

# INDUSTRIALIZAÇÃO E SISTEMAS AVANÇADOS DE FABRICO

## WORKSHOP CCDR-N

José Carlos Caldeira  
[jose.caldeira@inesctec.pt](mailto:jose.caldeira@inesctec.pt)

from knowledge  
generation to  
science-based  
innovation





# Principais Tendências

## **SUSTAINABLE**

**Produtos e Processos “Limpos”  
Eficiência Utilização de Recursos  
Economia Circular**

## **GLOBAL & NETWORKED + RESILIENT**

**Mercados / Consumidores  
Fornecedores / Parceiros  
Distribuído**

## **HUMAN CENTERED**

**Customização de Produtos  
Processos Inteligentes e Apoiados**

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## DIGITAL

# Impacto da Pandemia

- **“Remotização” (mas não necessariamente robotização) das atividades, mesmo as “físicas”!:** Preparar as organizações para minimizar impactos no futuro
- **Implementação de plataformas de comércio/negócio eletrônico:** forma de acesso direto aos mercados / clientes / consumidores
- **Redução do risco das cadeias de fornecimento:** redundância e proximidade
- **Flexibilização do desenvolvimento e da produção, mesmo para produtos diferentes/alternativos:** pensar em competências, para além de produtos/serviços

# A Visão MANUFUTURE 2030

- Customer-centric value creation networks
- Leapfrog productivity gains through technology intelligence
- “HUMANufacturing” as a new era of automation
- “Simplicity” – Making complex manufacturing systems simple
- Responsible value creation in a circular economy
- New partnerships for new manufacturing skills
- Manufacturing as networked and dynamic sociotechnical system
- **Sovereignty**



# A Visão MANUFUTURE 2030: SRIA

## 10 domínios de IDI

ENABLING TECHNOLOGIES AND APPROACHES	MANUFACTURING STRATEGIES
1. Manufacturing technology and processes	6. Customer-driven manufacturing
2. Digital transformation	7. Human-centred manufacturing
3. Robotics and flexible automation	8. Agile manufacturing systems design and management
4. Nanotechnology and new materials	9. Circular economy, resource and energy efficiency
5. Biological transformation of products, processes and value creation	10. New business models and logistics networks

Cada domínio gera uma média de 10 sub-domínios

Os sub-domínios cobrem temas de investigação fundamental, aplicada e demonstração e linhas piloto

Os temas são multi-setoriais (horizontais), embora tenham sido considerados algumas aplicações específicas.

# “Made In Europe” EU PPP: Roadmap

## Made in Europe General Objectives

Ensuring European Leadership & manufacturing excellence; generating new products and new markets

Achieving Circular and climate-neutral manufacturing

Mastering the digital transformation of manufacturing industry

Creating attractive value-added manufacturing jobs

## Made in Europe Specific Objectives

- Excellent, responsive and smart factories & supply chains
- Circular products & Climate-neutral manufacturing
- New integrated business, product-service and production approaches; new use models
- Human-centered and human-driven manufacturing innovation

## Operational/R&I Objectives

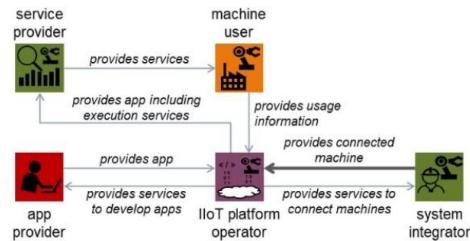
1. Zero-defect and zero-downtime high precision manufacturing, including predictive quality & non-destructive inspection methods
  2. Manufacturing for miniaturisation and functional integration
  3. Scalable, reconfigurable & flexible first-time right manufacturing
  4. Artificial intelligence for productive, excellent, robust and agile manufacturing chains - Predictive manufacturing capabilities & logistics of the future
  5. Advanced manufacturing processes for smart and complex products
  6. Data highways and data spaces in support of smart factories in dynamic value networks
- 
1. Ultra-efficient, low energy and carbon-neutral manufacturing
  2. De-manufacturing, re-manufacturing and recycling technologies for circular economy
  3. Manufacturing with new and substitute materials
  4. Virtual end-to-end life-cycle engineering and manufacturing from product to production lines, factories, and networks
  5. Digital platforms and data management for circular product and production-systems life-cycles
- 
1. Collaborative product-service engineering for customer driven manufacturing value networks
  2. Manufacturing processes and approaches near to customers or consumers
  3. Transparency, trust and data integrity along the product and manufacturing life-cycle
  4. Secure communication and IP management for smart factories in dynamic value networks
- 
1. Digital platforms and engineering tools supporting creativity and productivity of manufacturing development
  2. Improving human device interaction using augmented and virtual reality and digital twins.
  3. Human & technology complementarity and excellence in manufacturing
  4. Manufacturing Innovation and change management
  5. Technology validation and migration paths towards industrial deployment of advanced manufacturing technologies by SMEs

