

PESCA: Developing an Open Source Platform to Bring eHealth to Latin America and the Caribbean

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Abstract. Nowadays the society needs to communicate and the technologies are revolutionizing the information systems, especially for the health; where an effective use of the technologies is used to favor the needs of the persons. These technologies can contribute to the development of the local economies. Open source software (OSS) can be an useful strategy to bring information and communication technologies to developing countries. However, specially in Latin America and the Caribbean, there are some barriers in adopting OSS for health: the need for open standards, heterogeneous OSS developed without normalization and metrics, English predominance as top OSS language, lack of initiatives to evaluate existing health OSS and needs for quality control and functional validation. The Open Source Platform for eHealth (PESCA) has been designed as a set of interoperable modules that can solve either: simple problems on health management and communication in primary care or complex problems in healthcare systems, including telehealth communications between heterogeneous institutions.

1 Introduction

The Social Network of PESCA (Open Source Platform for eHealth) aims at providing a set of interoperable components with the capacity to provide response, both in an independent and combined way, to small organizational problems or healthcare issues such as the integral management of clinical, welfare, educational or health investigation information; including the support of cooperation between heterogeneous and remote healthcare institutions. In order to achieve this objective, alliances between different stakeholders are being established as demonstrated with the worldwide PESCA community already available as a web cooperative platform: <http://www.epesca.org>.

Historically the project was developed as initiative of FESALUD and the Centre of Innovation in eHealth of the University of Toronto, who named the project PESCA.

Soon after, in 2006, the network's task force was established with the participation of Spain and two more Latin American countries: Argentina and Colombia.

This platform is an initiative created to fill the existing gap in the implantation of eHealth applications and methodologies in developing countries. Its purpose is to coordinate the participation of all agents involved in the provision of eHealth services (developers, companies, and administrations. . .) joined under the commitment to bring health IT to the poorest. In this respect, the exploration and evaluation of good practices and open source applications for eHealth, and their future interoperability through a common standardized platform is considered the more important issue. In addition, the platform should facilitate the provision of IT solutions for concrete health problems and support of healthcare promotion through education in daily life habits. The midterm objective is to foster a knowledge society for the poorest, contributing to the socio-economic progress of citizens in developing countries.

2 PESCA Main Goals

The general goal will be complemented by the following specific objectives [4]:

- Establishment of an organization supporting the collaborative work infrastructure for the analysis and evaluation of Open Source Software (OSS), therefore providing the necessary human and technological resources. The created infrastructure includes the development and maintenance of the web portal, and the development of an advanced repository of OSS. It also includes the implementation of additional channels of communication, such as systems for the interactive communication between the project participants and users in general, including alternative systems such as web forums at the portal www.revistaesalud.com, and trouble report systems (issue tracker) or bug trackers. Other tools are also foreseen for the improvement and maintenance of the user's and/or developer's documentation in cooperative way, using special Web 2.0 tools (such as wikis).
- Evaluate and validate existing open source code or eHealth applications, and to select the most relevant ones. The categorization is important because despite several OSS for healthcares currently exist, they don't clearly state its functionalities, healthcare and IT standard compliance, extensibility, etc.
- Support the internationalization of PESCA. Translation of validated software to three languages: Spanish, Portuguese and English.
- Provide Workflow Management by creating agreements and regulations, develop the Master Project Plan, risk management, etc., to coordinate technical work, budget control for effective financial management, facilitate communication among partners and quality control.
- Evaluate the platform scalability for its local and regional implementation, using as reference pilot implementations in Argentina and Colombia.

One of the first goals of the project is to collect a repository of OSS solutions. All the solutions included will first be evaluated and validated under working conditions, also following generally accepted criteria for accomplishing technical requirements (relevance, feasibility, interoperability. . .)

The repository will be provided by multidisciplinary groups working worldwide to develop useful eHealth tools in Spanish that may be implemented and easily maintained through the Internet community. For this reason, a key step is to set up the collaborative infrastructure, not only offering technological resources but also human resources [1].

This way, a repository of solutions will be obtained in opened code that they will be able to install separately or forming modular sets as be the specific needs of the sanitary institutions, centers of health. . . In these moments there is a version of test of the forge under the domain forja.epesca.org

The e-leadership is important in PESCA, following a multiple level, multi-dimensional model described by Yammarino et al. [7], with special attention to vision and goal setting, project management and performance appraisal, communication, trust, and the virtual team dynamics.

3 Structure and Methodology

3.1 A Social Architecture

As a whole, the PESCA platform can be structured as a social architecture defined by Scenarios, which constitutes its functional units.

- Social Network Scenario. Social structure made of nodes that are tied by one or more specific types of relations.
- Content Management Scenario. Content imported into or generated from working groups in the course of their operations.
- GroupWare Scenario. Integration of users and working groups into the project.
- E-Learning Scenario. Development of modules for continuing health professional education.
- Documental Scenario. Facilities to edit and to share knowledge.
- File Scenario. Management of files (storage, access, integrity, etc.).
- Ontological and Semantic Web Scenarios: Allow the possibility of analyzing the metadata produced by the interaction between scenarios.

