POLITECNICO
DI TORINO

Politecnico di Torino past experiences and future perspectives in Research and Innovation

CRP, Budapest, 14 September 2019

http://www.pianostrategico.polito.it/en/content/download/416/3158/file/The%20Strategic%20Plan.pdf

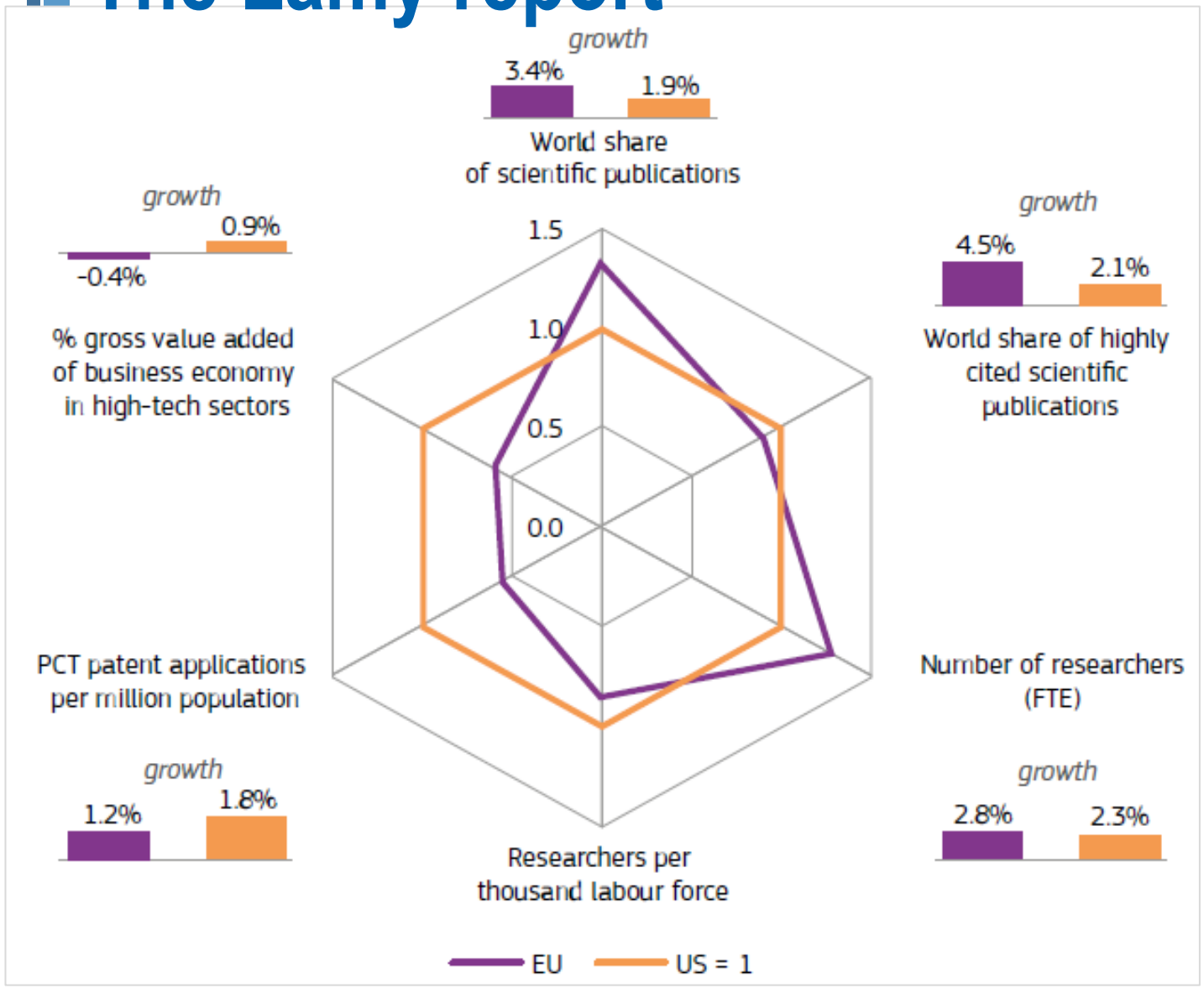
International framework

UN SDGs

Horizon Europe

PILLAR I: OPEN SCIENCE	PILLAR II: GLOBAL CHALLENGES AND INDUSTRIAL COMPETITIVENESS	PILLAR III: OPEN INNOVATION
European Research Council (ERC)	Joint Research Council (JRC)	European Innovation Council (EIC)
Marie Skłodowska-Curie Actions (MSCA)	*5 Clusters*: • Health • Inclusive and Secure Societies • Digital and Industry • Climate, Energy and Mobility • Food and Natural Resources.	Support to innovation ecosystems
Research Infrastructures (RI)		European Institute of Innovation and Technology (EIT)
PART IV: STRENGHTENING THE EUROPEAN RESEARCH AREA		
Spreading Excellence (Teaming, Twinning, ERA Chairs, COST)		
