plans are revised)



Workpackage 8:	**Technologies and Tools for in-silico oncology**
Task 8.1	In silico model of breast cancer tumour growth
Task 8.2	In silico model of nepthroblastoma
Task 8.3	Image processing and code acceleration
Task 8.4	VR visualization of clinical data
Workpackage 9:	**The Integrated ACGT Environment**
Task 9.1	Integration guidelines
Task 9.2	The integrated ACGT environment
Workpackage 10:	**Ethics, Legal and QA issues**
Task 10.1	Consolidation of requirements analysis
Task 10.2	Assesment of ethical, legal and security requirements
Task 10.3	Utilities for privacy protection
Task 10.4	QA standards & guidelines for multi-site CTs
Workpackage 11:	**Trust and Security**
Task 11.1	Consolidation of requirements analysis
Task 11.2	Implementation of Security Services
Workpackage 12:	**Clinical Trials**
Task 12.1	Preparing multi-centric CTs
Task 12.2	Definition & implementation of the validation trial
Workpackage 13:	**Evaluation & validation**
Task 13.1	Formulate evaluation criteria
Task 13.2	Coordinate local validation activities
Workpackage 14:	**Training**
Task 14.1	Consolidation of requirements analysis
Task 14.2	Dev. Of the prototype of the ACGT portal
Task 14.3	Training modules
Task 14.4	Summer Schools/Workshops
Workpackage 15:	**Dissemination**
Task15.1	External website
Task 15.2	Collaborative communications & notification tools
Task 15.3	Events organisation, participation and presentation
Task 15.4	Partnership programmes
Task 15.5	Project Conferences
Task 15.6	Publications production & dissemination
Task 15.7	Internal website
Workpackage 16:	**Exploitation**
Task 16.1	The market orientation of ACGT
Task 9.2	Exploitation Plan



3.5 Coordination activities

A number of coordination activities have been undertaken during the reporting period. Specifically the project has:

- Discussed and met with EGEE, exploring possibilities for utilizing EGEE's infrastructure as its biomedical grid layer and other forms of concertation
- Met with the management and technical coordinators of caBIG, discussing their architectural choices and exploring possibilities of collaboration.
- Discussed, through email and phone calls, with the UK's Cancer Grid. Have reached initial agreement with regards to potential concertation.
- Held a meeting with the "sister project" @nurist. Have reached initial agreement to collaborate on the domain of ontology development, with an ultimate objective to exhibit interoperable ontologies in their two domains of work.
- Met, discussed and formed a strategic alliance with the Center for the development of a virtual tumour (CViT, www.cvit.org) with the objective to collaborate on the domain of developing coherent "in-silico models" of tumor growth and its response to treatment.
- We have also planned joint scientific events with other projects, such as the (a) MATCH Specific Targeted Project - (Full Title: Automated Diagnosis System for the Treatment Cancer by discovering mutations on tumor suppressor genes.), (b) SMARTHEALTH Integrated Project – (Full Title: Smart Integrated Biodiagnostic Healthcare), and (c) the "LOCCANDIA" Targeted Research Project - (Full Title: Lab – On – Chip profiling for CANcer DIAgnosis). Common areas for potential concertation and exchange of experiences have been identified (i.e. semantic services and metadata (SMARTHEALTH), re-use of IS (Proteiomics IS with LOCCANDIA) and ontology engineering (MATCH)).
- Finally, we have been approached by the HealthAgents project (http://www.healthagents.net/) with a request (shown below) to coordinate or assist them in the domain of ethical and legal issues. We are currently discussing with the project.

  "Although we don't know one to each other, let me ask you to read my request and thank you in advance for your time.

  I'm coordinating HealthAgents project and there are some legal and ethical issues related to clinical data that worries me. I'm sending this mail as for some references I got I think you might help us on that.

  We're building a world wide network of clinical centres with the aim of providing a distributed decision support system for the diagnosis and prognosis of brain tumour.

