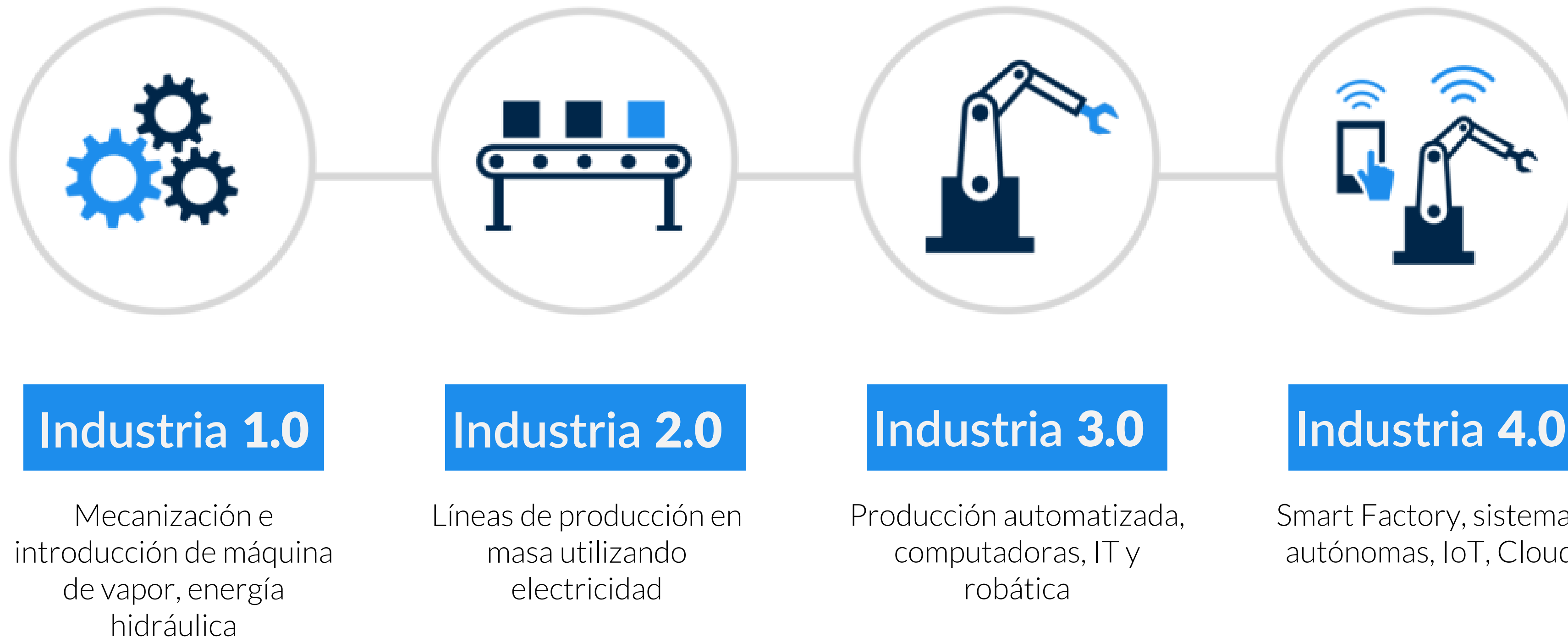


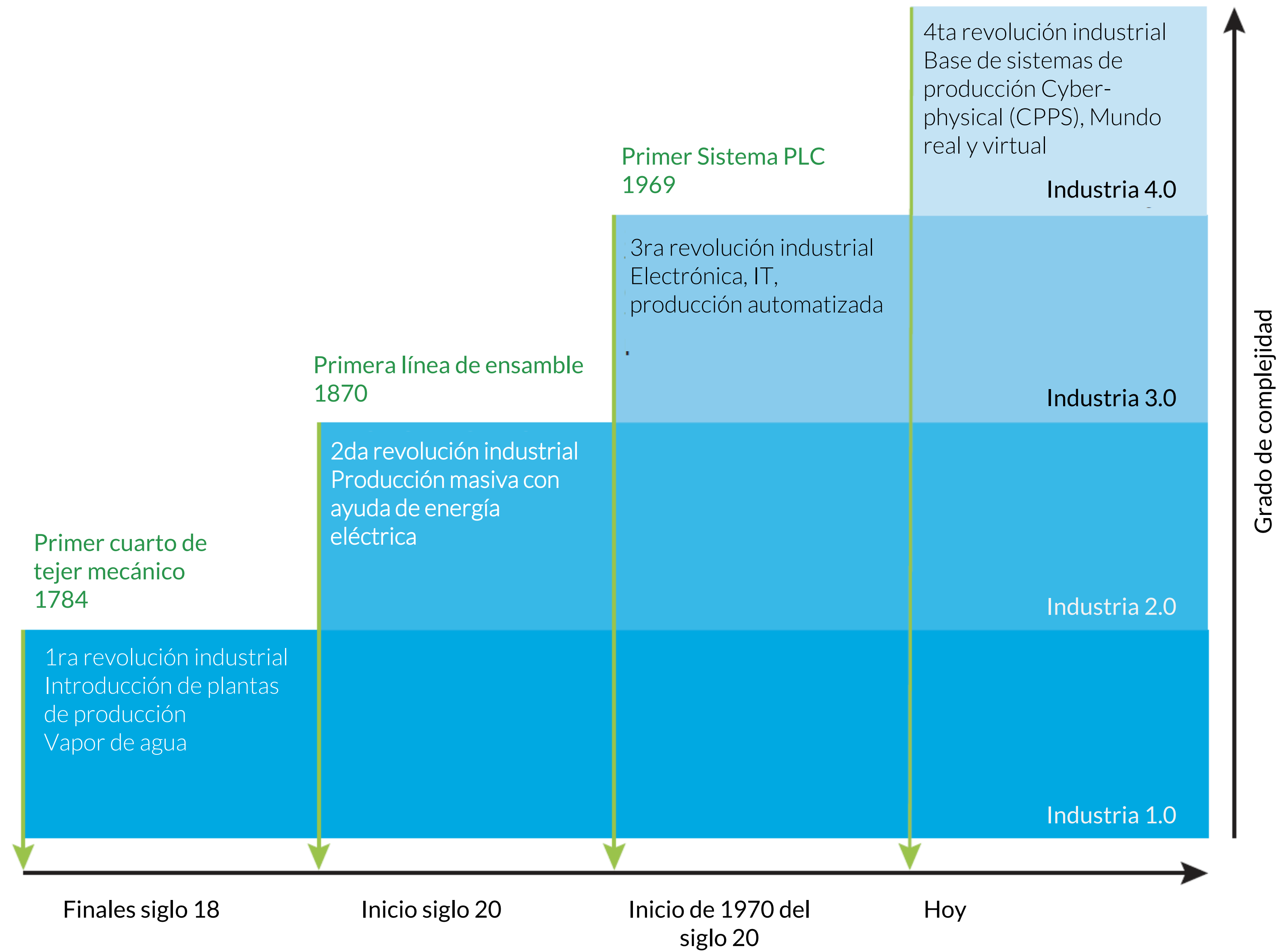


INDUSTRIA 4.0

Ing. Israel Valencia Chávez
06 de Junio 2019

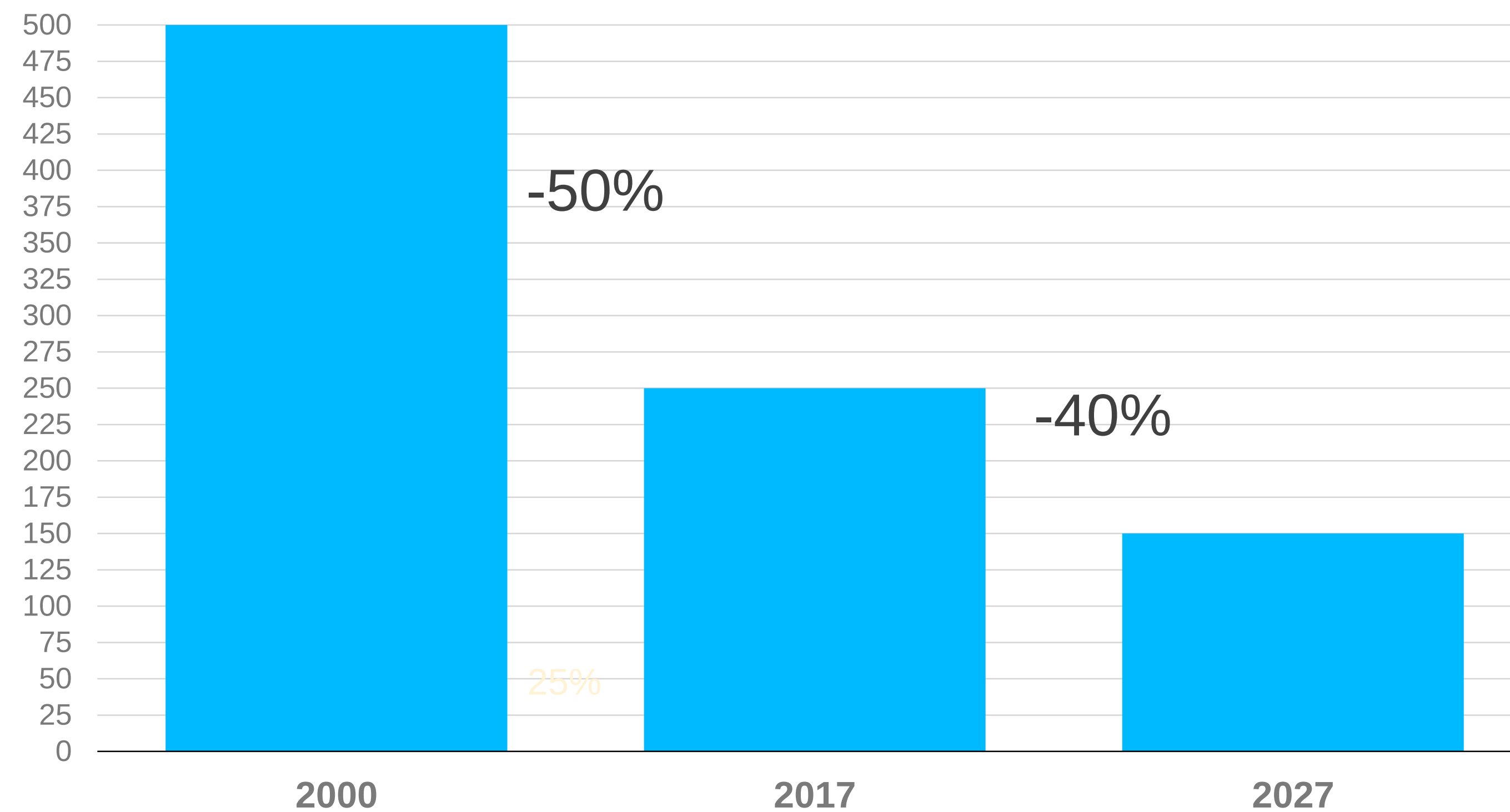
Las 4 revoluciones industriales



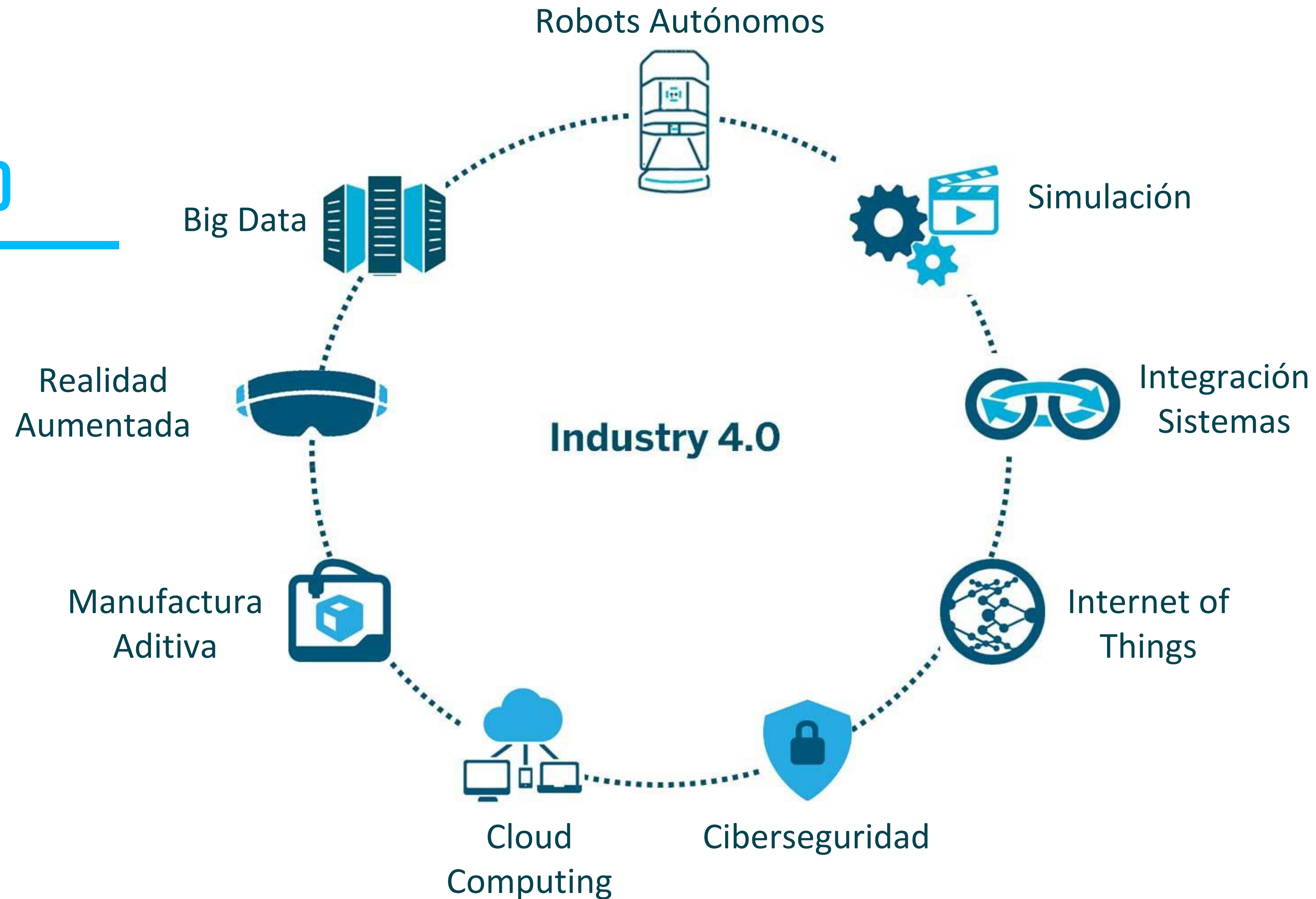


LISTA FORTUNE 500 DESDE EL AÑO 2000

La digitalización es el motivo principal por el que algo más de la mitad de las empresas de Fortune 500 han desaparecido desde el año 2000



