CRUI
Conferenza dei Rettori
delle Università Italiane

Collaborative platforms for supporting innovation in the regional economy: the Italian experience and the role of universities

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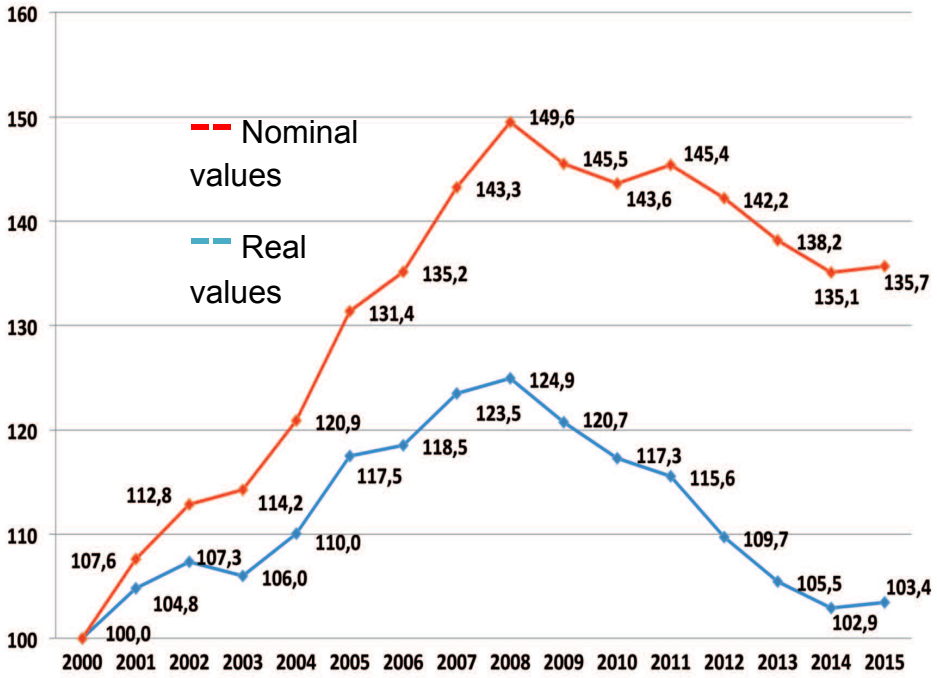
UNIVERSITÀ
POLITECNICA
DELLE MARCHE

The Italian university system

Funds allocated to universities in



Source: MIUR

2017/2018

- 91 universities (61 state-owned)
  - 12 big (more than 40,000 students), 29 medium-sized (15,000-40,000), 50 small (less than 15,000 students).
- 53,801 professors and researchers (-15% from 2008)
- 1.7 million students
- In 2015 state universities received 12.3 billion Euros (-17.2% in real terms than in 2008)

Despite declining public resources, the Italian university system shows a good performance on research and education

	Relative to EU – 2017 %
International scientific co-publications	124.3
Most cited publications	98.6

Source: European Innovation Scoreboard 2018

Technology transfer in Italian universities

In the last twenty years Italian universities have dramatically increased their involvement in the third mission.

