

K4CARE

Knowledge-Based HomeCare eServices for an Ageing Europe

K4CARE aims to combine the healthcare and the ICT experiences of several western and eastern EU countries to create, implement, and validate a knowledge-based healthcare model for the professional assistance to senior patients at home.

Objectives of the project

In modern societies, the care of chronic disabled patients at home involves life long treatment under continuous expert supervision that saturate European national health services and increase related costs.

K4CARE's main goal is to design, implement and validate a new ICT knowledge-based Homecare Model by integrating skills, procedures and experiences of several eastern and western European countries as a contribution to the new EU society to manage and respond to the needs of the increasing number of senior population requiring a personalised health-care at home. Other more specific objectives:

- Generate a new ICT Homecare Model (HCM).
- Provide an Electronic Health Record (EHR) to organise the information in the HCM.
- Use the EHR to integrate information coming from different EU countries.
- Provide an Actor Profile Ontology (APO) representing the profiles of the subjects involved in the HCM.
- Provide a patient-Case Profile Ontology (CPO) representing related symptoms, diseases, syndromes, and case mix.
- Define Formal Intervention Plans (FIPs) for a number of disease and syndrome treatments.

‘improves the efficiency of the care services for all the citizens in the enlarged Europe’

- Integrate homecare knowledge all over several EU countries.
- Propose a telematic and knowledge-based CS Platform (HCP) implementing the HCM.

Project Description

In order to facilitate the care of senior patients at home, **K4CARE** will investigate and develop several IST data- and knowledge-based technologies and integrates them in a CS platform.

The HCM will provide a description of the actors (i.e. professionals, patients, and citizens) involved in the care of senior citizens at home, the services a successful homecare system must provide, and the role that each actor plays in each service, integrating skills and particularities of several eastern and western EU countries. This model will be taken as the starting point both to analyse the data and information structures required by an EHR in the deployment of the HCM services, and also to represent, in a formal way, the knowledge which is beneath this homecare model. Two ontologies will be constructed: APO and CPO.

APO will gather all the relevant concepts and concept relationships to define actor profiles. CPO will comprise the concepts and the relationships to describe

Scenario

The family doctor, at patient's home, consults a shared EHR (same level and quality of information as in a hospital). During the examination, guidelines are automatically presented, standardized procedures proposed (FIPs); based on the CPO, the individual set of diseases is examined. The physician can immediately modify treatment: the EHR is updated in real time from different sources, following the evolution of the patient. Integration of medical and social information allows comprehensive interventions (e.g. nurse reporting side effects of therapy). APO concepts guide consultation of EHR. Distributed access allows optimization of interventions (e.g. relatives or social worker asking information on management of feeding).

the most common pathologies in the care system (i.e. post-stroke, diabetic, cognitively impaired, or mobility impaired patients).

K4CARE will adopt already existing FIPs for those pathologies with agreed treatments, will develop new FIPs for unpublished treatments, and will apply machine learning techniques to generate FIPs from the information in the EHR about past treatments.

Finally, a multi-agent platform will be implemented to allow all the actors to interact in the HCM. On the one hand, each actor interaction will be constrained through actor profiles that will be adjusted by the combination and adaptation of APO concepts. On the other hand, the CPO and the FIPs will serve to tailor the knowwhat and the know-how knowledges on the target pathologies to the particularities of a concrete patient.

This platform will be tested by healthcare professionals, caregivers and patients in order to verify the adherence to their needs and duties, the possibility of use in every day activity, the capability of collecting and integrating information from different sources, and the possibility of use of computer management tools for personalizing FIPs.

The test will be performed by staff of healthcare providers in real home care facilities on western and eastern EU societies. The assessment of a second release of the platform - final product - will be performed in the community of the town of Pollenza (Italy) and will involve the entire home care facility, GPs, the Municipality, Social Assistants, citizens representatives.

Expected Results & Impacts

K4CARE will foster a direct impact in healthcare centres, healthcare national systems, and ultimately in the process of constructing a general homecare model in Europe. Whenever this last occurs, the HCM is expected to act as a reference to inspire the integrated use of the **K4CARE** proved successful ICT technologies to deal with homecare patients.

From a social and economic point of view, the **K4CARE** model will reduce homecare complexity and will make healthcare closer to the citizens in the sense that, information will be integrated in the HCP, its access will be more direct and safe with the use of ICT technologies, and the flow of information about the updated state of the patient among the different professionals will become time-space independent.

From a professional point of view, **K4CARE** final product will represent an intelligent decision support system in which personalized FIPs will help caregivers to provide each patient with the best-available personalized treatment.

The final EHR, the knowledge-base, and the CS platform will remain public at the end of the project for further uses and considerations.



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- The Research Institute for the Care of the Elderly (UK);
- Comune di Pollenza Macerata (IT);
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