ELEMENTOS DE LA INDUSTRIA 4.0





México
Inversión y Comercio

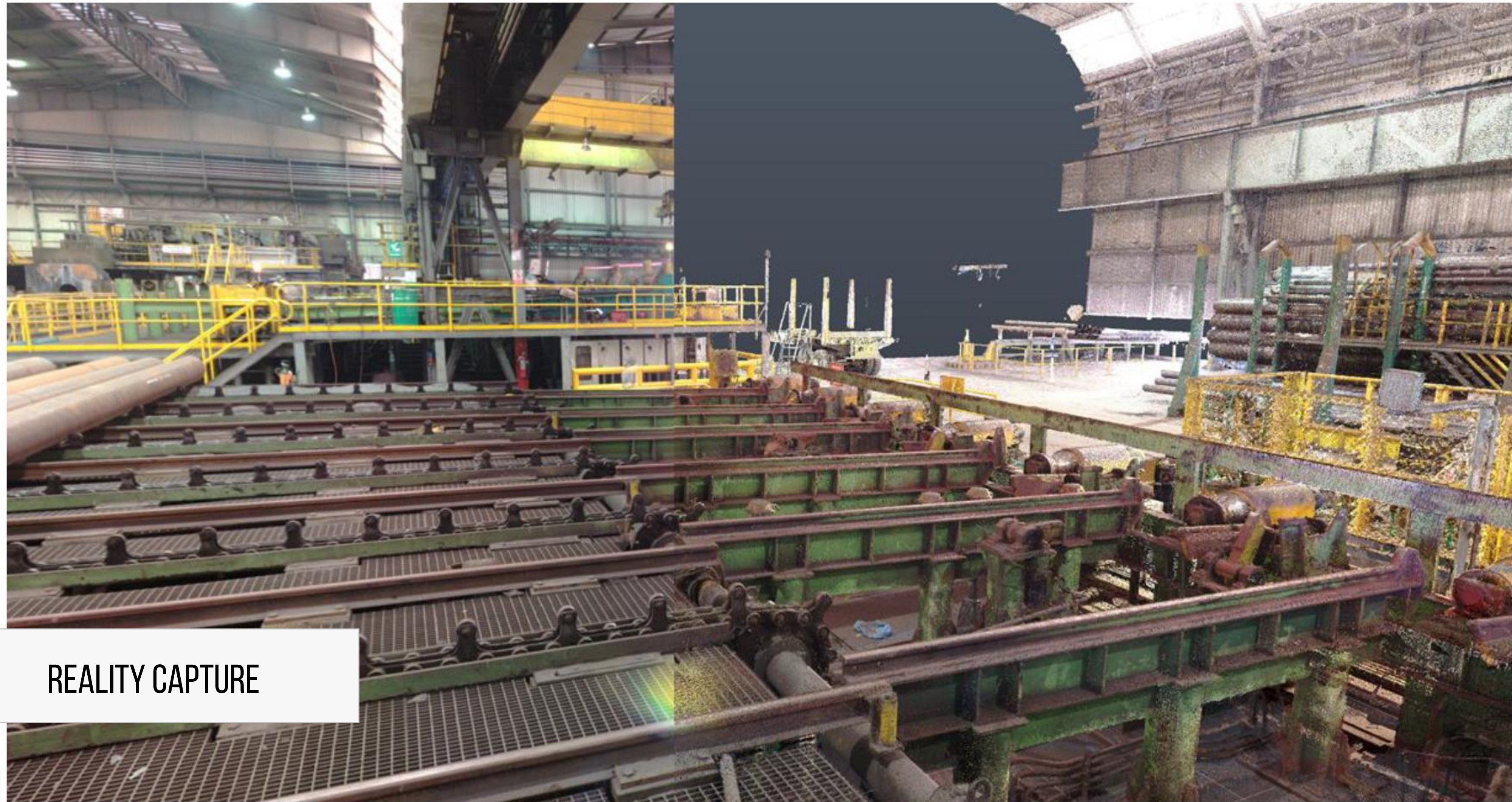


ARCHITECTURE, ENGINEERING & CONSTRUCTION



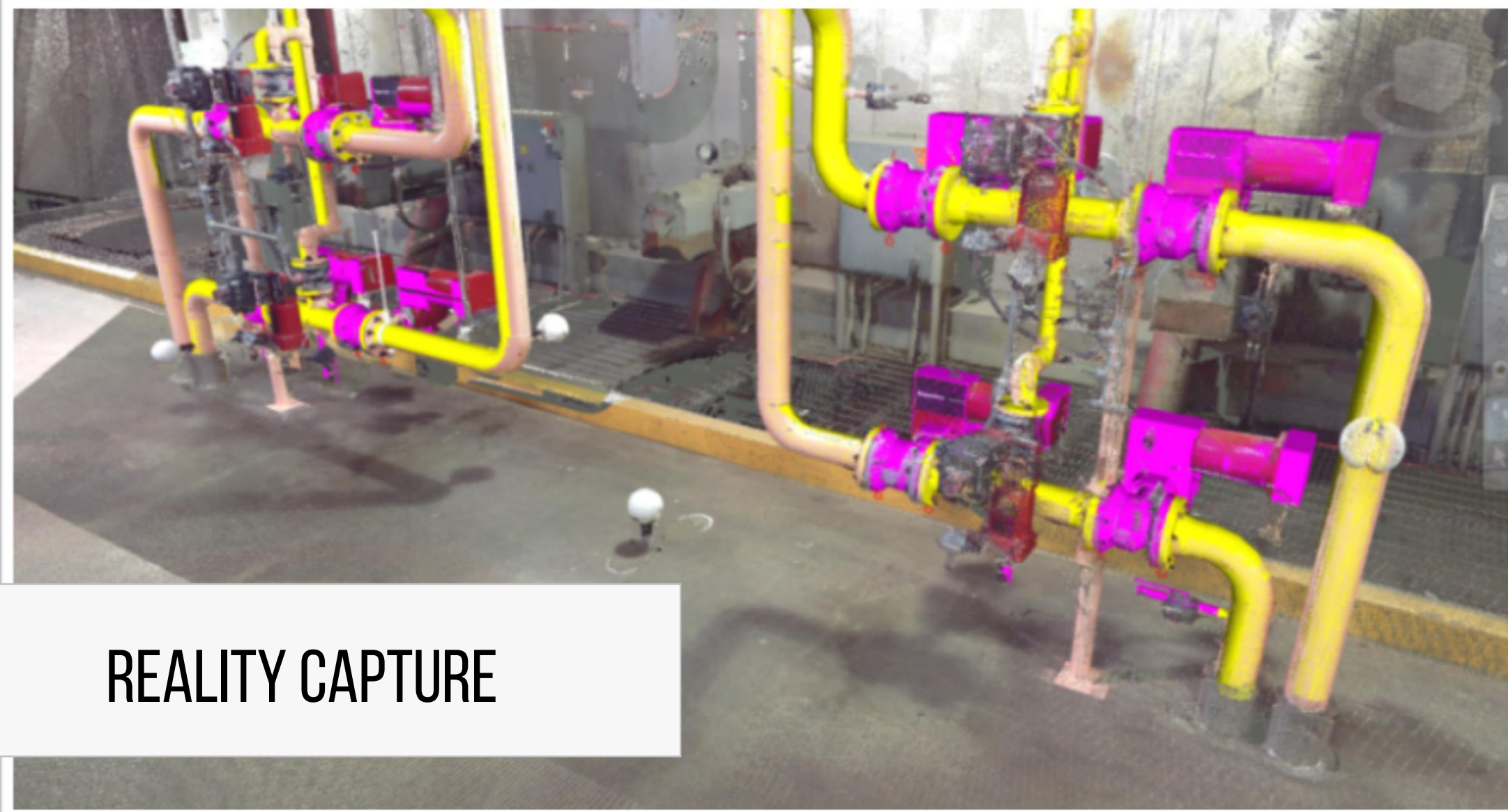
El sector de la industria de la construcción que proporciona los servicios de diseño arquitectónico, diseño de ingeniería y servicios de construcción.

