



Industria 4.0 e Smart Manufacturing: Vino vecchio in botti nuove o c'è di più?

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POLITECNICO
MILANO 1863

LARGEST AND OLDEST
TECHNICAL UNIVERSITY
IN ITALY, FOUNDED IN

1863

**Engineering,
Architecture
and Design**

1,400

PROFESSORS AND
LECTURERS

40,000

STUDENTS



12

DEPARTMENTS

2

MAIN CAMPUSES
IN MILAN

5

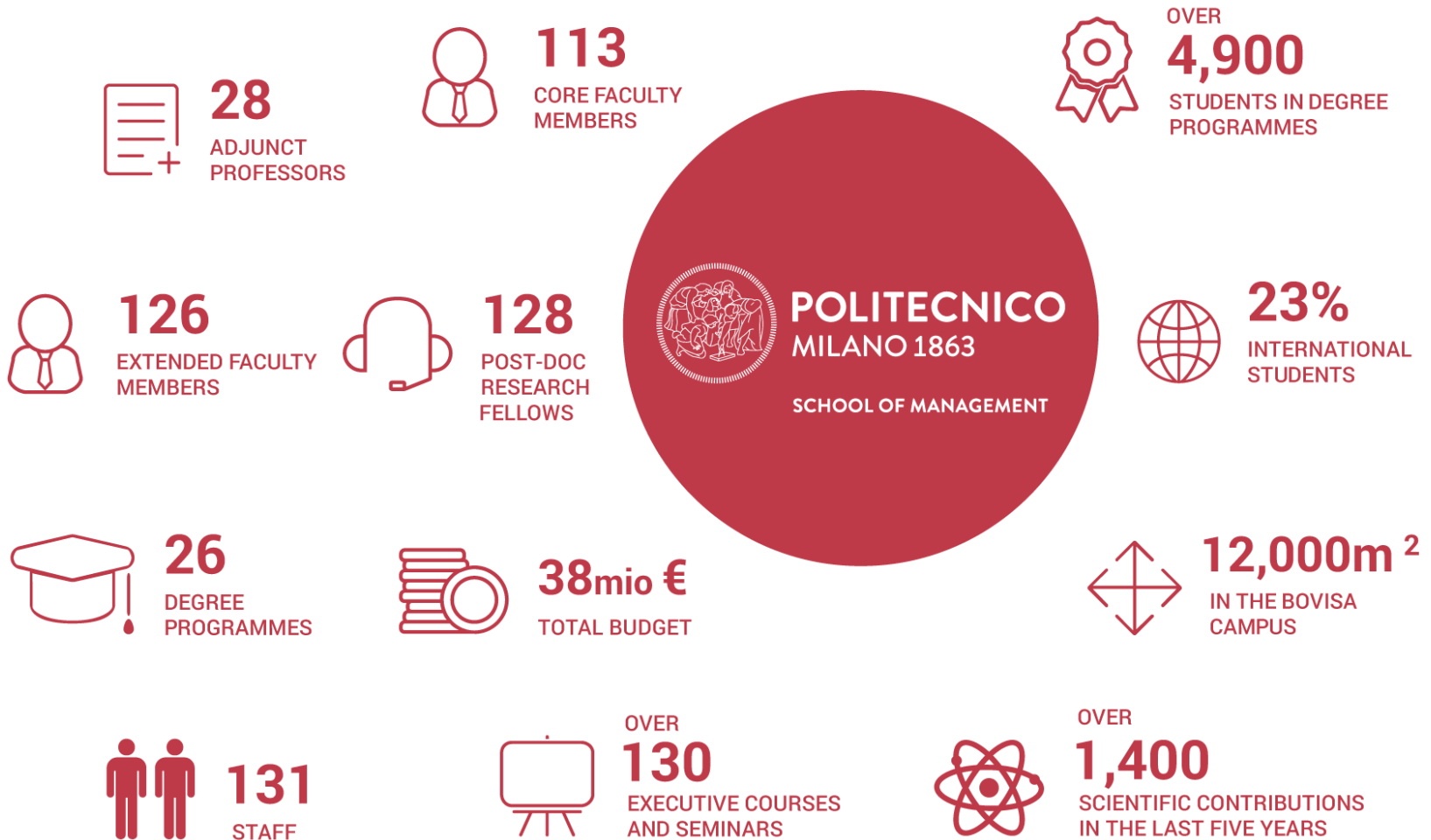
CAMPUSES IN
NORTHERN ITALY

**1 in China
and 1 in India**

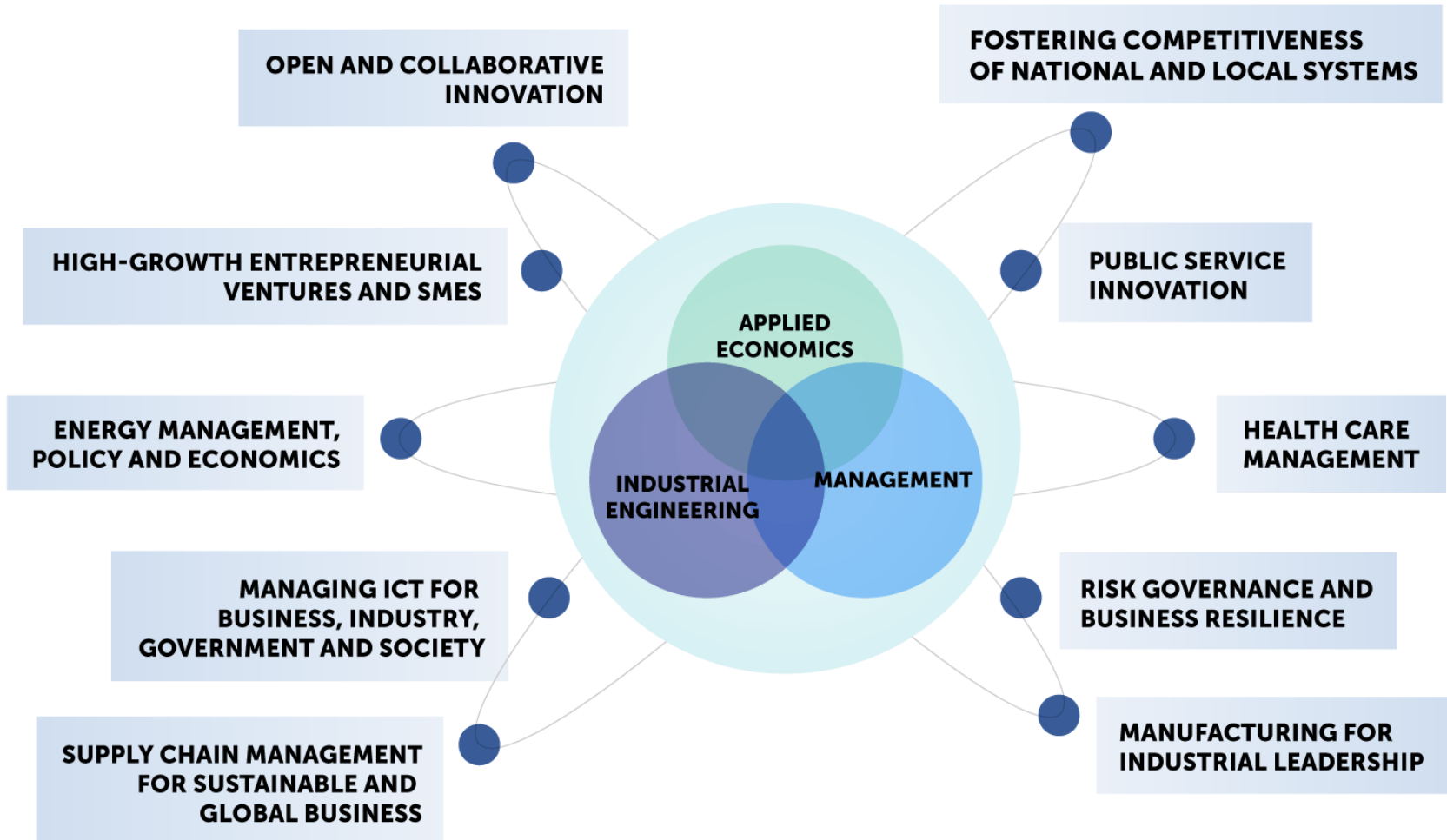
RANKED **no. 1** nationwide,
no. 24 worldwide

