HEARTFAID

D6 – Early Plan for Using and Disseminating Knowledge

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HEARTFAID

A KNOWLEDGE BASED PLATFORM OF SERVICES FOR SUPPORTING MEDICAL-CLINICAL MANAGEMENT OF THE HEART FAILURE WITHIN THE ELDERLY POPULATION

Project summary	
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Thematic Priority:	Information Society Technology
Instrument:	Specific Targeted Research or Innovation Project

Consortium

- UNICAL- Università della Calabria (Italy)
- UNICZ- Università degli studi Magna Graecia di Catanzaro (Italy)
- UNIMIB- Università degli studi di Milano Bicocca (Italy)
- JUMC- Jagiellonian University Medical College (Poland)
- VMWS- Virtual Medical World Solutions Ltd (United Kingdom)
- FORTHNET S. A.- Hellenic Telecommunications and Telematic Applications Company S. A. (Greece)
- SYNAP- Synapsis s.r.l. (Italy)
- CNR- Consiglio Nazionale delle Ricerche (Italy)
- FORTH-Foundation for Research and Technology Hellas (Greece)
- RBI- Rudjer Boskovic Institute (Croatia)
- AUXOL- Istituto Auxologico Italiano (Italy)

D6 Early Plan for Using and Disseminating Knowledge

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Short description
This document contains an overview of the early plan for dissemination and exploitation of the knowledge and overall results gained from HEARTFAID. Strategies on planning specific dissemination activities by each partners, horizontal activities and contributions to standards will also be outlined. The focus is on activities planned for the first 18 months. Where appropriate, also longer-term plans are indicated.

Change record		
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1.0	First draft of the document	30/08/2006
2.0	Revision in the structure and contents of the document	07/09/2006
3.0	Contribution from each partners	09/09/2006
4.0	Final version	12/09/2006

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Executive Summary

This document details the most relevant issues related to the use and dissemination of the knowledge "extracted" from the overall activities of HEARTFAID project.

The deliverable provides the overview of an early plan for exploitation, dissemination, horizontal activities, and contributions to standards, dissemination to the general public, publishable results. Moreover, plans for the specific dissemination activities of each partner will also be outlined.

The contents of the document are organized as follows. After the introduction, in which the "using knowledge" and the "disseminating knowledge" issues are highlighted, the section 2 presents a first sketch of the plan for the knowledge exploitation and use. In particular, a first draft of a synthetic business plan is given.

The section 3 contributes for almost all the document and regards the dissemination activities.

More specifically, we start by presenting the general guidelines for the organization and performance of dissemination activities: issues concerning contents, target groups, mechanisms and events are sketched.

Moreover, some key aspects related to the publication of the HEARTFAID results are presented.

Then, the focus is addressed on the overall consortium dissemination activities, with particular attention to dissemination to the general public, horizontal activities and contribution to standards.

Finally, a comprehensive list of the specific dissemination activities, which will be undergone by each partner, is detailed.

Some concluding remarks complete the deliverable.

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1 Introduction

HEARTFAID is a research and development project aimed at devising, developing and validating an innovative knowledge based platform of services, able to improve early diagnosis and to make more effective the medical-clinical management of heart diseases within elderly population.
In very general terms, the project aims at a broader availability and extension of IST applications and services. In particularly, by exploiting the up-to-date scientific achievements on knowledge discovery and decision support systems, the main project goal is to develop new systems and services that are able to effectively integrate and process relevant biomedical data and information for improving medical knowledge and processes related to the clinical management of Heart Failure (HF) patients.
Moreover, according to the overall vision of the IST priority in FP6, HEARTFAID project proposal aims to contribute in developing innovative intelligent environments that enable ubiquitous, effective and efficient management of citizens' health conditions and supporting health professionals in coping with major health challenges. In particular, HEARTFAID provides healthcare professionals with access to timely relevant information at the point of need (i.e. different types of health care delivery environments), with a set of functionalities and services for acquiring up-to-date relevant medical knowledge that will provide a reliable support to healthcare professionals in their daily medical and clinical operations, enabling new ways of working as well as improved patient quality.
Under this respect, it is of strong strategic importance for HEARTFAID to devise and effectively implement exploitation and dissemination strategies, with the aim to emphasize the overall impact of the project's results.
As far as the "***using knowledge***" issues are concerned, since HEARTFAID is a project mostly implementation oriented, theoretical and methodological work will be rapidly converted to experimental and practical applications. Furthermore, the knowledge and experiences gained from practical experiments will also be used by the HEARTAFAID partners for defining the next generation of products and services in the relevant domain. More specifically, the industrial partners will develop a detailed exploitation plan in the course of the project, based on the following steps: identification of the market segments; detailed business plan; detailed identification of the potential markets and the competitive environment; assessment of benefits by end-users; establishment of a commercial agreement among partners on the joint commercialization and exploitation after project end; after project completion, development of the prototypes into industrial products.
As far as the "***disseminating knowledge***" issues are concerned, it is of strong interest to the HEARTFAID project and its partners to disseminate its ideas and results to a community as wide as possible. Dissemination is an important interactive interface for the project for getting continued feedback on ideas and concept refinement. Dissemination is performed whenever possible by exploiting

the human network of the different partners, but more specific it will be done according to the following points:

- *Internal Dissemination*: each partner of the consortium will organise internal seminars during the project execution to inform about the project results. In particular, for the academics and research institutions this activity aims to disseminate, especially to young researchers and PhD students, the new scientific results and the innovation gained by the project activities. Moreover, for the partners of the medical domain, this could improve the professional skills, in terms of expanding the knowledge and use of advanced systems and services. For the industrial partners, the main aim of the internal dissemination will be to foster the wider re-use of the results within the same partner, for other products and software engineering process improvement.
- *Project Web Site*: The project web site will be established also to provide wide dissemination of the results and papers, and information about the project. All public deliverables will be available on the site.
- *User Interest Groups*: With the contribution of all the partners, an inner circle of User Interest Groups made of healthcare organizations and institutions from the 5 countries of the consortium will be established. These institutions could represent potential key customers of the industrial partners. In the different countries, a larger circle of a User Interest Group will also be established, to publicise on seminars in each country the project to a wider audience of healthcare institutions. These seminars will also support the exploitation of the project results. The involvement and interaction with end-users health care organizations will encourage further experimentation and clinical validation of the developed systems, services and tools.
- *Conferences Exhibitions*: There will be articles in healthcare journals, and other publications as part of the dissemination activities. All the partners will publish scientific and technical papers on the results of the project, and will present the project at European and national conferences and exhibitions. In particular, VMWS will represent the HEARTFAID project within the International Council for Medical and Care Compunetics (ICMCC).
- *Intermediaries*: To create a wider project awareness impact, European regional governmental bodies and healthcare professional associations will be addressed to support the dissemination and to create wide publicity of the project and its results. It is intended to hold seminars in each country during the project in cooperation with the interested intermediary organisations.