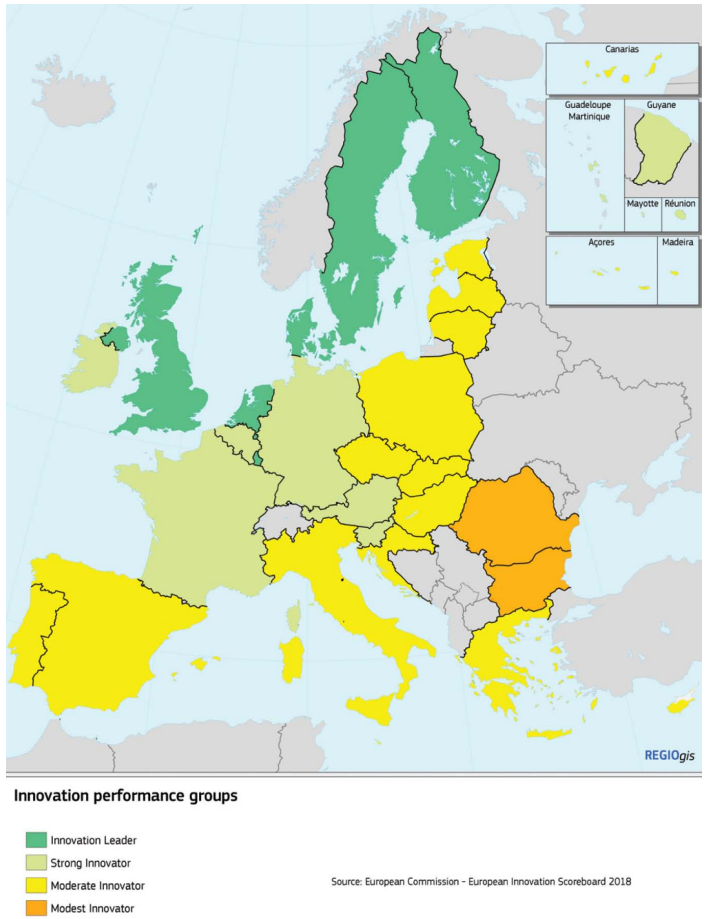
Patents	
- Patents involving academicians	3,013
- Patents owned by universities	1,094
- *revenues per year (millions of Euros)*	*0,5*
Spin-offs	
- active spin-offs (end of 2014)	1,031
- new spin-offs per year (average 2011-2014)	120
- *Sales of spin-offs in 2014 (millions of Euro)*	*165.2*
Third party funding	
- average per year 2011-2014 (millions of Euros)	1,000.1
- *average per university* (millions of Euros)	*16.1*

Third mission indicators have become part of the periodical assessment the university system and influence the allocation of public resources

Universities are aware of the key role they play in their regional innovation ecosystem

Source: ANVUR – 2018 report

The Italian innovation system



Source: European Innovation Scoreboard 2018

- prevalence of SMEs
- importance of low and medium-tech sectors
- low level of R&D investment

A model of «Innovation without research»

	Relative to EU – 2017 %
SMEs introducing product or process innovations	109,3
Business R&D expenditure	63,3
PCT patent applications	61,1
Public-private co-publications	73,7

Source: European Innovation Scoreboard 2018

The S3 in Italy: the institutional context

The Ministry of Economic Development (MISE) set the S3 at national level and has a coordinating role of regional strategies

The S3 at national level indicated 5 specialization areas:

1	Aerospace and defense
2	Digital agenda and smart communities
3	Health, nutrition and quality of life
4	Smart manufacturing, energy and environment
5	Tourism, cultural heritage and creative industries

Regions have large autonomy in the design and implementation of industrial and innovation policy. As a result they not necessarily followed the national indications

National Research Plan – Technology clusters

In 2012 the Ministry of Education, University and Research (MIUR) promoted the creation of **national technological clusters** with the aim of stimulating university-industry interaction

1	Green chemistry
2	Agrifood
3	Ambient assisted living
4	Life science
5	Technology for smart community
6	Transport
7	Aerospace
8	Smart manufacturing

To the eight clusters indicated in 2012, four were later added (2015) based on the actual domains of specialization indicated by regions in their S3

9	Blue growth
10	Design, creativity and made in Italy
11	Energy
12	Cultural heritage

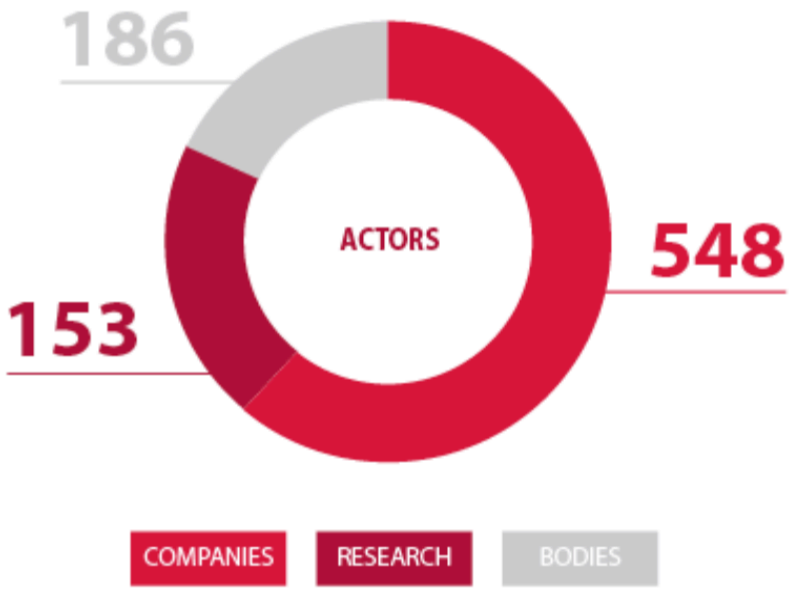
The *Ministry of Education, University and Research* (MIUR), in line with the priorities set by the EU Framework Programme for Research and Innovation *Horizon 2020*, promoted in 2012 the creation and development of *National Technology Clusters*, in order to:

- ***simultaneously mobilize*** the excellences of the ***industrial system***, the ***world of research*** and regional and national ***Public Administrations*** on shared themes identified as priorities and strategic for the Country in the long and medium term;
- promote the ***sharing*** and ***transfer*** of ***knowledge*** and ***skills*** between the different actors of the industrial and research system;
- ***optimize*** the use of public and available ***economic resources***;
- improve the ability to ***attract investment*** and ***talent***, also through internationalization processes;
- promote sustainable ***economic growth*** of the regions and the entire national economic system;
- play an ***important role*** at European and international level in research and innovation;
- enhance ***Made in Italy***

National Research Plan – Technology clusters

CLUSTERS' STRATEGIC AREAS

- AGROFOOD
- AEROSPACE
- GREEN CHEMISTRY
- SUSTAINABLE MANUFACTURING
- SYSTEMS FOR MARINE AND EARTH MOBILITY
- LIFE SCIENCE
- SMART LIVING TECHNOLOGIES
- SMART COMMUNITIES TECHNOLOGIES



887
COMPANIES AND RESEARCH INSTITUTES

30
RESEARCH AND INNOVATION NATIONAL PROJECTS

288.400.000
EUROS

National Research Plan and National S3

		National S3				
		Aerospace and defence	Digital agenda and smart communities	Health, nutrition and quality of life	Smart manufacturing, energy and environment	Tourism, cultural heritage and creative industries
Technology clusters (National Research Plan)	Aerospace	■				
	Agrifood			■		
	Blue growth				■	
	Design & creativity				■	■
	Energy & environment				■	
	Green chemistry				■	
	Smart manufacturing				■	
	Health			■		
	Smart and inclusive communities		■			
	Sustainable mobility		■			
	Technology for e-leaving		■			
	Technology for cultural heritage					■

Distribution of regional S3 specialization

		National S3					
		Aerospace and defence	**Digital agenda and smart communities**	**Health, nutrition and quality of life**	**Smart manufacturing energy and environment**	**Tourism, cultural heritage and creative industries**	**Total**
Technology clusters (National Research Plan)	Aerospace	127	16		13	1	**157**
	Agrifood		7	130	21	13	**171**
	Blue growth	2	10	4	19	4	**39**
	Design & creativity		11		22	29	**62**
	Energy & environment		53	3	131	4	**191**
	Green chemistry			1	30		**31**
	Smart manufacturing	4	15	3	153	12	**187**
	Health		1	224	9		**234**
	Smart and inclusive communities		53	5	4	9	**71**
	Sustainable mobility		69		25		**94**
	Technology for e-leaving		52	3	14	4	**73**
	Technology for cultural heritage	6	21			92	**119**
	Total	**139**	**308**	**373**	**441**	**168**	**1429**

RIS3 and universities in Italy

The EU cohesion policy set 4 priorities:

1. **Strengthening research, technological development and innovation**
2. Enhancing access to and use of ICT
3. Enhancing the competitiveness of SMEs
4. Supporting the shift towards a low-carbon economy