SOLUCIONES AEC



REALITY CAPTURE

SOLUCIONES **AEC**

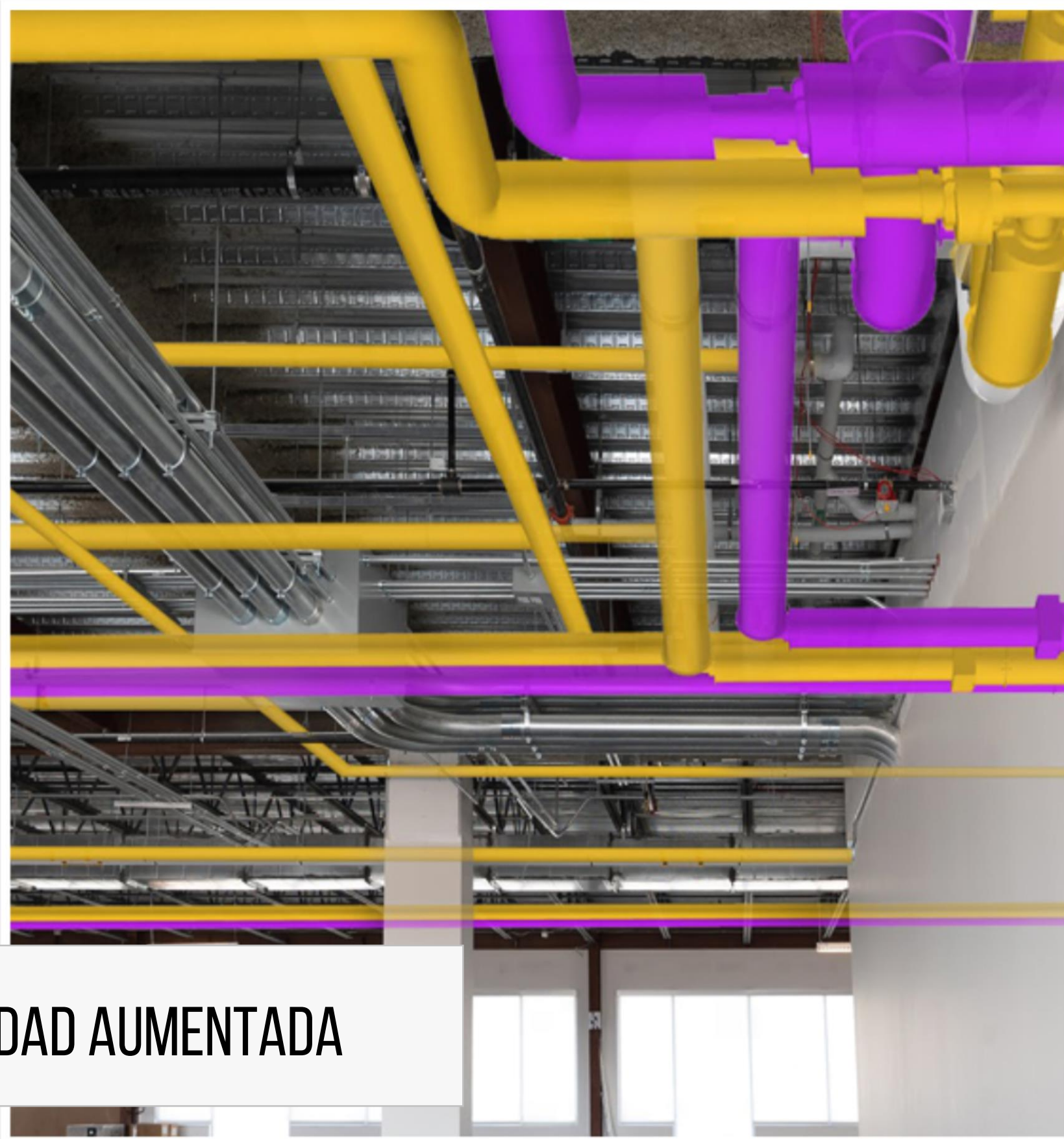


REALITY CAPTURE



REALIDAD VIRTUAL

SOLUCIONES **AEC**

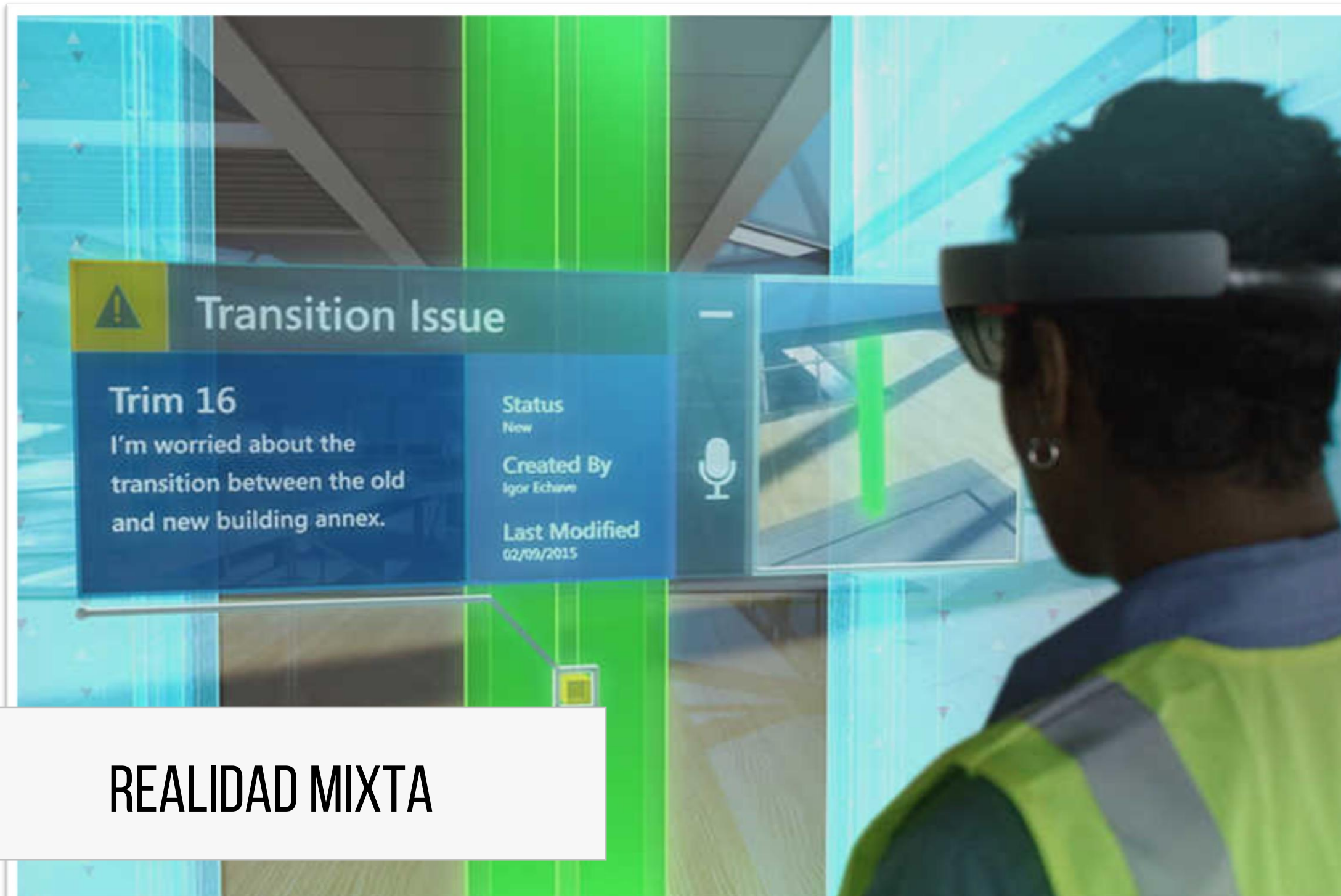


REALIDAD AUMENTADA



REALIDAD MIXTA

SOLUCIONES AEC



REALIDAD MIXTA

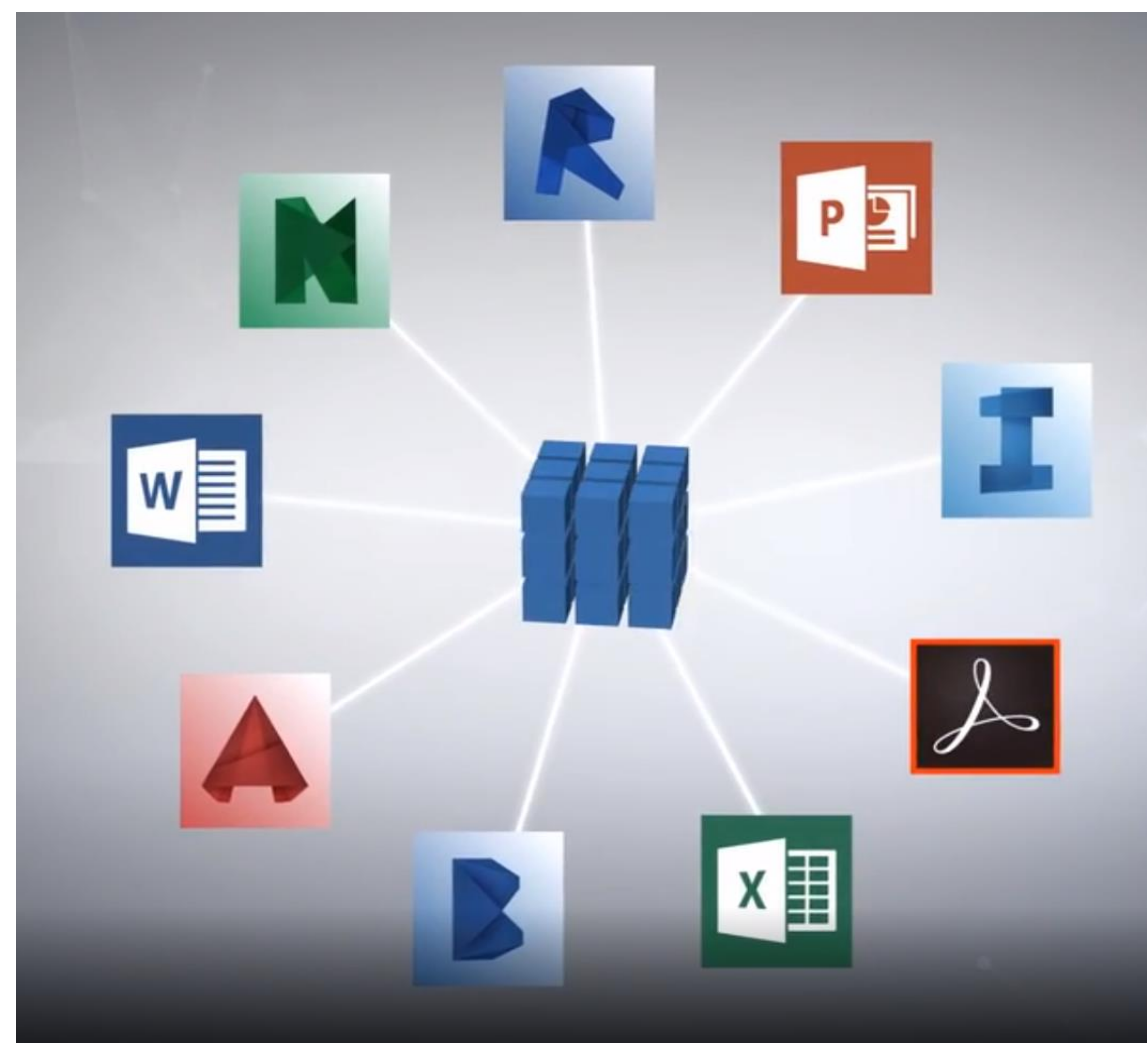


IMPRESIÓN 3D

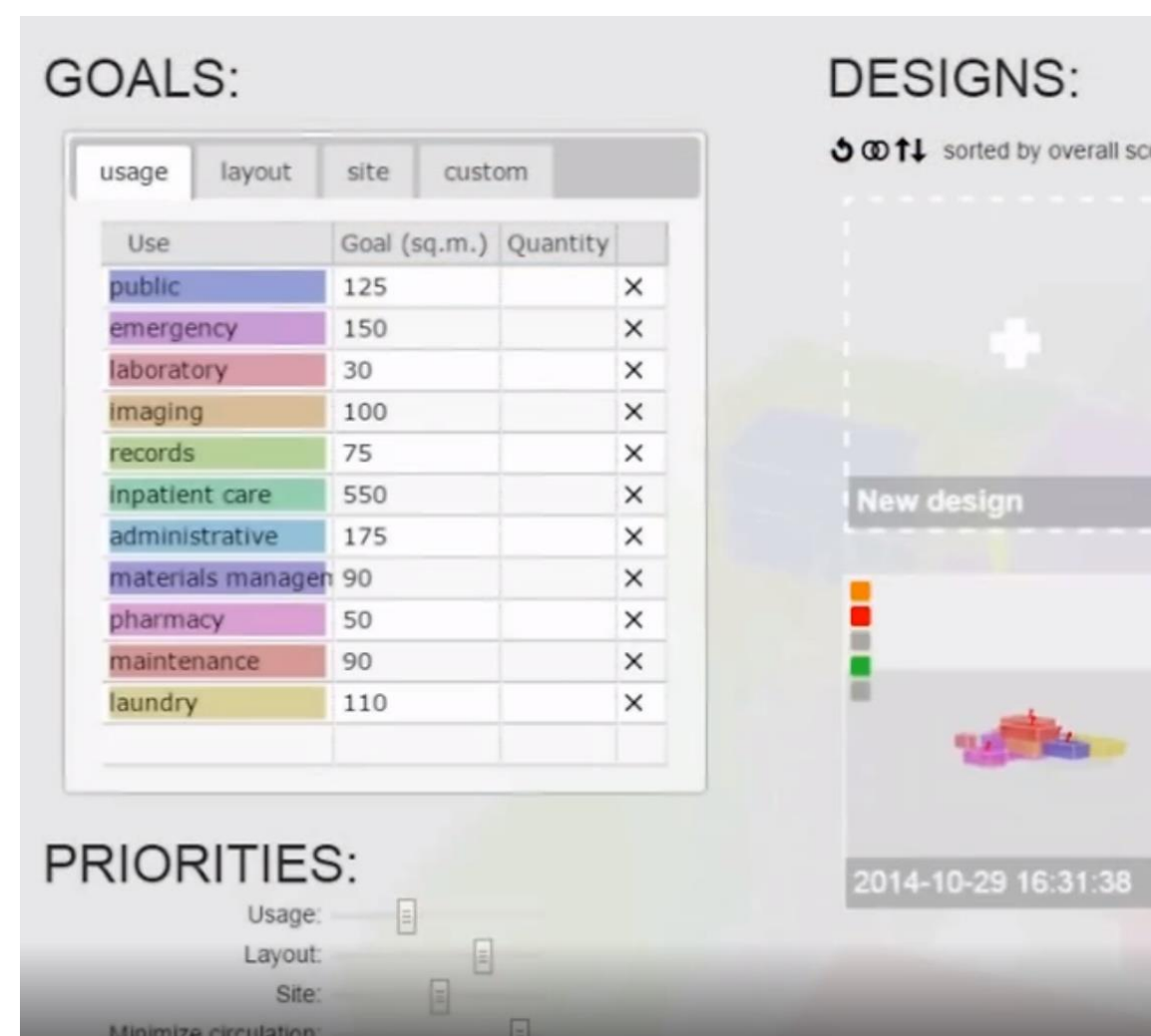