2 Exploitable Knowledge and its Use

In the framework of the WP8, the partners will study and define a detailed exploitation plan of the results obtained in the project. In particular, the industrial partners will be interested in exploiting the HEARTFAID platform and the added-value services that could be provided with the HEARTFAID system. The exploitation plan will be based on both the clinical validation after the deployment

of the HEARTFAID system prototype in suitable clinical settings, and the outcome of the investigation on new models for healthcare processes, developed with the support of the clinical partners.

In order to understand the potential market of the HEARTFAID solution, we should consider the incidence of the HF on the population and the correlated costs, which are not limited to hospitalization and visit costs, but are directly connected also to frailty and disability in late life, derived by chronic diseases within cardiovascular domain. Given the fact that the HEARTFAID concept is a response to one of the most significant social and economic problems Europe faces, exploitation of valuable HEARTFAID project results must mean applying them quickly and broadly to meet existing demand across Europe.

A very preliminary study showed that the prevalence of clinically overt HF increases considerably with age and that the prevalence of HF has increased over the past few decades. In Europe[1] almost 10 million patients have HF, and nearly a half will die within 4 years, suggesting that heart failure related mortality is comparable to that of cancer; moreover, considering patients with severe heart failure, more than 50% will die within 1 year.

Hospitalization costs are also impressive: about 78% of the total patients have at least 2 hospital admissions per year, and HF hospital admission rates appear to be steadily increasing in all industrialised countries, especially among older individuals. Overall, annual admission rates for 1990 ranged from 10-40 admissions/10000 population and increased to greater than 75 admissions/10000 population in those aged greater than 65 years. The cost of managing HF in the early 1990s was estimated to be 1-2% of total health care expenditure in a number of industrialized countries. Because hospital care consumes a significant proportion of this expenditure, and rates of HF related hospitalisation have probably risen, this may be an underestimate of the current cost of HF. Under this respect, the measurable benefits provided by HEARTFAID are basically related to improve indices of healthy related quality of life and to control and reduce the overall economic and social costs of medical care, by decreasing the frequency of hospital admissions.

By analysing in more details the Italian situation, it can be seen that the scenario is in line with the information provided above. In fact, several studies promoted and supported by both international and national bodies highlight a critical situation. In order to perform a feasible evaluation of the economic impact of the heart failures on the healthcare structures, it is worth to evidence that the number of HF in Italy is among the lowest values in Europe. The MONICA Project, that is a multicentre study involving formation of population-based registers promoted by WHO, produced valid and reliable information on fatal and non-fatal acute coronary and cerebrovascular events in different populations during the years 1983-1995. During the last 5 years of the MONICA study period, the highest attack rates of coronary events, that exceeded 600 cases per 100.000 population per year, were observed among the male populations aged 35-64 years in United

[1] European Society of Cardiology, 2001

Kingdom, Finland and Poland, while the lowest ones, about 250 cases - in the populations of Switzerland, Spain, France and Italy.
In addition, it is important to notice that although the important advances performed by the research led to a significant reduction of the percentage of mortality in HF patients, the prevalence of clinically overt HF is actually unchanged. In other words, the general number of deaths is gradually reduced while the number of people that has an overt HF is stable and hence the number of hospitalisations and the economic impact increase considerably.
For these reasons our evaluation of the costs related to heart failures, based on the Italian scenario and taking into consideration statistical values that have considerably grown during the last years, is without any doubt very prudential or even underestimated.
A study published in 2001 at the World Heart Day, supported by the Italian Ministry of Healthcare, promoted by the World Heart Federation, the Italian Federation of Cardiology and the Italian Foundation for Heart and co-sponsored by WHO and UNESCO, stated that the incidence of heart failures is on average of 300 cases over a population of 100.000 people. This study reports also the following information:

- Approximately the 34% of the patients die within the first day (32% for men and 36% for women);
- The 8% of patients die after the first hospitalisation;
- The average cost of the first hospitalisation is 2.000 Euro;
- The average cost of the successive hospitalisations is 3.500 Euro.

A study performed in 2000 by the "Associazione Nazionale Medici Cardiologi Ospedalieri" (National Association of Hospital Cardiologists) and the Italian Society of Cardiology, with the support of the Italian Federation of Cardiology, had the goal to draft a report on the number and distribution of healthcare structures with specialised cardiovascular divisions, throughout the Italian territory. In particular the study evidenced the mean number of inhabitants for each hospital divided by regions, as shown in Figure 1.

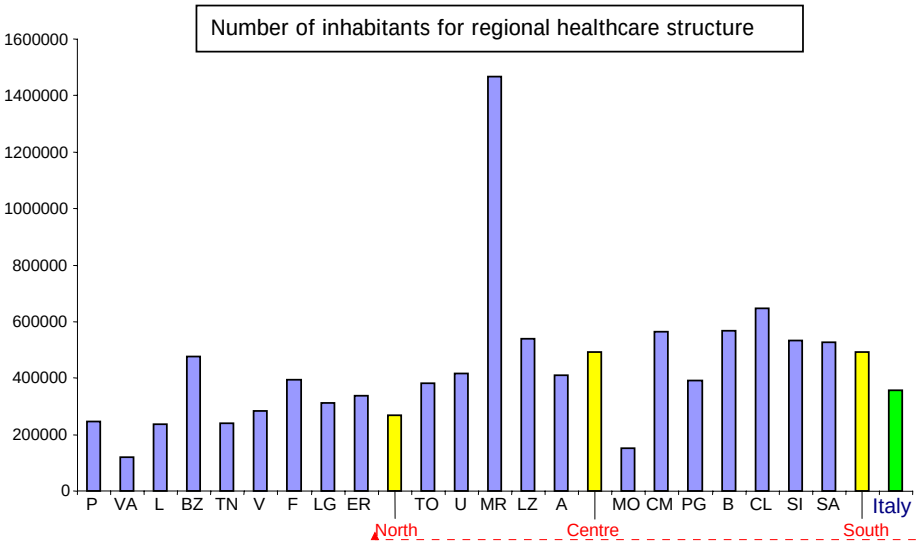

Figure 1 – Number of inhabitants in the Italian population for each healthcare structure with specialised cardiovascular division, organised by region.