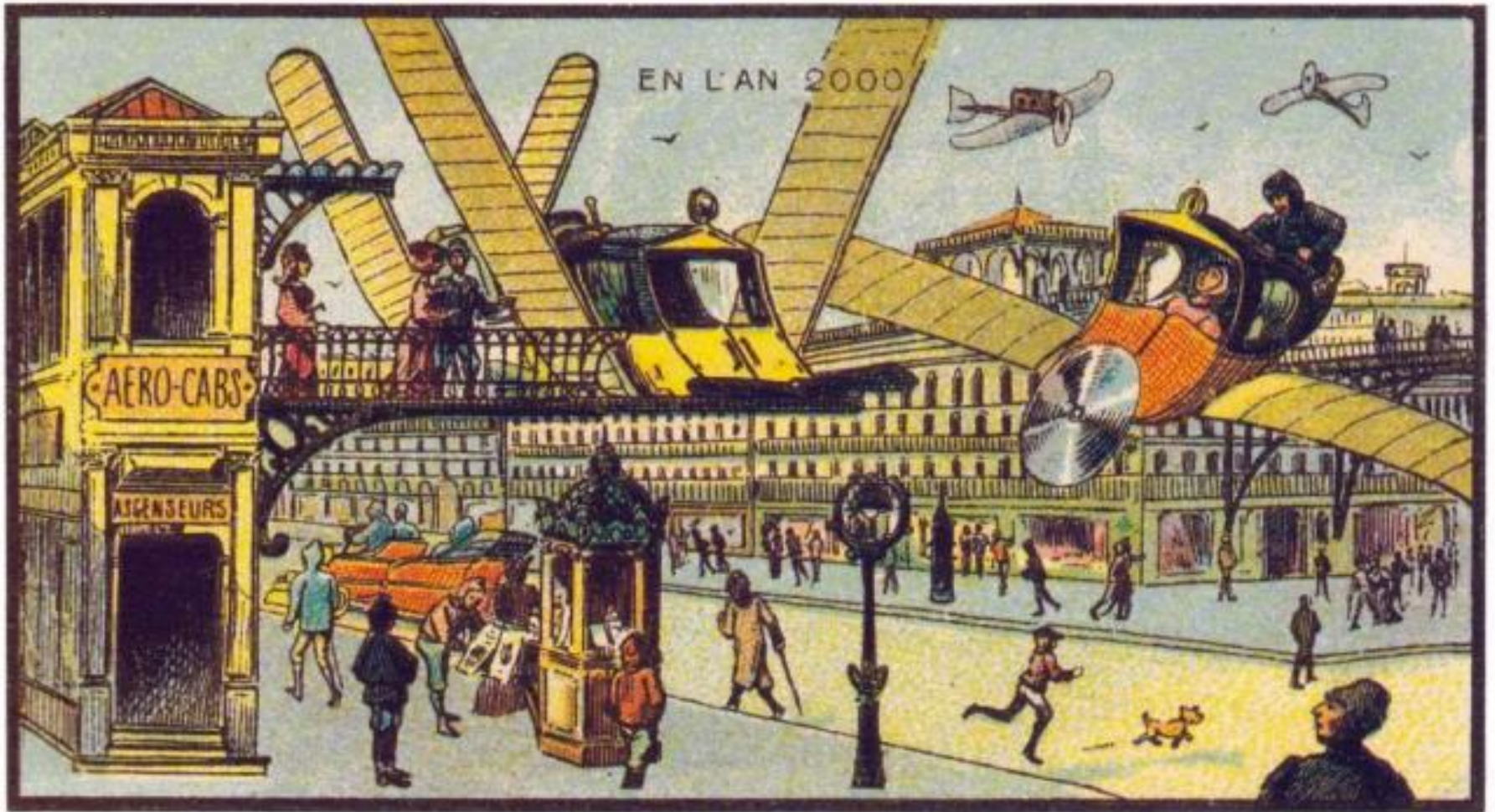
(QS WORLD UNIVERSITY RANKINGS 2015)