PARTNERS



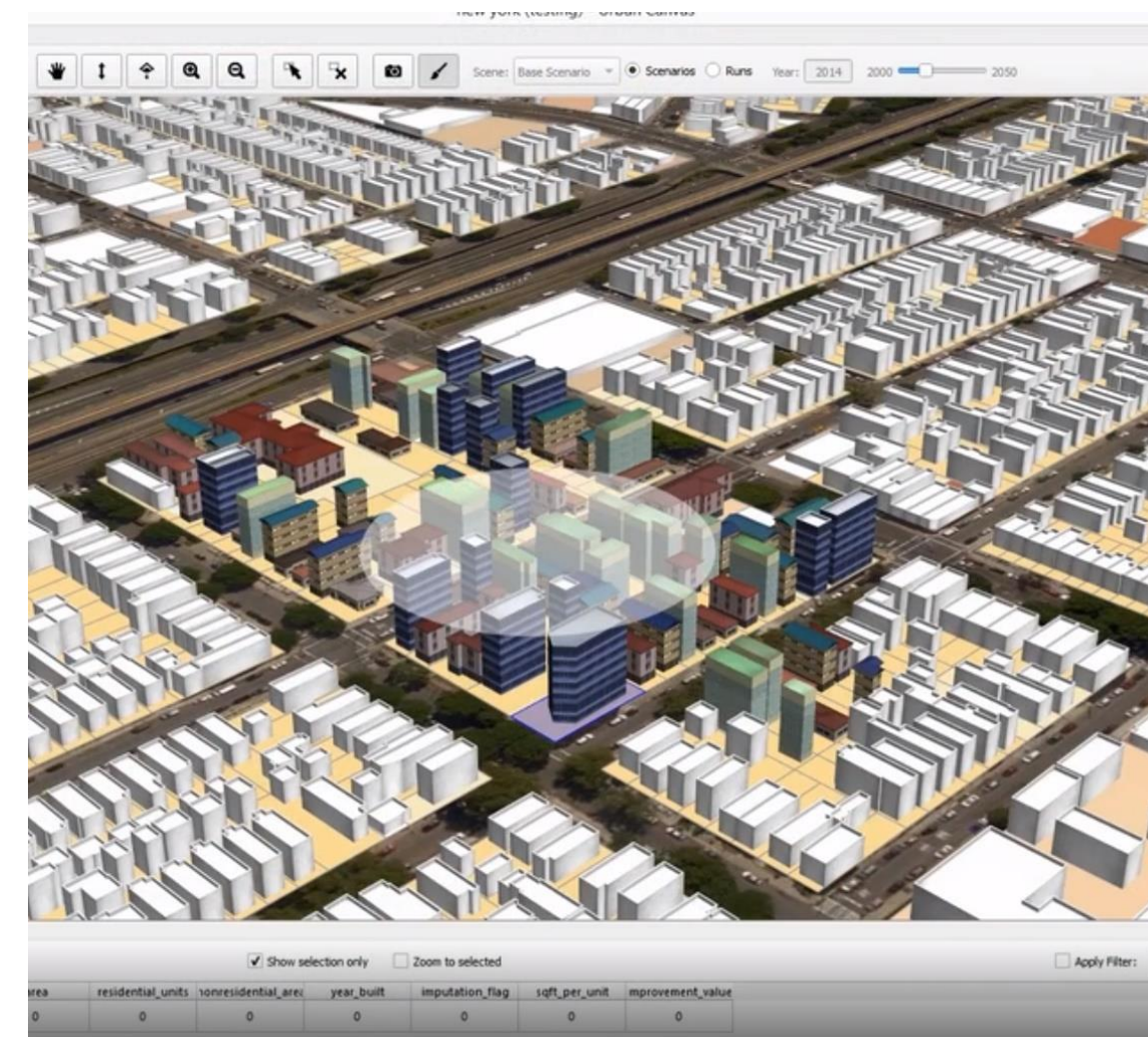
EVOLUCIÓN PARA AEC



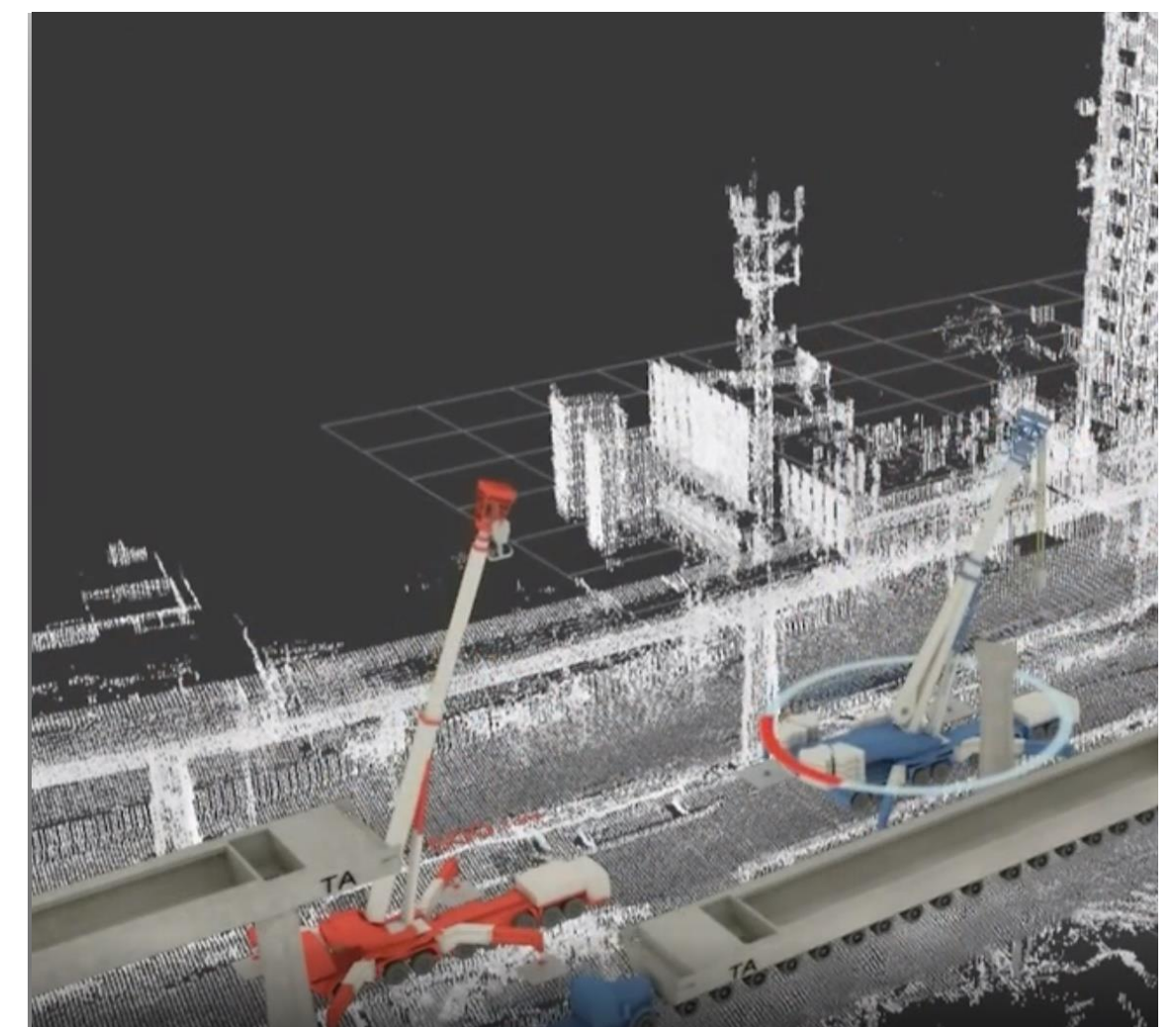
PROYECTOS



GENERATIVE DESIGN



BIG DATA



BUILD LOGIC

MITOS DE LA INDUSTRIA 4.0

Falta de claridad sobre lo que significa la Industria 4.0 y confusión sobre lo que es (y no es) posible con estas nuevas tecnologías.