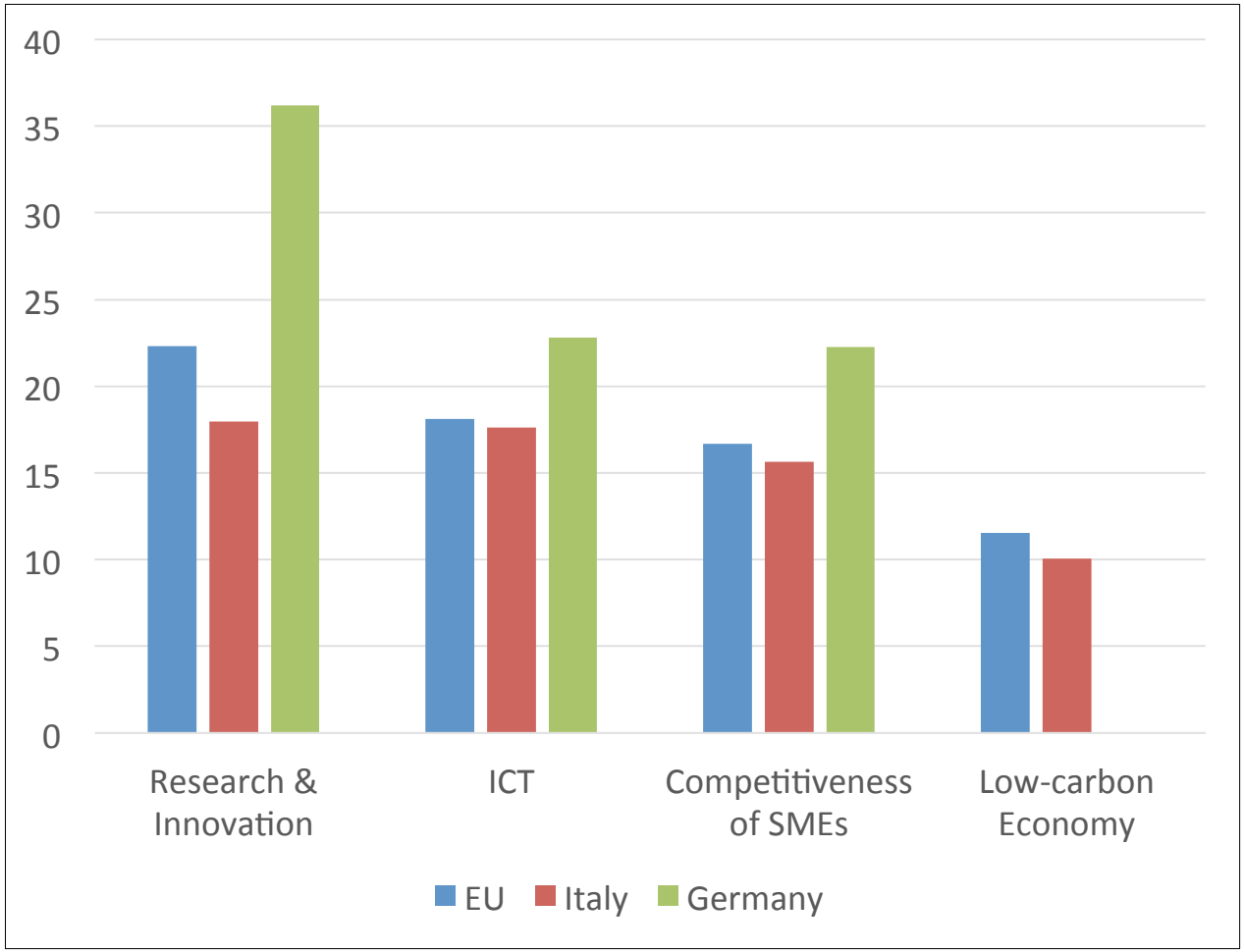
The implementation of RIS3 is a key opportunity for enhancing **university-firms relations** in Italy:

- modifying the '*innovation without research*' model which is prevailing in Italian firms (especially SMEs)
- fostering the increasing commitment of Italian universities in technology transfer
- counterbalance the decrease of state funds to universities

Resources allocated by funds in Italy – 2014-2020

	ESIF						
Themes	**ERDF**	**ESF**	**CF**	**EAFRD**	**EMFF**	**YEI**	**Total**
Research & Innovation	18.0			4.1			9.2
ICT	7.6			2.8			4.2
Competitiveness of SMEs	17.6			41.6	41.5		19.9
Low-carbon Economy	15.6			4.3	2.3		8.2
Climate change	4.7			16.4			6.6
Environment protection	12.1			18.7	39.3		11.1
Network infrastructure	10.1			0.0			4.5
Quality of employment	0.0	37.6		1.6	10.8	100.0	12.3
Social inclusion	5.9	21.7		6.8			9.6
Education & Training	4.4	31.6		1.1			9.6
Technical assistance	3.3	3.5		0.0			2.3
Efficient public administration	0.8	5.6		2.6	6.0		2.4
Total (billions of Euro)	**34.2**	**17.7**	**0.0**	**20.9**	**1.0**	**2.3**	**76.1**