It appears immediately that apart from region Marche (MR in the picture), that has a very high value of more that 1.400.000 inhabitants for each hospital, on average there are 400.000 inhabitants for each healthcare centre.
With this information we can perform an approximate evaluation of the mean cost for the healthcare structures with a specialised cardiovascular division.
With an average of 300 cases for 100.000 people, we can approximate to 1.200 the average number of cases for each centre. Since in the 78% of cases there are AT LEAST 2 hospitalisations, we can prudentially suppose that the average number of hospitalisations is 3. Therefore, considering the percentage of deaths and the costs of the first and the successive hospitalisation, the average annual cost for each centre is 7.5 million Euros, while the cost at national level amounts at 1.05 billion Euros. This evaluation is perfectly in line with the study performed by partner UNICZ, who evaluated a mean cost of 8 million Euros per year for each hospital due to cardiovascular diseases.
Under these conditions, if we make a drastically prudential hypothesis that the adoption of the HEARTFAID platform would slightly reduce the number of hospitalisation to a the pessimistic value of 2.7 (i.e. a reduction of 10%), the costs for each healthcare structure would be reduced of 730.000 Euros per year, which becomes more that 1.2 million euros if the average number of hospitalisations will be reduced to 2.5 (i.e. a reduction of 16.6%). Even considering the annual depreciation of the platform[2] (i.e. about 16.500€) and a maintenance cost of 20.000 Euros per year, the total costs reduction would be slightly below 700.000 Euro in the first case and slightly below 1.2 million Euros in the second case.

[2] We have considered the same depreciation rate adopted for computers, which is 1/3 per year, for 3 years.

The study performed in 2000, evidenced also that in Italy there are more than 720 centres with accredited cardiovascular division, among which almost 620 are public unit while more than 100 are private.
These data can be used to perform a preliminary study concerning the market sustainability of the HEARTFAID approach, as far as the Italian scenario is concerned, and a coarse exploitation plan.
We can make the hypothesis that the HEARTFAID platform will cost approximately 50.000 Euros per installation, and that an additional income of 20.000 Euros will come from services, assistance and licences. Furthermore, we can prudentially assume that after an industrialization process the HEARTFAID platform will be purchased the first year by only 0.5% of the potential customers (i.e. 3 products), by 1% of the potential customers the second year (i.e. 4 new products), 3% the third year (14 new products), 5% the fourth year (14 new products) and 10% the fifth year (35 new products). Under these assumptions, the overall incomes are reported in the following table:

Year	%customers over a total of 700 cardiovascular units	Number of installations	Proceeds for sales	Proceeds for services/ maintenance/ licences	TOTAL income x year
1st	0,5%	3	150.000	60.000	210.000
2nd	1%	4	200.000	140.000	340.000
3rd	3%	14	700.000	420.000	1.120.000
4th	5%	14	700.000	700.000	1.400.000
5th	10%	35	1.750.000	1.400.000	3.150.000

It is important to notice that the number of installations of the HEARTFAID platform indicated above is very prudential, since the real number of potential customers is considerably higher than what has been considered. In fact, in the table above we have considered as potential customers only the 700 centres classified as “cardiovascular unit”. Indeed, specialised cardiovascular assistance is provided also by Internal Medicine divisions and Geriatric wards, which are widespread among almost all the healthcare centres and hospitals. In 2000 there were about 1.570 centres able to provide hospitalization services, among which 1.030 are public structures whilst 531 are private: most of these centres provide cardiovascular assistance on the national territory and would beyond any doubt benefit from the adoption of the HEARTFAID platform.
It is obvious that all these evaluations are merely hypothetical, although realistic. During the project lifetime we will have a more detailed view on the added-value services that will be provided by the HEARTFAID platform, as well as a more detailed evaluation of the industrialisation costs and, consequently, a better picture on the market value of the final product. These details will allow the accurate design of both exploitation and business plan.
The exploitation will take into account any regulation coming from the European Directives in the Healthcare domain. The plan will be developed also according to the inputs coming from an accurate market research analysis. In particular, the

identification of modern and economically sustainable management approaches of social and healthcare service provision will be a must for the HEARTFAID project. Being the HEARTFAID partnership composed of European public administrations, research centres and SMEs, it is quite natural to promote the development of jointly exploitation plans at EU level. Even though industrial partners included in the consortium have committed themselves to commercially exploit the project results toward the European market, the HEARTFAID partnership will evaluate the possibility of setting up consortia with other EU SMEs. The new consortia shall distribute the achieved results into a wider area than the one covered by the current partners.

In this context, the industrial partners of the HEARTFAID consortium will realize a detailed feasibility analysis for the exploitation of project results, by defining business plans for the services and the integrated systems that will be developed. The business plan will take into account an accurate Cost/Benefits analysis by performing an assessment of benefits for the end-users and by evaluating the effort for the engineering of the prototype that is the development of the prototypes into commercial products.

The target users of the HEARTFAID platform are not only the Cardiological departments of public and private healthcare structures, for patients' management and follow-up, but also health authorities aiming at improving the National strategy for HF management. Moreover, the HEARTFAID platform can be used also for supporting the training of cardiologists and to diffuse a new integrated approach to the HF domain.