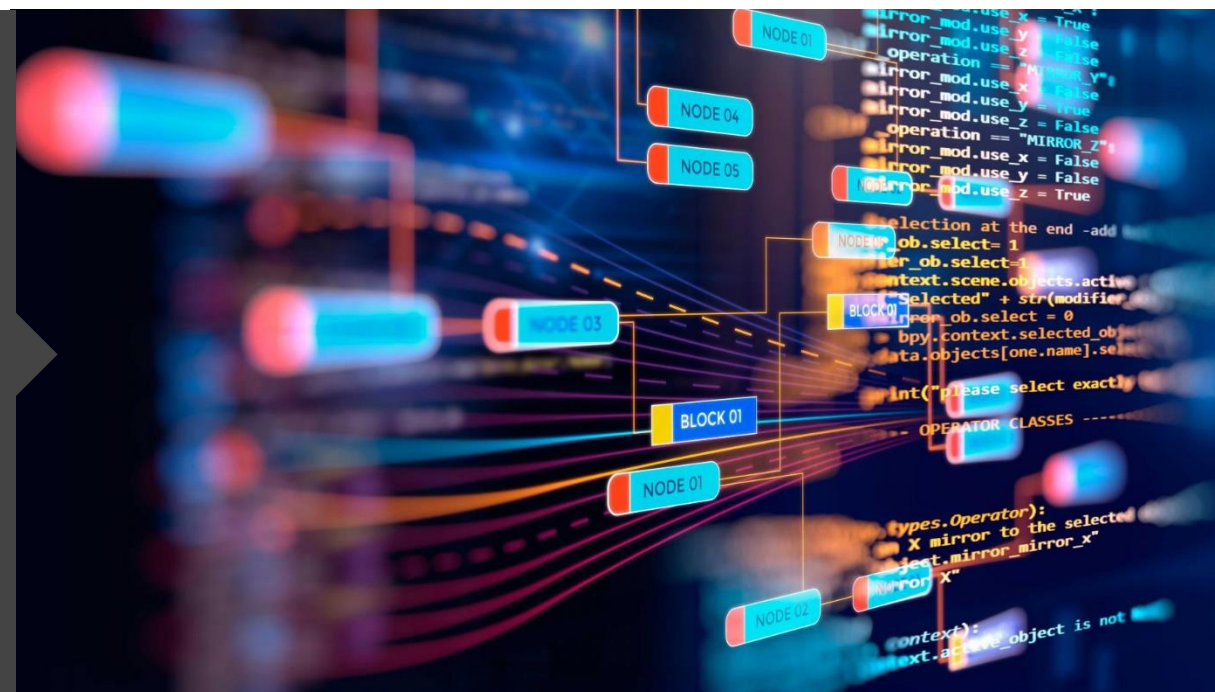


1. Es solo para grandes empresas y requiere mucha inversión



2. La automatización eliminará empleos.

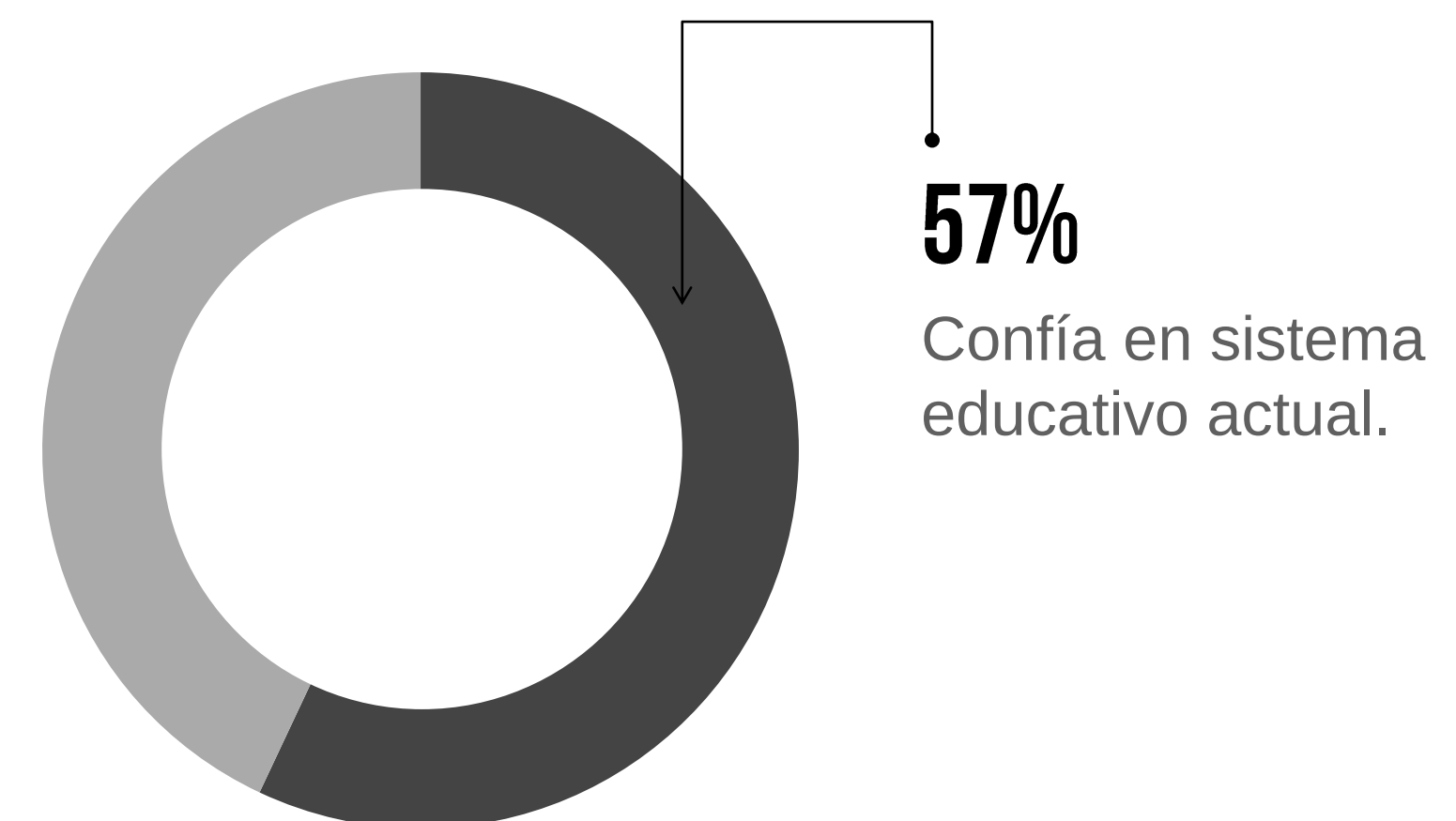
