

Emerging and innovative technologies: IE University Library reinventing higher education

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Abstract:

The IE Library serves international students, academics, researchers and senior executives in the education programs of the IE University and IE Business School, Spain. These users demand access to data and value information through the technology and devices they use.

IE is a pioneering institution in Europe and around the world, in the development of innovative learning models, such as the WOW Room, Window to the World. The IE Library anticipates the latest technological trends and integrates them into the user experience, offering new formats and environments to provide an innovative, diverse and disruptive learning environment as an essential part of the current digital transformation in higher education.

This paper describes technologies we have implemented such as Augmented Reality, Virtual Reality, immersive reality, sensory immersion, gesture recognition, humanoid robots, mobile app, and gamification. These initiatives have totally changed our user experience and makes information discovery more intuitive, accessible and fun.

Keywords: Digital transformation, Disruptive technologies, Immersive technologies, Humanoid robots, Academic libraries.

Introduction

The IE Library serves international students, academics, researchers and senior executives in the executive education program of the IE University and IE Business School, Spain. These users often demand access to data and information through the technology and devices they use.

IE is a pioneering institution in Europe in the development of innovative learning models, such as the WOW Room, Window to the World. The WOW Room is a physical space located on IE's Madrid campus with 48 screens that make up a digital tapestry of 45m². The room also has two touch screens and cameras, latest generation computers, robots and holographic projectors. The WOW Room benefits from software developed specifically for the project through gestures recognition, it allows the teacher to have information in real time, about the student's attention, if the topics discussed create the student's view, etc. With advanced videoconference solutions that enable connectivity using any kind of device anywhere in the world.

The IE Library anticipates the latest technological trends and integrates them into the user experience, offering new formats and environments to provide an innovative, diverse and disruptive learning environment as an essential part of the current digital transformation in higher education.

We have implemented technologies such as Virtual Reality (VR) which creates an immersive environment to increase the Library's reach, integrating library resources into the WOW Room, and mobile applications like my IE Library app which allow users to manage their library account from their smartphones whenever they are. We have also implemented innovative technologies like gesture recognition devices for students to enhance their projects and personal lives, and making access and management of information much more intuitive, accessible and fun.

Vertical Library and the Virtual Library

The IE Library is located vertically on several floors in a building on the IE Madrid campus. Our library instruction materials as well as technology projects are developed here.

In our Virtual Library, the physical barriers are removed and the technology applications and devices turn the library space into an intelligent space, thanks to beacons managed by geolocation. This technology allows those within the perimeter of the beacon to silence their electronic devices within the area and, once outside, to automatically restore the sound, and to receive personalized notifications on their smartphone. Messages can be sent in bulk, or distributed by zones, type of device, or language and range from welcome messages, to alerts about new resources, services, schedules or events organized by the library and the institution. This service can be extended to the whole organisation, integrating the Library even more actively into the life of the organisation.

DiY (Do it Yourself) IE Library App

Do it Yourself IE Library App.

Enjoy this new user experience!

Choose how to access: From the Borrow & Return Smart Station Do it Yourself using the smartphones at the Library or from your own device.

With the DiY IE Library app, users have access to their IE Library personal space, manage their loans, holds and fines, borrow, renew and return items **by themselves**, make payments (credit card or paypal), check the catalog, access the full text, etc. Users can enjoy IE Library 24/7, from anywhere and from any e-device. The app is available for download on Android and iOS devices.

Now the role of the librarian takes a 360 degree turn. The librarian no longer performs functions that can be automated and that can be performed by the user, it is the user who does it.

Virtual Reality

Technologies such as VR can make the teaching and learning process more engaging and fun, and users can almost forget they are training despite the sweat running down their body.

Similarly, in IE library we have adopted VR and Leap Motion, a gesture recognition device, to motivate our students to access library resources in a fun, interactive and immersive way. Examples include hands-free reading of New York Times and complete control of the computer without the need for hardware.

Video at <https://youtu.be/kA5YR-4o2F8>

Immersive Reality

This technology consists of the immersion in an artificial environment where the user feels just as immersed as in the real world. It combines the real image with dynamic 3D elements to create scenes users can enjoy in 360°, or move and continue to see different images. This immersive reality is virtual, in real time, live and without the need for devices like helmets, glasses or green screens.

In exhibitions and presentations the immersive experience increases the ability to receive, understand and retain the message. The speaker can enter in a digital environment and interact with 3D virtual elements, so that speaker and attendees are immersed in it.

Video at <https://youtu.be/vpebkOJQH18>

Tags Beat

Another technology we have implemented in the Library is IE Tags Beat, which combines Big Data, gamification and Artificial Intelligence (AI). It is a new way of perceiving and accessing information through a gesture recognition device, which gives an immersive sensation. AI makes it possible to interact with the library online catalogue in real time and creates a bar recording the number of visits according to the times the student uses the gesture recognition device.

This gamification of information access makes it more intuitive, easy and enjoyable as well as mobile. Thanks to the QR code that is generated, the user can transfer the online resource to their own mobile device.

Video at https://youtu.be/cY9w6_dEfD4

Artificial intelligence

Research firm Gartnerⁱ predicts that we will have more chats with bots than with our significant others by 2020; while David Levyⁱⁱ, author of “Love and Sex with Robots” says we are only 50 years away from marrying robots.

AI is becoming a basic element in many technology changes today, for example in robotics. Humanoid robots are closer to us than ever including within libraries. Let me introduce you to...



...Pepper, our new assistant in IE Library.

This technology project is a humanoid robot, named Pepper, that can easily be programmed to complement the librarian, taking care of functions such as circulation. Pepper is able to analyse verbal and nonverbal communication such as the position of someone’s head and the tone of voice with a 3D camera and four microphones. This allows Pepper to recognize the emotional state of people, gestures, sounds and touch, creating an environment of empathy and connection that fosters a fluid and effective communication between robot and library user.

Incorporated with a tablet, Pepper can access the catalogue and library website, answer queries and perform circulation tasks. For example, if a user would like to search for a specific subject area, Pepper – who has a map of the Library with each subject area location defined in her programme – would accompany the user to the specific area and talk him through specific items of interest. The same process applies to the Library’s electronic resources.

In this way, Pepper becomes a tool for research and development of new applications, as its work is not limited to the physical library but also to environments such as the WOW room. Pepper was recently joined by Robbie which allows students to connect remotely to classes when they are unable to attend in person for whatever reason.



Video at <https://youtu.be/KBg4sPU96Ao>

ⁱ Elliot, Bern; Andrews, Whit. (2017). A Framework for Applying AI in the Enterprise. <http://www.gartner.com>. ID: G00336031.

ⁱⁱ Levy, David. (2007). Love and Sex with Robots: The Evolution of Human-Robot Relationships. Harper Collins. P.35.