Reforming and enhancing the European R&I system		

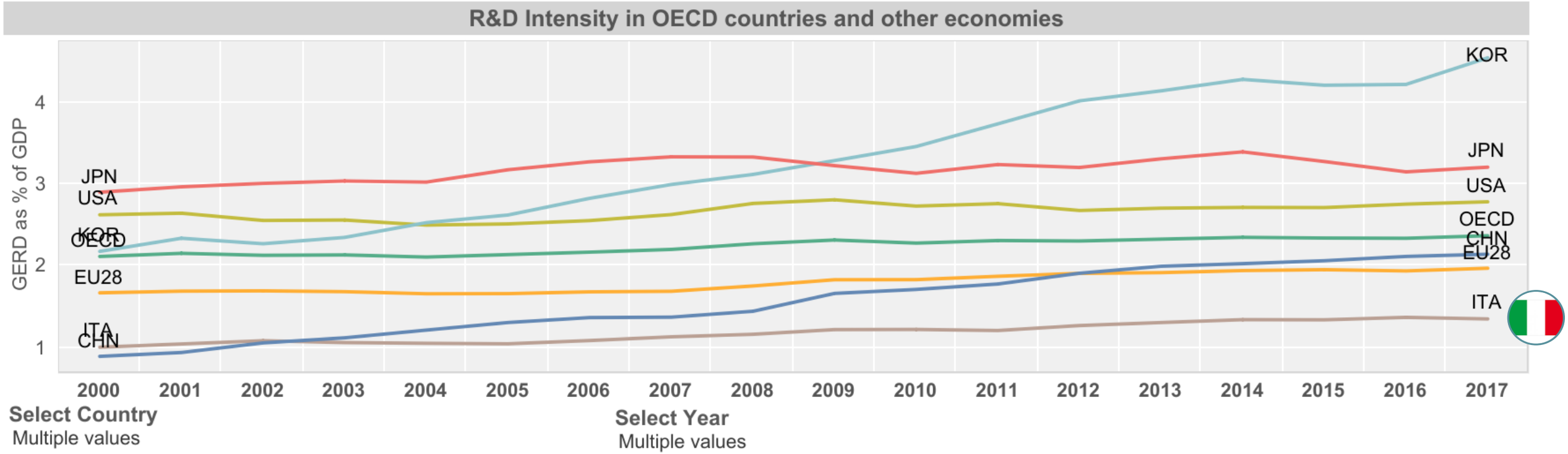
The Lamy report



Comparative and growth rates of scientific publications, highly-cited scientific publications, researchers,
patent applications and valued-added of high-tech sectors in the EU and the USA.

(Source: European Commission,
DG Research and Innovation.
Data: Eurostat, OECD, CWTS based on Web of Science database)

Expenditure on R&D (% of GDP)



Source: OECD estimates based on OECD Main Science and Technology Indicators Database, August 2019.

Italian and local context

- Italy and in particular the **Turin area**, are deeply involved in global transformations and have to tackle them from a difficult situation.
- Social and economic bases are being undermined by severe **demographic decline**, an **imbalance** between emigration and immigration **of young graduates**, **sluggish productivity growth** in different economic sectors.