School of Management



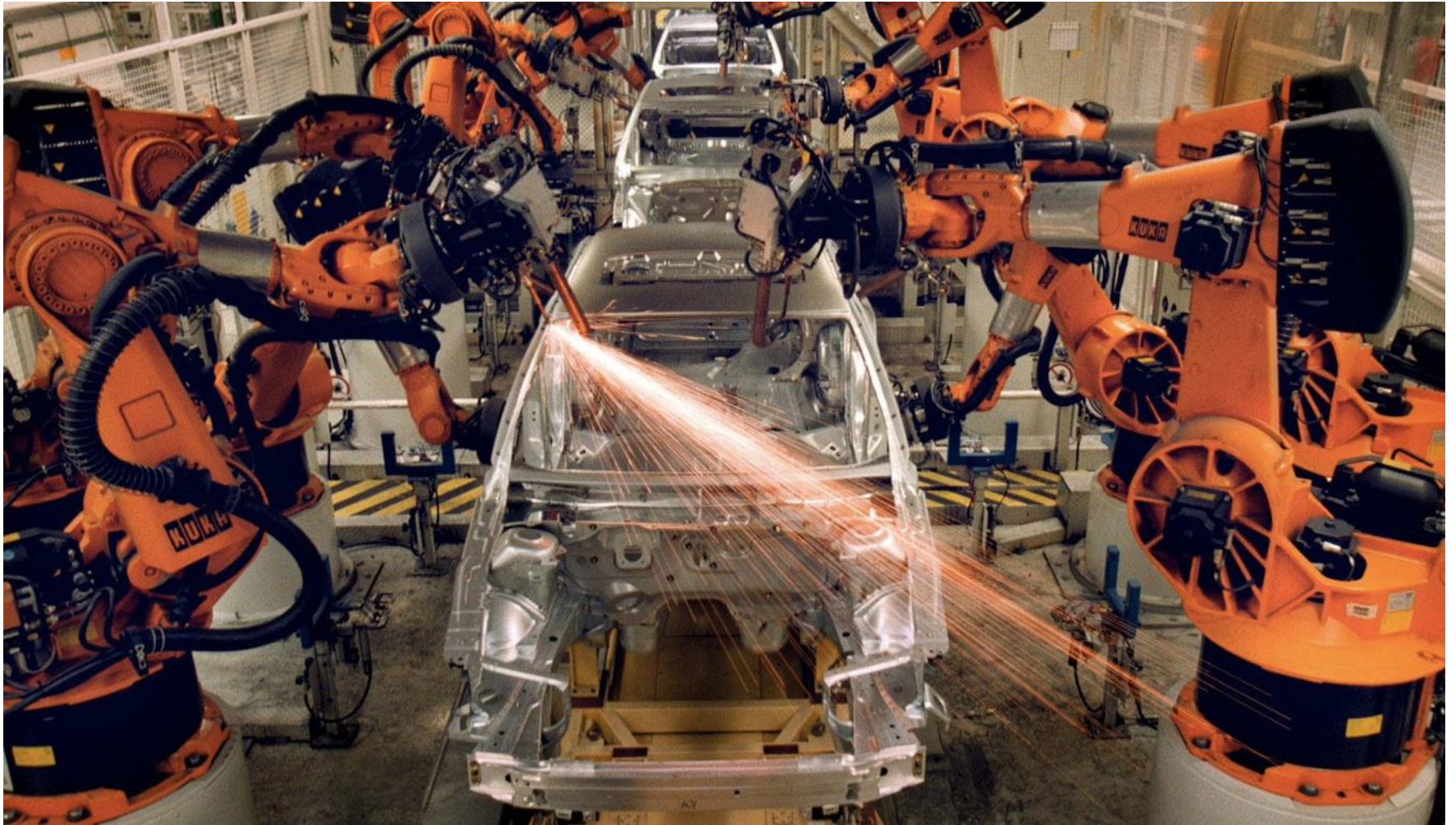
School of Management

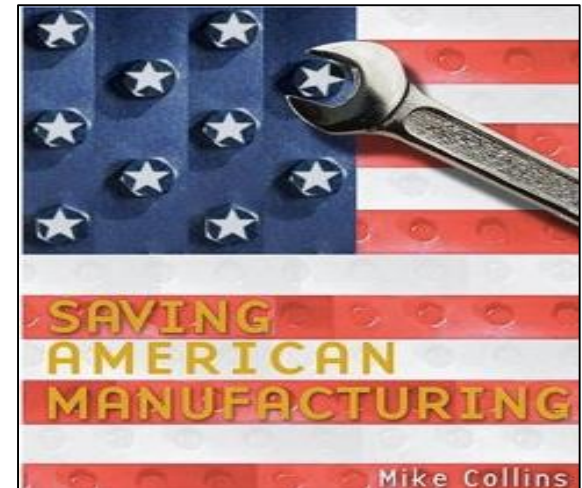
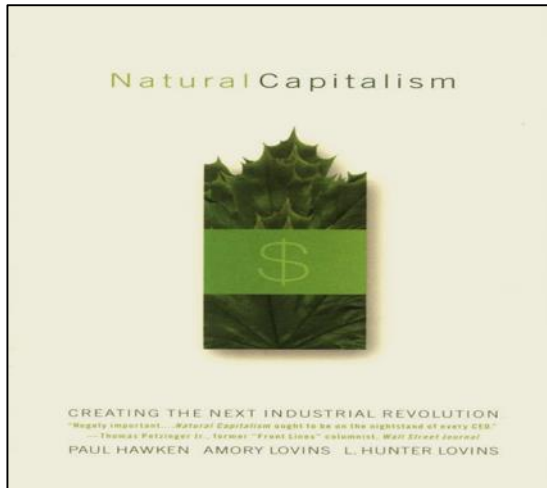