After the necessary scenes were tested, the community will evaluate five Scopes of every existing open source tool for eHealth:

- Open Source Software. The objective of this scope is to guarantee the transparency of the development process and to encourage distributed peer review.
- Quality. The quality tests are essential for ensuring the proper development and maintenance of standard software. They are also important for assuring the conformity with the standards and specific data interoperability.
- Pedagogical scope. Software must be able to provide a learning and content management environment.
- Security and privacy. Each software solution must maintain the integrity and confidentiality of electronic health data, amongst other things.
- Normalization. This is not aimed to elaborate new standards and specifications, but to define a set of those which are relevant for each module in the platform, besides defining some interoperability requirements.

- Internationalization. Internationalization of the platform is one of the main priorities, since the platform will be used in different Spanish speaking countries in Latin America and the Caribbean.

This evaluation process has to be continuous and iterative, where the members of the PESCA platform, alongside other users, propose new instruments, methods and procedures, and also propose improvements for well-known procedures. These community interactions will generate a best practices repository on eHealth. In addition, these interactions will support the creation of a specialized platform where specific solutions are defined. This can also improve the chances of incrementing the employment rates of ICT in health care [6].

4 Results: PESCA Social Network

PESCA does not exclusively focus on the development of a technological platform. It also gives importance to the exchange of ideas and information between human beings. Therefore, PESCA pursues the formation of an eHealth Alliance. As a first step towards the creation of this Alliance, we propose the creation of a Social Network that will not only provide support for the project, but also create an environment where information can be exchanged and eHealth best practices can be learned.

In social networking tools, it is possible to collect data about members and store it inside user profiles. Such profiles can then be shared among the members of the network. Social network platforms offer a free and easy way to create personal Web pages and fill them with multimedia content, such as blogs, digital photographs, and short video clips. Working groups can be formed spontaneously as members find other users that share a common interest by searching similar profiles. After that, the members of the same working group can collaborate closely with each other.

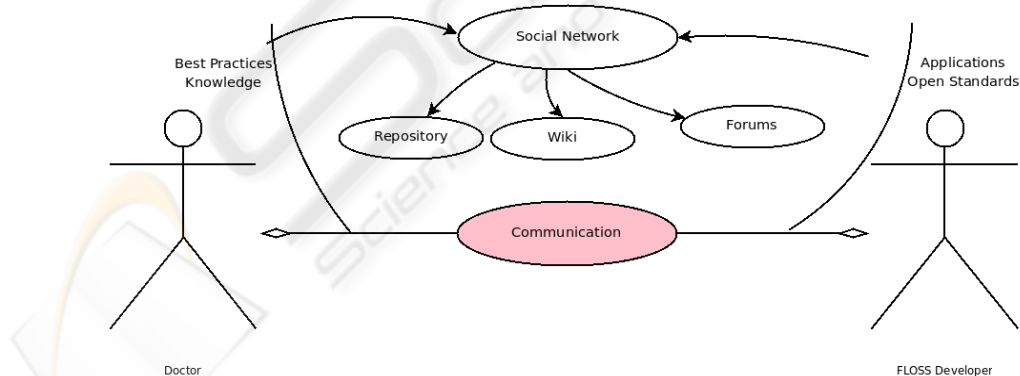


Fig. 1. PESCA Social Network.

The human community of PESCA is then organized as a Social network, implemented using web-based OSS. Inside this network, the members of PESCA can com-

bine their knowledge and technologies in order to promote the application of electronic and communication processes in their relevant health care needs: health management and logistic, diagnosis and treatment methods, monitoring of chronic pathologies, knowledge of scientific advances, staff training, and so on.

The initial prototype of the Social network of the PESCA project (known as “Open Source Platform for eHealth Portal”, located in <http://redes.epesca.org>) was deployed in late 2007, in order to provide support for the developers of PESCA. The first stable version of the PESCA Social network was implemented in January 2008, and in February it was installed in the servers of the Andalusian Scientific Computing Centre (CICA).

This first phase of the operation of the Social network have already provided interesting results, with the creation and sharing of interrelated content and the emergence of new ideas and projects. As of April 2008, the platform has 60 registered users from 6 different countries. Since the project is focused on the application of technology to health care, the majority of the users have a technological (65%) and healthcare (30%) background. There are 12 different communities: electronic medical records, standards and normalization, tools and applications, privacy in eHealth, etc [5].