The result is a clear responsibility to work to the benefit of the society at territorial and national level.

PoliTo human capital

Teaching Staff

230 Full Professors

370 Associate Professors

300 «Researchers»

Administrative Staff

~880 Staff members

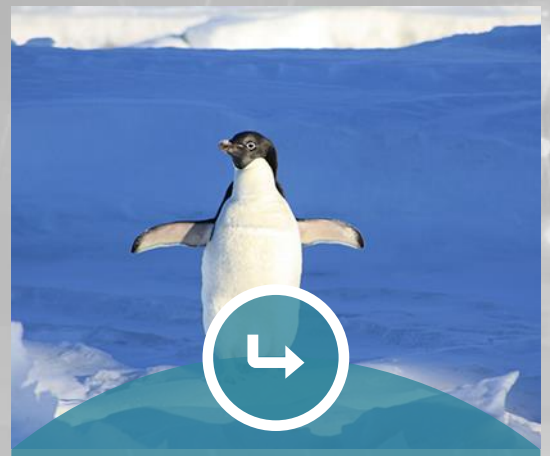
33.500 Students enrolled in Bachelor's and Master's degree programmes

~15 % International students in total

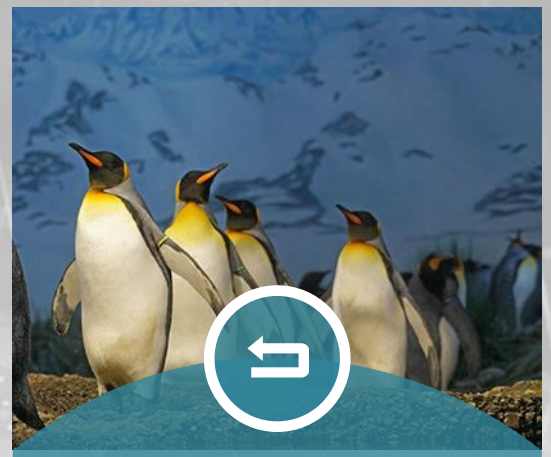
5.300 Students enrolled in the first year (applications ~ 2x, and growing)

650+ PhD candidates

Levels and organisation of research



Individual researcher



Departmental Research Group

Department

InterDepartmental Centre(s)

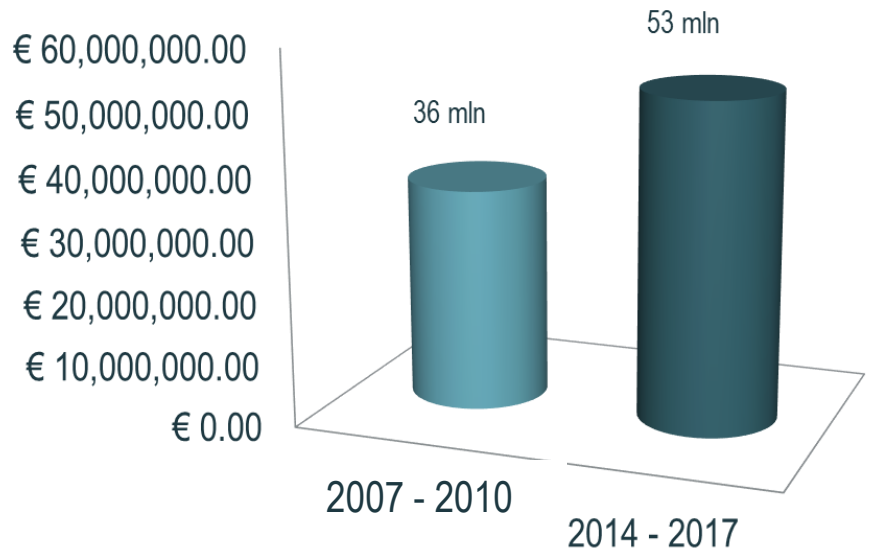
Platform(s)

PoliTo research performance indicators

Citations per publication (2013-2017)

	6.1
	6.2
	5.2

Funding FP7 vs H2020 (1st 4 years)