  We're now in the middle of a discussion related to how legal regulations have to be applied. From the experience of other projects we thought it might be worthwhile to ask others (like you) how this has been taken into account (and solved, if possible) in similar frameworks.

  ……

  Thanks in advance for your time and greeting from Catalonia."

  Magí Lluch i Ariet

  HealthAgents Coordinator"

4 Other Issues

Ethical issues are of paramount importance for the project, since it will be handling sensitive personal, including genetic, data.

The project is devoting substantial resources for the analysis of the legal requirements to be fulfilled for lawfully establishing an integrated Clinico-Genomic ICT environment employing data extracted from human tissues. Special emphasis is laid on the issues of data protection and privacy.

The starting point of the analysis is the European Data Protection Directive 95/46 EC, which introduces rules applicable to every processing of personal data and sensitive data on a European level. As every EU Member State has to implement the regulations of the Data Protection Directive into national law, for an EU- wide project like ACGT, this Directive is the common legal basis for all participating states. Furthermore, the relevant sections of the Directive on Electronic Commerce 2000/31/EC are analysed.

As genetic data is very sensitive data, which holds information not only about the data subject itself but also about his or her relatives, possible diseases, etc., the processing of this kind of data is only possible under special requirements.

The data protection structure to be established for ACGT has to find a balance for the two competing aims of modern genetic research and the data protection needs of the participating patients. In order to comply with current data protection legislation, it is recommended to (de-facto) anonymize as much of the patient's genetic data as possible. Besides, an informed consent of the participating patients is needed because of ethical and legal reasons.

Furthermore a data protection framework has to be set up for ACGT, which consists mainly of three parts. First, an ACGT Data Protection Board has to be implemented. It will be the central data controller within ACGT as well as a legal body able to conduct contracts regarding data protection on behalf of ACGT. Second, a Trusted Third Party is needed in this data protection framework, which is responsible for the pseudonymization of the patient's genetic data and which will also be the keeper of the pseudonymization key to re-identify the patient concerned. Therefore the patient's genetic data is de-facto anonymous for users and participants of ACGT not having the link. Third, contracts between all participating hospitals, research units or other users of the genetic data and ACGT must be concluded in order to ensure confidentiality, data security and compliance with data protection legislation.

Annex: Plan for using and disseminating the knowledge

1.1 Exploitable knowledge and its Use

The project, at its current stage of implementation, has produced no exploitable results to report.

1.2 Dissemination of knowledge

A significant number of dissemination activities have taken place. These are listed below.

