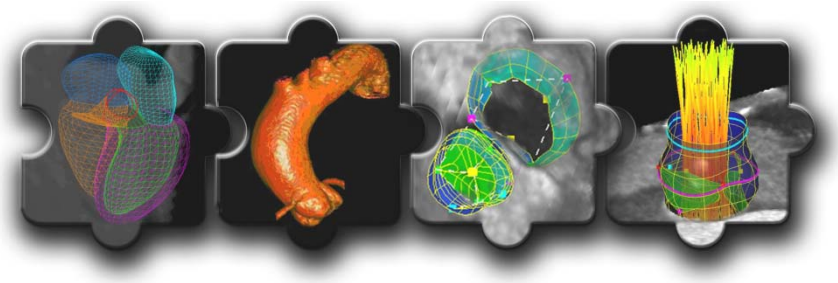
FP7-ICT-2009-4 (248421)
SeC
Sim-e-Child



Collaboration Project

Thematic Priority: ICT

Deliverable D6.1
Dissemination Strategy Plan and Preliminary Materials

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Sim-e-Child Consortium

The partners in this project are:
01. Siemens AG (Siemens)
02. Lynkeus Srl (Lynkeus)
04. maat France (MAAT)
05. Technische Universität München (TUM)
06. I.R.C.C.S. Ospedale Pediatrico Bambino Gesù (OPBG)
07. Siemens Corporate Research, Inc. (SCR)
08. Johns Hopkins University (JHU)
10. American College of Cardiology Foundation (ACCF)
11. Siemens Program and System Engineering srl (PSE)

List of contributors

Name	Affiliation	Co-author of
Edwin Morley Fletcher	Lynkeus	
William McFadden	Lynkeus	
Michael Sühling	Siemens	

List of reviewers

Name	Affiliation
Michael Sühling	Siemens
Giacomo Pongiglione	OPBG
Alan Everett	JHU

Abbreviations

HeC	Health-e-Child
SeC	Sim-e-Child
ToF	Tetralogy of Fallot
MR	Magnetic Resonance or Magnetic Resonance Imaging
DICOM	*D*igital *I*maging and *CO*mmunications in *M*edicine (ACR-NEMA 3.0) - the DICOM standard facilitates interoperability of medical equipment by addressing the exchange of digital information.

Table of Contents

1. Introduction

1.1. Executive Summary

This document outlines the elements that define the strategy to disseminate the actions and results of Sim-e-Child (SeC). This is the first version of D6.1 and covers phase 1 of the project (months 1-10). The report will be updated again by the end of both the 2nd and 3rd phases (month 20 and 30). In this sense also the tasks indicated in this Deliverable cannot be considered as exhaustive nor set in stone, and additional activities may be added to the scope of activities undertaken to appropriately disseminate SeC.

The guidelines for SeC dissemination have been based on the following principles:

- conception of dissemination as "knowledge sharing" on a bi-directional level;
- cross fertilisation and liaison with industrial, research, and standardisation communities;
- involvement of independent experts to validate SeC protocols and entry criteria;
- transfer of results to the industrial, research, and standardisation communities;
- establishment of close collaboration with related projects;
- publication of SeC results in relevant international scientific journals;
- organisation of seminars and workshops within relevant conferences in the area, producing brochures and posters;
- set-up of a web site dedicated to the project, containing a public area for general communication
- publication and circulation to interested communities and stakeholders of an annual newsletter

The SeC Consortium is well aware that the nature of the project and its evolution may well dictate changes in the course and enactment of some of the activities set out below. In fact, numerous dissemination channels not foreseen here may come into being and may demand exploitation, while some activities deemed promising at present may later on be found to be unattractive and/or ineffective. SeC will nonetheless adhere to the above mentioned overriding principles in its further pursuit of the broadest array of dissemination activities possible.

SeC's dissemination efforts will mirror the original call for which it received funding. Namely for the internationalisation of research and development of the Virtual Physiological Human, in this direction for the duration of the project special attention will be paid to utilising the expertise of SeC's US partners in the dissemination of the results.

1.2. Overview of the document structure

The first version of D6.1 is separated into three further informative sections:

Section 2 is devoted to SeC's dissemination strategy, providing an outline of the project and its message.