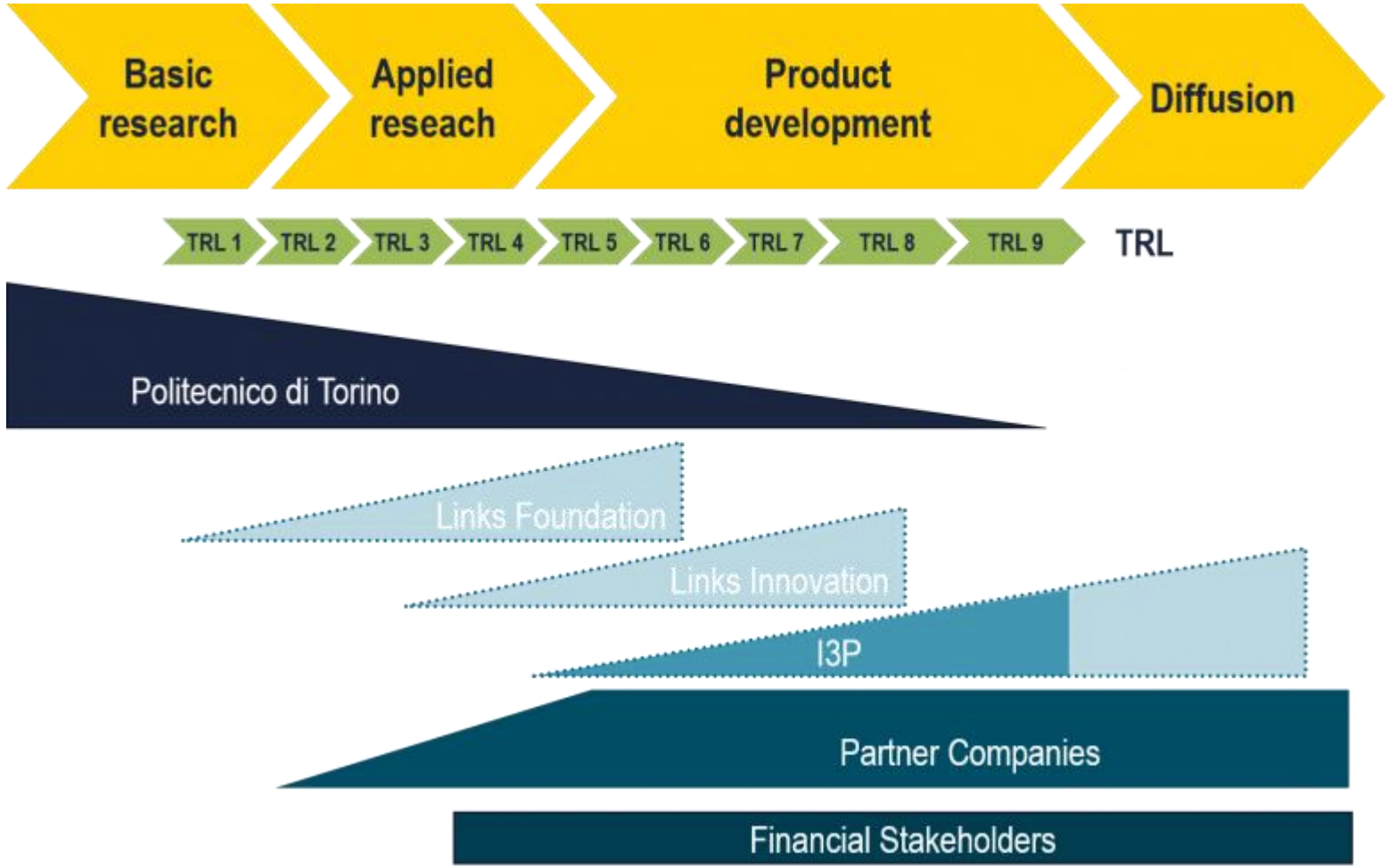
Success rate in H2020 proposals (2014-2017)