1.2.1 Dissemination activities performed

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
January 2006	*Shanghai*	*Chinese Grid computing community*	*China, Korea, Japan*	*100*	*PSNC*
Feb 2006	*Presentation at the Annual caBIG Conference*	*Mixed audience (Medical, Bio & IT)*	USA	*200+*	*FORTH*
4th April 2006	*Press release (http://idw-online.de/pages/de/news153573)*	*General public*	Germany		*USAAR / USAAR*
7th April 2006	*Press release (http://www.uni-saarland.de/de/medien/2006/04/1144141058)*	*General public*	Germany		*USAAR / USAAR*
11th May 2006 in Homburg	*Conference*	Project ELAN2LIFE	South America	*10*	*USAAR / USAAR*
May 2006	*Philips Corporate Exhibition 2006*	IT	Global	*150+*	*Philips*
30th May 2006	*Scientific Workshop, Budapest*	Bioinformaticians & IT specialists	Europe	*40*	*FORTH/FORTH, FhG, UPM, UHann*
19th June 2006 in Berlin	*Conference*	*GPOH, group of Informatics*	Germany	*15*	*USAAR / USAAR*
29th- 30th June 2006 in	*ICT for BIO-Medical*	*Mixed audience*	European	*250*	*EU / USAAR &*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
January 2006	*Shanghai*	*Chinese Grid computing community*	*China, Korea, Japan*	*100*	*PSNC*
Brussels	*Sciences 2006 Conference*	*(Medical, Bio & IT)*	countries		*FORTH*
Campus 3/2006	*Press release (http://www.uni-saarland.de/mediadb/fotos/universitaet/Veroffentlichungen/campus/2006/3/20.pdf)*	*Members of the University*	Germany		*USAAR / USAAR*
9^{th} -16^{th} September 2006, Jakarta, Indonesia	*ENGAGE Conference (http://www.engage-ist.org/index.php?id=7907)*	*IT*	Asia	*100*	*USAAR*
21^{st} October 2006 in Wuhan, China	*Conference on Lymphoma and Clinical trials* *Title of the Talk:* *N. Graf: Advancing Clinico-Genomic Trials (ACGT) – A European Project*	*Physicians*	China	*250*	*USAAR / USAAR*
1^{st} – 2^{nd} February, London	*SIOP Nephroblastoma committee meeting* *Title of the Talk:* *N. Graf: ACGT for clinico-genomic trials*	*Clinicians, molecular biologists*	Europe, Brazil, USA	*50*	*USAAR*
Oct. 06	*Publications* *Datenschutzrechtliche Aspekte bei der Forschung mit menschlichen Genen; in: Hochberger, Christian/Liskowsky, Rüdiger*	*Research, Industry (computer science)*	Germany		*UHANN*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
January 2006	*Shanghai*	*Chinese Grid computing community*	*China, Korea, Japan*	*100*	*PSNC*
	(Eds.):INFORMATIK 2006-Informatik für Menschen Vol. 1, Bonn 2006, pp. 702-70				
5th Oct. 06	*Conference* *Data protection regarding human genetic research; Dresden, at the 36th annual summit of the Gesellschaft für Informatik*	*Research, Industry (computer science)*	Germany	*50*	*UHANN*
25/10/06	Presentation at conference ICT Technologies for Cancer Research and Management in the Post-Genomic Era: Status and Challenges, ITAB 2006, Ioannina, Greece Christos Andronis: Knowledge Generation through advanced literature mining techniques: BEA	Researchers	International	40	Biovista / ERCIM
25th Oct. 06	*Conference* *Bio-ethical considerations: Addressing the complex legal, regulatory and ethical issues in the post genomic era; Ioannina at the ITAP 2006 Pre-Conference Workshop*	*Research, Industry (computer science)*	international	*150*	*UHANN*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
January 2006	*Shanghai*	*Chinese Grid computing community*	*China, Korea, Japan*	*100*	*PSNC*
25-26/10/06	*Presentation at booth (INRIA) at EuroBio06, Paris*	Mixed	International	4500 (20 at presentation)	Biovista
October 2006	Krakow	EGEE audience, high energy physics	European	100	PSNC
Nov. 06	*Publications* *Arning, Marian/Forgó, Nikolaus/Krügel, Tina: Datenschutzrechtliche Aspekte der Forschung mit genetischen Daten; in:DuD 2006, pp. 700-705*	*Research*	Germany		*UHANN*
8th Dec. 06	*Conference* *Requirements for european multicentre trials including genetic data of subjects; Berlin, at the workshop "Personal Data Issues in European/International Medical Research Projects" organized by the Telematikplattform für Medizinische Forschungsnetze e.V.*	*Research, Industry (computer science)*	international	*50*	*UHANN*
Jan 07	*Project web-site*	*General public*	international		*UHANN*

Planned/actual Dates	Type	Type of audience	Countries addressed	Size of audience	Partner responsible /involved
January 2006	*Shanghai*	*Chinese Grid computing community*	*China, Korea, Japan*	*100*	*PSNC*
19 March 07	*Exhibition* *Cebit Hannover*	*Research, Industry (computer science)*	international	*200*	*UHANN*