# Economia das Plataformas

## Identified Pattern of Digital B2B Platforms Overview

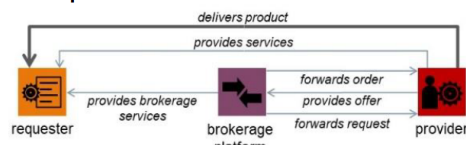
### IloT platform

connectivity of devices, machines and plants as basis for data-based services



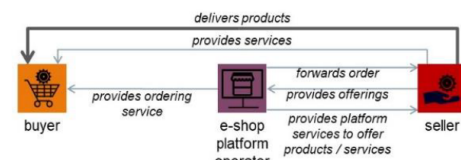
### brokerage platform

brokerage of negotiable offerings between requester and provider



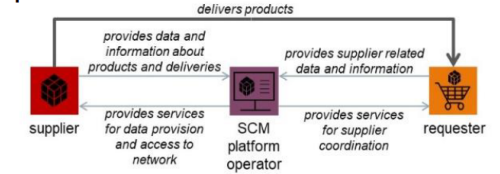
### e-shop

enables direct buying and selling of products and services



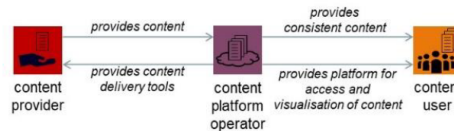
### SCM platform

enables cross-company coordination of delivery processes



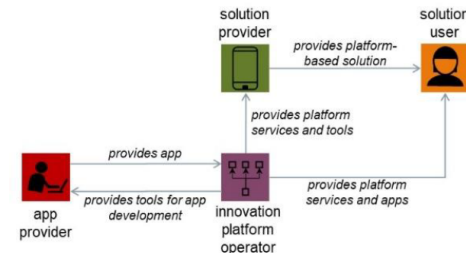
### content platform

provides uniformly prepared information for large number of content users



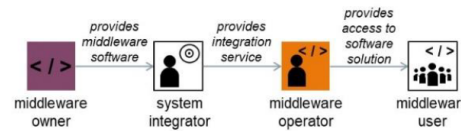
### innovation platform

technical basis for the development of complementary products or services



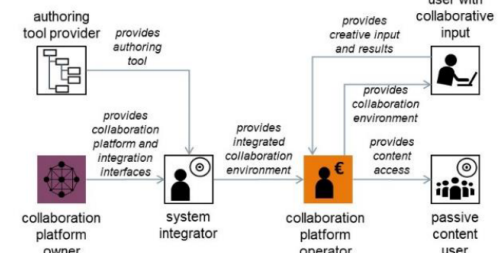
### data exchange platform

provision of a middleware for information exchange between different entities



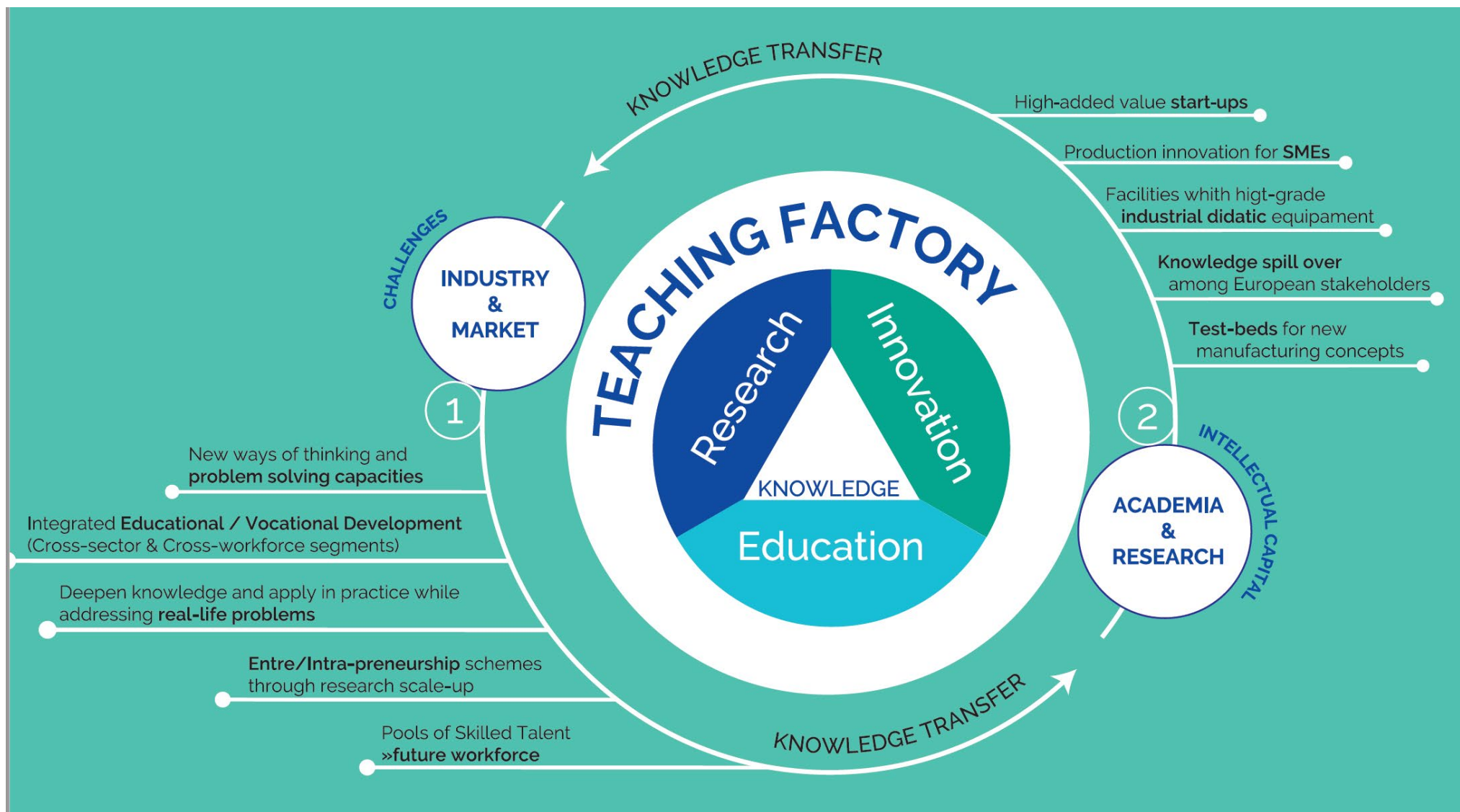
### collaboration platform

provision of a common data model for interdisciplinary cooperation





# O Desafio da Educação e Formação





# Principais Mensagens

## (R)Evolução tecnológica

Acompanhar/monitorizar a evolução e estar atento às mudanças radicais **induzidas** pela tecnologia (ultrapassagens pela direita). É possível fazer isso na mesma empresa?