	12%
	11%
	16,5%

The new challenges

- Support to **multidisciplinary research** activities and cross-contamination, also through the advancement of the organizational model adopted by the **Interdepartmental Centres**.
- Progressive diffusion of the principles of ***Open Science*** for a wide knowledge sharing and dissemination of the research results and data, as well as of the **Responsible Research and Innovation**
- Integration between the different phases of research and third mission activities

The PoliTo contribution to the innovation value chain



See also the CESAER white paper on "ROLE OF UNIVERSITIES OF SCIENCE & TECHNOLOGY IN INNOVATION ECOSYSTEMS, by T. Bedford et al., 2018

The Third Mission (*) over time

Analysis

- Politecnico di Torino has always recognized the fundamental importance of its role in the activities related to the "third mission" of a university and actively supported the development of Piemonte and Italy by cooperating with industry in the different phases of our history

(*) To have a relevant impact on society

Actions

Two core strategic objectives:

- to **increase the resources available for the University**
- to **contribute to the development of our territory** and country

Two main directions:

- the strengthening of the innovation value chain
- working in fields that are still relatively unexplored by our University, dealing with cultural promotion, communication and public engagement

Third mission actions

- **IPR management** to increasingly support researchers
- achieve a critical mass of the **patent portfolio**
- foster **Proof of Concept** initiatives
- **Support the creation of innovative enterprises → I3P incubator (1999, 1st in Italy) spin-offs** and **start-ups**
- attract **venture capital** funds
- Achieve effective integration into the innovation ecosystem that we are building around our University