1.2.2 Dissemination activities planned

Planned/actual Dates	*Type*	*Type of audience*	Countries addressed	*Size of audience*	*Partner responsible /involved*
September 23-27, 2007	European Cancer Conference (ECCO)	*Mainly Clinical researchers and medical professionals*	Europe	*500+*	*Management Board*
October 30-November 3, 2007	Congress of the International Society of Paediatric Oncology (SIOP)	*Mainly Clinical researchers and medical professionals*	International	*500+*	*Saarland*
April 12-16, 2008	Annual Meeting of the American Association for Cancer Research (AACR)	*Mainly Clinical researchers and medical professionals*	International	*1000+*	*Management Board*
25-27 June 2007, Barcelona	International Symposium on Biomedical Informatics.	*Biomedical Informaticians*	International	*~200*	*UPM & UMA*
5-9 November 2007, New Zealand	1st International WORKSHOP on Ontologies and Information Systems for the Semantic Web (ONISW 2007) (http://www.ischool.drexel.edu/faculty/hhan/onisw2007/)	*IT*	International	*50+*	*FORTH & IFOMIS*

1.3 Publications (papers, journals)

During the first year of ACGT's lifespan a number of early introductory publications directly related to ACGT were produced. Nevertheless, a substantial number of previously worked out papers by ACGT partners concerning the background and the scientific basis of ACGT, the methodologies employed and its technologies were published (or submitted for publication) within the same period. For this reason both kinds of publications are included in the following representative list.

1.3.1 Publications done

Title	Details
HealthGrid 06 Conference	M. Tsiknakis, et al, Building a European Biomedical Grid on Cancer: The ACGT Integrated Project, 2006
Proceedings of the 2nd IARWISO Conference; Kolympari, Chania, Greece, 25th September 2006	Norbert Graf, Alexander Hoppe: What are the expectations of a Clinician from "In SILICO Oncology"; page 36 – 38
Proceedings of the 2nd IARWISO Conference; Kolympari, Chania, Greece, 25th September 2006	N. Sofra, G. Stamatakos N. Graf, N. Uzunoglu: A four dimensional simulation model of the in vivo response of nephroblastoma to vincristine; page 17 – 19
IEEE ITAB 2006 Conference, Workshop on ICT Technologies for Cancer Research and Management in the Post-Genomic Era: Status and Challenges, Ioannina, Greece	Mathias Brochhausen: Towards a Cancer Ontology: Present Status and Challenges
IEEE ITAB 2006 Conference	M. Tsiknakis, S. Sfakianakis, Semantic Grid services in support of multi-centric, post-genomic trials on Cancer
Computational Methods in Science and Technology	Programming Grid Applications with Gridge , J. Pukacki, J. Nabrzyski, M. Stroiński et al.,, ", in J. Nabrzyski, M. Stroiński (eds.) „Grid Applications – New Challenges for Computational Methods" Volume 12 (1) 2006 of the Computational Methods in Science and Technology, Scientific Publishers OWN, 2006.

Abstracts of the DIMACS Workshop on Computational Tumor Modeling, organized by D. Axelrod, Rutgers University, T. S. Deisboeck, Harvard Medical School and Center for the Development of a Virtual Tumor, August 3 - 4, 2006, DIMACS Center, Rutgers University, Piscataway, NJ, USA. (http://dimacs.rutgers.edu/Workshops/TumorModeling/abstracts.html)	G.S.Stamatakos, "Towards a collaborative formulation of the Mathematical Principles of Natural Philosophy: Living Matter. The paradigm of In Silico Oncology
Cancer Informatics	D.D.Dionysiou and G.S.Stamatakos, "Applying a 4D multiscale in vivo tumor growth model to the exploration of radiotherapy scheduling: the effects of weekend treatment gaps and p53 gene status on the response of fast growing solid tumors", Cancer Informatics, 2: 113-121, 2006
Cancer Bioinformatics: from therapy design totreatment Edited by Sylvia Nagl © 2006 John Wiley & Sons, Ltd.	G. S. Stamatakos and N.Uzunoglu "Computer Simulation of Tumour Response to Therapy" in Cancer Bioinformatics: from therapy design totreatment Edited by Sylvia Nagl © 2006 John Wiley & Sons, Ltd.
Int J Cancer	Zirn B, Hartmann O, Samans B, Krause M, Wittmann S, Mertens F, Graf N, Eilers M, Gessler M: Expression profiling of Wilms tumors reveals new candidate genes for different clinical parameters. Int J Cancer: 118:1954–1962, 2006
Cell Cycle	Desmedt C and Sotiriou C. Proliferation: The Most Prominent Predictor of Clinical Outcome in Breast Cancer. Cell Cycle. 2006 Oct 1;5(19).
J Pediatr Surg	Szavay P, Luithle T, Graf N, Furtwängler R, Fuchs J: Primary Hepatic Metastases in Nephroblastoma – A Report of the SIOP/GPOH Study. J Pediatr Surg 41:168-172, 2006
Computers in Biology and Medicine	D.D.Dionysiou, G.S. Stamatakos, N.K.Uzunoglu, K.S.Nikita "A computer simulation of in vivo tumour growth and response to radiotherapy: new algorithms and parametric results", Computers in Biology and Medicine