Certainly the development and deployment of a platform that supports, at decisional level, the heart failure health operators and that improves the heart failure medical knowledge, allowing a better understanding of the HF domain, has a very important characteristic: it will be a concrete way to improve indices of health related quality of life, thanks to personalised therapies, real-time monitoring and assistance of the patient, and to control and reduce the overall economic and societal costs of medical care by decreasing the frequency of hospital admissions. Therefore, the application of HEARTFAID, by assuring the optimisation of medical processes, will bring an important increase of the treatment quality of the individual patient as well as a remarkable reduction of healthcare costs. The exploitation plan will take into account these aspects, evaluating the impact that the highly innovative systems and services derived from HEARTFAID project could have on targeted healthcare domains. In particular, the exploitation in HEARTFAID will have two principal goals:

- spreading the use of the HEARTFAID family of services to the largest possible number of clinicians and health authorities in order to improve the treatment of the heart failures;
- identifying commercial opportunities for the project results over and above the straightforward sale of the HEARTFAID platform that will assist Health Authorities in their healthcare planning activity. They will be geared to provide answers to questions concerning the most suitable mix of healthcare resources required to assist a given population on the basis of the likely evolution of they healthcare needs.

Different market strategies will be investigated, starting from direct/indirect sale, ASP (Application Service Provider) model to consulting on healthcare management and eHealth related training courses.
The presence in the consortium of a large company like Forthnet will guarantee an extensive range of broad-based international activities. The group will face the exploitation of the HEARTFAID project from two points of view: the commercial Exploitation of the results and the Know-how Enhancement.
The presence of SMEs, like Synapsis and VMW Solutions will favour an efficient transformation of the R&D results into business initiatives, thus transforming the knowledge and competences acquired during R&D projects into market ready commercial solutions. An example of this dynamism is represented by the follow-up of the projects TELEMATICS-WOMAN, IST-HUMAN and LIFE-EMECAP carried out by Synapsis in the last years, by putting in the market innovative healthcare solutions like a multi-platform, web-hosted medical records (Electronic Patient Records), designed for individual departments (gynaecology, neurology), able to communicate with hospital IT systems and radiology services using IHE and HL7 standards, as well as Clinical Decision Support Systems able to support doctors in the diagnostic procedure.
After the identification of the market segments, with an accurate identification of the potential markets and the competitive environments, and the release of a detailed business plan, the industrial partners will establish a commercial agreement on the post-project joint commercialization and exploitation of the results.

3 Dissemination of Knowledge

The HEARTFAID consortium will carry out dissemination activities along the entire duration of the project. These activities will be related to the wide diffusion and distribution of knowledge and information related to the project and to the establishment of a close cooperation with potential end-users, the scientific community and professional organizations. The consortium will always try to balance the need of a capillary diffusion of the information that can better be done using individual efforts by all the partners with the provision of a uniform image of the consortium itself.

3.1 Dissemination Guidelines

The dissemination activities will be mainly organized as follows:

- The members of the HEARTFAID consortium will raise awareness of their own project but will also actively participate in activities that will raise the profile of the HEARTFAID initiative in general. The partners will seek to collaborate and cooperate amongst each other, and participating in any “clustering” activity which may be organized in the future, e.g. workshops or joint review meetings. In addition to the planned activities at project level, the partners will contribute to common dissemination activities of the project (as

e.g. organising press conferences, inviting press to major project events, spreading articles to specialised and non-specialised press, and organising events with different stakeholders' participation as part of conferences or seminars).

- A common website will be created and maintained during the project period and beyond it in order to inform the public worldwide about the aims and the main results of the HEARTFAID project. Public deliverables will be made available on this common web site.
- Dissemination activities beyond the consortium: publications, conferences, workshops and Web-based activities aiming at disseminating the knowledge and technology produced. As far as the participation to relevant conferences and workshop, the following will be a fairly probable event list:
  - Computers in Cardiology 2006 (Valencia, Spain)
  - Computers in Cardiology 2007 (Duke University, North Carolina, USA)
  - Computers in Cardiology 2008 (Bologna, Italy)
  - World Congress of Cardiology 2006 (Joint Congress of the European Society and the World Heart Federation, Barcelona, Spain)
  - EUGMS – European Union Geriatric Medicine Society 2006 Congress (Geneva, Switzerland)
  - VI European Congress on Gerontology (Saint Petersburg, Russia, 2007)
  - European Society of Cardiology Annual Congress 2007 (Vienna, Austria)
  - European Society of Cardiology Annual Congress 2008 (Munich, Germany)
  - International Society of Electrocardiology Meeting 2006 (Koln, Germany)
  - International Society of Electrocardiology Meeting 2007 (Istanbul, Turkey)
  - International Society of Electrocardiology Meeting 2008
  - Euroecho Annual Meeting 2006 (Florence, Italy)
  - Euroecho Annual Meeting 2007
  - Euroecho Annual Meeting 2008
  - Heart Failure 2006 (Helsinki, Finland)
  - Heart Failure 2007
  - Heart Failure 2008
- Studies on socio-economic aspects: assessment of the expected socio-economic impact of the knowledge and technology generated, as well as analysis of the factors that would influence their exploitation (e.g. standardisation, ethical and regulatory aspects, etc.).
- Activities promoting the exploitation of the results: development of the plan for the use and dissemination of the knowledge produced.
- Finally, the project will promote both the coordinated publication in research journals as well as in sector oriented magazines. Under this respect, a plausible list could be the following:

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- Annals of Non-invasive Electrocardiology
- Circulation
- IEEE Transactions on Biomedical Engineering
- International Journal of Cardiology
- European Journal of Heart Failure
- European Journal of Prevention and Rehabilitation
- Journal of Applied Physiology
- IEEE Transactions on Information Technology in Biomedicine
- Technology and Health Care
- Journal of Medical Systems
- European Journal of Operational Research
- Computers and Operations Research
- Operations Research
- Journal of Operational Research Society
- Health Care Management Science
- INFORMS Journal of Computing
- Journal of Machine Learning Research
- Bioinformatics
- Artificial Intelligence in Medicine
- Machine Learning
- Journal of Biomedical Informatics
- Medical Decision Making
- The Journal of Information Technology in Health Care
- Computerized Medical Imaging & Graphics
- Medical Image Analysis
- Physics in Medicine and Biology
- Applied Intelligence
- Medical Physics
- Pattern Recognition and Image Analysis.