Section 3 is dedicated to the channels SeC has identified for disseminating its actions and results, the target audiences and the means for communicating with them.
Section 4 presents SeC's dissemination instruments

2. Dissemination Strategy

2.1. The Sim-e-Child Message

A scarcity of relevant cases, the lack of integrated data and the limited opportunities for clinical comparison are just some of the reasons why patients with rare diseases, such as congenital heart diseases, are difficult to treat. Advances in paediatric cardiac surgery, interventional cardiology, intensive care and non-invasive imaging have led to a substantial increase in life expectancy for many patients with congenital heart disease. However, difficult challenges still persist due to the evolving nature of a child's heart and vascular system.

In order to achieve better and more reliable risk stratum, to improve and personalise therapies, and to ultimately increase the patient survival rate, there is a need for comprehensive and accurate computer models to be constructed from patient specific data and simulated physical constraints. SeC is working towards these goals by building on the achievements of the HeC project which was completed in April 2010, rated as "surpassing expectations" by the EC and the winner of the ICT08 Best Exhibition Award.

Supporting Clinical Decisions

SeC expands the Grid-based eHealth infrastructure developed by the HeC project and uses the high bandwidth pan-European GÉANT research network to:

- establish a multi-site database of paediatric cardiology data, information and knowledge for translational research
- develop a grid-based platform, supporting the definition, execution and sharing of scientific cardiac modelling and simulations
- enhance and expand the Health-e-Child heart model with of the aorta, aortic and mitral valves, and blood flow dynamics

By integrating these three elements, SeC will provide paediatric cardiology professionals in Europe and the US with a Virtual Physiological Human (VPH) decision support and virtual laboratory. This will enable them to construct and validate multi-scale and personalised models of a growing child's heart and blood vessels. Ultimately this will support their clinical decisions and allow better understanding of their patient's condition, thanks to the huge amounts of bandwidth and computing resources made available.

E-infrastructure for paediatric cardiologists

SeC is creating the first Trans-Atlantic platform for large scale simulations in cardiology. The clinical applications are further developing the original (HeC's) grid infrastructure based on the EGI Grid middleware (the gLite technology and European Grid Infrastructure - www.egi.eu) and the enabling GÉANT network. Together they provide virtually unlimited computing power, data storage capacity and network bandwidth across continents. Drawing on these resources, the SeC platform will be able to deliver innovative predictive disease models, complex data visualisation and knowledge discovery applications at the point of care.

Fig 1: The Expansion of the HeC network to the USA

SeC's applications are based around the concept of data integration, in the way that HeC integrated the data from four European hospitals over three disease areas (cardiology, rheumatology and neuro-oncology). SeC is further integrating the legacy cardiology data with a large number of cases from two, ongoing US multi-centre studies, the Coarctation Of the Aorta Stent Trial [COAST] and the National Registry of Genetically Triggered Thoracic Aortic Aneurysms and Cardiovascular Conditions [GenTAC] with the support of the American College of Cardiology (Washington, D.C), and with the support of Johns Hopkins Children's Centre (Baltimore, Maryland) to validate the existing models and those being developed.

2.2. Identification of Target Groups and End Users

Achieving the mission and ambitions summarised above requires a consolidated effort aimed at establishing links with distinct - but overlapping - target groups and end users: IT specialists, paediatric health care providers, and health care authorities and policy makers. Reaching each of these user bases involves varying approaches, but for purposes of simplification, these can be defined as either clustering activities with other ongoing actions/projects sharing similar or complementary goals, or through conference activity, be this at periodic venues or specific SeC co-organised or co-sponsored events.

Regarding the former, the project is in the position to exploit numerous opportunities: many SeC members are partners in more than one ongoing EU-funded project/network sharing overlapping missions with which HeC plans to liaise and establish and/or enhance relations. Particularly telling is the close collaboration with the Enabling Grids for E-Science project and SeC's utilisation of the EGEE's grid middleware "gLite". Other conspicuous examples of projects sharing partners with SeC are Géant and SHARE.

