An innovation will attach patients’ electronic medical record to the foot of their hospital bed

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Researchers from Universidad Carlos III of Madrid (UC3M) are collaborating with the firm IonIDE to develop a system that will enable hospital patients who suffer some type of handicap to have access to digital entertainment and communication services by means of an intelligent terminal attached to their beds, which will also allow medical personnel to consult the patient’s medical history.

Information and Communication Technologies (ICT) present tremendous potential in the field of healthcare, according to the researchers. “ICTs are going to contribute to a change in focus in aid and health services,” comments Jesús Espinosa, CEO of IonIDE Telematics. According to accreditation and standardization associations, Spain is a leader in the management of clinical processes, because it has the greatest number of hospitals that have adopted electronic medical record (EMR). This computerized registry of patients’ social, preventive and medical data allows all of that information to be centralized in an integrated multimedia system that can be accessed when necessary, for example in the case of emergencies, primary care or hospital admissions.

In this project, IonIDE is trying to attach the EMR to the foot of the patient’s bed. To do this, they have proposed changing the traditional television found in many hospital rooms for a touch screen that can be voice activated, and through which all of the patient’s clinical information can be accessed, as can other services connected to ICT, such as entertainment and communication. In fact, they have already collaborated with Grupo Hospitalario Povisa (Povisa Hospital Group) to implement this system using a multifunctional integrated terminal (data, voice and TV), called IonPAD, which is attached to one end of an adapted articulated arm. Now the researchers at UC3M’s Centro de Innovación para la Discapacidad y Dependencia (Center for Disability and Dependence) have added a user interface to the device for use by patients with some degree of incapacity.

“We have developed a speech recognition system that allows the IonPAD to be controlled by voice, in addition to a voice synthesis system that allows individuals with a visual handicap to understand what is shown on the screen,” explains Luis Puente, of the SOFTLAB research group at UC3M and the Centro Español de Subtitulado y Audiodescripción (CESyA- Spanish Center for Subtitling and Audiodescription), which operates in the University’s Science Park. “Surprisingly,” he adds, “there was no solution available that enabled a handicapped person to have access to this type of service.”
Currently, the system that is in the testing phase shows an 81% rate of accuracy, although with further filtering and specific training the researchers expect to achieve rates of up to 95%. “The most complicated part,” Luis Puente says “has been obtaining an interface that would be accessible to the majority of the

handicapped patients, and which would also be economically viable, because we have had to base our equipment on adapted commercially available equipment along with open source software or software we designed ourselves."

For doctors and patients

This novel multi-tactile terminal can be used by medical and nursing personnel to access a patient's electronic medical history, introduce vital signs, report on the treatments administered or see reports regarding tests that have been carried out, such as MRIs, x-rays, etc. In addition, the patients can use the terminals to access hospital services (notify the nurse's station, select a dietetic menu, receive information, etc.), for personal entertainment (television, games, etc.), and to communicate (telephone, videoconference, e-mail, etc.). With the introduction of the accessible terminal, patients with motor or sensorial handicaps will be able to use it (thanks to voice command, audiodescription and subtitles) and overcome the barriers that habitually impede their access to information technology.

The innovation here consists in equipping the content audiodescription and execution systems with voice command capability. "A blind person will be able to know what contents are available and to select the ones they are interested in simply by speaking to the device; or someone whose arms are in plaster casts will be able to change the television channel by telling the ionPAD terminal to do so, without having to rely on help from a companion or a nurse, which up until now was absolutely essential," explains Roberto Peña, the technical director of IonIDE. "This way," he continues, "not only are we improving the integration of the handicapped into society, we are also improving the efficiency of hospital resources, allowing the personnel to dedicate their time to purely medical tasks."

IonIDE Telematics is a technologically based firm created as a start up incorporating the R + D capabilities and resources of Quantion Tecnologías de Telecomunicación, a company which was founded in 2006, and which is a pioneer in implementing ICT solutions that involve computerizing patient's hospital beds. Currently, ionIDE is located in UC3M's Business Incubator in the Science Park of Leganés Tecnológico (Leganés Technology Park), a space that has benefited from synergies with the Centro de Innovación para la Discapacidad y la Dependencia (Center for Disability and Dependence) at Universidad Carlos III of Madrid's Science and Technology Park. This project constitutes an example of the transfer of academic knowledge to the entrepreneurial fabric, and of how a young, technology-based company can enter the market with force, offering technologically advanced solutions thanks to the innovation and knowledge transfer that UC3M's Science Park provides.

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