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- Each partner will operate its own dissemination activity as well using its web site and its dissemination channels mainly on a geographical base. Thus the English partner will take care of the UK, Iceland, Ireland, Benelux and France. The Italian partners will take care of Italy, Malta, Spain, Portugal, Switzerland, Austria and Germany. The Croatian partner will take care of Croatia, Slovenia, Serbia, Montenegro, Bosnia, FYROM, Hungary, Romania and Albania. The Polish partner will take care of Poland, Denmark, Scandinavian countries, Czech Republic, Slovakia, Russia and the other ex URSS countries. The Greek partners will take care of Greece, Bulgaria, Turkey, Cyprus and the Middle East.

3.2 Publishable Results

As it is already established in the Project Handbook, if the Work Package Leaders Group has agreed a Project Deliverable to be available to the public, any partner may publish information included in such Project Deliverable without any notifications to the other partners and without any other partners' consent.
All the publications shall make reference to the Project title, the partner and to the funding institutions.
At this stage of the project, it is possible to foresee that potential publishable results could come from the following deliverables:

- WP1: D5 and D8.
- WP2: D14 and D19.
- WP3: D11, D20 and D28.
- WP4: D21, D22 and D29.
- WP5: D15, D30 and D36.
- WP6: D23, D31 and D37.
- WP7: D40 and D44.

3.3 Consortium Dissemination Activities

3.3.1 Dissemination to the General Public

Raising public participation and awareness is a strategic activity of the whole project, which will involve all the partners.
In order to create a wider project awareness impact, the main objectives of raising public participation and awareness are the effective involvement of all relevant intermediaries, actors and stakeholders, with particular attention to European regional governmental bodies, health care professional associations, patient associations and Higher Education institutions.
With the contribution of all the partners, an inner circle of User Interest Groups made of healthcare organizations and institutions from the 5 countries of the consortium will be established.
In the different countries, a larger circle of a User Interest Group will also be established, to publicise by seminars in each country the project to a wider audience of healthcare institutions. The involvement and interaction with end-users health care organizations will encourage further experimentation and clinical validation of the developed systems, services and tools.
Strong interactions will be established also with the interested intermediary organisations (European regional governmental bodies, healthcare professional associations and patient associations), by holding, in cooperation, seminars, workshops and press conferences. This will further support the dissemination and will create wide publicity of the project and its results.

Particular attention will be devoted to the interaction with European higher education institutions (i.e. Universities and Colleges), with the end to disseminate the innovative results of HEARTFAID to young student at several grade levels (bachelor, master and PhD).
Suitable connections and agreements will be established with Schools of Medicine, Faculties of Biology and Faculties of Engineering, by organizing specific initiatives, based, for instances, on e-learning and face-to-face short courses (to this end, an "E-learning Area" of the project web site will be developed).
Also secondary education institutions, at European level, will be involved by disclosing events which could improve the awareness of young people on the broad matter of information technologies in medicine and health care delivery.
Especially at the launch of the project, but also during its run, particular attention will be paid to the issue of press releases, in order to give wide public resonance to the overall project's activities.
The resources made available by the Commission for media and information activities will be closely monitored and put to use to increase the impact the HEARTFAID results and publications on the general public.
Finally, additional material will be developed during the project's lifetime like fact sheets, leaflets, press releases, web links and articles, etc. and this will further contribute to the dissemination activities.

3.3.2 Horizontal Activities

This section identifies current and potential future horizontal activities of the HEARTFAID project. This includes joint work with other projects as well as further co-operations and exchange activities. Moreover, the participation to concertation and clustering activities organized by EU Commission will be taken into account.
Already in the starting phase of HEARTFAID, it became obvious that there are many projects and initiatives with which a co-operation should in principle be possible. HEARTFAID is generally open to all these co-operation activities. However, mainly because of resource issues, each co-operation opportunity needs to be evaluated carefully, considering resource requirements, mutual benefits and synergies, and time lines of the different activities.
Specially in the starting phase of HEARTFAID, focus has to be on achieving HEARTFAID own goals, while obviously making sure that the project is aware of all relevant results from other activities in order to avoid unnecessary duplicated work.
The HEARTFAID partners have agreed on a process within the consortium to handle these co-operation activities. The key points are:

- A free exchange of overview information with any other activity that shows interest in HEARTFAID (or, with activities to which HEARTFAID partners would like to set-up a contact).

- In case that there is mutual interest and certain activities or potential working areas are defined, the consortium will agree on whether HEARTFAID shall engage in this co-operation.
- If the consortium supports such an activity, a responsible contact person ("liaison officer") will be appointed, representing HEARTFAID and acting as key interface to the other project.
- The definition of co-operation details, including topic areas and formal steps that might be required, will be defined on a case-by-case basis.

At this stage of the project, some potential links to other European projects have been identified. In fact, very interesting relationships could be established with the following FP6 projects (this is only a partial list):

- MYHEART (IST-2002-507816): MyHeart mission is to empower citizens to fight cardio-vascular diseases by preventive life style and early diagnosis. This is achieved by a continuous monitoring of the vital signs of the individual. The approach is therefore to integrate system solutions into functional clothes with integrated textile sensors.
- AMICA (IST-2002-507048): Amica main objective is to bring together at the point of care all information available on patients in the electronic accessible universe, together with relevant knowledge and evidence, and make use of this data and knowledge in computerized decision support modules, to improve medical decision making and prevent medical errors.
- DOC@HAND (IST-2002-508015): the aim of Doc@Hand is to support health care professional by providing a set of IT tools that help in reducing time and associated costs for collecting the required information and knowledge and, more crucially, in making the best use of this knowledge for a more informed decision making.
- NOESIS (IST-2002-507960): the Noesis project aims at the development of a web based personalized system with enhanced intelligence that will support health professional in taking the best possible decisions on prevention, diagnosis and treatment. Noesis has selected the domain of cardiovascular diseases due to its significance.
- CLINICIP (IST-2002-506965): The project is developing a closed loop sensing and infusion system for automatic glycaemic control which will reduce the mortality rate for patients in intensive care units. To this end, particular attention is devoted to data management and analysis.
- ACGT (IST-2004-026996): the project will develop a biomedical GRID infrastructure supporting seamless mediation services for sharing clinical and genomic expertise for diagnosis and treatment of cancer. The development of a knowledge GRID infrastructure for the distributed mining and knowledge extraction form data repository is one of the key issue of the project.

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The overall activities of HEARTFAID project could take into account, extend and integrate, in a suitable way, the results of the above mentioned projects.

