TECHNICAL REVIEW REPORT

Information and Communication Technologies
ICT

Project acronym:	CHIC
Project title:	Computational Horizons in Cancer:Developing Meta- and Hyper-Multiscale Models and Repositories for In Silico Oncology
Grant agreement number:	600841
Funding scheme:	Collaborative project
Project starting date:	01/04/2013
Project duration:	48 months
Coordinator:	Institute of Communication and Computer Systems National University of Athens (Greece)
Project web site:	http://www.chic-vph.eu

Period covered by the report:	Period No. 1, from 01/04/2013 to 30/09/2013
Place of review meeting:	Brussels
Date of review meeting:	15/11/2013
Experts:	Tor BLOCH Henry KANOUI Jorge MARTINEZ de HURTADO Elena TSIPORKOVA
Project officer:	Dr Jaakko AARNIO

Individual report	☐
Consolidated report	☒

SEVENTH FRAMEWORK PROGRAMME

European Commission
Information Society and Media

1. OVERALL ASSESSMENT

a. Executive summary

Please give your overall assessment of the project, commenting on the following:

- *main scientific/technological achievements of the project*
- *quality of the results*
- *attainment of the objectives and milestones for the period*
- *adherence to the workplan, any deviations (whether justified) and remedies (whether acceptable)*
- *take-up of the recommendations from the previous review (if applicable)*
- *contribution to the state of the art*
- *use of resources*
- *impact*

CHIC proposes the development of a suite of tools, services and secure infrastructure that will support accessibility and reusability of VPH mathematical and computational hypermodels. The CHIC tools, services, infrastructure and repositories will provide the community with a collaborative interface for exchanging knowledge and sharing work in an effective and standardized way. Clinical adaptation and partial clinical validation of hypermodels and hypermodel oncosimulators will be undertaken. The vision presented is that CHIC will test and validate the overall architecture defined in the VPHOP project.

This is the first review of the project covering the first 6 month period. The purpose was to assess the preliminary results and the cohesion of the consortium. The majority of the project work in this period has been devoted to the state of the art studies, setting up the right collaboration environments and other preparation activities allowing initiating the different work packages.

Generally, the work reported is of good quality. All deliverables have been released on due date. They are very well written and they are homogeneous, despite the number of different contributors. The technical content is sound although the results reported need to be further deepened and refined in subsequent versions.

Dissemination issues have been very well addressed with the participation to many events (workshops, conferences, etc.) and publication of scientific papers. Activity on exploitation is at a very early stage.

There is good cooperation between partners, especially between clinicians and IT specialists; all seems committed and participated actively in the review meeting. Project management looks effective.

b. Recommendations concerning the period under review

Please give your recommendations on the acceptance or rejection of resources, work done and required corrective actions – e.g., resubmission of reports or deliverables, further justifications, etc.

Complete the resources consumption report and provide a consolidated table.
Clarify the recruitment issues at UBERN and UOXF (status and impact).

All deliverables are quite comprehensive and of overall good quality (although sometimes complex to follow). D6.1 "Cancer hypomodelling and hypermodelling strategies and initial component models" does not elaborate sufficiently on strategy but on general topics on modelling, state of the art, Oncosimulator and what CHIC will contribute to the field. All this information, contained in 10 pages, is the same as contained in Annex1 DoW.

c. Recommendations concerning future work

Please give your recommendations – e.g., overall modifications, corrective actions at WP level, re-tuning of the objectives to optimise the impact or to keep up with the state of the art, better use of resources, re-focusing, etc. Where appropriate, indicate the timescale for implementation.

Provide a formal presentation of the hypermodeling strategies and their clinical implementation in deliverable D6.2 and/or D7.1, as was clarified during the review.

It would be of help to deliver a glossary and definition of terms concerning the field of Hypermodeling

IPR issues inside the consortium should be clarified and an agreement between the partners should be signed as soon as possible. The issues that could arise in connection with the modelling software should be covered (in particular with the plan the project has to invite modellers from outside the project in Month 38 onwards), as well as the case where a novel therapeutic technique might be inspired by some of the CHIC work.

Concerning WP4, and for the next deliverable D4.3.1, "Development of the Data Protection and Copyright Framework for CHIC - first iteration", clearly separated analysis should be provided both for the early research phase, and for the targeted "service" phase. The latter will be potentially dealing with processing real patient data, probably including genetic information, sent by (external) clinicians, who will be expecting some preliminary results that may influence treatment decisions.