	36: 448-464, 2006.
British Journal of Radiology	G. S. Stamatakos, V.P. Antipas, N. K. Uzunoglu, R. G. Dale, "A four dimensional computer simulation model of the in vivo response to radiotherapy of glioblastoma multiforme: studies on the effect of clonogenic cell density." British Journal of Radiology, 2006, vol. 79, 389-400.
IEEE Transactions on Biomedical Engineering	G. S. Stamatakos, V. P.Antipas, and N. K. Uzunoglu, "A spatiotemporal, patient individualized simulation model of solid tumor response to chemotherapy in vivo: the paradigm of glioblastoma multiforme treated by temozolomide" IEEE Transactions on Biomedical Engineering, Vol. 53, No 8, pp.1467-1477, August 2006
Cancer Informatics	G. Stamatakos, " Spotlight on Cancer Informatics," Cancer Informatics No 2, pp.99-102, 2006.
28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS)	Th. Margaritis, K. Marias, D. Kafetzopoulos, "Improved Microarray Spot Segmentation by Combining two Information Channels", 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS), August 30 to September 3, 2006, New York City, USA.
Methods Inf Med	V. Antipas, G. S. Stamatakos, N. K. Uzunoglu, "A patient-specific in vivo tumor and normal tissue model for prediction of the response to radiotherapy", Methods Inf Med 2006; 45 XX (in press).
Methods Inf Med	Maojo V, Garcia-Remesal M, Billhardt H, Alonso-Calvo R, Perez-Rey D, Martin-Sanchez F. "Designing new methodologies for integrating biomedical information in clinical trials." Methods Inf Med. 2006;45(2):180-5
Genes, Chromosomes & Cancer	Zirn B, Samans B, Pietsch T, Leuschner I, Eilers M, Graf N, Gessler M: Target genes of the Wnt/ß-catenin

	pathway in Wilms tumors. Genes, Chromosomes & Cancer: 45:565-574, 2006.
Cancer	Furtwängler R, Reinhard H, Leuschner I, Schenk JP, Göbel U, Claviez A, Kulozik A, Zoubek A, von Schweinitz D, Graf N for the GPOH Nephroblastoma study group: Mesoblastic Nephroma – A report from the Gesellschaft für pädiatrische Onkologie und Hämatolgie (GPOH). Cancer 106:2275-83, 2006
Fortschr Röntgenstr	Schenk JP, Schrader C, Zieger B, Furtwängler R, Leuschner I, Graf N, Tröger J: Referenzradiologie des Nephroblastoms: Diagnosegenauigkeit und Bedeutung für die präoperative Chemotherapie. Fortschr Röntgenstr 178:38-45, 2006
Human-Computer Interaction International 2007, 22-27 July, Beijing International Convention Center, Beijing, P.R. China	K. Marias, D.D.Dionysiou, G.S.Stamatakos, F.Zacharopoulou, E.Georgiadi, T.G.Maris, I.Tollis "Multi-level analysis and information extraction considerations for validating 4D models of human function"
Wiley Science (www.interscience.wiley.com)	J.F. Aldana, et al., Bio-Broker: a tool for integration of Biological Data Sources and Data Analysis Tools, Software, Practice and Experience 2006; 36:1585-1604. Published Online: 13 Jul 2006 in Wiley Science (www.interscience.wiley.com) ;
Journal of Biomedical Informatics	R. Alonso-Calvo, V. Maojo, H. Billhardt, F. Martin-Sanchez, M. Garcia-Remesal, D. Perez-Rey. An agent- and ontology-based system for integrating public gene, protein, and disease databases. Journal of Biomedical Informatics 40 (2007) 17–29

