ARTIFICIAL INTELLIGENCE,

an inevitable trend which is a challenge to humanity

Today, as never before, the evolution of technology implies a very big challenge for companies and governments. Being prepared for and trained to adopt and develop it will clearly make a difference and determine the fate of most of them.

By: Alejandro Ramírez Peña
Photos: Alberto Sierra, Leonardo Parra, 123RF

I f anything has shown the advance of technology in recent years, it is the development of artificial intelligence (AI), which has not only arrived to stay but will revolutionize the life and customs of mankind.

That reality can be seen in different industries, trades and even the daily activities of individuals. Nowadays, autonomous vehicles and drones do home deliveries and robots work in the financial system.

The range of options offered by artificial intelligence is broad and the abovementioned examples are usually the most striking. Another application of equal importance is the development of intelligent computational systems, capable of adapting themselves to the medium in which they operate. In this field, it is usual to find web platforms designed to publish the grades of students at a university, the results of a census of a population or even to collect taxes. These platforms have to deal with critical situations of a very high demand during very short periods.

This is precisely one of the fields being investigated by Juan Fernando Pérez, a professor at the Department of Applied Mathematics and Computer Sciences and director of the INNovation and Transference of Knowledge Hub of the Universidad del Rosario, and Dora Suárez, coordinator of the Hub´s projects for digital transformation. Their findings may potentially simplify the operations of the technological platforms used by State agencies and private sector companies in order to provide services or manage their internal processes.

In the three abovementioned cases, the average use of such platforms is relatively low. However, when certain deadlines approach, the massive entrance of users leads to some very high and unexpected peaks which cause them to collapse.

As Pérez explains, a number of precautions may be taken when such peaks occur so that the systems are alert to the times when a greater capacity is needed and instead of running the application with four or five computational resources, they can do it with 10, 15 or 20, depending on what is needed.

"But there are cases when not even that is possible. If a new game is launched on Facebook, for example, two situations may arise: That people access it, play it for a while and do not like it much, or that it goes viral and in any moment the demand increases in an uncontrollable way, which would require a very quick reaction. And that
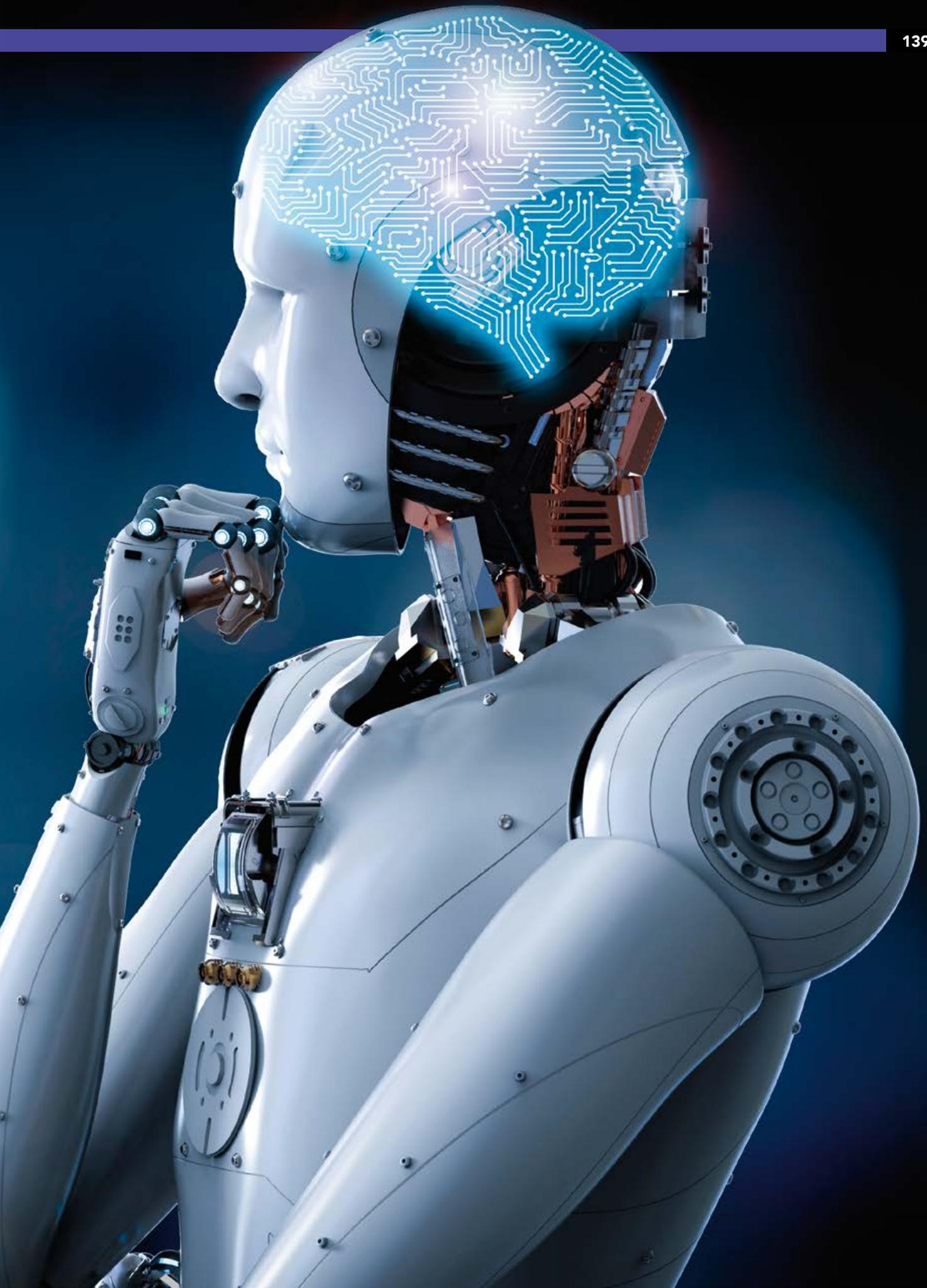
is where those intelligent systems come in, because their first function must be to adapt themselves to those kinds of changes," he adds.

