



indra

**Press
Release**

INDRA OFFERS “CLOUD” SERVICES FOR MOTOR REHABILITATION OF UPPER BODY LIMBS

- **The multinational consultancy and technology firm has integrated Toyra into its In Cloud offering, the system developed with the National Paraplegics Hospital and the support of the Rafael del Pino Foundation based on virtual reality and movement capture for interactive and personalised therapy exercises**
- **The “cloud” version is especially targeted to clinics and rehabilitation centres that lack the capacity to acquire a version with exclusive usage rights**
- **It represents an important step towards treatment decentralisation that enables patients to continue with remote rehabilitation from their homes post-discharge**

The multinational consulting and technology firm will offer remote rehabilitation services with all the cost-reduction and efficiency benefits associated with cloud computing models. The company has placed the Toyra system in “the cloud”. Toyra was developed in collaboration with the National Paraplegics Hospital of Toledo with the support of the Rafael del Pino Foundation and combines virtual reality and real-time movement capture for motor rehabilitation of the upper limbs (shoulder, arm, forearm and hand). This tool, in use since 2011 with excellent results in the hospital, allows interactive execution of therapy exercises, boosting the patient's motivation towards treatment and enabling objective measurement and tracking of the patient's real condition and progress.

The “cloud” version of Toyra is offered in SaaS (Software as a Service) mode and is especially tailored to the needs and characteristics of clinics and rehabilitation centres that are unable, both due to patient volume and the cost of technology infrastructure, to use an *ad-hoc* version installed on their servers. Toyra's service provision model is totally flexible, in both its on-premise (software installed on the customer's servers) and cloud modes, making it possible to establish the business relationship that best suits the needs of the customer and its patients.

Centres and users will also have access to immediate software updates at no additional cost because, this being a “cloud” implementation, all customers benefit from upgrades. Another significant advantage is that it improves the traceability and security of the company's data. Indra provides all the mechanisms required to guarantee network security, user authentication and management of access to application resources. In addition, this service provision model allows creation of a reference database that is shared and updated in the



cloud by the centres in order to, for example, track whether the patient's progress is following the expected course for the injury type.

Greater patient motivation

Toyra is based on movement capture, using either inertial sensors or the Microsoft Kinect sensor device. These movement capture devices are connected to the interactive therapy station, which sends the location and position of the exercises being performed by the patient to the system for re-creation on the screen using an avatar. With received information stored on a central server, Toyra assesses records and analyses the patient's results from the session. The system also increases motivation thanks to the use of specular vision (mirror image), re-creation of movements in the virtual world and by giving the exercises a fun dynamic.

In addition, Toyra provides an electronic platform for managing the therapy and rehabilitation history that enables individualised analysis of therapy results. This information helps when it comes to conducting studies and developing clinical protocols and could even be integrated in the patient's electronic medical record.

In the case of cloud service provision, the user gains access to the system installed on the interactive therapy device using a personal password. All the information is stored in Flex-IT, Indra's hybrid cloud, where it is accessible at all times to the professional and even to the patient. In addition, the technology multinational will supply the interactive therapy stations in the most appropriate mode for the customer's needs.

Towards treatment decentralisation

Adaptation to “the cloud” also signifies an additional boost to the main goals of Toyra, that of serving a base for future treatment decentralisation that will permit remote rehabilitation after discharge. That is, to allow the patient to continue treatment from home with remote tracking by the clinic.

Indra and the National Paraplegics Hospital, with the collaboration of the Rafael del Pino Foundation, have already developed an autonomous version of Toyra aimed at patients who have achieved a certain degree of autonomy and are capable of executing the therapies on their own. This version is easy for patients to use and more economical, as it works with the Microsoft Kinect sensor device, and it allows remote tracking of rehabilitation by professionals who direct and monitor the rehabilitation process. Both Toyra Autónomo and Toyra Asistido (aimed at the initial phase of rehabilitation in hospital environments) are available in cloud mode.

Proven results

The Objective Reality and Audiovisual Therapy (TOYRA) system is the product of an R&D project started in 2008 by Indra and the Biomedical and Assisted Techniques Unit of the National Paraplegics Hospital with the support of the Rafael del Pino Foundation. Initially this



tool was created specifically for people with spinal cord injuries affecting upper-limb mobility. Nevertheless, as this is an evolving project, a need to target it to other sectors of the population was recognised and specific exercises were created also for people who have suffered an ischaemic stroke or with any mobility problems or traumatic injuries affecting the upper limbs. Currently work is underway to expand it to patients with problems affecting the lower limbs, trunk and neck.

Since 2011, almost 50 patients between 16 and 80 years of age have experienced the benefits of this advanced rehabilitation system. In this context, a pilot study was conducted with ten patients with complete cervical spine injuries with positive results for patients who used Toyra as a complement to traditional therapies in terms of mobility, functionality and coordination of precise movements. Similarly, in one of the studies carried out with 20 users to assess overall satisfaction, Toyra scored 90.5 points out of 100.

On the cutting edge of Cloud services

The “cloud” version of Toyra is part of the multinational consulting and technology firm's new SaaS portfolio currently made up of over 35 solutions that address specific business needs with the idea of gradually adding new products incrementally.

Indra is on the cutting edge of cloud computing services and solutions thanks to its comprehensive offer, called Indra InCloud, which covers the entire value chain of information technology services: from consultancy (helping customers optimise their capacities and minimise their costs) to the development of new solutions and the outsourcing of IT services.

One of the main objectives of InCloud is the development of Software as a Service (SaaS) solutions that address specific business needs. To this end, Indra offers its customers a wide range of “end-to-end” solutions adapted and tailored to each sector (public administrations, healthcare, energy, financial services, industry, etc.) designed to expand the functionality of their IT infrastructure.

This product is part of a new proprietary Cloud Computing model called Flex-IT developed to provide on-demand services to its customers. Flex-IT is based on the premise that managing information technology requires a combination of traditional and virtual models supported on private and/or public clouds, while maintaining a unique vision with a hybrid management approach. This delivery model, more evolved than the traditional one, represents a significant change in the way outsourcing services are offered, as it provides access in record time from any location with customers paying only for what they use.

Indra

Indra is one of the leading multinational consulting and technology firms in Europe and Latin America. Innovation is the cornerstone of its business and sustainability, with over €550 million dedicated to R&D&i in the last three years, making it a leader in Europe in its sector in terms of investment. With sales of approximately €3,000 million, nearly 60% of its revenue



comes from the international market. The company employs 42,000 professionals and has customers in 128 countries.