HEARTFAID will participate to all the relevant concertation and clustering activities organized by the EC. Moreover, particular attention will be devoted to the participation to IST events (conference, workshop, and exhibition).

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3.3.3 Contribution to Standards

The possibility to access and exchange efficiently all the patients' clinical data acquired both during home monitoring and during his/her contacts with the health facilities is of primary importance, and will be taken into account in HEARTFAID project. The issue of both data accessing, exchanging, integration and interoperability becomes more and more sophisticate for medical companies and healthcare structures, due to the heterogeneity of the informative systems. The origin of this phenomenon should be searched into the complex organization of the medical structures, usually composed of a high number of departments, operative units, wards and services, which are typically provided with a wide decisional autonomy. So, many separate "islands", not communicating among them, have grown up so far.
In this scenario, in which Babel of information is effective, standards become necessary.
As standard for communication between systems, the HEARTFAID platform will make use of the Health Level 7 (HL7) and HL7 Clinical Document Architecture (CDA). HL7 is a standards-setting organization accredited by the American National Standards Institute (ANSI). They have developed communication protocols widely used in the United States, with growing international recognition and implementations. As vendor- and provider-supported organization, its mission is to provide standards for the exchange, management, and integration of data that support clinical patient care and the management, delivery, and evaluation of health care services. This encompasses the complete life cycle of a standard specification-development, adoption, market recognition, utilization, and adherence. The HL7 specifications are unified by shared reference models of the health care and technical domains. The HL7 version 2.4 messaging standard is currently in use, and version 3, which represents several fundamental changes to the HL7 messaging approach, is in an advanced stage of development. Many people know of HL7 as an organization that creates health care messaging standards. Health Level 7 is also developing standards for the representation of clinical documents (such as discharge summaries and progress notes). These document standards make up the HL7 Clinical Document Architecture (CDA).
The HL7 Clinical Document Architecture (CDA) is an XML-based document mark-up standard that specifies the structure and semantics of clinical documents for the purpose of exchange. Known earlier as the Kona Architecture, then as the Patient Record Architecture (PRA), CDA provides an exchange model for clinical documents such as discharge summaries and progress notes, and brings the healthcare industry closer to the realization of an electronic medical record. By leveraging the use of XML, the HL7 Reference Information Model (RIM) and coded vocabularies, the CDA makes documents both machine-readable (so they can be easily parsed and processed electronically) and human-readable (so they

can be easily retrieved and used by the people who need them). CDA documents can be displayed using XML-aware Web browsers or wireless applications such as cell phones. Being a part of the emerging HL7 version 3 families of standards, the CDA derives its semantic content from the shared HL7 Reference Information Model. The document specification however is independent of the transport, that is, HL7 version 3 messaging is not required. A document can be sent inside an HL7 message or through various different transport mechanisms, including (but not limited to) HTTP POST with XML payload, Web Services over HTTP, FTP, SMTP, IBM MQ.Series Messaging and Microsoft MSMQ.

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This standard, thanks to the use of XML, sets itself as fulcrum in the process of communication between different entities belonging to the same environment of interoperability, allowing the exchanging of clinical documents from and to the existing applications without requesting the total re-engineering of informative systems already installed.

Furthermore, CEN TC 251 is devoting efforts in the standardization in the field of Health Information and Communications Technology (ICT) to achieve compatibility and interoperability between independent systems and to enable modularity. This includes requirements on health information structure to support clinical and administrative procedures, technical methods to support interoperable systems as well as requirements regarding safety, security and quality.

The work is carried out in the following Working Groups:

- Information models (WG I)
- Terminology and knowledge representation (WG II)
- Security, safety and quality (WG III)
- Technology for interoperability (WG IV)

HEARTFAID will pay particular attention to the EN standards published by CEN that refers to the clinical examination representation (e.g. EN 1064 for the Standard Protocol Communication for Computerized Electrocardiography (SCP-ECG)) in order to implement them in the platform verifying them in a real clinical application and providing retrofits and comments to the standardization body.

It is worth to highlight that most of the above mentioned standards are not yet consolidated, not universally adopted or not properly implemented. This is related to the fact that there is a wide proliferation of standards in the literature, each with its own features, characteristics, pros and cons. In other words they are still under verification although they are extensively used.

During the project lifetime, we will adopt and experiment the standards most commonly used and widespread among the scientific community and the medical organizations. Therefore, the HEARTFAID project will contribute spreading the use of the best standards, testing the available characteristics and, overall, improving their features and the overall quality, thus boosting research in this field and promoting the identification and spreading of the most adequate solution for the medical field addressed.

3.4 Individual Dissemination Activities

3.4.1 Dissemination Activities of UNICAL

The HEARTFAID's research activities of the partner UNICAL will be mainly faced by the Department of Electronics, Informatics and Systems (DEIS) within the Research Laboratory on DECISION ENGINEERING FOR HEALTH CARE DELIVERY (***de_Health Lab***), whose scientific responsible is Prof. Domenico Conforti.
The ***de_Health Lab*** is currently working on developing models, methods and techniques for the support of decision making in health care. This activity is doing in collaboration with several health care institutions. In particular, the overall activity covers two broad research items: the development of Knowledge based Decision Support Systems for medical diagnosis, prognosis and therapy; the development of quantitative models and methods for the Health Care Management.
The specific dissemination activities, which will be carried out by UNICAL, are the following:

- As HEARTFAID coordinator, interaction and collaboration with other EU projects.
- Participation to concertation and clustering meeting and IST events.
- Dissemination of HEARTFAID results and methodologies within the world wide scientific community of Operations Research and Management Science.
- Publication of HEARTFAID methodological results on international journals of Operations Research and Management Science.
- Transferring of HEARTFAID methodological results to undergraduate, graduate and PhD courses.
- Transferring of HEARTFAID results to the health care operators involved in the relevant medical domain.
- Development, within the Project Web Site, of an e-Learning platform for dissemination to the general public and long-life learning.