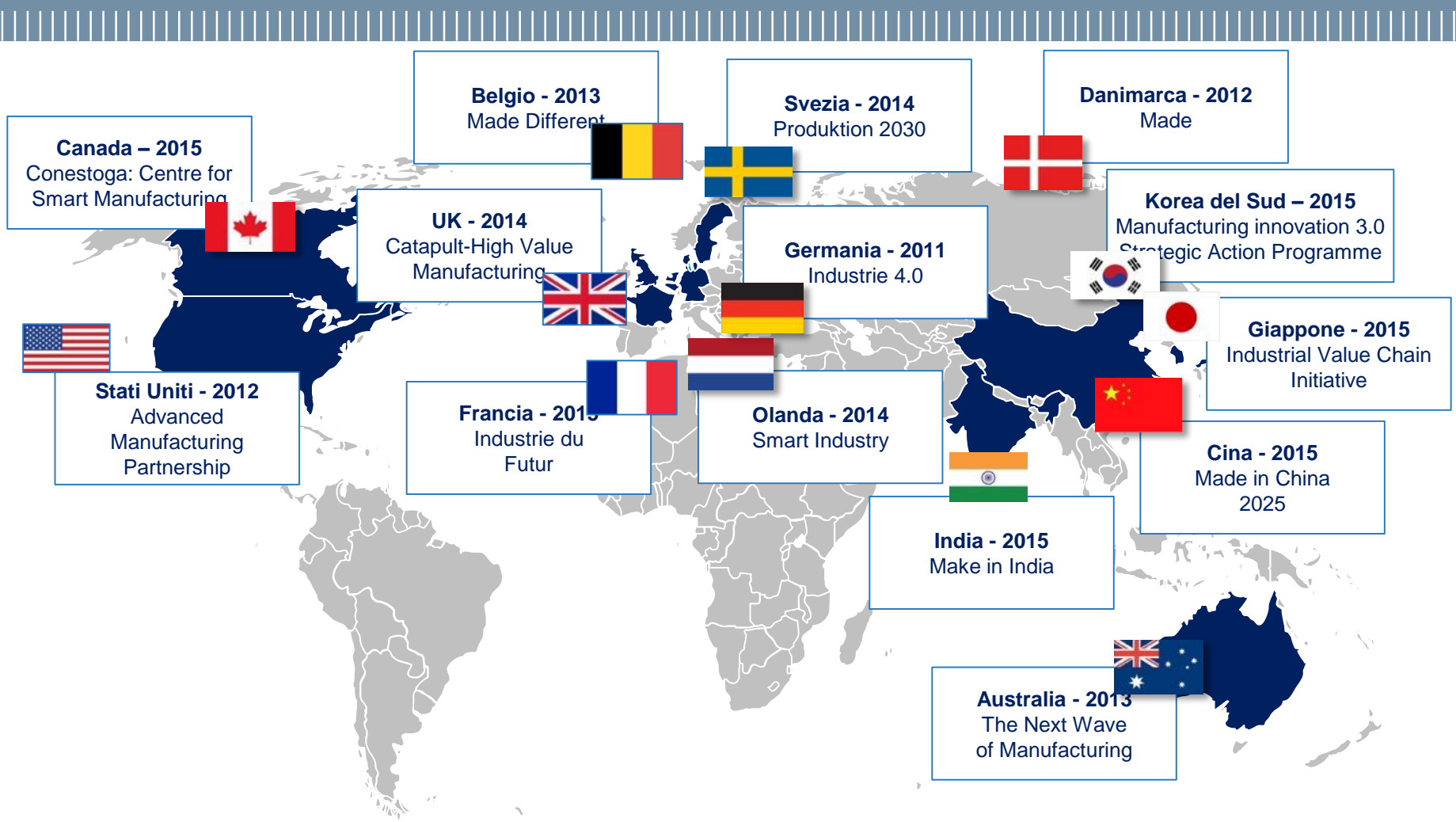


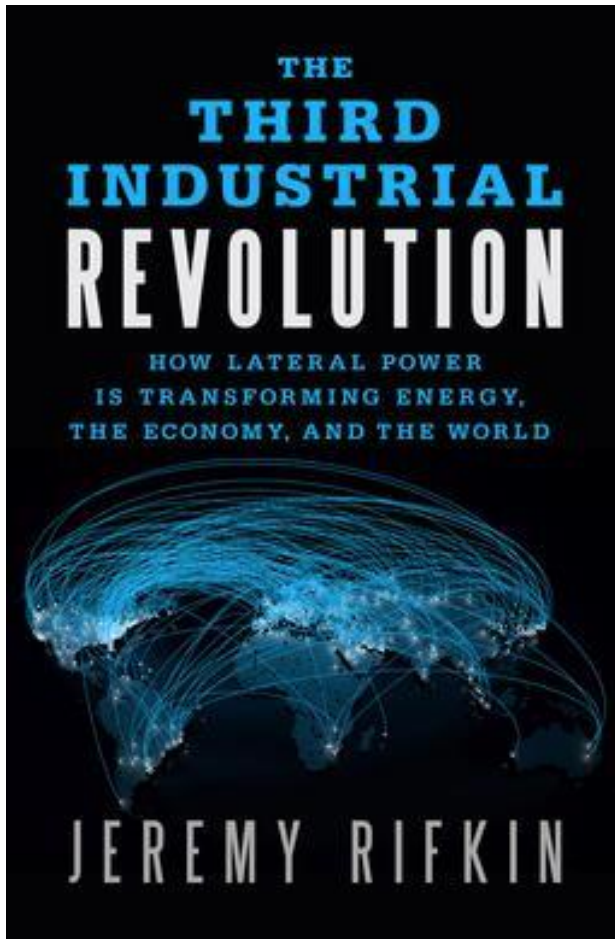






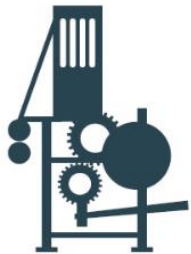






Prima Rivoluzione Industriale

- Introduzione di strumenti meccanici di produzione



1780

Primo telaio a vapore

Seconda Rivoluzione Industriale

- Organizzazione del lavoro e produzione di massa grazie all'utilizzo dell'energia elettrica

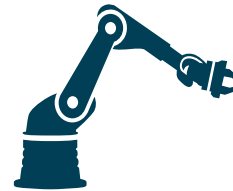


1870

Prima catena di montaggio (1870)

Terza Rivoluzione Industriale

- Produzione ulteriormente automatizzata grazie all'utilizzo in fabbrica di sistemi IT ed elettronici



1970

Primo PLC (1969)