«MANUFACTURING» UNIVERSITY

PROFESSIONALS

UNIVERSITY

SOCIETY

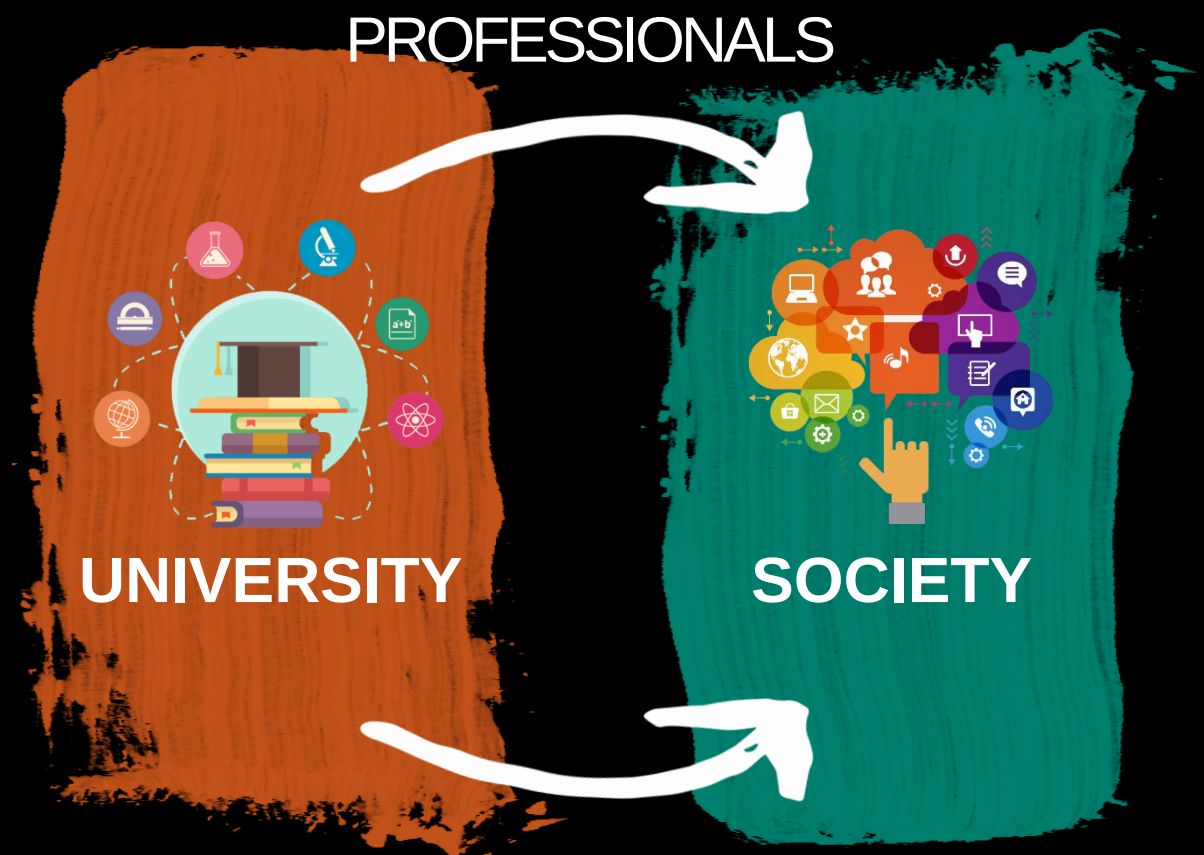
KNOWLEDGE & INNOVATION

«PLATFORM» UNIVERSITY

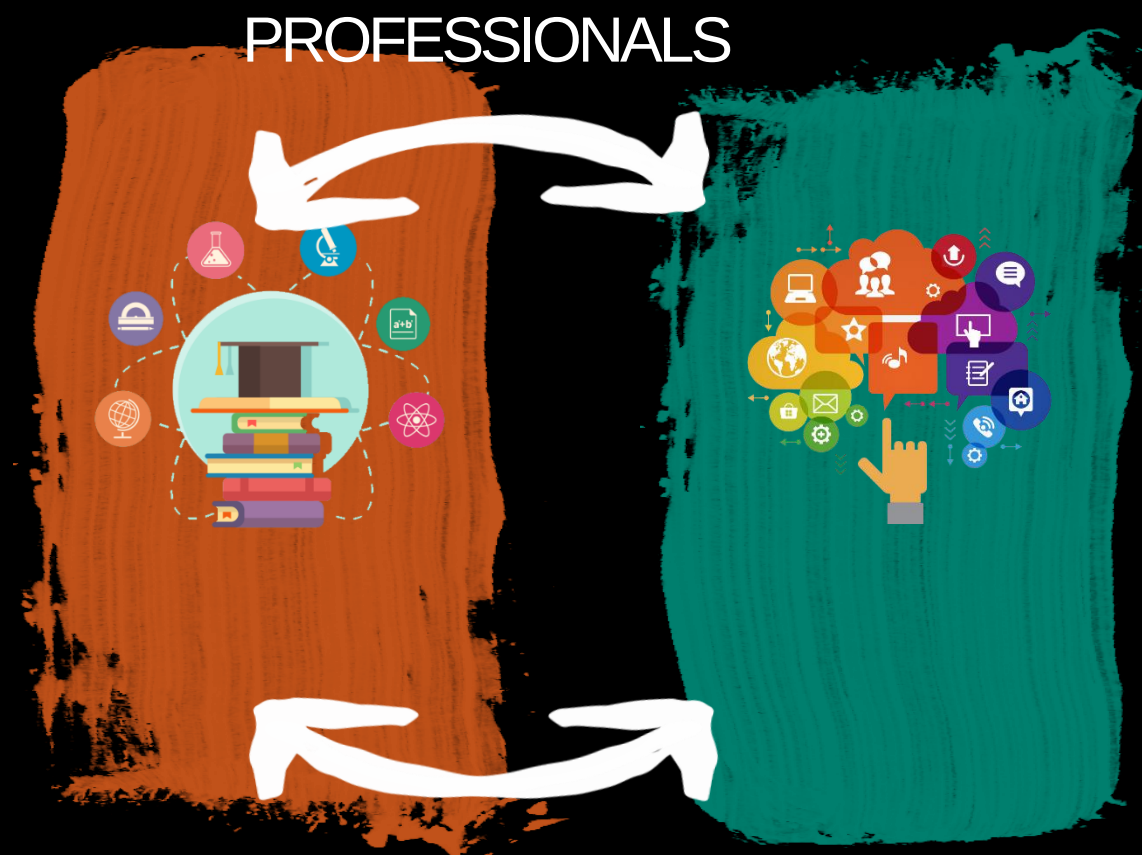
UNIVERSITY

SOCIETY

«MANUFACTURING» UNIVERSITY



«PLATFORM» UNIVERSITY



Refs: KICs, Imperial College White City, …

Platforms

Piattaforma
Economia Circolare
Piattaforma
Mobilità 3D
Piattaforma
Energia e Acqua
Piattaforma
Digital Revolution
Città delle Scienze
Grugliasco
Campus
Ingegneria
Campus
Architettura
Co-location of university and companies
Piattaforma
Patrimonio e Rigenerazione
Piattaforma
Manufacturing 4.0
Città della Salute

EDUCATION

BACHELOR,
MASTER,
PhD,
TECHNICAL-JOB
ORIENTED
(FACHHOCHSCHULE)

RESEARCH

APPLIED,
INTERDISCIPLINARY,
LARGE
INFRASTRUCTURES

INNOVATION

OPEN INNOVATION,
THEMATIC START-UPS,
IPR VALORIZATiON

SERVICES

FINANCIAL SERVICES,
CONTINUOUS
EDUCATION,
RE-SKILLING

Other ongoing actions @ PoliTo

- Strengthening the PhD
- PoliTo hub @ BXL
- Strengthening the participation to International University Networks (CESAER, CLUSTER, EUA, Magalhaes, T.I.M.E., UniMed, …)
- European University Alliance UNITE!

TECHNISCHE UNIVERSITÄT DARMSTADT

U LISBOA | UNIVERSIDADE DE LISBOA

KTH VETENSKAP OCH KONST

Aalto University

Grenoble INP

POLITECNICO DI TORINO

UPC UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

UNITE!

University Network for Innovation, Technology and Engineering

BACK-UP

Interdepartmental Centres

CARS@PoliTO

Center for Automotive Research and Sustainable Mobility

CWC

CleanWaterCenter @PoliTo

Ec-L

Energy Center Lab

FULL

Future Urban Legacy Lab

IAM@PoliTo

Integrated Addtive Manufacturing

J-Tech@PoliTO

PEIC

