

Health-e-Child

The Health-e-Child project aims at developing an integrated healthcare platform for European paediatrics, providing seamless integration of traditional and emerging sources of biomedical information.

Objectives of the project

There is a compelling demand for the integration and exploitation of heterogeneous biomedical information for improved clinical practice, medical research, and personalised healthcare.

The **Health-e-Child** project focus will be on individualised disease prevention, screening, early diagnosis, therapy and follow-up of paediatric heart diseases, inflammatory diseases, and brain tumours. The project will build a Grid-enabled European network of leading clinical centres that will share and annotate biomedical data, validate systems clinically, and diffuse clinical excellence across Europe by setting up new technologies, clinical workflows, and standards.

The objectives of **Health-e-Child** are:

- To gain a comprehensive view of a **child's health** by vertically integrating biomedical data, information, and knowledge;
- To develop a **biomedical information platform**, supported by sophisticated and robust search, optimisation, and matching techniques for heterogeneous information, empowered by the Grid;
- To build enabling tools and services on top of the **Health-e-Child** platform:
 - Integrated disease models exploiting all available information levels;
 - Database-guided biomedical decision support systems provisioning novel clinical practices and personalised healthcare for children;
 - Large-scale, cross-modality, and longitudinal information fusion and data mining for biomedical knowledge discovery.

Project Description

Like most activities in society today, medical practice as well as research is intimately dependent on information technology. From DNA sequencing to laboratory testing and epidemiological analysis, clinicians and researchers produce as well as search for information, as part of their daily routine and decision making.

Taking advantage of technology has improved dramatically the quality of these activities' results, facilitating better health-care provision and more advanced biomedical research. Nevertheless, the current state of affairs is still severely restricted with respect to the kind of information that is available to clinicians. None of the current long-term targets of the field, e.g., personalised medical care, distributed medical teams, multidisciplinary biomedical research, etc. can be realised given the present level of technology support.

“Health-e-Child comes to fill the gap between what is current practice and the needs of modern health provision and research”

Health-e-Child comes to fill the gap between what is current practice and the needs of modern health provision and research. Its goal is to eventually overcome some constraints, e.g. clinicians focusing on a particular genre of information, etc. of today's systems and empower clinicians to further advance their profession. Ultimately, with the **Health-e-Child** system, information will be available to all professionals with the appropriate level of clearance. The vision is for the

Scenario

A child is born in a family in which there was an occurrence of idiopathic Dilated Cardiomyopathy (DCM). Her biomedical record is cohesively integrated. It is shared through a coherent view at different clinical sites. An intelligent classification algorithm combines the generative and the discriminative models in an optimal way and confirms an increased risk of DCM. Imaging data show left ventricle enlargement. An intelligent retrieval system for examining similar cases helps the doctor. A prevention/treatment plan especially fitted for her genomic or proteomic profile and existing symptoms is suggested.

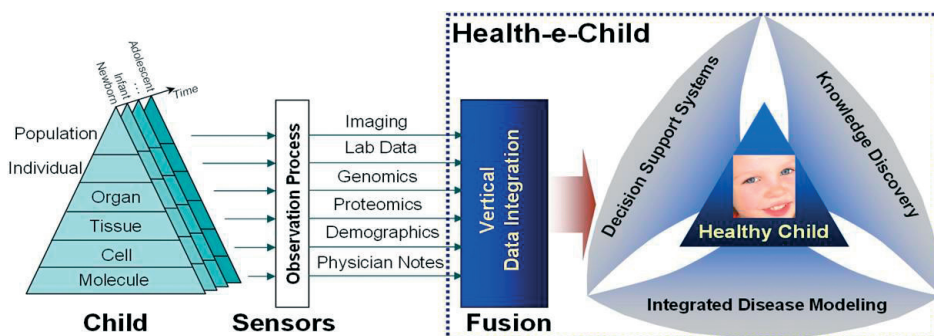
Health-e-Child system to become the universal biomedical knowledge repository and communication conduit for the future, a common vehicle by which all clinicians will access, analyze, evaluate, enhance, and exchange biomedical information of all forms. It will be an indispensable tool in their daily clinical practice, decision making, and research. It will be accessible at any time and from anywhere, and will offer a friendly, multi-modal, efficient, and effective interaction and exploration environment.

Expected Results & Impacts

The activities and outcome of the **Health-e-Child** will have substantial impacts in:

- **Strategy:** Enhancing the level and quality of medical services offered in Europe and will significantly advance medical research, beyond what is traditionally possible and improvement of the competitiveness in the area of medical service provision and will facilitate the adoption of new policies in member state.
- **Technology:** Bringing forward information-based medical technology and integration of mostly separate areas, i.e., vertical information integration, advanced medical querying, Grid infrastructures, disease modelling, medical imaging, knowledge discovery and data mining, and decision support.
- **Society and economy:** Improvement of the success rate in resolving difficult medical cases, saving children's lives. Furthermore, such improved medical decision making will often result in lowering medical cost and/or treatment duration.

To ensure its impact, the **Health-e-Child** project will carry out various networking activities, beyond the provision of the system and its underlying research. An important part of the networking activities as well as of the general project strategy will be the establishment of strong liaisons with other national and international research initiatives. Added value will be achieved by carrying out the project at a broad European level.



Health-e-Child

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integrated healthcare platform; decision support; data mining.