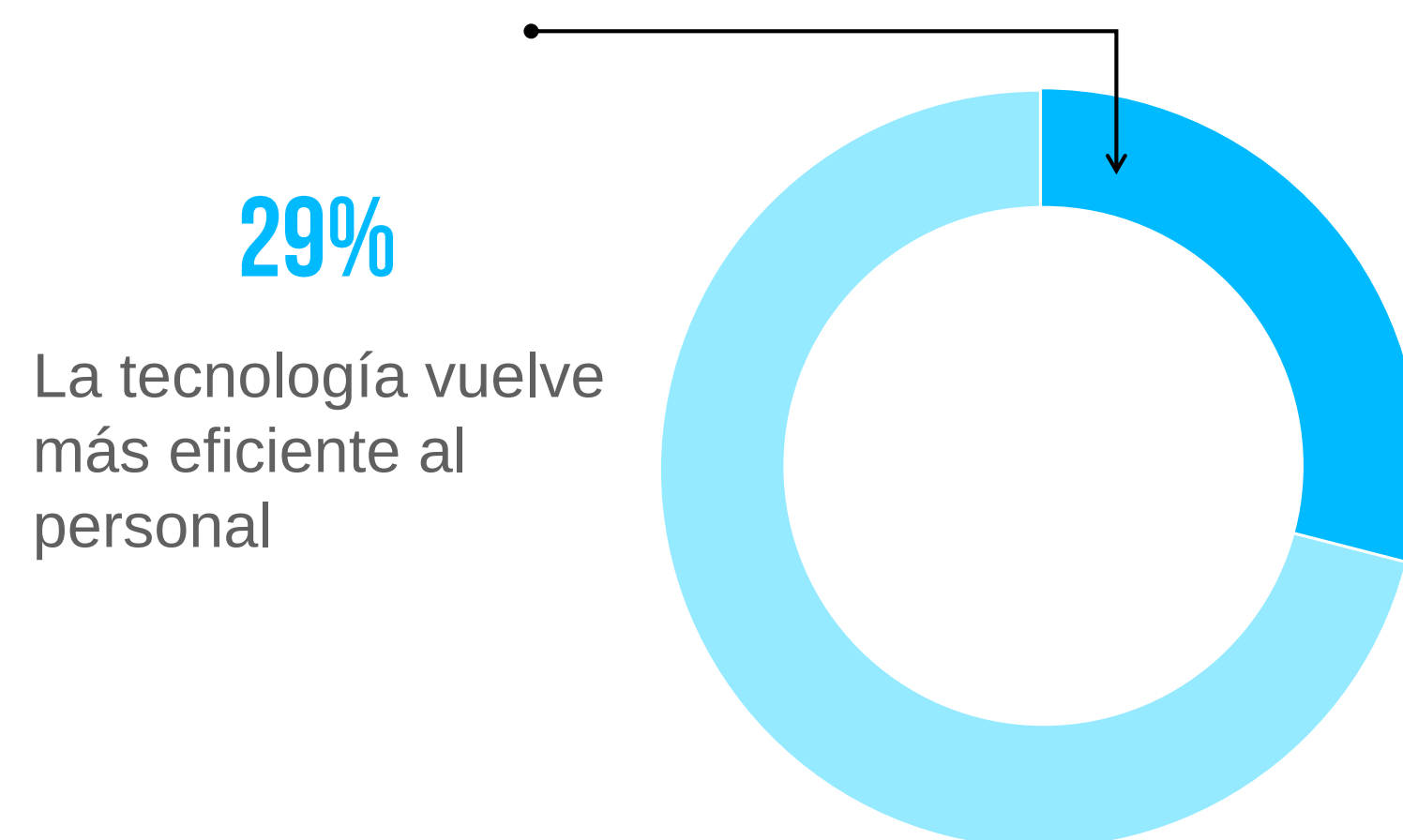
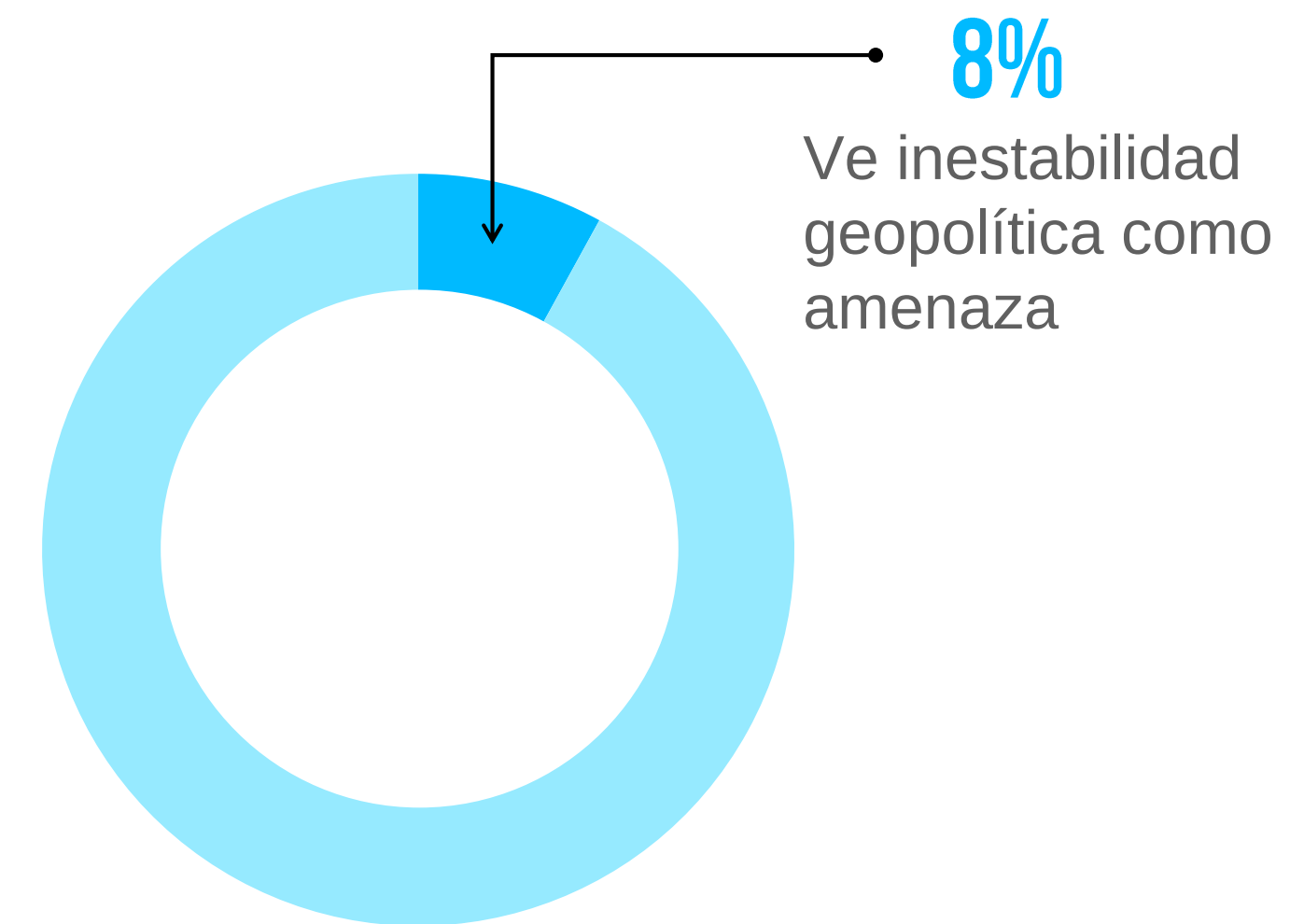
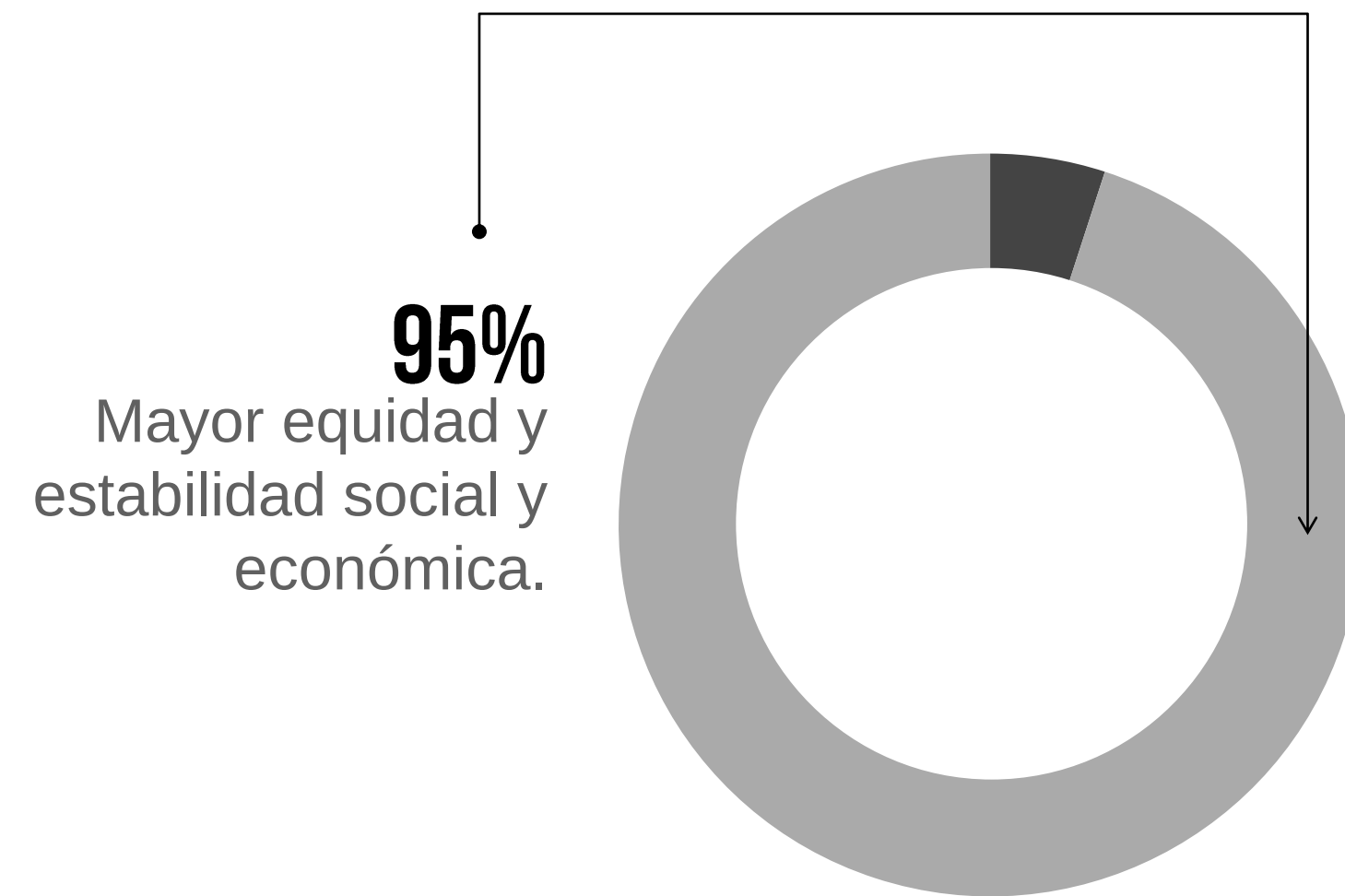
3. Más datos es mejor