Power Electronics Innovation Center

PhotoNext

Applied Photonics

PIC4SeR

PoliTO Interdepartmental Centre for Service Robotics

PolitoBIOMed Lab

Biomedical Engineering Lab

R3C

Responsible Risk Resilience Centre

SmartData@PoliTO

Big Data and data Science Laboratory

Terza Missione: insieme di attività con le quali le università entrano in interazione diretta con la società*

a) Terza Missione di valorizzazione economica della conoscenza

OBIETTIVO: favorire la crescita economica, attraverso la trasformazione della conoscenza prodotta dalla ricerca in conoscenza utile a fini produttivi.

- gestione della proprietà intellettuale,
- la creazione di imprese,
- la ricerca conto terzi (rapporti ricerca-industria)
- gestione di strutture di intermediazione e di supporto, in genere su scala territoriale.

Margini di attenzione: la conoscenza prodotta dal sistema pubblico di ricerca assume la natura di un bene privato. Da qui nascono delicati problemi di regolazione e di definizioni normative e operative.

b) Terza Missione culturale e sociale.

OBIETTIVO: Produzione di beni pubblici che aumentano il benessere della società con contenuti:

- culturale (eventi e beni culturali, gestione di poli museali, scavi archeologici, divulgazione scientifica), sociale (salute pubblica, attività a beneficio della comunità, consulenze tecnico/professionali fornite in équipe),
- educativo (educazione degli adulti, live long learning life long learning, formazione continua) o di consapevolezza civile dibattiti e controversie pubbliche, expertise scientifica).

Per la fruizione di tali beni non è previsto, in linea generale, il pagamento di un prezzo, o in ogni caso di un prezzo di mercato.