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3.4.2 Dissemination Activities of UNICZ

Concerning the contribution of UNICZ and in particular of Cardiovascular Disease Unit to dissemination of HEARTFAID, we may present HEARTFAID approaches and methods in next meetings as:

- national meeting of Italian Society of Internal Medicine (2006)
- national meeting of Italian Society of Cardiology (2006)
- national meeting of ANCE (National Association of Not-Hospital Cardiologists) (2006)

and HEARTFAID results in the same meetings in 2007 and 2008.
Moreover we could organize some workshops also in meetings organized by the same Cardiovascular Disease Unit so as "The Magna Græcia Meeting",

"Cardiovascular Prevention Days", and others in which are involved both local and national participants.
Then we could utilize the UNICZ website (www.unicz.it) as dissemination knowledge channel.
In addition Cardiovascular Disease Unit typically organizes forums and round tables to discuss about clinical and research topics. In this context we could insert the information about HEARTFAID methods and results, to bring the knowledge above all to young people.
About the publications of HEARTFAID scientific topics, all the scientific activity which is currently developed in WP1 could lead to original contributions, which could be submitted to some important international clinical journals as Circulation, European Heart Journal, etc.
Finally, we can utilize as knowledge dissemination channels magazine and newspapers and TV.

3.4.3 Dissemination Activities of UNIMIB

Concerning the contribution by UNIMIB to dissemination of HEARTFAID results, we may foresee presentations of methods and results to future meetings of the Italian Society of Cardiology and the Italian Society of Hypertension (year 2007) and publications on the same topics as soon as sufficient and adequate material will be available. In this frame, the possibility to publish a concise version of the Deliverable N.5 on the Journal of Cardiovascular Medicine (the official Journal of the Italian Society of Cardiology) will be explored.

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3.4.4 Dissemination Activities of JUMC

JUMC may contribute to the dissemination of HEARTFAID through presenting its design and, if possible, preliminary experience or results at several scientific meetings:

- XI International Congress of Polish Cardiac Society (September 2007)
- Scientific meeting of the Section of Non-invasive Electrocardiology and Telemedicine of Polish Cardiac Society (March 2007)
- 4-th Central European Meeting on Hypertension (11-13.10.2007, Krakow)
- XI Meeting of Polish Hypertension Society (2008)
- at the scientific meeting of the Krakow Division of The Polish Cardiac Society (2007)
- at the scientific meeting of the Krakow Division of The Polish Hypertension Society (2007)
- internal meeting for the staff of I Cardiac Department of JUMC
- if possible at a national bioengineering meeting, in cooperation with JUMC Department of Bioinformatics and Telemedicine (2007)

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Further dissemination activities might include publications in national journals: "Kardiologia Polska", "Folia Cardiologica", "Choroby Serca i Naczyń", "Nadciśnienie Tętnicze", "Przegląd Lekarski".

The information on HEARTFAID will be placed on the webpages of the I Cardiac Dept. at JUMC (http://www.cm-uj.krakow.pl/kardiologia1) and University Hospital (http://www.su.krakow.pl/htm/kliniki/18.htm) websites as dissemination knowledge channels.
We will also seek to disseminate the information via non-specialist channels, including local or national magazines and newspapers as well as radio and TV programmes.
JUMC will also be willing to join other partners in disseminating information on HEARTFAID through international meetings and journals previously mentioned in this document as well as in "European Journal of Heart Failure" and "European Journal of Prevention and Rehabilitation".
In order to provide information on HEARTFAID also to the patients and their families, educational leaflets will be prepared on heart failure containing information on the platform design and possible applications.

3.4.5 Dissemination Activities of VMWS

VMW Solutions Ltd will promote the HEARTFAID project at the ICMCC 2007 event and a number of UK events sponsored by the Department of Trade and Industry. VMW Solutions Ltd is also arranging to include the HEARTFAID project as a chapter in an upcoming book on homecare technologies and submit a number of joint journal publications.

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3.4.6 Dissemination Activities of FORTHNET

FORTHnet's planning on dissemination activities is focused on the presentation of HEARTFAID project development and implementation methods in the following international meetings:

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1) BioPattern NoE (Network of Excellence) next Project Assembly meeting.

2) Computational Intelligence in Medicine and Healthcare (CIMED) international conference, Summer 2007, Plymouth.

Information about HEARTFAID and its functionality will be placed in the company's web portal (www.forthnet.gr), through which, visitors will be able to acquire an overview idea of the project.

3.4.7 Dissemination Activities of SYNAPSIS

Synapsis is a SME operating in the field of healthcare delivery on the territory. In this context Synapsis will disseminate the goals, the advances and the results that will be achieved during the project lifetime, to both public and private centres, among its contacts and customers, operating in the cardiovascular field.
In the short/mid term, Synapsis, together with partner CNR, will present a paper at the "11th WORLD CONGRESS ON INTERNET IN MEDICINE", October 13-

20, 2006 concerning the design of an advanced middleware to provide decision support services with applications also in the cardiovascular field.
Moreover Synapsis is involved in other Italian and European IST project regarding eHealth and in these contexts Synapsis will disseminate the main goals and the research objectives of the project, and will compare the different experiences performed within these projects.
Concerning the internal dissemination, Synapsis will play an active role in organising project meetings of the entire HEARTFAID consortium.

3.4.8 Dissemination Activities of CNR

The Institute of Information Science and Technologies (ISTI) is an institute of the Italian National Research Council (CNR). The Institute is committed to producing scientific excellence and to playing an active role in technology transfer. The domain of competence covers Information Science, related technologies and a wide range of applications.
SI (Signals & Images) is an ISTI Research Laboratory working in the fields of signal processing, image understanding and artificial vision. SI Lab (CNR henceforth) is involved in Heartfaid.
CNR aims at developing its activities dynamically, fully becoming a part of the national and international, academic and industrial network in the field of automated vision. Particular attention will be paid to the most advanced research programs and high-level education programs, to the creation of new channels of technical-scientific and industrial cooperation, and possibly to the promotion of spin off initiatives.
CNR is actively involved in collaborations with the academic world and in cooperative research and development programs, both national and international and will use these channels to disseminate the achievements of HEARTFAID.
Moreover, as for internal dissemination, ISTI seminars will be organized and publicized all over the institutions in the Pisa area, thus covering a wide range of audience.
In recognition of the importance of training in today's Information Society, CNR will disseminate innovative results of HEARTFAID to the doctoral students and post-doctoral fellows that, traditionally, are involved in its research activities.
CNR will acknowledge HEARTFAID in papers submitted to international Journals and Conferences on topics related to the project. Submissions will be especially in the following fields: signal and image processing, artificial intelligence, data mining, semantic web and information technology.
International conferences and workshops will be organized by CNR on project related topics; the International Conference on Mass Data Analysis of Images and Signals in Medicine, Biotechnology and Chemistry MDA´2007 (jointly organized by CNR and IBaI Institute) is already scheduled.
Exploiting CNR participation to MUSCLE NoE and W3C XG MMSEM and its collaborations with AIM@SHAPE NoE, horizontal dissemination activities will

be carried out. In particular, these exchanges may be profitable in spreading the most adequate standard for metadata representation, access and exchange.
Finally, further visibility of HEARTFAID will be obtained by a project page on the CNR website, describing the general goals and the specific partner activity.