Quarta Rivoluzione Industriale

- Prodotti e processi interconnessi grazie all'utilizzo in fabbrica dell'Internet delle Cose e delle nuove tecnologie digitali



oggi

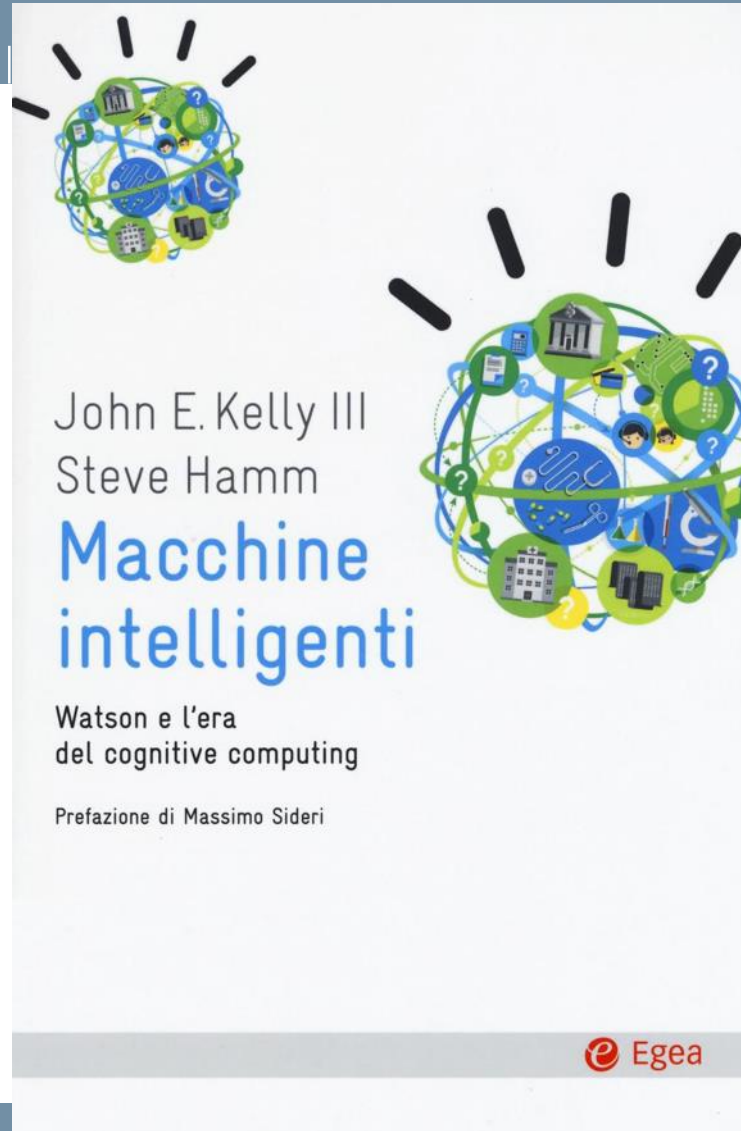
TEMPO

*L'espressione **Industria 4.0** esprime una **visione del futuro** secondo cui le **imprese industriali e manifatturiere**, grazie alle **tecnologie digitali**, **aumenteranno la propria competitività** grazie alla **maggiore interconnessione delle proprie risorse** (impianti, persone, informazioni), siano interne alla Fabbrica sia distribuite lungo la catena del valore*

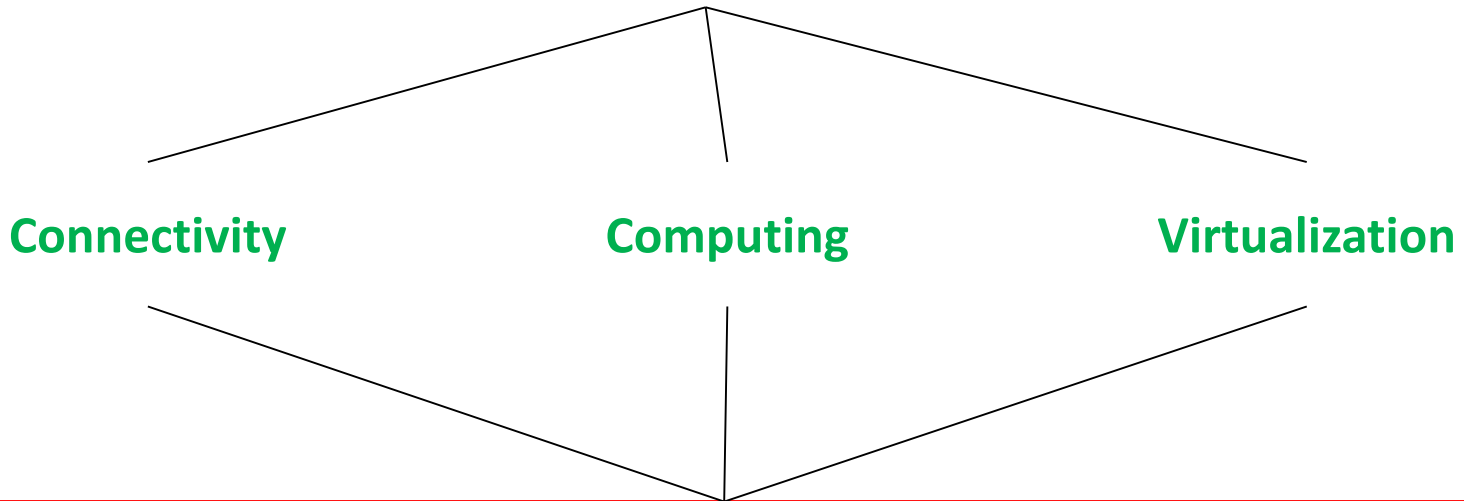
[Politecnico di Milano, 2015]