*Rapporto ANVUR 2013

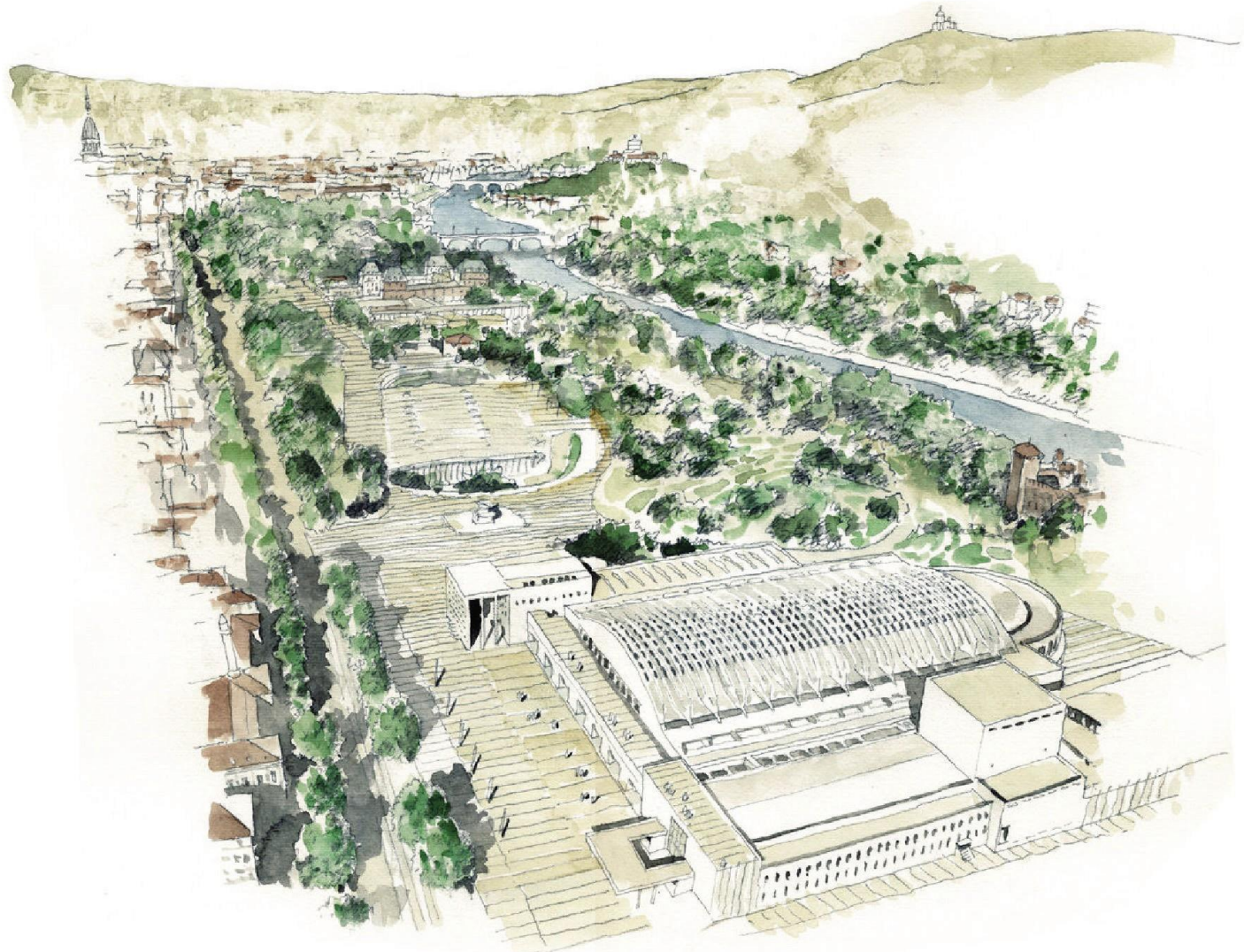
Piattaforma Energia e Acqua

Piattaforma Digital Revolution

Piattaforma Manufacturing 4.0

Piattaforma Mobilità 3D

Piattaforma Patrimonio e Rigenerazione

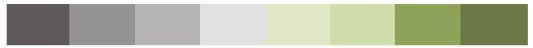


Piattaforma Economia Circolare

Impatto delle Piattaforme sull’appetibilità delle aree

PRIMA

DOPO



INADEGUATO ADEGUATO APPETIBILE