In this same deliverable D4.3.1, the exact choices of IT solutions retained for all the relevant issues (encryption, double encryption, data transmission, storage (type of clouds), etc.) should be presented, so that the main drivers of the CHIC Project, i.e. clinicians, can plan their work in detail with total assurance that they are on safe ethical and legal grounds. Clinical needs are supposed to drive the development of IT solutions. Simple solutions should be chosen which have proven themselves to be acceptable in the **existing** legal framework.

It is therefore expected to see in place an initial working IT platform at the end of next period, as was mentioned by TEI-C & FORTH representative during the review.

A clear and explicit Gantt chart documenting **which services are available to the clinicians when and from where,** should be presented at the next review

A simple but complete end-user oriented description of the project services should be also prepared during next period, with annotations of which type of data will be accepted from where and the legal and IPR framework used and permitting the service.

d. Assessment

☐ Excellent progress (the project has fully achieved its objectives and technical goals for the period and has even exceeded expectations).

☒ Good progress (the project has achieved most of its objectives and technical goals for the period with relatively minor deviations).

☐ Acceptable progress (the project has achieved some of its objectives; however, corrective action will be required).

☐ Unsatisfactory progress (the project has failed to achieve key objectives and/or is not at all on schedule).

2. OBJECTIVES and WORKPLAN

a. Progress towards project objectives

Assess to what extent the objectives of the project for the period have been achieved. In particular, please indicate if the project as a whole has been making satisfactory progress in relation to the Description of Work (Annex I to the grant agreement) and comment on the interaction between the work packages and the level of integration demonstrated.

The project has progressed in conformance with the DoW, the objectives set for the reported period have been attained. The contractual deliverables are of adequate quality and were issued on schedule. There appear to be fruitful cross exchanges between work packages as well as among individual participants.

b. Progress in individual work packages

For each work package (WP), assess the progress in relation to the Description of Work (Annex I of the grant agreement). Please also report and comment on any delays, reasons for them and any remedial action taken. Specify the work packages concerned.

WP1 – Project management

Work and activities performed along the first 6 months of the project are comprehensively described in the 1st interim report. The project management is of good quality. All the work packages have been started and the engagement and the motivation of the research partners is high.

Progress accomplished in each work packages and individual tasks (with details on the work achieved by each contributing partner), issues raised (if any) and their resolution, as well as project management meetings, events and dissemination activities (conferences and paper submission or publication in scientific journals), have been documented. An analysis of resources consumption is also reported (although there are missing data for 4 partners).

WP2 – User needs and requirements

Started and progressing according to the schedule. No deliverable due for the period. The focus was on initialising the collection of state of the art knowledge about building hypermodels, working on the development of realistic use case and scenarios and the collection of data from different cancer domains.

WP3 – Clinical and Translational science scenarios
Started and progressing according to the schedule. No deliverable due for the period. The work package concentrated on exploration and collection of data for the three different cancer types considered by the project.

WP4 – Legal and ethical framework
Task 4.1 has been completed and the resulting deliverable D4.1 has been issued on schedule. A comprehensive overview and detailed analysis of the issues related to *the* ethical and the legal requirements for sharing data is presented. Other tasks have progressed as expected.

WP5 – IT architecture
Started and progressing according to the schedule. No deliverable due for the period. The work package performed an evaluation of existing architectures and private cloud technologies, to be used by the consortium.

WP6 Cancer Models and Hypermodel Design
A first review of existing models already available or under refinement or development from consortium partners was provided (task 6.1). The hypermodelling "strategy" in D6.1 has been approached only from mathematical perspective. A more general and sound strategy approach was presented during the review. The consortium has committed to deliver a more operative strategy in D6.2 (and perhaps D7.1 as well).
The other tasks progressed as well. Delay in staff recruitment is reported. Although the impact at the moment is qualified as "minimal", the issue should be immediately clarified.

WP7 – Hypermodelling infrastructure
Started and progressing according to the schedule. No deliverable due for the period. The focus was on the definition of the component models of the ICT hypermodelling infrastructure. Work has only just started on how to link the existing and future components (hypomodels). For this Json (Java Script Object Notation) was mentioned as a favoured candidate.

WP8 – Models and data repositories
Started and progressing according to the schedule. No deliverable due for the period. The work package focused on the analysis of models/tools and clinical data specifications, collection of knowledge representation requirements for multiscale cancer biology and initiated the design of a semantic interoperability framework

WP9 – Image processing and visualization.
This work package focused on the analysis of the user requirements, at this stage the modellers' in particular, for the visualization toolkit and image analysis toolkits. Task 9.1 has progressed as expected and issued Deliverable 9.1 on time, with inputs from T6.1. The work produced is of good quality and is considered as a solid basis for the specification work. Significant preparatory work for task 9.8 (starting month 8) could also be achieved.