3. Dissemination channels

3.1. Conferences and clustering/networking events

The first 5 months of SeC's work saw the project heavily disseminated in conjunction with the preceding Health-e-Child (HeC) project. In March 2010 the work and objectives of SeC were presented as part of HeC's final dissemination efforts. HeC had been invited by the EC to present its work at the invitation only ministerial day that preceded the World of Health IT and the EC's high level eHealth conference which for the first time were being held at the same time in Barcelona within the eHealth week 2010. As a concrete example of how HeC's results were to be exploited, SeC's objectives were central to all dissemination activities. Following on from this high level of dissemination, HeC and SeC were selected to be one of five success-stories of the ICT for Health unit to be highlighted in briefings for the new EC Vice-President and Digital Agenda Commissioner N. Kroes and the new Director General R. Madelin to raise awareness about eHealth research activities, its results and achievements.

HeC's final international conference was held in Sestri Levante in April 2010. The conference was designed to highlight the achievements of the project and place the work in the broader scheme of the EC's VPH framework. A special presentation was given by SeC's original Project Coordinator, Martin Huber, on the results of HeC and on how SeC had been designed to build on the most successful elements of the projects work in cardiology and further expand the grid network.

David Manset of Maat G also introduced the work of SeC during his key note address "*From Health-e-Child to Sim-e-Child, Experiences from Adopting the Grid to Adapting it to Translational Medicine for Paediatrics"* at the International Symposium of Grid Computing in March 2010 in Taipei, Taiwan (http://event.twgrid.org/isgc2010/program.html).

Over the summer and autumn of 2010 the SeC project was disseminated throughout Italy in conjunction with GARR, the Italian network of University research centres. In July SeC's Project Manager, Edwin Morley-Fletcher, wrote an article which was published in the "GARR News" magazine (Fig. 2 & 3 below), and was subsequently invited to present SeC's objectives on the first day and through GARR's booth at the First National Conference on Health Research (http://www.garr.it/eventiGARR/cernobbio-ws/programma.php) which was held in Cernobbio, near Milan, on the 8/9th November 2010.


Sim-e-Child
Diagnosi e terapie personalizzate in cardiologia pediatrica
Approfondimento a cura del prof. Morley-Fletcher

Edwin Morley-Fletcher

DECIDE
Diagnostic Enhancement of Confidence by an International Distributed Environment

Obiettivo:

Coordinatore: Consortium GARR

Partner:

Data di inizio:

Durata:

Budget totale:

Finanziamento dalla Comunità Europea:

Sito web:

La piattaforma di Grid sviluppata da Sim-e-Child fornisce le risorse per integrare innovativi modelli predittivi delle malattie dell'infanzia

Gli obiettivi di Sim-e-Child

Sim-e-Child consentirà la simulazione di interventi sulla dinamica e l'emodinamica cardiaca per effettuare previsioni personalizzate di terapia ottimale

Il successo di Health-e-Child

La rete GÉANT

Figures 2 and 3: SeC article in GARR News

SeC cooperated with GÉANT and neuGrid at ICT2010 at ICT10 to develop a booth that gave practical examples of how the data networking services developed within the GÉANT project, such as Bandwidth-on-Demand and performance monitoring tools were having an impact on EC funded research.

The demonstration showed off a prototype SeC service combining the use of iPad and Augmented Reality (AR) to display medical image processing pipeline outputs. 3D/4D models were personalized from HeC's patient records and displayed in augmented reality instead of regular visualization. The iPad was used as an advanced remote controller to browse datasets, select pipelines to be run, etc (everything was delivered through Web interfaces interacting with a grid infrastructure underneath). Once the analysis completed, the iPad could display the resulting AR pattern, the latter being then interpreted in a dedicated AR spot (a short video clip can be seen at www.youtube.com/watch?v=LXuL__W4-FE). The interactive nature of the demo was considered as raising SeC's profile within ICT 10 and as a good model to follow for the duration of the project.

Figures 3 and 4: SeC's dissemination material at ICT2010

SeC at MICCAI (Beijing, September, 2010)

Two members of the SeC consortium, Sasa Grbic (Siemens) and Razvan Ionasec (SCR), both PhD students supervised by Prof. Nassir Navab (TUM), received the MICCAI Young Scientist Award for 2010 in Beijing, China.