That is why the two professors believe that the idea of this kind of technology should be to provide a very good level of services, at the lowest possible cost, within a business context, which is what upholds this application. The intelligent system will thus be responsible for controlling the application and act as a kind of security guard which is observing the behavior of the demand in order to react in a timely and suitable way with the relevant component which has to be replicated.

In the course of this study, these experts from the Universidad del Rosario began to note the ever more frequent use of applications which gather together and process big amounts of data, since those are the ones which are gaining the most ground in different fields, parts of the economy and other sectors. In their opinion, such applications too need to adapt themselves to their surroundings, which in this case are more advanced applications which require training in models of machine learning, for example. This is another layer of intelligence, which is highly oriented towards computational systems.

The uses of these kinds of tools are closely associated with cloud computing, without which they could not exist, since they guarantee the obtaining of resources in a dynamic form to the extent that they are needed. If not, companies would have to limit themselves to their own equipment alone, instead of being able to build a hybrid configuration like the one provided by the cloud, in order to both to increase or reduce the capacity of the configuration, depending on what is required.
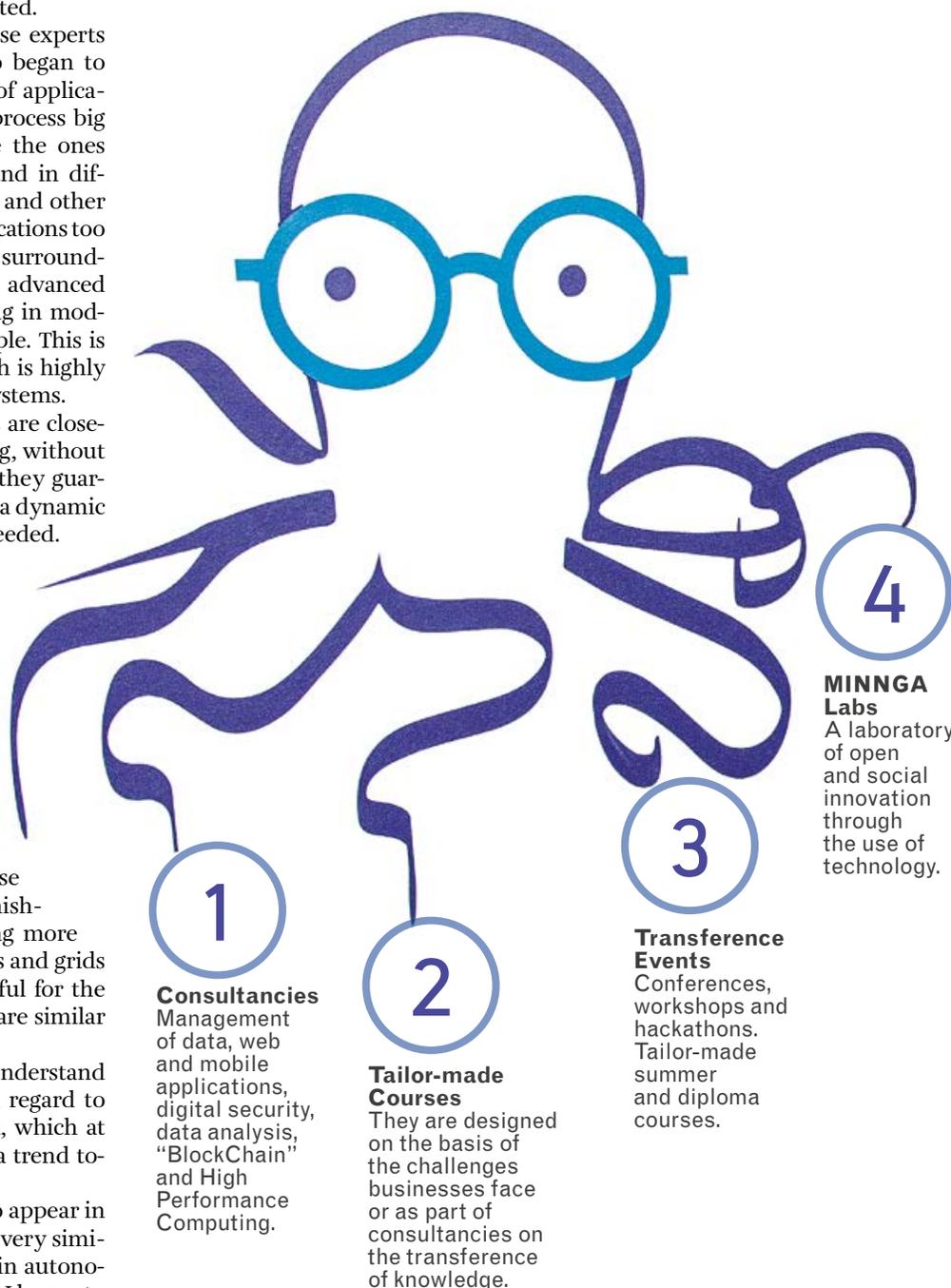
The start of the project

