TELEHEALTH AND TELE-EDUCATION USING MOBILE PLATFORMS – UNA-SUS AMAZÔNIA

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Abstract

The UNA-SUS (SUS Open University) project aims to meet the training needs and continuing education of health professionals working in the SUS (Health Unic System), offering courses with dynamic perspective using trivial clinical events. But, one of the characteristics of UNA-SUS courses was the requirement of online access, making it difficult to professional connection of the most remote and underserved areas, specifically in isolated municipalities, indigenous areas and throughout the Legal Amazon. Because of this the UNA-SUS Amazônia project, which seeks to address the issue of access to training and information, through the development of technologies, including mobile applications that provide educational resources offline was implemented. The solution is based on local data storage and synchronisation (upload and download) when there is an available connection, always taking into account the displacement of the professional. In addition, the project aims to incorporate new interactive technologies, such as virtual reality environments and extended reality.

Keywords: UNA-SUS Amazônia; telehealth; mobile applications; offline; new interactive technologies

Introduction

Brazil is experiencing a great demand for quality health services and due to the dependence of the health sector on human resources, the demand for qualification and permanent education of health professionals also grows.[1]

For this reason, in December 2010, the Federal Government of Brazil created the Open University of SUS (UNA-SUS), through Decree No. 7385/2010. It is composed of three elements: a network of universities that offer free courses for the qualification of health professionals (UNA-SUS Network); an information system on health professionals in Brazil (AROUCA Platform) and the Collection of Educational Resources in Health (ARES), where all the educational contents produced by UNA-SUS are made available. Thus, the investment made by the Ministry of Health in the Production of courses for distance education is transformed into public patrimony, with open access on the Internet.[2-4]

However, one of the characteristics of UNA-SUS courses was online use. There were no mechanisms for reading, using, and performing exercises offline. This caused difficulties for professionals in the most remote areas, especially in the indigenous regions and throughout the Legal Amazon. To overcome these difficulties, the Oswaldo Cruz Foundation (Fiocruz) has produced a set of methods and technologies for UNA-SUS in a project called UNA-SUS Mobile.[5] These methods, however, had not been aggregated into a solution for large-scale use, with the proper investments in usability and connection and synchronisation tests for optimisation. In 2014, the University of the State of Amazonas (UEA) became part of the System UNA-SUS in 2014, gained access to the methods and technologies developed by the UNA-SUS Mobile project, and created a UEA-Fiocruz working group to develop and test telehealth solutions and health tele-education using mobile platforms.[6] This working group identified the need to carry out various research and development activities, resulting in the implementation of UNA-SUS in the Amazon.

Methods

The UNA-SUS Amazônia project is forecast to run 24 months, divided in 3 phases. The first phase of three

months consists of implementation and technical planning, and the second phase is 15 months of training, theoretical studies and development of concepts in tele-education in health. The last stage of six months is for corrective development, validation, tests and final reporting.

UNA-SUS Amazônia uses the SCRUM systems method of development. It is an agile and incremental development methodology, whose main benefit is the delivery of parts of the product in short time intervals, called Sprint.[7] At the beginning of each cycle there is a Sprint Planning Meeting and at the end a Review Meeting takes place, with the purpose of approving the functionalities developed.

As the initial Sprint of the project, theoretical studies related to tele-education through systematic studies of the literature and of benchmarking were carried out to answer the question of legal limits of tele-education services in Brazil and survey of potentially disruptive technologies in relation to professional practice. As a second Sprint software was developed for the Android Platform, with strong management of templates, content and applications embedded in HTML5 according to the UNA-SUS (PPU) Standards Package and using the UNA-SUS Bus as protocol Communication and storage of information.
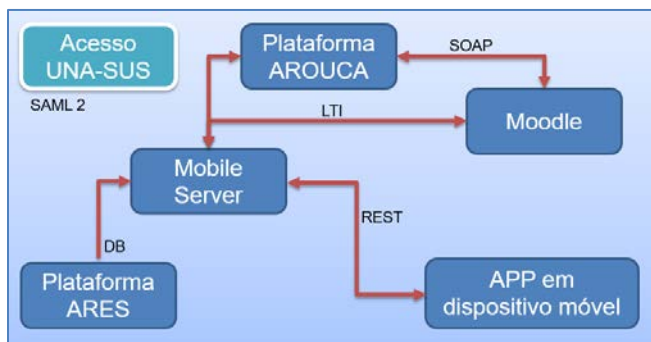

Figure 1. Example of use of the UNA-SUS bus and the main communication protocols used between services.