## O desafio (enorme) dos recursos humanos

O Estado não chega – as empresas vão ter que dinamizar e assumir uma parte deste esforço. Academias empresariais?

## A “ditadura” da sustentabilidade

O novo “departamento”

## Incertezas e alterações na envolvente

Flexibilidade. E as pessoas vão reganhar importância

## E como se consegue fazer isto nas PMEs?

Cooperação: centros tecnológicos; clusters; associações empresariais; grupos de empresas; etc.



# Principais Desafios

## Operações integradas

Combinar, na mesma operação, projetos de I&D, com demonstração, com formação avançada de RH, com formação, com apoio à contratação de RH altamente qualificados, etc.

## Tirar partido da transversalidade das tecnologias horizontais

Promover a disseminação intersectorial e a fertilização cruzada

## Conjugar setores tradicionais e emergentes

Capitalizar o contexto regional e promover sinergias entre estes dois tipos de setores

## Internacionalização, também na componente de Conhecimento

Dinamizar a participação ativa nas iniciativas e nos programas europeus

## Discriminar positivamente a cooperação

A cooperação é crítica mas é necessário apoiá-la de forma adequada!

Rua Dr. Roberto Frias  
4200-465 Porto  
Portugal

T +351 222 094 000  
[info@inesctec.pt](mailto:info@inesctec.pt)  
[www.inesctec.pt](http://www.inesctec.pt)