The winning paper was supported by SeC and represents the first data-driven modelling of the complete valvular apparatus. The heart valves represent a critical component for the multiscale modelling, simulation, understanding and prediction of the whole heart function.

The MICCAI awards commission citation read:

"The original contribution of this paper is in the estimation of patient-specific cardiac valve parameters from cine images enabled by a new constrained Multi-Linear Shape Model. This work addresses a very challenging clinical problem, which is a complex 4D modelling problem, and demonstrated impressive results."

Other Major Dissemination Events

During the VPH NoE's annual meeting, VPH 2010, in Brussels in September Razvan Ionasec of TUM presented a paper entitled "Patient-Specific Modelling of Whole Heart Anatomy, Dynamics and Hemodynamics from 4D cardiac CT Images".

David Manset of Maat G also introduced the work of SeC during his key note address "From Health-e-Child to Sim-e-Child, Experiences from Adopting the Grid to Adapting it to Translational Medicine for Paediatrics" at the International Symposium of Grid Computing in March 2010 in Taipei, Taiwan (http://event.twgrid.org/isgc2010/program.html).

Late in the reporting period Yannick Legré of maatG and President of the International HealthGrid Association presented SeC at the Health Informatics New Zealand 2010 Conference (November 3rd, Wellington, New Zealand, www.healthgrid.org) and at the FP7 project Decide's kickoff meeting (September 23rd Rome Italy, www.eu-decide.eu/launch_event/legre_decide_230910.pdf

3.2. International Outreach

SeC's US partner JHU has had an abstract entitled "*Development and validation of a novel automated learning based algorithm for quantification of MRI right ventricular volume in Tetralogy of Fallout"* submitted to the 45th Annual Meeting of the Association of European Paediatric Cardiology (www.aepc2011.com/) which will be held in Grenada (Spain) in May 2011. Philip Spevak, Paediatric Cardiologist at JHU, intends to present the abstract and has cooperated with OPBG in preparing a clinically directed overview of the project to inform the US and EU Paediatric Cardiology communities about SeC's work and objectives.

4. Dissemination Instruments

4.1. Project Logo

In the first 4 months SeC decided on a final logo that will accompany all official project dissemination material.

4.2. Communication templates

SeC has a uniform PowerPoint template that all projects presentations are presented using. Below is a copy of the title screen.

4.3. Public Website

During the first phase of SeC the project delivered the first version of the projects website (www.sim-e-child.org). The website was designed to be completely compatibly with the directions laid out by the EC for all dissemination materials and Annex II of the Grant Agreement. The website currently contains sections entitled:

- About
- Partners
- Events
- Public Documents
- Newsletter
- Publications
- Links
- Health-e-Child
- Contacts

In July 2010 the website was updated at the EC's request to include news from the High Tech Wire service. The website will be updated later in the project to reflect the achievements of the projects as opposed to the goals of the project as it is currently doing.

Figure 5: The SeC website home page

4.4. Simulation Portal

SeC has engaged a significant infrastructure setup and migration in the first reporting period, aimed at interconnecting HeC and SeC, according to the SeC work plan and with the ultimate goal of making HeC's mature components sustainable and therefore reusable in SeC in the first phase of the project, while giving SeC a significant technical basis onto which further elaborating. This infrastructure setup is now well advanced and the SeC Web portal, with public and private parts, providing users with access to the grid and integrated applications is now up and running.

As of month 10, the portal provides users with access to:

- The SeC Grid infrastructure and computing resources, using a standard and internationally recognized GridPMA certificate. The Portal is cross platform and therefore works under MS W7/XP, major Linux distributions and Mac OS X in latest version
- The SciPort database and interfaces for manipulating data and simulations' outputs (please note that SciPort is being integrated to the security infrastructure; it will therefore be possible to enter SciPort directly once logged in the SeC portal soon),
- The Desktop Fusion facility, a remote desktop service allowing to run demanding and/or "Web unaware" applications such as the HeC Case Database, the HeC Patient Browser as well as the HeC CaseReasoner). Additional tools to support researchers in their daily activities to store electronic documents, to blog/forum/wiki project information etc