The service bus UNA-SUS, is a set of services and protocols that allows the configuration of several other services, facilitating and standardising the exchange of information between them. Figure 1 shows the main services of this bus in a configuration for educational offer using a mobile device APP integrated into a learning management system (LMS) Moodle environment, a modular object-oriented dynamic

learning environment for creating online courses, which will be one of the possible settings to be explored in this project.[8]

Results and Discussion

During the first phase, the formation of the Research and Development Centre for Tele-education and Telehealth UNA-SUS AMAZÔNIA, benefited researchers and health professionals and offered an innovative environment for the conception, development and application of new concepts for the area of applied education in health sciences, as shown in Figure 2.
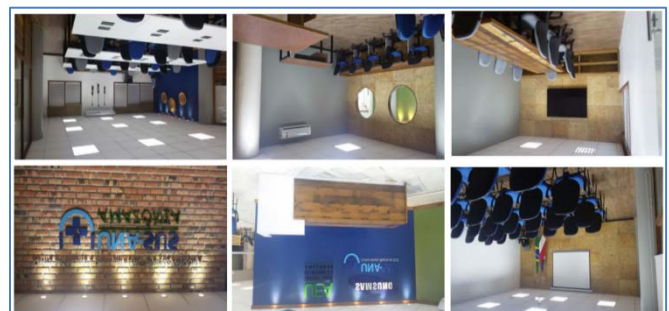

Figure 2. Centre for Research and Development in Tele-education and Telehealth UNA-SUS AMAZÔNIA

The inauguration of the Research and Development Centre of the School of Health of the University of the State of Amazonas, a member of the UNA-SUS network, was widely publicised in several newspapers and magazines in the city. (Figure 3)

Figure 3 - Press release of the inauguration UNA-SUS Amazônia.

This is the first result of a technical and scientific

co-operation project between the University of the State of Amazonas (UEA), Fundação Oswaldo Cruz (Fiocruz) and Samsung Electronics.

The first workshop for the production of distance learning courses in the UNA-SUS planning model took place in October, where questions about the demand for professional qualification, identification of the target public, construction of a Pedagogical Action Plan and various pedagogical issues were addressed (Figure 4).

Figure 4. The first workshop.

During the period of November and December, theoretical studies were carried out on the technologies used and made available by UNA-SUS, such as the UNA-SUS Shelf app, UNA-SUS Bus, UNA-SUS Access, ARES, AROUCA and Moodle platforms, as well as a benchmark on the most popular applications on distance education. Internal workshops were also held to discuss the implementation of development processes, technical visits and alignment meetings between FIOCRUZ, UFCSPA and UFMG to elaborate the Exchange Work Plans.

After theoretical studies on the main services of the UNA-SUS bus, the UNA-SUS APP was conceived, which will be divided into three stages: pre-course, course and post-course, always having as a target, health professionals already enrolled in the UNA-SUS System. At first, the application will be based on recommendations according to the professional's history of courses and their data. The application will provide training courses and continuing education, where the student can have offline access. Finally, the post-course aims to offer complementary applications according to the course taken. Among the functions of the application are identity management, profile, news, access to the ARES platform, courses, synchronisation

of information, interaction with students and tutors and gamification. Studies of low and high fidelity wireframes, web services, technologies that work with offline mode and stream of videos on Android are being conducted.

Conclusion

Faced with the situation of the great demand for professional qualification, the project has the potential to solve this problem in remote regions with low connectivity. as in the region served by the UEA, it is necessary to adapt the contents to face this restriction. In this way, the distribution of educational content packages stored on mobile devices being available for offline use, is an excellent solution that has been tested in the laboratory and developed by UNA-SUS Amazônia, in partnership with the State University of Amazonas, which already has a strong experience in tele-education and telehealth.

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