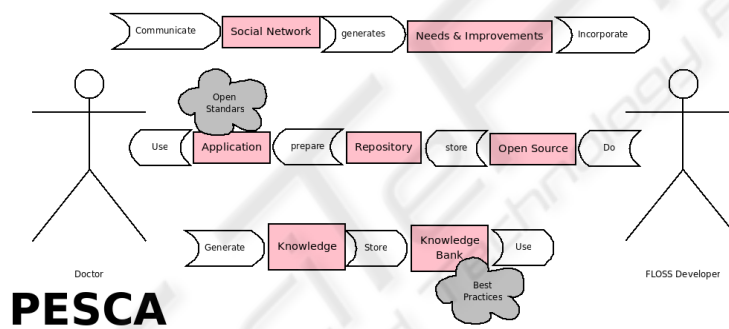


Fig. 2. PESCA: Information flows between doctors and FLOSS developers.

The creation and sharing of contents is growing at a constant rate: a) more than 60 tags describing different eHealth topics, b) more than 80 blog entries published either by the users or by the community as a whole, c) more than 15 shared documents, d) around 7 videos describing eHealth issues, and e) more than 45 eHealth OSS solutions that can be used by the members of the network.

In addition, there have been different activities that have been carried out using the tools provided by the Social network platform. For example, on January 17, 2008, 10 members of the network used the chat capabilities of the platform to approve the plan of action for the first quarter of 2008. Also, on March 18, 2008, 15 members of the project established the dissemination calendar of the project for the year 2008 through a virtual meeting. Moreover, the capabilities of the Social network allow all users to easily access and download the minutes of all meetings, which are stored in the “Funding and Logistics” community.

The potential of our project is motivating the creation of similar projects that make use of Social networks, such as the project that our colleague Manuel Amayones, from the UOC (Open University of Catalonia), is starting with David Mason and his Virtual application Clinic [2]. On the other hand, some subprojects derived from PESCA, which are focusing on the integration of OSS solutions in health infrastructures, are being carried out in Argentina and Colombia [3].

Finally, there are other parts of the project, such as the PESCA document management tool (<http://wiki.epesca.org>), that will be integrated in the future. These tools will be used as a base for the administration of knowledge flows throughout the various stages of our project.

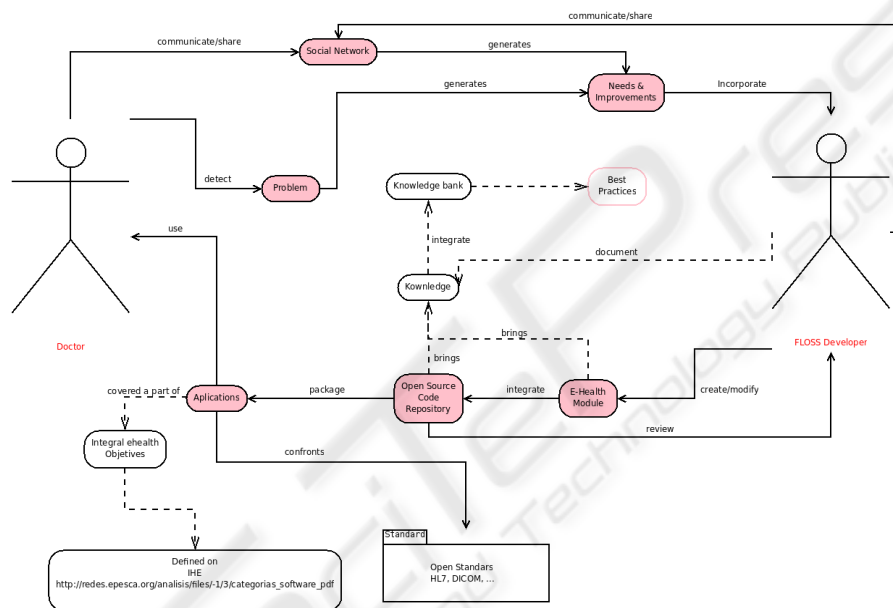


Fig. 3. PESCA: actions.

The human community is being organized as a Social Network using an OSS web tool, which will combine existing open knowledge and technologies to widespread the practical use of information and communication technology on health management and logistic, diagnosis and treatment of diseases, follow up of chronic pathologies, and professional interactions for sharing scientific advances or training healthcare staff.

5 Conclusions

PESCA is an open source platform that seeks to fulfill the existing gaps in the adoption of Health Information technologies, especially in Spanish speaking countries. PESCA does not exclusively focus on technology; it intends to build a Social Network where the principal actors in eHealth can collaborate. Also, PESCA foresees the creation and

integration of complementary projects, which will support a wide range of health care scenarios.

As a result of the first phase of PESCA, we have established an international social network of evaluation and validation of eHealth OSS. Such open source social networking platform has demonstrated to be a powerful tool for managing projects, facilitating personal contacts, and encouraging interactivity and sharing of resources.

This first experience will serve as a foundation for development of new eHealth applications. We envision that, in the near future, people and professionals will be able to adapt and make use of PESCA tools to solve their small/local or regional problems. The Social network is growing and all partners and collaborators are welcome to cooperate and provide feedback.

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