Figure 6: The SeC Portal's Public home page

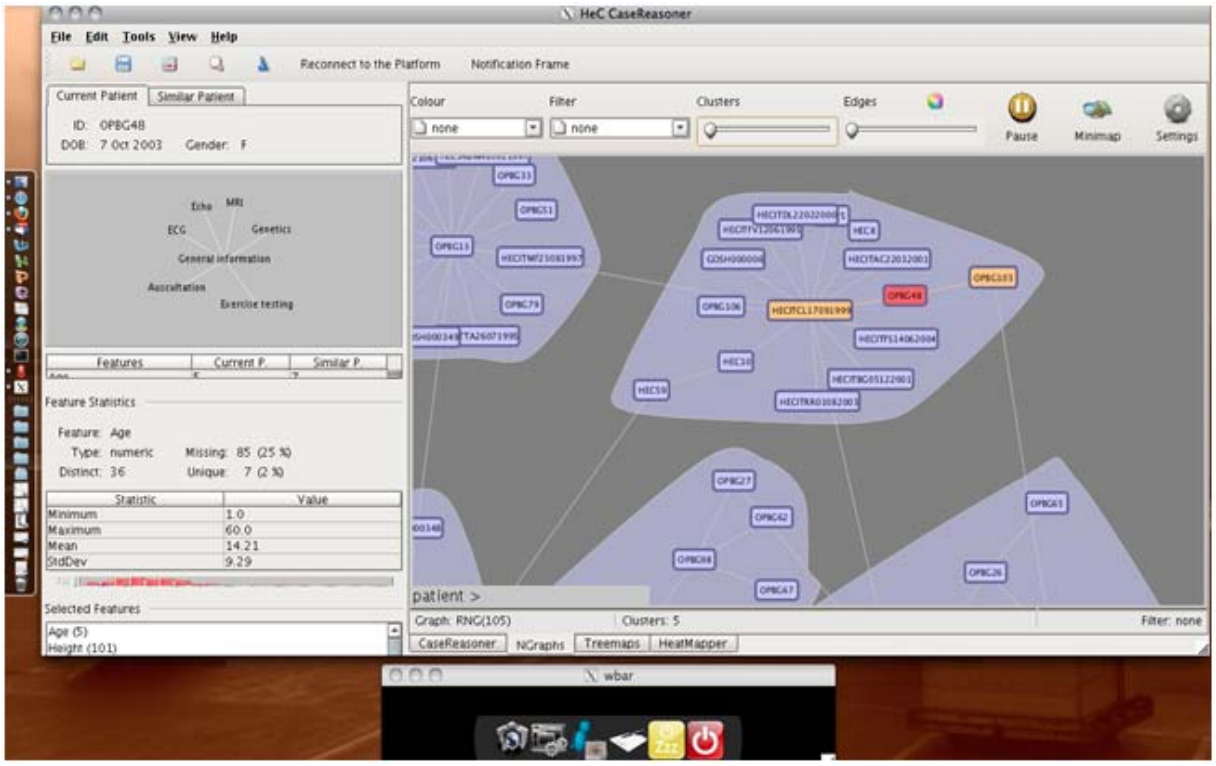

Figure 7: HeC's CaseReasoner working through the SeC portal

4.5. Newsletter

The SeC consortium will be producing an annual newsletter; the first edition will be distributed at the end of January 2011 to interested parties through the website and in paper and digital form at all SeC dissemination events. The newsletter will include highlight of the project achievements, reviews of the dissemination events of the past twelve months, descriptions about related work of the projects partners and insights into the clinical impact of the project.