Planned allocation of ESI funds in Italy - 2014-2020



Less concentration of resources in the four main themes

Less resources to research & innovation

Main challenges of RIS3 in Italy

- Much emphasis on innovation rather than research.
- Large disparities in the effective implementation of RIS3 between regions
  - Disparities between regions in the role of universities in the design and implementation of the strategy
- Too many areas of specialization at national and regional level

Positive achievements

- To finalize collaborations between private and public entities
- Emersion of specializations
- Technology clusters

National Competence Centers

Regional Collaborative platforms

National Competence Centers

- **Industry 4.0 National Plan** to support innovative investment and empowerment of skills

setting the framework for attracting private investment in technologies, support to research, development, and innovation and the promotion of investment in venture capital and start-ups.

Universities as Regional Lead Institutions

- **National Competence Centers**: Highly specialized network to provide a service to business innovation in the areas of enabling digital technologies for Industry 4.0.
  73 Milion € engaged, about 8 Milion € for each CC

Italian national Competence Centers

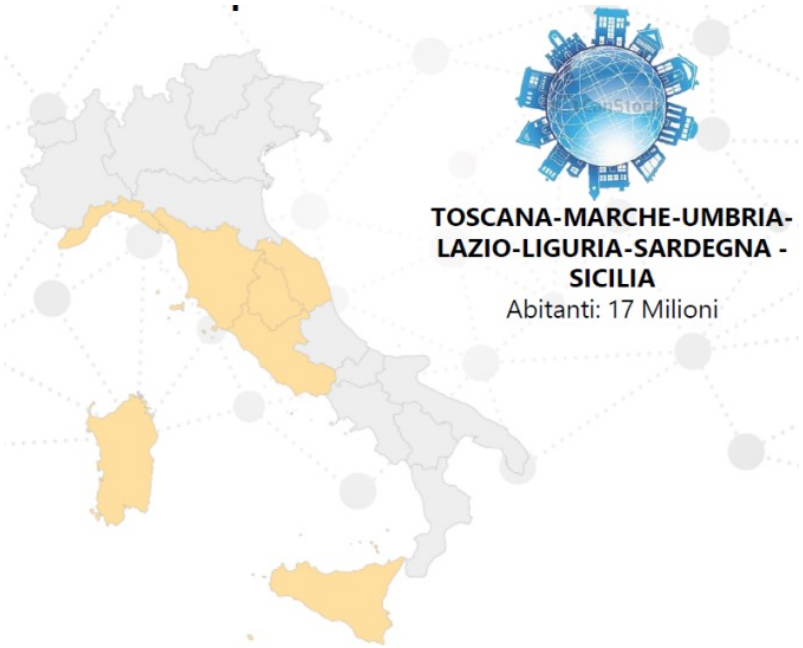
High Specialization **Competence Centers** Industry 4.0

1. Torino - Politecnico di Torino - Manufacturing 4.0
2. Milano - Politecnico di Milano - Made in Italy 4.0
3. Bologna - Università degli Studi di Bologna - BI-REX
4. **Pisa - Scuola Superiore Sant'Anna - ARTES 4.0**
5. Padova - Università degli Studi di Padova - SMACT
6. Napoli - Università Federico II - Industry 4.0
7. Genova - CNR Consiglio Nazionale delle Ricerche – START 4.0
8. Roma - Università La Sapienza- Cyber 4.0

ARTES 4.0 Competence Center

- **Case study: the Competence Center in the middle of Italy**
  ARTES 4.0, a highly specialized network to provide a service to business innovation in the areas of Advanced Robotics and enabling digital technologies for Industry 4.0.