WP10 – Integrated platform
An evaluation of portal frameworks and technologies was conducted and a development installation of a portal ("liferay" selected) to be used for CHIC was set up. Started and progressing according to the schedule. No deliverable due for the period.

WP11 – Clinical adaptation and validation
Some initial work on the definition of evaluation and validation criteria for enhancing the clinical adaptation of hypermodels was performed. Progressing according to the schedule. No deliverable due for the period.

WP12 – Dissemination plan
The dissemination issue receives a great attention and it is clear that it is considered as a key aspect of the project success. A full dissemination strategy is presented in D12.1.

c. Milestones and deliverables

Indicate whether the planned milestones and deliverables have been achieved for the reporting period (please give more detailed comments first and then fill in the summary table below).

All planned milestones (MS1, MS2, MS11 and MS30) have been attained and the contractual deliverables have been issued on schedule. All deliverables are of overall good quality, substantial and informative.

STATUS OF DELIVERABLES			
No.	**Title**	**Status** *(Approved/Rejected)*	**Remarks**
D4.1	Initial analysis of the ethical and legal requirements for the sharing of data	**A**	Sound analysis of ethical and legal issues regarding the use and exchange of patient data in the context of the project. A comprehensive framework for data protection is proposed. It features a strict policy and covers all aspects relevant to the security and protection of data during their full life cycle during the development phase. The appointment of a data protection office (CDP), an external body as a guarantee of compliance with the adopted policy is welcome.
D6.1	Cancer hypo-modeling and hyper-modeling strategies and initial component models.	**A**	A first review of existing models already available or under refinement or development from consortium partners was provided. The hypermodelling "strategy" in D6.1 has been approached only from mathematical perspective. A more general and sound strategy approach was presented during the review. The consortium has committed to deliver a more operative strategy in D6.2 (and perhaps D7.1 as well).
D9.1	User requirements for the visualization toolkit and image analysis toolkits	**A**	These are technological requirements rather than users' ones. The methodology used for

			eliciting these requirements consists in a series of studies of 49 available cancer simulation models with respect to image analysis and visualization needs stressing on the particular challenges of the project. These studies are completed by brain tumor image analysis and MRI requirements in the scope of the project. The document is of good quality; the issues are discussed and explained in good details, pointing out the methods used and the difficulties and challenges encountered.
D12.1	Dissemination plan	**A**	This document outlines a full strategy for the dissemination of project outcomes. This strategy relies on a dissemination model in which the various sources, targets, channels and contents of disseminated material as well as the individual partners' responsibilities are identified and carefully described. This presentation features a sound vision of the consortium for what regards the dissemination activities and its evolution along the project timeframe.

d. Relevance of objectives

Indicate whether the objectives for the coming periods are (i) still relevant and (ii) still achievable within the time and resources available to the project. Assess also whether the approach and methodology continue to be relevant.

The project objectives are still highly relevant and achievable within the remaining time and resources. The relevance of the scientific approach and methodology were assessed by the quality of the deliverables and explanations given during the review meeting.

e. For Networks of Excellence (NoEs) only

Assess how the Joint Programme of Activities has been realised for the period and whether all the planned activities have been satisfactorily completed.
NA

3. RESOURCES

a. Assessment of the use of resources

Comment on the use of resources, i.e. personnel resources and other major cost items. In particular, indicate whether the resources have been utilised (i) to achieve the progress and (ii) in a manner consistent with the principle of economy, efficiency and effectiveness[1]. Note that both aspects (i) and (ii) have to be covered in your answer. The assessment should cover the deployment of resources overall and by each participant. Are the resources used appropriate and necessary for the work performed and commensurate with the results achieved? Are the major cost items appropriate? In your assessment, consider the person months, equipment, subcontracting, consumables and travel.

Personnel costs

Although resources data are missing for 4 partners, expenditures as reported in the 1st Periodic Report are globally consistent with the amount of work performed to achieve the project objectives, while respecting the principles of economy, efficiency and effectiveness. All partners have committed skilled staff in time and volume according to the workplan, despite some delay in staff recruitment for 2 partners.

Because of missing data, the comparison between actual and planned expenses could not be fully assessed. The figures as provided show a slight underspending during the period.

Other expenditures

No specific comment. Look adequate and quite reasonable.

b. Deviations

If applicable, please comment on major deviations with respect to the planned resources.