4.6. International scientific journals List

1. Amodeo A, Brancaccio G, Michielon G, Filippelli S, Ricci Z, Morelli S, Gagliardi MG, Iacobelli R, Pongiglione G, Di Donato RM., *Pneumatic pulsatile ventricular assist device as a bridge to heart transplantation in pediatric patients*, Artif Organs. 2010 Nov;34(11):1017-22.
2. Barcudi S, Sanders SP, Di Donato RM, de Zorzi A, Iacobelli R, Amodeo A, Gagliardi MG, Borgia F, Pongiglione G, Rinelli G., *Aberrant left innominate artery from the left descending aorta in right aortic arch: echocardiographic diagnosis*, J Am Soc Echocardiogr. 2010 Feb;23(2):221.e5-7.
3. Brancaccio G, Amodeo A, Ricci Z, Morelli S, Gagliardi MG, Iacobelli R, Michielon G, Picardo S, Parisi F, Pongiglione G, Di Donato RM., *Mechanical assist device as a bridge to heart transplantation in children less than 10 kilograms*, Ann Thorac Surg. 2010 Jul;90(1):58-62.
4. Carotti A, Albanese SB, Filippelli S, Ravà L, Guccione P, Pongiglione G, Di Donato RM., *Determinants of outcome after surgical treatment of pulmonary atresia with ventricular septal defect and major aortopulmonary collateral arteries*, J Thorac Cardiovasc Surg. 2010 Nov;140(5):1092-103.

5. Cavallini M, Di Zazzo G, Giordano U, Pongiglione G, Dello Strologo L, Capozza N, Emma F, Matteucci MC., *Long-term cardiovascular effects of pre-transplant native kidney nephrectomy in children*, Pediatr Nephrol. 2010 Dec;25(12):2523-9. Epub 2010 Sep 25.
6. Comaniciu, D., ***Patient-Specific Modelling of Whole Heart Anatomy, Dynamics and Hemodynamics from 4D cardiac CT Images*****,** Interface Focus 2010 - (invited publication-submitted)
7. De Caro E, Smeraldi A, Trocchio G, Calevo M, Hanau G, Pongiglione G., *Subclinical cardiac dysfunction and exercise performance in childhood cancer survivors*, Pediatr Blood Cancer. 2011 Jan;56(1):122-6.
8. De Caro E, Spadoni I, Crepaz R, Saitta M, Trocchio G, Calevo MG, Pongiglione G., *Stenting of aortic coarctation and exercise-induced hypertension in the young*, Catheter Cardiovasc Interv. 2010 Feb 1;75 (2):256-61. Erratum in: Catheter Cardiovasc Interv. 2010 Jun 1;75 (7):1143.
9. Everett, A., *Development and validation of a novel automated learning based algorithm for quantification of MRI right ventricular volume in Tetralogy of Fallot*, submitted abstract for the 45th Annual Meeting of the Association of European Paediatric Cardiology, to be held in Granada, Spain in May 2011.
10. Gagliardi MG, Papavasileiou L, Pongiglione G, *Rescue treatment by percutaneous closure of interatrial septal defect or PFO in infants with berlin heart*, Catheter Cardiovasc Interv. 2010 Sep 17
11. Grbic S., Ionasec R., D. Vitanovski, Ingmar Voigt, B. Georgescu, , N. Navab, D. Comaniciu, *Complete Valvular Heart Apparatus Model from 4D Cardiac CT*, Medical Image Computing and Computer Assisted Intervention (MICCAI), Beijing, China, September 20-24 2010.
12. Ionasec R., Georgescu B., Navab N., Comaniciu D., *Patient-Specific Modelling of Whole Heart Anatomy, Dynamics and Hemodynamics from 4D cardiac CT Images*, BMT – 2010, Rostock2010
13. Ionasec R., Suehling M., Comaniciu D., *Sim-e-Child: Grid-Enabled Platform for Simulations in Paediatric Cardiology Toward the Personalized Virtual Child Heart* – VPH NoE 2010
14. Mihalef, V., Ionasec, IR., Sharma, P., Georgescu, B., Huber, M., Comaniciu, D., *Patient-Specific Modelling of Whole Heart Anatomy, Dynamics and Hemodynamics from 4D cardiac CT Images***,** Virtual Physiological Human Conference 2010, Brussels 2010
15. Vitanovski D., Razvan Ioan Ionasec, A. Tsymbal, B. Georgescu, M. Huber, Joachim Hornegger, D. Comaniciu, *Cross-modality Assessment and Planning for Pulmonary Trunk Treatment using CT and MRI imaging*, Medical Image Computing and Computer Assisted Intervention (MICCAI), Beijing, China, September 20-24 2010.