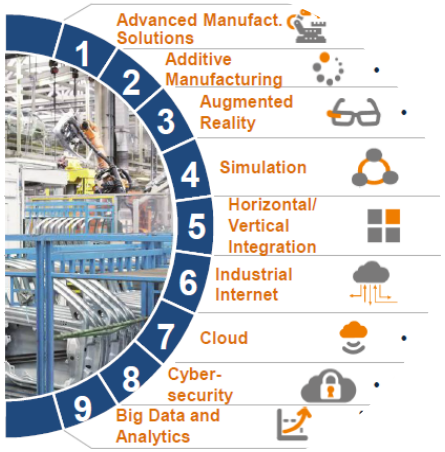
regional areas involved:
7 regions



TOSCANA-MARCHE-UMBRIA-LAZIO-LIGURIA-SARDEGNA - SICILIA
Abitanti: 17 Milioni

ARTES 4.0
Industry 4.0 Competence Center on
Advanced Robotics and enabling digital TEchnologies & Systems 4.0

Inclusive actions for connecting enterprises and institutions; **Universities** are the **main technological regional institutions**



ARTES 4.0
the Competence Center in the middle of Italy

ARTES 4.0 Competence Center

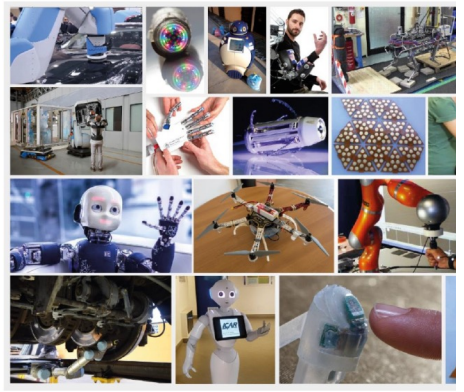
- **the regional spread of the ARTES 4.0 Competence Center in the middle of Italy**

  - Universities are the leader of the high specialized Competence Center network.
  - 5 Nodes leaded by Universities and 11 partners involving universities and research centers

ARTES 4.0 Competence Center

Industry 4.0 Competence Center on
Advanced Robotics and enabling digital TEchnologies & Systems 4.0

- **Università Poltecnica delle Marche** is one of the key Nodes in ARTES 4.0 highly specialized network



IDN
- Innovation Demonstration Node of ARTES 4.0

7 Key enabling technologies:
- Collaborative Robotics, Automation
- Additive & Hybrid manufacturing
- Virtual Protoyping & Data-driven design
- Big Data, IoT, Cybersecurity
- CyberPhysicalSystems & Predictive Maintenance
- Business innovation & intangibles
- Cognitive Automation in construction building

ARTES 4.0
Marche Region CC Node

Regional Collaborative platforms

COLLABORATIVE PLATFORMS

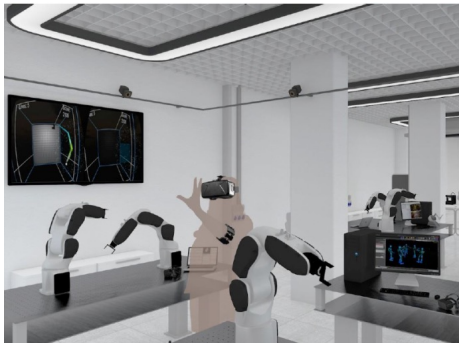
- instruments to support the development of collaborative research, development and innovation in the areas of smart specialization.
- Smart specialization thematic areas:
  - **Industry 4.0**
  - Domotic
  - Health
- Actions performed
  - **i-Labs**
    - technological platform for collaborative research in the area of **Industry 4.0**
    - almost 1000 square meters of Laboratories, tachnological facilities, Open spaces, offices, conference alls

i-Labs

Collaborative platform

Regional Collaborative platform:

i-Labs



- A collaborative laboratory as a partnership of regional Universities, research centers, and enterprises

- Founding action of about 5.2 Milion €
- Research and Innovation action on Smart Specialisation Strategies
- Specialization on Industry 4.0 enabling technologies:

- Collaborative Robotics
- Cyber physical systems and IIoT
- Data Mining and Analytics
- Cybersecurity
- Predictive Maintenance
- Augmented and Virtual Reality

Conclusions

- Many tool to support regional innovations
- Technological Clusters
- Competence Centers
- Regional Collaborative platforms

- Integration and collaboration are required

Thanks for the kind attention!

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