No significant deviations reported

[1] "The principle of economy, efficiency and effectiveness refers to the standard of "good housekeeping" in spending public money effectively. Economy can be understood as minimising the costs of resources used for an activity (input), having regard to the appropriate quality and can be linked to efficiency, which is the relationship between the outputs and the resources used to produce them. Effectiveness is concerned with measuring the extent to which the objectives have been achieved and the relationship between the intended impact and the actual impact of an activity. Cost effectiveness means the relationship between project costs and outcomes, expressed as costs per unit of outcome achieved." Guide to Financial Issues, Version 02/04/2009, p.33.

4. MANAGEMENT, COLLABORATION AND BENEFICIARIES' ROLES

a. Technical, administrative and financial management of the project

Assess the quality and effectiveness of the project management, including the management of individual work packages, the handling of any problems and the implementation of previous review recommendations. Comment also on the quality and completeness of information and documentation.

The management has been adequate. The role of the participants and their mutual relationships are clearly stated, with provision for quality assurance, quality criteria and risk analysis. There is a contingency plan in place.

The structure and contents of deliverables reflects an effective organisation of the work and a suitable coordination between all involved parties. All project documents (deliverables, periodic report, etc.) were delivered on time and were very informative.

A Consortium Agreement relative to IPR issues should have been signed by now, so that IPR usage between partners be clarified.

The review was well prepared and all presentations were effective.

b. Collaboration and communication

Comment on the quality and effectiveness of the collaboration and communication between the beneficiaries.

There is good coordination between partners. The consortium works with efficiency. Evidence of collaboration and knowledge transfer among partners is exemplified by the work done in the first deliverables which gathers expertise and contribution from many different participants.

c. Beneficiaries' roles

Give an assessment of the role and contribution of each individual beneficiary and indicate if there is any evidence of underperformance, lack of commitment or change of interest.

All partners seem fully committed. All have attended the review and were very reactive on experts' questions.

5. USE AND DISSEMINATION OF FOREGROUND

a. Impact

Is there evidence that the project has so far had, and is it likely to have, significant scientific, technical, commercial, social or environmental impact (where applicable)?

If successfully completed, the project should have a high impact in scientific and clinical terms. Large scale hypermodeling is a real challenge and the demonstration of a feasible approach would be a decisive progress. Clinical and social consequences should also be important in optimizing the diagnostic, assessment of evolution and treatment of cancer diseases helping thus to improve the patient's quality of life.

b. Use of results

Comment on whether the plan for the use of foreground, including any updates, is still appropriate. Comment also on the plan for the exploitation and use of foreground for the consortium as a whole, or for individual beneficiaries or groups of beneficiaries, and its progress to date.

To date, only preliminary activities regarding exploitation of results have taken place.

c. Dissemination

Assess whether the dissemination of project results and information (via the project website, publications, conferences, etc.) has been adequate and appropriate.

The dissemination activity has been very effective at this stage of the project: 13 presentations at workshops and conferences, 4 newspaper or online articles and 4 scientific peer-reviewed papers published or accepted.

The project web site has been opened. It features easy and natural interaction; the content and presentation are of good quality (cf. the project newsletter); the information displayed is relevant.

d. Involvement of potential users and stakeholders

Indicate whether potential users and other stakeholders (outside the consortium) are suitably involved (if applicable).

User organisations are present and active as consortium members. A number of dissemination events targeting external interested bodies (including industries) have been organized during the period.

e. Links with other projects and programmes

Comment on the consortium's interaction with other related Framework Programme projects and other national/international R&D programmes and standardisation bodies (if relevant).

Continuous interactions between other on-going or completed European projects as well as with the VPH-Share infrastructure are reported. External interfacing is given a particular attention since it is specifically addressed by the workplan (subtask T12.1.g).

6. OTHER ISSUES

If applicable, comment on whether other relevant issues (e.g. ethical issues, policy/regulatory issues, safety issues) have been handled appropriately.

The ethical and legal situation regarding the sharing of data electronically within Europe and beyond have been particularly well analyzed (cf. comments on Deliverable D4.1).

It is suggested by the review team to have the next review after Month 14 (and not month 12), when deliverable D4.3.1 (the operational recommendations for the "legal" IT system and IPR) is due. It would even be desirable to have D8.1 (in month 16) available (Design of the CHIC repositories) at the same time. It is also suggested to have next review in situ at FORTH premises, so as to evaluate the initial working platform.

Name(s) of expert(s):
Tor BLOCH
"signed"

Henry KANOUI,
"signed"

Jorge MARTÍNEZ DE HURTADO,
"signed"

Elena TSIPORKOVA
"signed"

Date: 15 november 2013