3.4.9 Dissemination Activities of FORTH

Overview

Objectives

- Liaise with regional governmental bodies and healthcare professional associations in Greece.
- Raise awareness about the results of HEARTFAID through a large circle of User Interest Groups.
- Organize seminars in Greece for a wide audience of healthcare institutions.
- Execution of promotion activities in FORTH'a area of influence.
- Publications in major conferences.

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Deliverables

FORTH is involved in WP-8 "Dissemination and Exploitation" for a total amount of 2MM. Being FORTH a research institute, its main effort will be more devoted to the dissemination than to the exploitation.
FORTH will contribute material to the following deliverables:

- D6 – Early Plan for Using and Disseminating Knowledge (Month 6)
- D16 – First Report on Dissemination Activities (Month 12)
- D32 – Second Report on Dissemination Activities (Month 24)
- D45 – Report on Dissemination activities and Exploitation activities Plan (Month 36)
- D46 – Report on Raising Public Participation and Awareness (Month 36)

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Activities Plan

FORTH has been active in dissemination activities since the beginning of the projects early publishing the relevant information about the HEARTFAID project on its web site
http://www.ics.forth.gr/bmi/projects.jsp?projectStatus=&projectType=&mode=projectDetails&projectID=51
The dissemination activities will continue on a planned and opportunistic basis. FORTH's dissemination strategy is to focus separately on each stakeholder group stressing benefits and advantages from the HEARTFAID platform of services.
More specifically FORTH dissemination activities are listed below.

Liaison in the geographic area assigned to FORTH

According to the HEARTFAID Description of Work, FORTH is assigned to promote the HEARTFAID project mainly in the Balkans and the Middle East.

FORTH participates in projects, which involve Europe, the Balkans, the Mediterranean and the Middle East. In these forums, HEARTFAID objectives will be promoted in every opportunity. In addition, FORTH plans to participate in conferences, exhibitions, and related activities in order to promote the objectives and the results of the HEARTFAID project.

Through its involvement in HYGEIAnet, the regional health information network of Crete, FORTH builds contacts with various healthcare organizations and providers and will attempt to promote the HEARTFAID project. At the same time, FORTH will attempt to involve health care professionals and the public at large through the organizations of 2 information days targeted at healthcare professionals, decision makers and the public.

HEARTFAID brochures and leaflets will be distributed at the main international, European and national conferences and circulated to the regional health care authorities in Greece. FORTH will also consider the possibility to translate the leaflet to the Greek language and distributed to health care authorities.

Cooperation with other networks, European and National Projects and initiatives

We have already established contact with important European initiatives in healthcare including:

- HYGEIAnet (**http://www.hygeianet.gr**)
- CEN TC 251
- OpenEHR (**http://www.openehr.org**)
- IHE (**http://www.ihe-europe.org**)
- HL7 Clinical Document Architecture (**http://www.hl7.org**)

Further activities include EU and national projects that have similar objectives like myHEART and ACGT.

Participation in relevant conferences

FORTH has participated or plans to participate in several exhibits and conferences promoting the causes and reporting progress in the HEARTFAID project.

These conferences include:

- Computers in Cardiology 2006 (Valencia, Spain)
- Computers in Cardiology 2007 (Duke University, North Carolina, USA)
- Computers in Cardiology 2008 (Bologna, Italy)
- ITAB 2006 (Ioannina, Greece)
- ESBME 2006 (Patras, Greece)
- European Society of Cardiology Annual Congress 2007 (Vienna, Austria)
- European Society of Cardiology Annual Congress 2008 (Munich, Germany)
- International Society of Electrocardiology Meeting 2006 (Koln, Germany)

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- International Society of Electrocardiology Meeting 2007 (Istanbul, Turkey)

As other opportunities for publication and presentation of the HEARTFAID results arise, those will be pursued by FORTH.

3.4.10 Dissemination Activities of RBI

Laboratory for Information systems work is concentrated on research and applications in the fields of machine learning, knowledge discovery and knowledge representation. With respect to the work under HEARTFAID project contributions to the dissemination activity are especially expected in following areas:

- Presentation of modern intelligent data warehousing solutions simultaneously supporting decision support, knowledge discovery and overall patient management under the HEARTFAID platform;
- Publication of knowledge discovery models obtained during validation and exploitation of the HEARTFAID platform, primarily related to out-patient monitoring process and decision making in that segment;
- Representation of the heart failure related knowledge on the Web using standard ontological language OWL.

Dissemination channels will mostly conform to those specified in Section 3 of this report. Local conferences with topics corresponding to HEARTFAID domain and WP 4 deliverables (like "International Conference on Information Technology Interfaces"), will be used for local dissemination of knowledge in Western Balkans region. Active participation on international meetings like "International Symposium on Biological and Medical Data Analysis (ISBMDA)" and "Conference on Artificial Intelligence in Medicine (AIME)" is also expected.

3.4.11 Dissemination Activities of AUXOL

The contribution of AUXOL will be, substantially, the same of UNIMIB. Specific activities will be proposed and coordinated together with UNIMIB.

4 Conclusions

In this document, an early plan of the exploitation and dissemination activities, foreseen within the HEARTFAID project, has been presented. The focus has mainly been on activities planned for the first 18 months. Where appropriate, also longer-term plans have been indicated.

It is worth while to remark that the exploitation and dissemination activities are inherently characterized by highly “dynamic” issues and, hence, new ideas, strategies and opportunities for these activities could be devised and realized within HEARTFAID project.