3. La única ventaja de impresión 3D es para prototipos



¿QUÉ PIENSAN EN MÉXICO?



INICIATIVAS DEL GOBIERNO



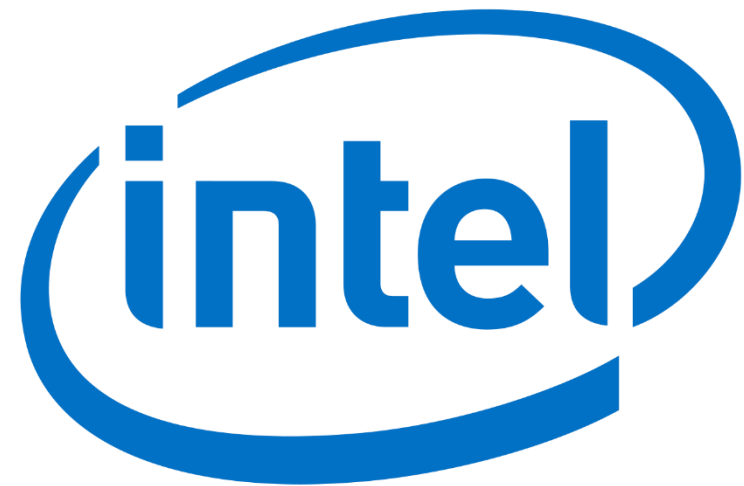
Centro de Innovación Aplicada en Tecnologías Competitivas



Centro de Ingeniería y Desarrollo Industrial

CASOS DE ÉXITO

Proyectos Actuales para mejorar y especializar fabricación y diseño avanzado en México



Intel Corporation

US\$ 170 millones.
Design Center en
Jalisco

Honeywell

Honeywell

Innovation and
Design Center.
Chihuahua.

Continental 

Continental AG

Engineering Center.
Jalisco



Arreglos y Montajes
Técnicos

Disrupción Design
Engineering.
Veracruz – Nuevo León

A close-up, high-angle shot of an industrial robotic arm, painted orange and grey, performing a welding task on a silver car chassis. The arm is positioned on the left side of the frame, with its end effector (a welding torch) making contact with the metal. A dense spray of bright orange and yellow sparks is being ejected from the point of contact, creating a dynamic and energetic scene. The background is slightly blurred, showing other parts of the factory environment, including another robotic arm and various mechanical components. The overall lighting is bright, highlighting the metallic surfaces and the intense light from the sparks.

...la combinación del **talento humano** Mexicano y la transferencia de tecnología derivada de la inversión son la clave para la transformación digital.

SOFT SKILLS

En donde las máquinas
NO compiten

LAS 4 TENDENCIAS QUE ESTÁN TRANSFORMANDO EL LUGAR DE TRABAJO

Soft Skills

91%

A horizontal bar chart for 'Soft Skills' showing 91%. The bar is dark blue and extends to 91% of the total length, with a light gray segment remaining.

Flexibilidad

72%

A horizontal bar chart for 'Flexibilidad' showing 72%. The bar is dark blue and extends to 72% of the total length, with a light gray segment remaining.

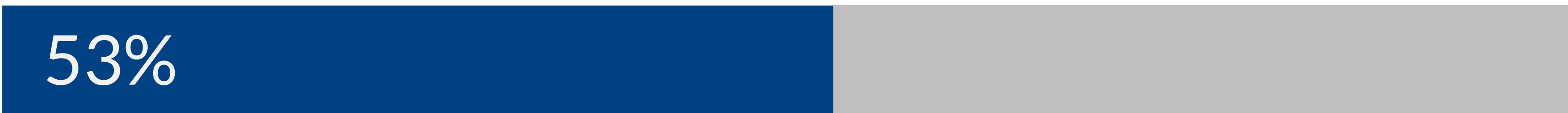
Acoso

71%

A horizontal bar chart for 'Acoso' showing 71%. The bar is dark blue and extends to 71% of the total length, with a light gray segment remaining.

Transparencia \$

53%

A horizontal bar chart for 'Transparencia' showing 53%. The bar is dark blue and extends to 53% of the total length, with a light gray segment remaining.

5000 Talent Professionals / 35 Countries

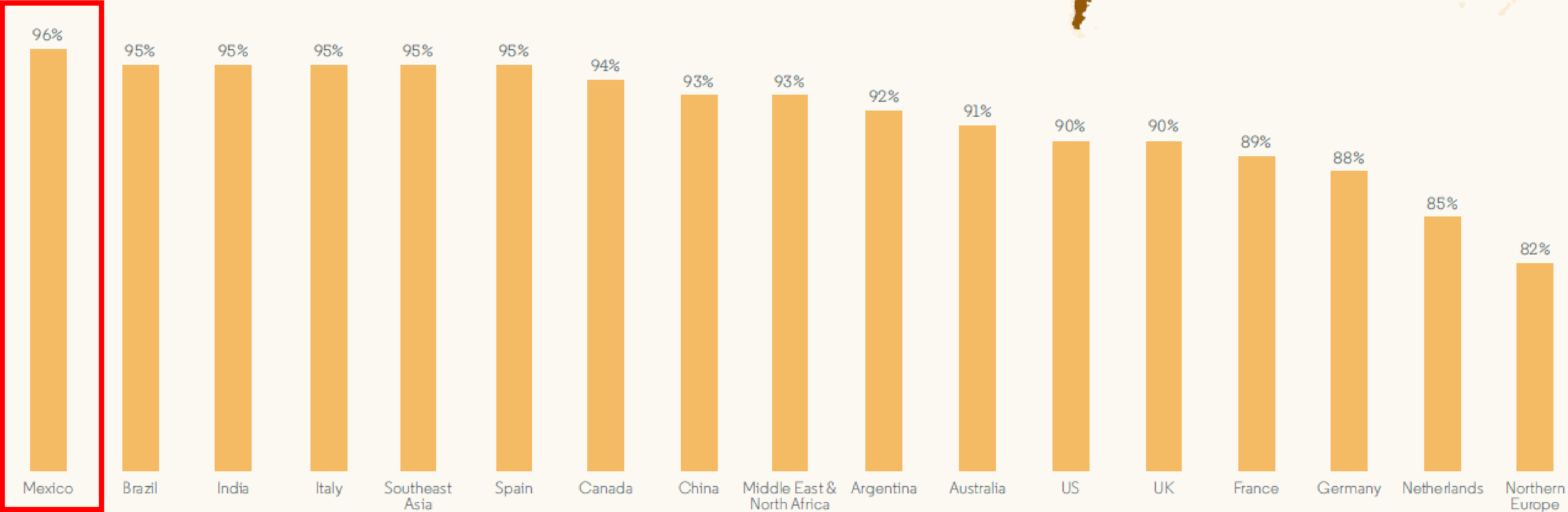
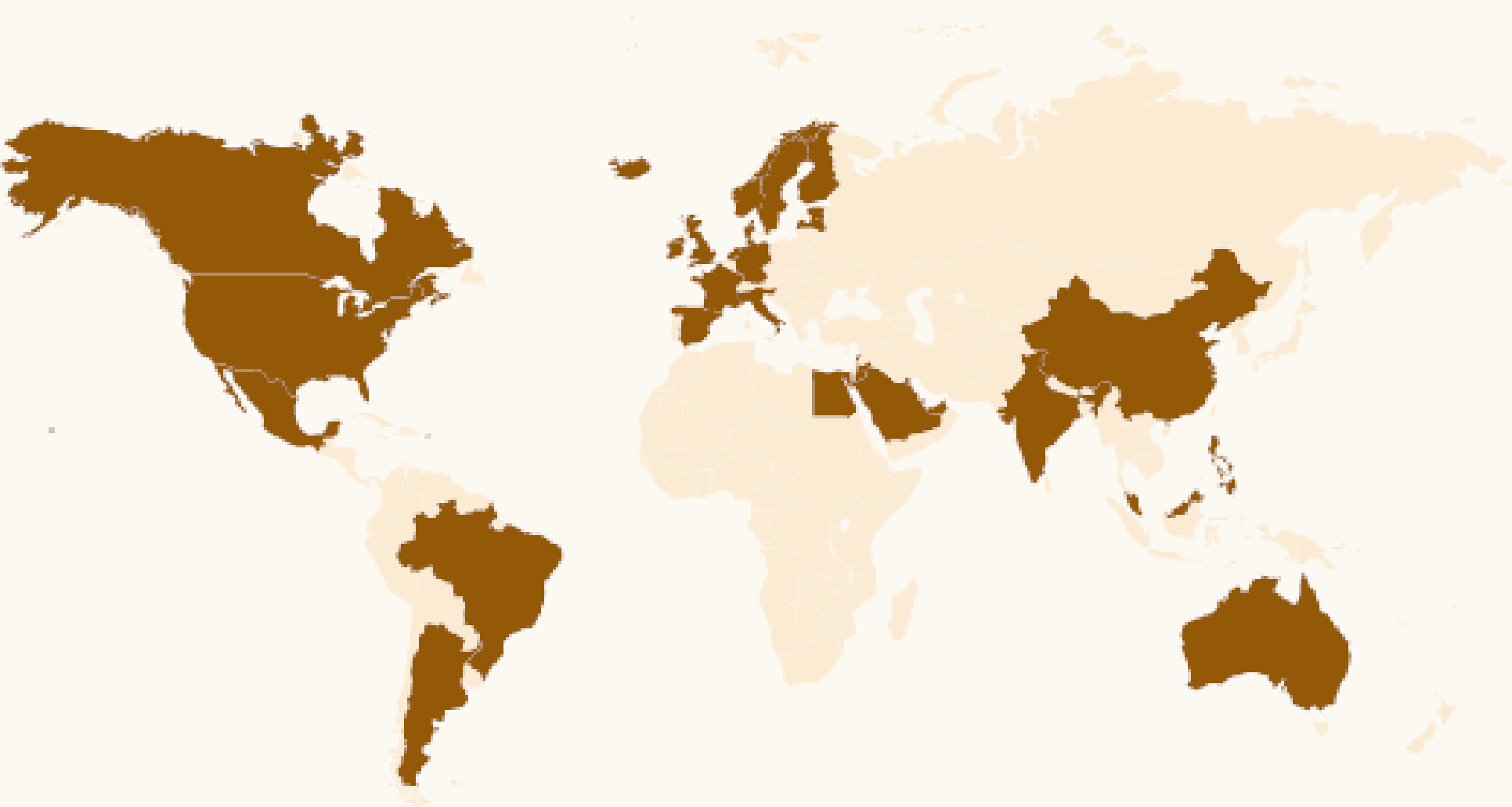
LinkedIn Report: These 4 Ideas Are Shaping the Future of HR and Hiring