IT (r-)evolution



Internet of Things

*High Performance
Computing*

*Virtual & Augmented
Reality*

Cloud

Big Data

*Human Machine
Interaction & Interface*



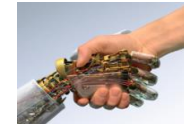
**Industrial
Internet of Things**



**Advanced
Human-Machine
Interface**



**Industrial
Analytics**



**Advanced
Automation**



**Cloud
Manufacturing**



**Additive
Manufacturing**



- CAD/CAM
- Computer Aided Engineering (CFD, FEM)
- Product Data Management
- Product Lifecycle Management

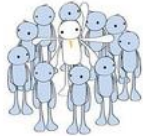
- Warehouse Management System
- Manufacturing Execution System
- Advanced Planning Systems
- Computerized Maintenance Management Systems
- Governance Risk and Compliance

'The Tipping Point' by Malcolm Gladwell

POWER OF CONTEXT

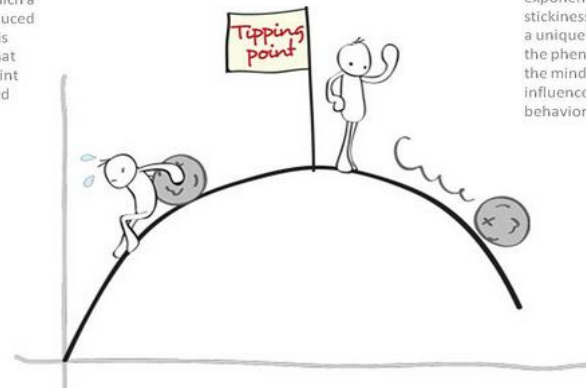
LAW OF 150

Groups of less than 150 members usually display a level of intimacy, interdependency, and efficiency that begins to dissipate markedly as soon as the group's size increases over 150.



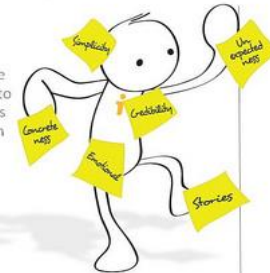
Environment

If the environment or historical moment in which a trend is introduced is not right, it is not as likely that the tipping point will be attained



STICKYNESS FACTOR

A crucial factor that plays a key role in determining whether a trend will attain exponential popularity is "the stickiness factor." This refers to a unique quality that compels the phenomenon to "stick" in the minds of the public and influence their future behavior.



LAW OF THE FEW

The attainment of the tipping point that transforms a phenomenon into an influential trend usually requires the intervention of a number of influential types of people.