Pérez first started delving into these questions in 2008, when he was finishing his doctorate and was working more on the design of systems, networks and grids (which later turned out to be useful for the problems of the cloud, since they are similar concepts).

That experience helped him to understand their full potential, not only with regard to their design but operation as well, which at that time was already marked by a trend towards autonomous systems.

"Thus, research groups began to appear in many places which were studying very similar questions, but had an interest in autonomous computation in common. So I began to

THE INNOVATION AND TRANSFERENCE HUB

The Department of Applied Mathematics and Computer Sciences of the Universidad del Rosario has an Innovation and Transference Hub, which proposes and develops projects of digital change.

1 Consultancies
Management of data, web and mobile applications, digital security, data analysis, "BlockChain" and High Performance Computing.

2 Tailor-made Courses
They are designed on the basis of the challenges businesses face or as part of consultancies on the transference of knowledge.

3 Transference Events
Conferences, workshops and hackathons. Tailor-made summer and diploma courses.

4 MINNGA Labs
A laboratory of open and social innovation through the use of technology.

get more involved in all this and then, in 2013, I worked in the computer department of the Imperial College London, where I participated in a project, financed by the European Union, which focused on business applications, above all on how to design them and then the best way to implement them, taking all the uncertainties of use and crowding into account," he recalls.

After that, his passion for these subjects took him to Melbourne, Australia, where he remained until 2016, and in January 2017 he joined the faculty of the Universidad del Rosario, where he began to work on several projects to do with the creation of an undergraduate program at the Department of Applied Mathematics and Computer Sciences, novel in the country, which dealt with artificial intelligence, among other lines of study.

With the work team which has been formed there, the Department has won approval for the start of an internal project (financed by the University) which will study clusters of "Intelligent Big Data" (which process large amounts of information).

Artificial intelligence is not optional

For these experts at the Universidad del Rosario, both the public and private sectors, and the academic sphere as well, are in a stage of transition towards the new technologies, which has driven research and the implementation of its results in companies.

The adoption of these kinds of solutions is a commonplace on a global level, along with all that is related to artificial intelligence, where there is a strong demand for talent, with an infinite number of possibilities, but substantial flaws in training students to meet the expectations which so much potential raises.

"I don´t think Colombia is doing so badly in this field. We are not leading it, but we are not in last place either. I believe that it is a good time for many people to join in this initiative and link themselves to all of these questions, in different roles, especially in development, analysis and investigation, and with a stronger emphasis on the appropriation and incorporation of these trends in companies and public institutions," Pérez remarks.

The Universidad del Rosario likewise counts on the Innovation and Transference Hub of the Department of Applied Mathematics and Computer Sciences, which, according to Dora Suárez, the leader of the projects for digital transformation, is the arm of the university which reaches out to other spheres of the country, insofar as it offers services of consultancy in data analysis, digital security and similar fields to public and private sector entities.

Nevertheless, the most active part of the Hub nowadays has to do with the transference of knowledge, in the form of summer courses on subjects like big data, machine learning, the transference of technology and cryptography, among others.

"Another project we have is called the 'MINNGA Labs', which are basically laboratories of open innovation. Here, the idea to take all of this technological innovation to different sectors and regions of the country in order to develop joint solutions through digital transformation. In addition, our consultancies provide companies with the chance to contract us in order to help them solve problems, and we also train them to go ahead with their projects," Suárez explains.

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And real life has shown that such organizations can no longer leave these questions in the hands of external agents. If they want to survive in the long term, one of their biggest challenges is to form internal teams capable of appropriating such innovations and leading and continuing with projects, a process where training is fundamental and decisive.

The positive side of it is that business leaders and public officials are becoming more and more aware of this need to keep up with the latest technology, since they already understood that artificial intelligence with all of its fields of development, is, like other advances, no longer optional. And the better prepared they are for the whole of this change, the better their chances of not only holding onto their markets but expanding them as well and turning their companies into prosperous and lasting business ventures. ◘