



6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015) and the
Affiliated Conferences, AHFE 2015

Ergonomic design in eHealthcare: a study case of eHealth technology system

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Abstract

The eHealthcare theme through the support of ICT (Information and Communication Technologies) is the focus of a number of European, national and regional actions, to improve service in remote patient care. The paper intends to contribute to the theme of "Human Factors and Ergonomics in eHealthcare" through the presentation of a study case of eHealth technology system design developed in the Department of Architecture of Pescara (Italy) for the Abruzzo Region with the contribute of European funds. The intent of this study case is to promote discussion on a possible new solution eHealthcare widespread in retail pharmacies, to improve the quality of the organization, management and sustainability of the health system, as well as the performance and interaction between employees and patients, and between computers and medical equipment. E-Health technology system is an integrated set of service (E-Health technology service) [1, 2, 3] and the teleservice medical product (E-Health technology station). The design was based on some methods known in the areas of Design for Sustainability (MSDS Method for System Design for Sustainability)[4] and the ergonomic design (Hta, Hierarchical Task Analysis) and Owas (Ovako Work Analysis System) [5].

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Peer-review under responsibility of AHFE Conference

Keywords: Ergonomic design; eHealthcare; Service design; Product design

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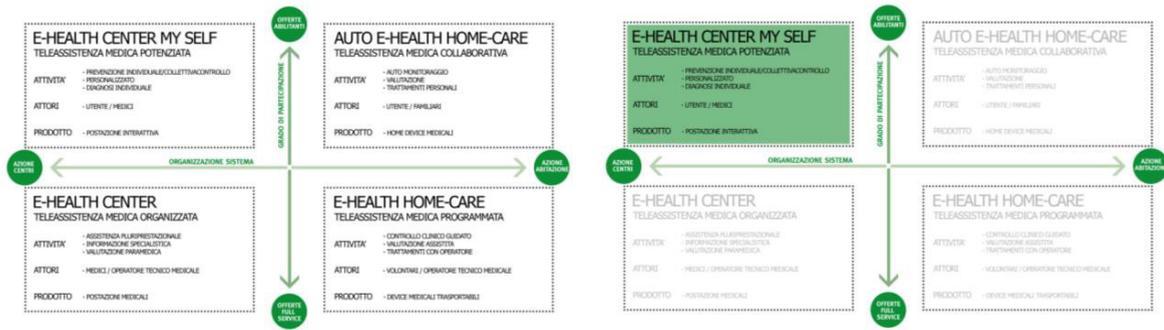


Fig. 1. (a) Design orienting scenario; (b) Vision 1.

1. eHealth technology orienting scenario

The design of eHealth technology system follows the MSDS methodology, Method for System Design for Sustainability, developed by the Research and Innovation System Design for Sustainability (Dis) Indaco Department of the Politecnico di Milano. The approach to the project required the choice of a scenario planning guidance, understood as the set of configuration options that the system of medical telecare can assume, called *eHealth center myself*. By using the polarity diagram which relates the *Organization of the system* (home and center) and the *user participation degree* (low and high autonomy), four visions were identified: 1. *eHealth home-care*, which provides a programmed medical Telecare service; 2. *Auto eHealth home-care*, which provides a collaborative medical Teleservice; 3. *eHealth center*, which provides an organizations medical Teleservice; 4. *eHealth center myself*, which provides an enhanced medical Teleservice.

The vision selected to generate ideas and solutions to the system is the *eHealth center myself* characterized by: individual and collective prevention activities, custom control, individual diagnosis; The actors consist of users, practitioners, medical specialists, health care pharmacies network, technicians; an interactive station that represents the main product of the system.

2. eHealth technology service

eHealth technology service offers a solution for remote medical support widespread in retail pharmacies. The innovation character of the service it’s about the computerized management system and the evolved degree of interaction between the user and the involved actors. The service design displays the solution proposed from the point of view of the individuals subjects that can take part into the system (2.1 *Stakeholder motivation matrix*), provides a graphic representation of the structure of the system with the actors and their interactions (2.2 *System map*), represents the features offered by the system (2.3 *Offering diagram*), displays and describes the sequence of the main actions performed by the user during service delivery (2.4 *Interaction table*).

2.1. Stakeholder motivation matrix

Stakeholder motivation matrix is a design and visualization tool finalized to represent the service solution from the point of view of the individual motivation related to the actors which that take part in the system. It is a useful tool to define what is the role and what are the contributions that each actor can bring in general to the partnership, and in particular every single. It’s a double-entry table and the various players are positioned on both sides. Crossing the various actors motivations, its possible to understand the reasons, the potential contributions and expected benefits which are deriving from being a part of the service. The main actors participating in the *eHealth Technology service* are: pharmacies, which make up the scene, and are the locations in which the interaction between service and user takes, hosting the *eHealth Technology station*; primary care physicians and medical specialists, who play the role of remote operators to control and monitor user through the reading and interpretation

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