CONNECTOR

Connects people to each other



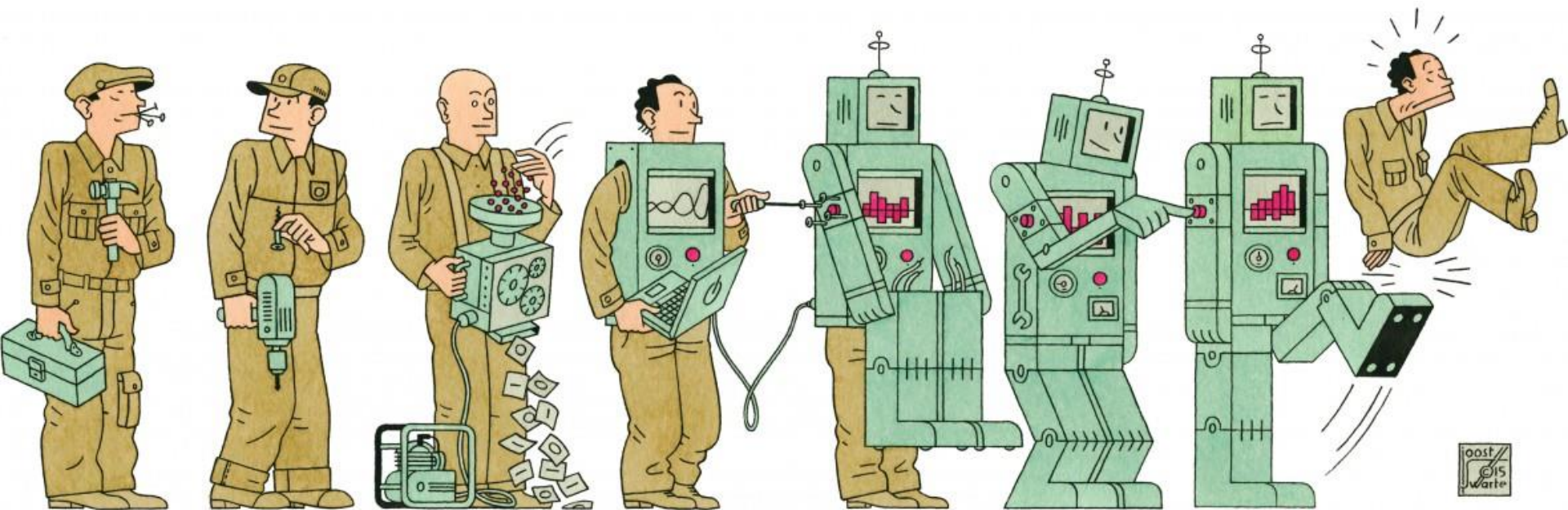
MAVEN

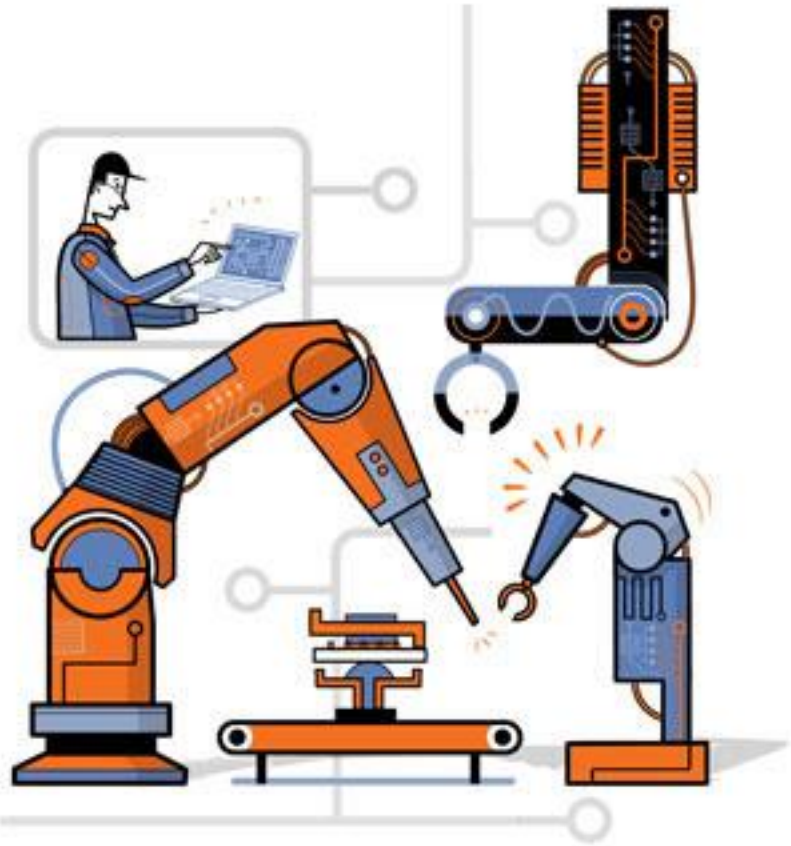
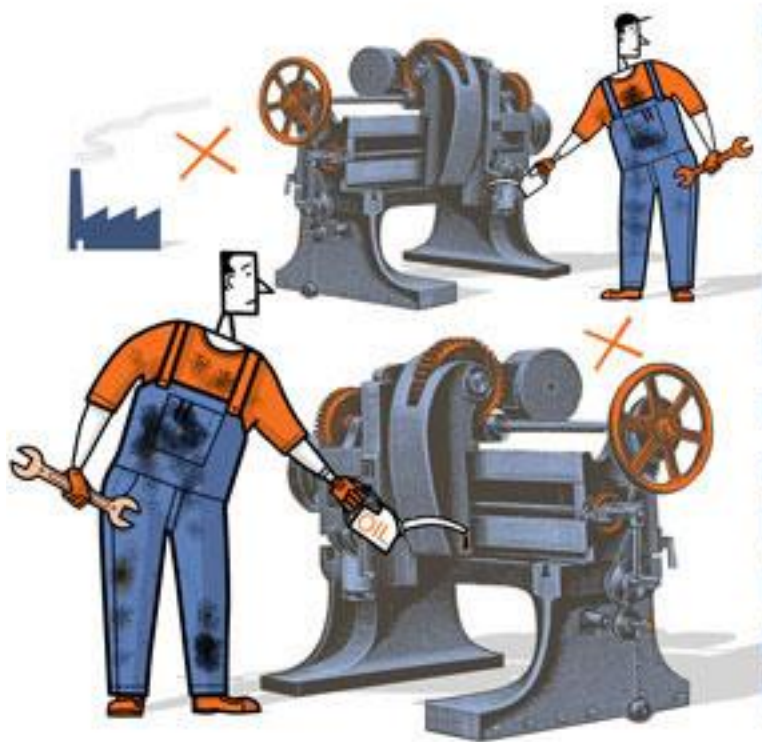
Help others to make informed decisions



SALESMAN

Is extremely persuasive in inducing others' buying decisions and behaviors through his unusual charisma







**KEEP
CALM
AND
design your
INDUSTRY 4.0**