Soft Skills que las
compañías necesitan y que
son difíciles de encontrar.

- 1 Creatividad
- 2 Persuasión
- 3 Colaboración
- 4 Adaptabilidad
- 5 Manejo del tiempo
- 6 Resolución de problemas
- 7 Orientación a Objetivos
- 8 Toma de decisiones



IMPORTANCIA DE SOFT SKILLS EN EL MUNDO



¿QUÉ HACEN OTROS PAÍSES?

Modules unique to NUS MSc in I4.0

42 modules ranging from 2-4 MCs each

40 Modular Credits (MCs)

4 Core Modules (16 MCs)

1. Introduction to Industry 4.0 and Applications
2. Data Analytics for Sense-making
3. Digital Physical Integration in Industry 4.0
4. Digital Infrastructure and Transformation Systems

**MSc in
Industry 4.0**

9 Graduate Certificate Courses

(Select one GC + a few other elective modules to make up 20 MCs)

1. Additive Manufacturing
2. Data Mining and Interpretation
3. Deep Learning for Industry
4. Digital Business
5. Digital Supply Chain
6. Internet of Things
7. Principles and Practice of Secure Systems
8. Quality Assurance and Yield Optimization
9. Robotics and Automation

Final Core Module (4 MCs)

Industry Consulting and Application Project



¿QUÉ HACEN OTROS PAÍSES?

What's New^{new!} in Engineering Education at NUS?

To ensure you are ready for the jobs of tomorrow, we have introduced exciting **new modules** for all engineering undergraduates:

- **Systems-Thinking and Dynamics:** understand systems thinking and apply systems dynamics modelling to describe and simulate real world problems and recommend solutions for different scenarios
 - **Design and Prototyping:** develop skills in eliciting user needs, ideating solutions, and get hands-on in making prototypes
 - **Machine Learning:** find out how machines learn and the supporting mathematical tools
 - **Python Computing:** learn to code in the next-generation programming language
 - **Materials:** understand the main classes of engineering materials available and how to select them
-
- **Internet of Things:** learn how sensors and devices work and communicate with one another across wireless networks *(Available if you are applying to Computer Engineering or Electrical Engineering)*
 - **Robotics:** learn how robots move and are controlled, and how they interact with their surroundings and humans *(Available if you are applying to Biomedical Engineering, Computer Engineering, Electrical Engineering or Mechanical Engineering)*
 - **Digitalisation in Urban Infrastructure:** learn how virtual systems and data analytics enhance safety and improve urban planning and design *(Available if you are applying to Civil Engineering or Environmental Engineering)*

¿QUÉ HACEN OTROS PAÍSES?

INNOVATION HUB TEC-CHINA

HOME HUB ▾ CALL NEWS



Tecnológico
de Monterrey



CALL APPLY

“This is the first operation focused on research outside Mexico in 75 years.”
Salvador Alva, President of Tecnológico de Monterrey.

¿QUÉ HACEN OTROS PAÍSES?

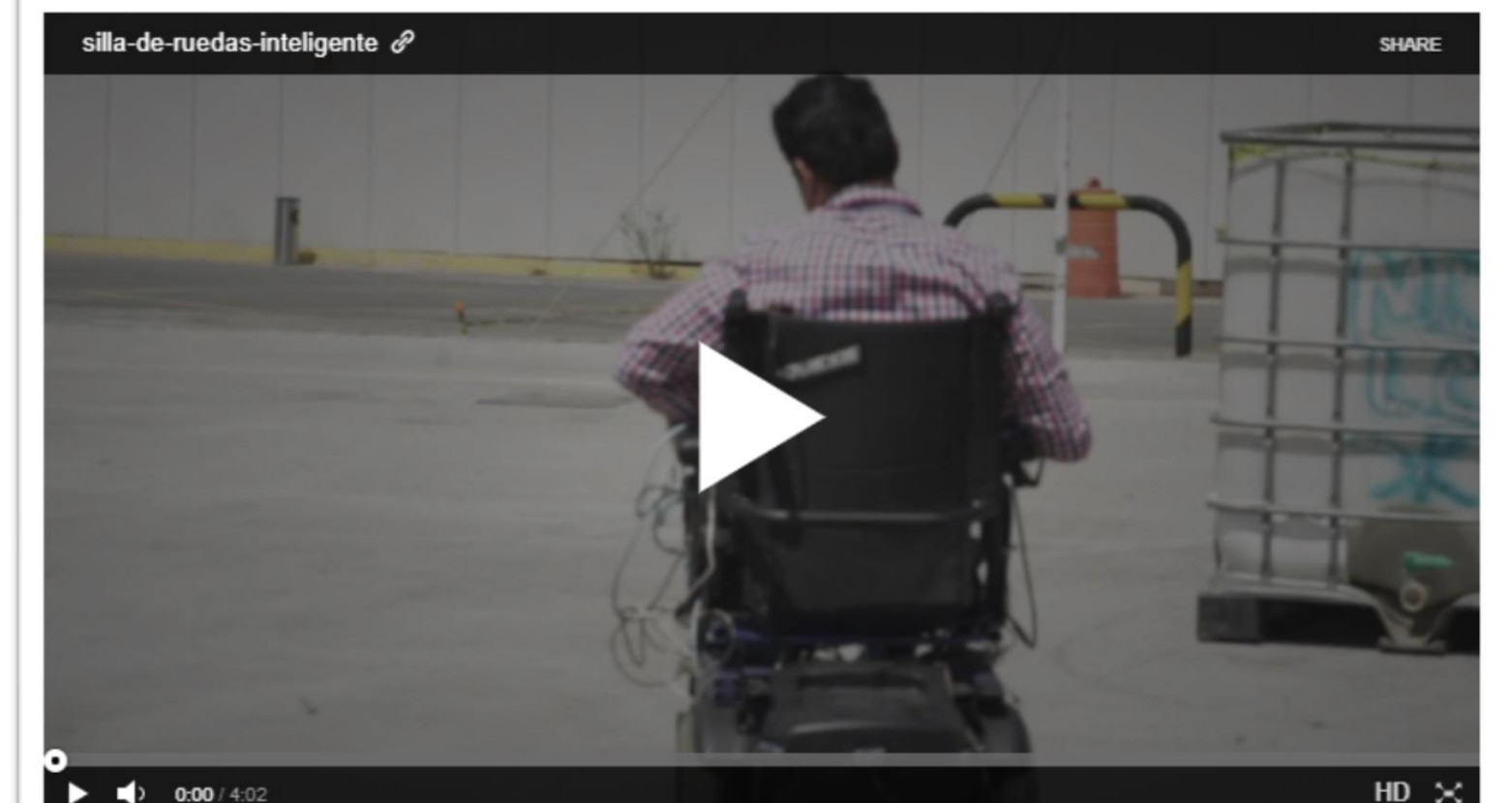
Exoskeletons Alice & Aknee



Global Nano Additives



Intelligent Wheelchair System



<https://ihubtc.com/projects/>

RETOS

- 1 Poco conocimiento de la i4.0 y su aplicación entre compañías.
- 2 Infraestructura tecnológica insuficiente y deficiente.
- 3 Acceso limitado a capital y crédito para PyMEs.
- 4 Mercado Interno no desarrollado.
- 5 Ambiente innovador deficiente
- 6 Dilema Hombre VS Máquina
- 7 Desalineación entre sector educativo e industria.
- 8 Falta de estrategia nacional a largo plazo.



We cannot wait until
there are massive
dislocations in our
society to prepare
for the Fourth
Industrial Revolution

Robert J. Shiller
Yale University

*The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred
Nobel 2013*



A photograph of a car body on an assembly line. The car is positioned in the center, with its front end facing the viewer. It is surrounded by yellow robotic arms and other industrial equipment. In the foreground, a worker is seated on the left, working on the car's front end. Another worker is visible on the right, also working on the car. The background shows more of the factory floor, with various machines and components. The overall scene is a busy automotive manufacturing environment.

Q & A