1.3.2 Publications submitted

IEEE Trans on Nanobioscience – Special issue on GRID & Ontology Applications	M. Tsiknakis, V. Maojo, G. Potamias, A. Analyti, M. Brochhausen, S. Rueping, L. Martin, D. Kafetzopoulos. Semantic grid services enabling ontology based integration and analysis of multilevel biomedical data. IEEE Trans on Nanobioscience – Special issue on GRID & Ontology Applications 2006
Mathematical Biosciences	D.D.Dionysiou and G.S.Stamatakos "Introducing operator notation to in silico oncology: the paradigm of imageable glioblastoma treated with radiotherapy", Mathematical Biosciences.
IEEE Transactions of Information Technology in Biomedicine Journal	M. Tsiknakis, M. Brochhausen, J. Nabrzyski, J. Pucaski, et al, A semantic grid infrastructure enabling integrated access and analysis of multilevel biomedical data in support of post-genomic clinical trials on Cancer, IEEE Journal on ITB
2nd EGEE User Forum, 9-11 May 2007, Manchester, UK	T. E. Athanaileas, D. D. Dionysiou, G. S. Stamatakos, N. Mouravliansky, D. I. Kaklamani, N. K. Uzunoglu. "Applying Grid Technologies to In Silico Oncology", 2nd EGEE User Forum, 9-11 May 2007, Manchester, UK.
Human-Computer Interaction International 2007, 22-27 July, Beijing International Convention Center, Beijing, P.R. China	D.D.Dionysiou, G.S.Stamatakos, K.Marias "Simulating cancer radiotherapy on a multi-level basis: biology, oncology and image processing", submitted to HCI (Human-Computer Interaction) International 2007, 22-27 July, Beijing International Convention Center, Beijing, P.R. China.
INFORSALUD 2007	L. Martín, V. Maojo, M. Tsiknakis, A. Anguita, G. de la Calle. ACGT: Una plataforma europea para la ayuda a la integración de datos genéticos y clínicos para la terapia y el tratamiento personalizado en cancer. INFORSALUD 2007

1.3.3 Publications planned

Title	Details
Healthgrid 2007 Conference, Geneva, 24-27 April 2007	Stefan Ruping, Stelios Sfakianakis, Manolis Tsiknakis "Extending Workflow Management for Knowledge Discovery in Clinico-Genomic Data"
QA-gen Workshop: Quantitative approaches for knowledge discovery and decision support in the post genomic era, in conjunction with the 15th International Conference on Conceptual Structures (ICCS 2007), 22-27 of July, 2007, Sheffield Hallam University, UK	Manolis Tsiknakis, Stefan Rueping, Stelios Sfakianakis, "The ACGT Knowledge discovery tasks and technologies"
American Medical Informatics Association Conference (AMIA 07), August 07	Luis Martín, Alberto Anguita, Guillermo de la Calle, Miguel García-Remesal, Jose Crespo, , Manolis Tsiknakis, Víctor Maojo, "Semantic Data Integration in the European ACGT project"

1.4 Publishable results

There are no publishable results during the first reporting period of the project. The first such result, according to the project's DoW is the initial version of the "ACGT Master Ontology on Cancer", which is planned to be released in month15.

1.5 Project Logo and public Web Site

The public web site of the project can be found at: http://eu-acgt.org/

The project logo is as shown below: