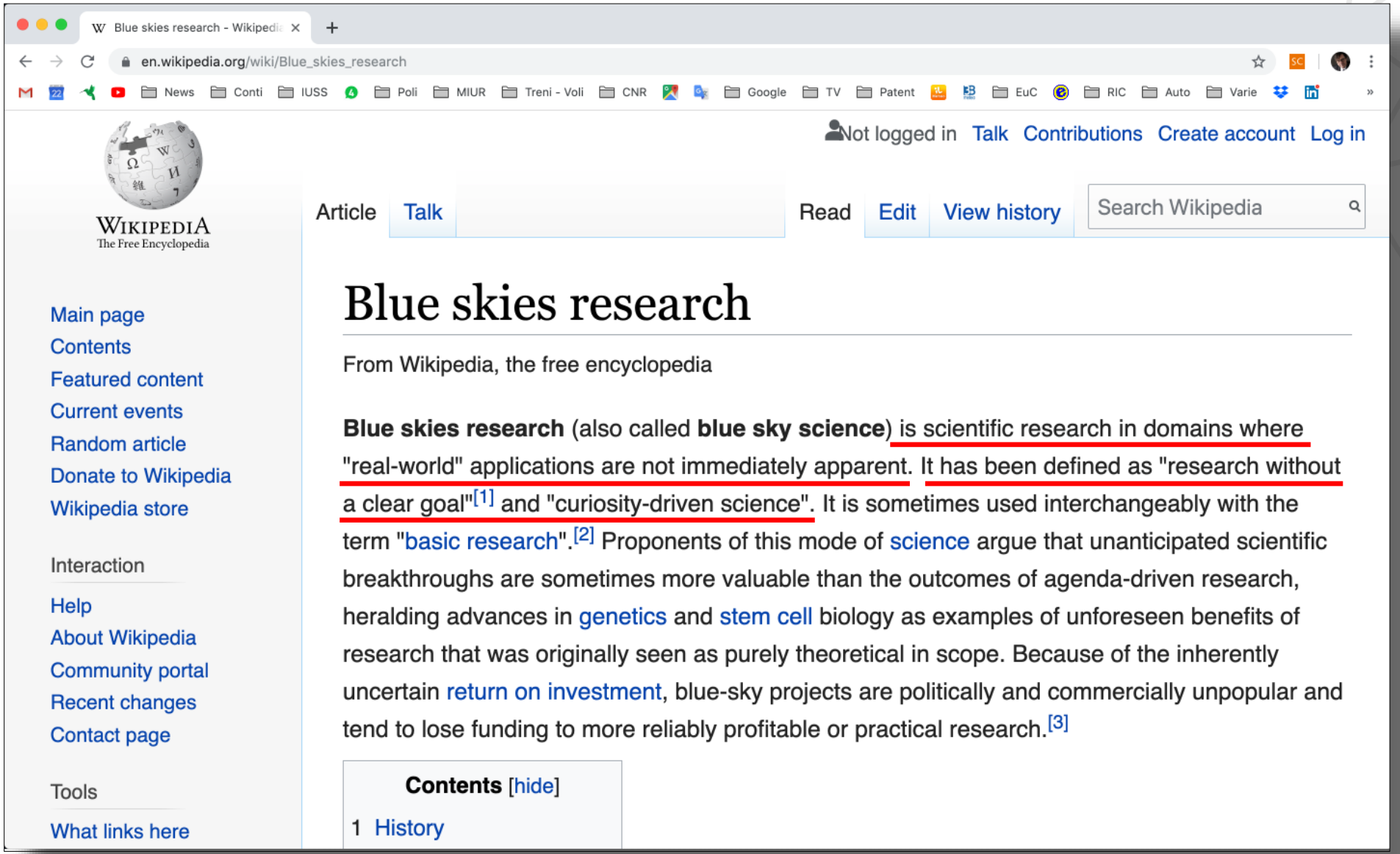
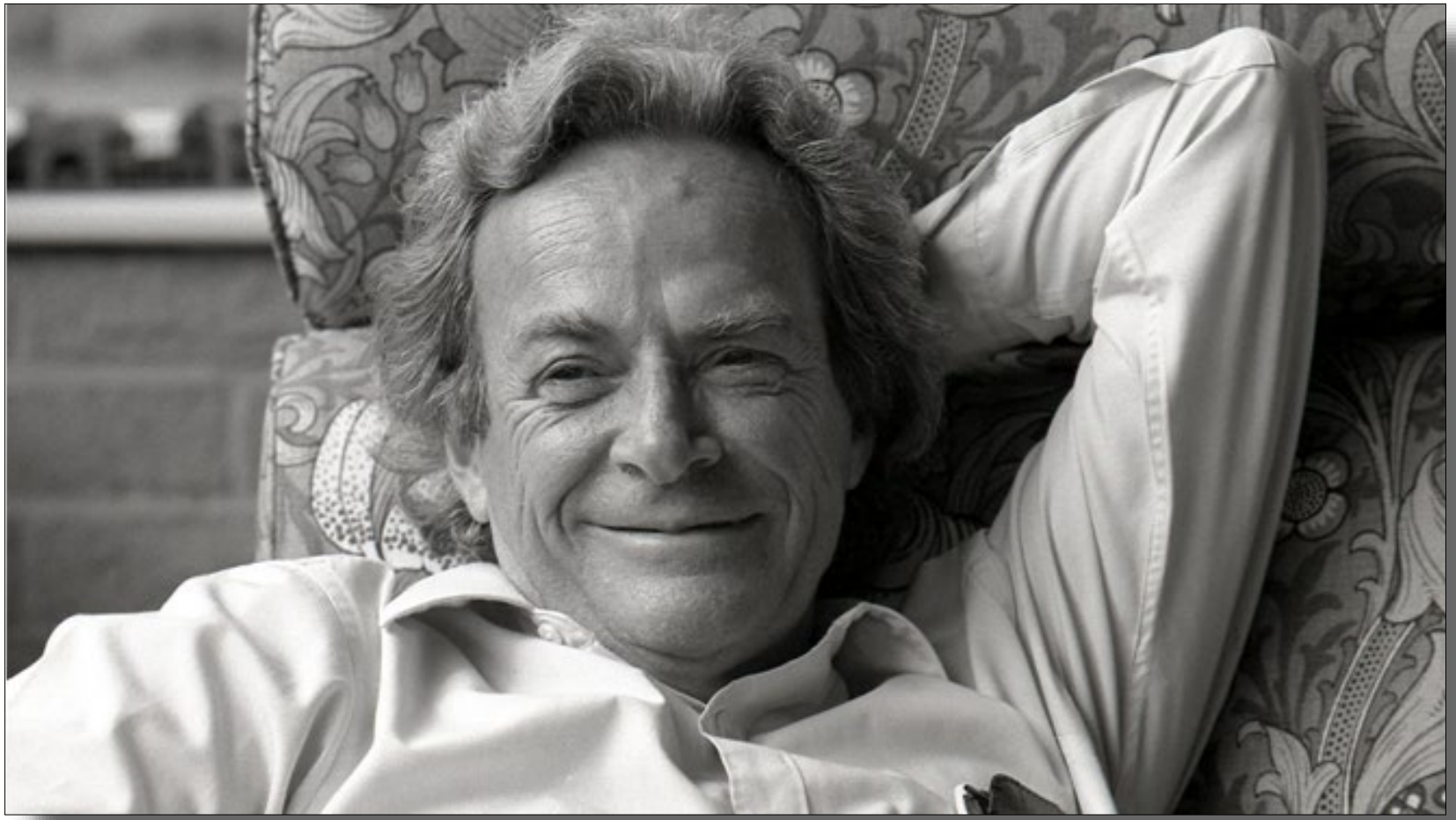
IUSS
Scuola Universitaria Superiore Pavia

Riccardo Pietrabissa

Introduction to technology transfer



…application is not a motivation for researchers, but is among the consequences



Richard Feynman
Nobel Prize in Physics 1965

“Physics is like sex:
sure, it may give some
practical results,
but that’s not why we do it.”

Johann Carl Friedrich Gauss (1777 – 1855) has been a German mathematician, astronomist and physicist that gave fundamental contribution to manifold fields of science.

the problem the solution

$$1 + 2 + 3 + \dots + 98 + 99 + 100 = 5050$$

$$+ \quad + \quad + \qquad + \quad + \quad +$$

$$100 \quad 99 \quad 98 \quad \dots \quad 3 \quad 2 \quad 1$$

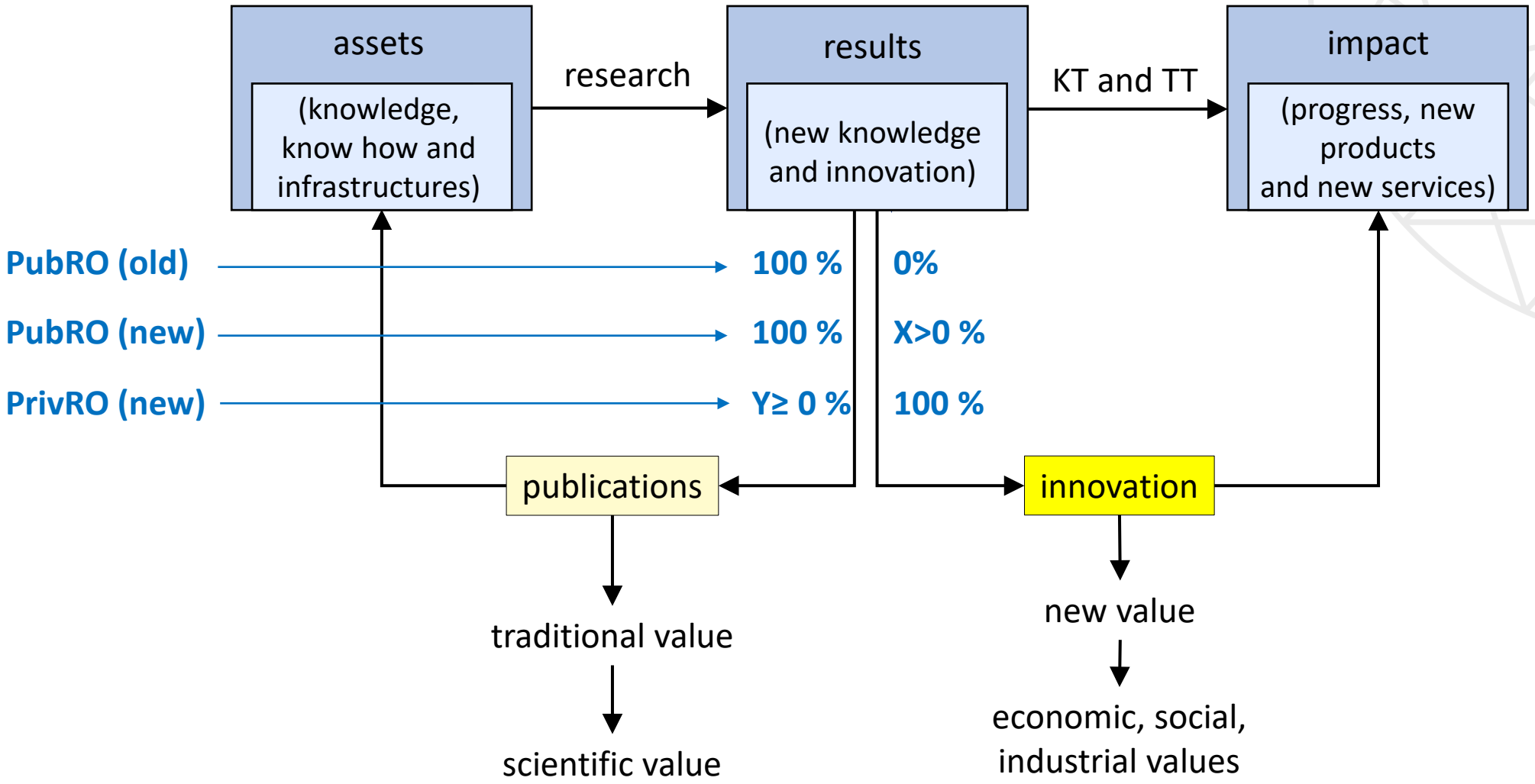
$$= \quad = \quad = \qquad = \quad = \quad =$$

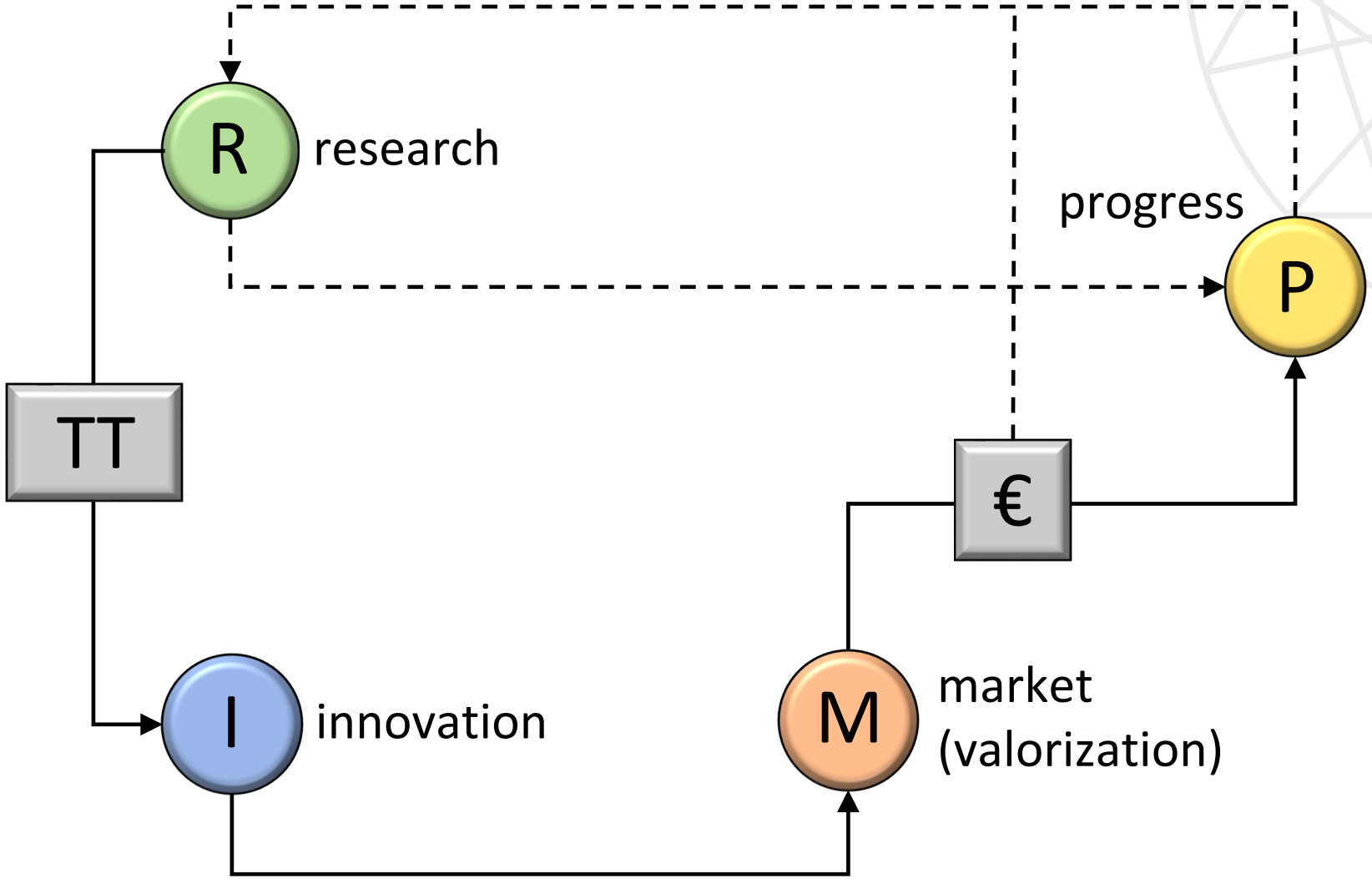
$$101 \quad 101 \quad 101 \quad \dots \quad 101 \quad 101 \quad 101 = (101 \times 100)/2 = 5050$$

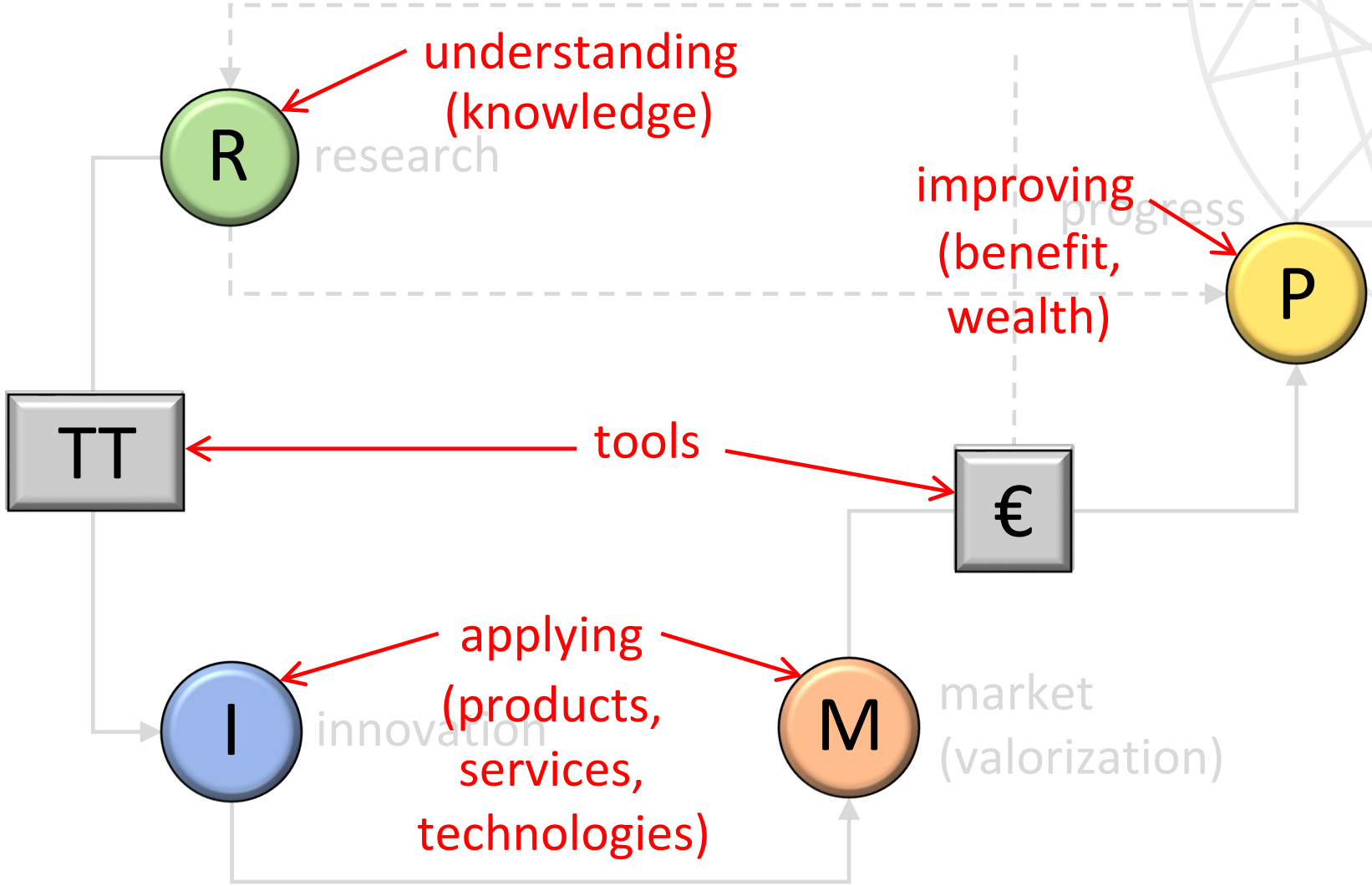
new method or new problem?

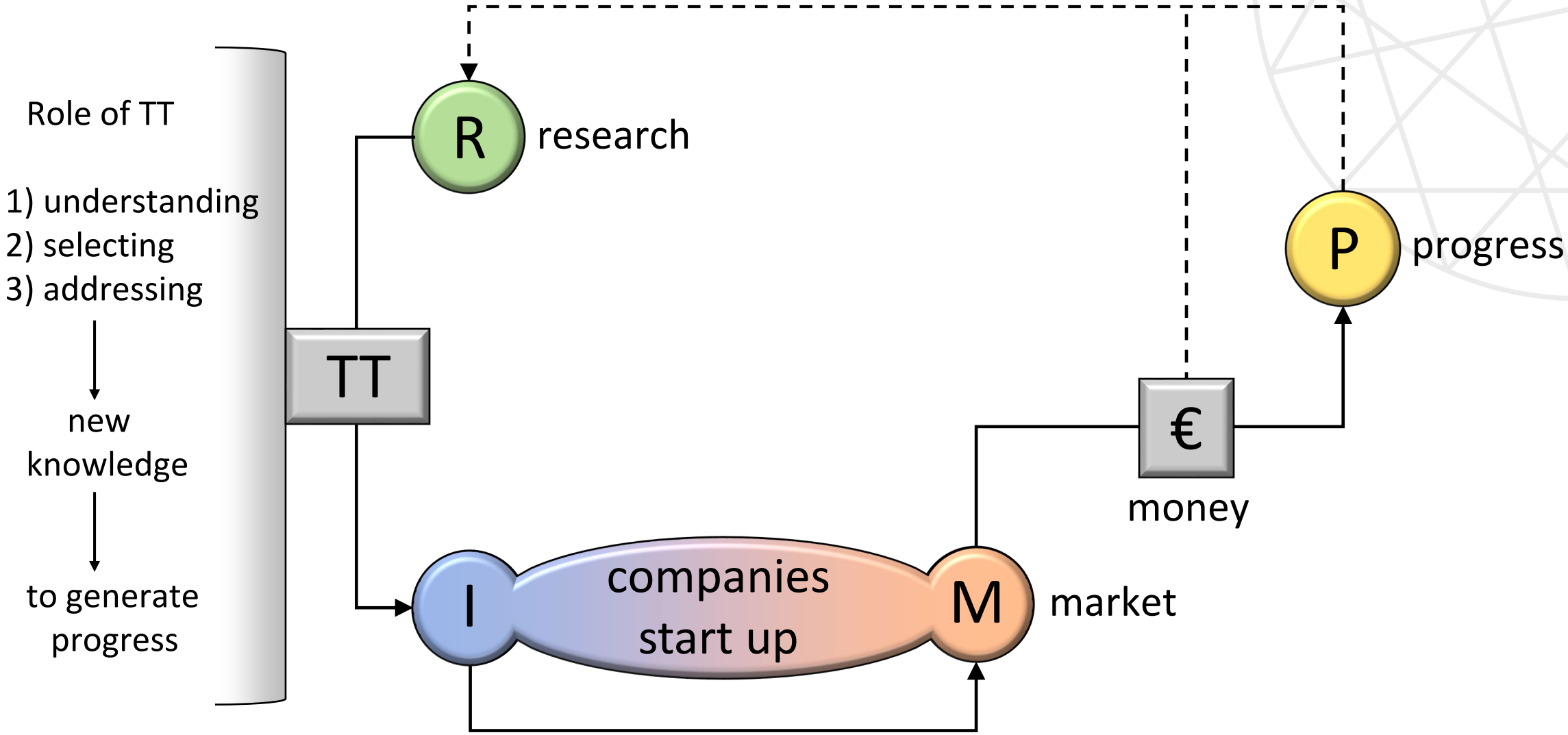
the generalisation – new knowledge

$$\sum_{n=1}^{i} n = \frac{(i+1) \times i}{2} \qquad \sum_{n=a}^{b} n = (a+b) \times (b-a+1)/2$$

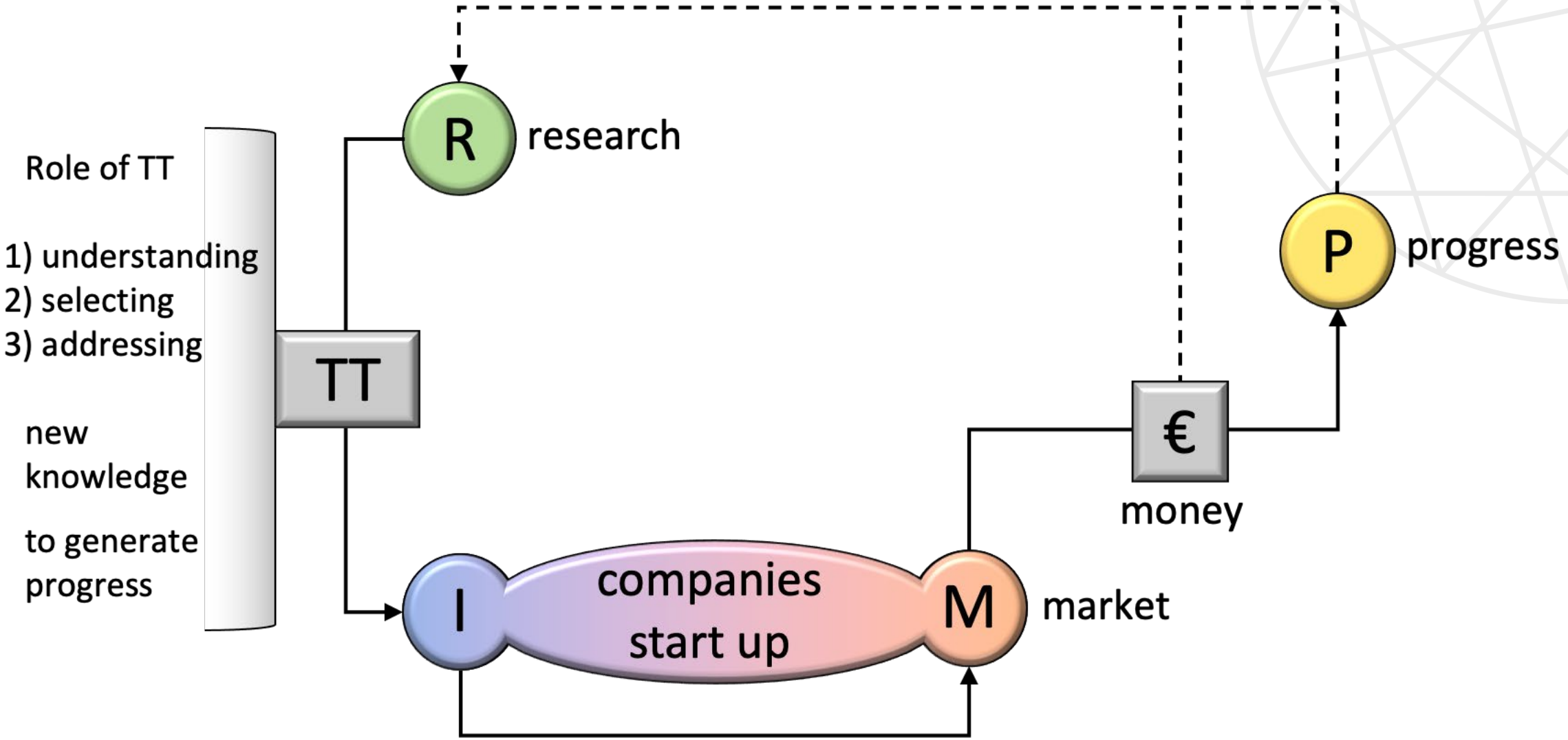

assets
(knowledge, know how and infrastructures)
research
results
(new knowledge and innovation)
KT and TT
impact
(progress, new products and new services)
PubRO (old)
PubRO (new)
PrivRO (new)
100 %
100 %
Y≥ 0 %
0%
X>0 %
100 %
publications
innovation
traditional value
scientific value
new value
economic, social, industrial values


R
research
progress
P
TT
€
I
innovation
M
market
(valorization)

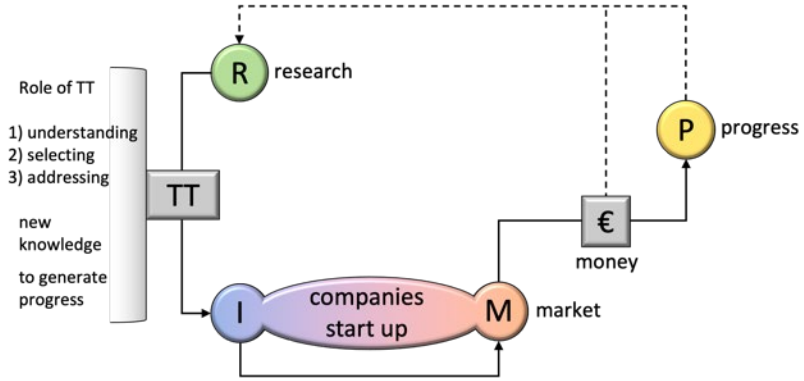

understanding
(knowledge)
R
research
improving
(benefit,
wealth)
progress
P
TT
tools
€
applying
(products,
services,
technologies)
I
innovation
M
market
(valorization)


Role of TT
1) understanding
2) selecting
3) addressing
new knowledge
to generate progress
TT
R
research
P
progress
€
money
I
companies start up
M
market

Old paradigm –> Technology Transfer



Old paradigm –> Technology Transfer



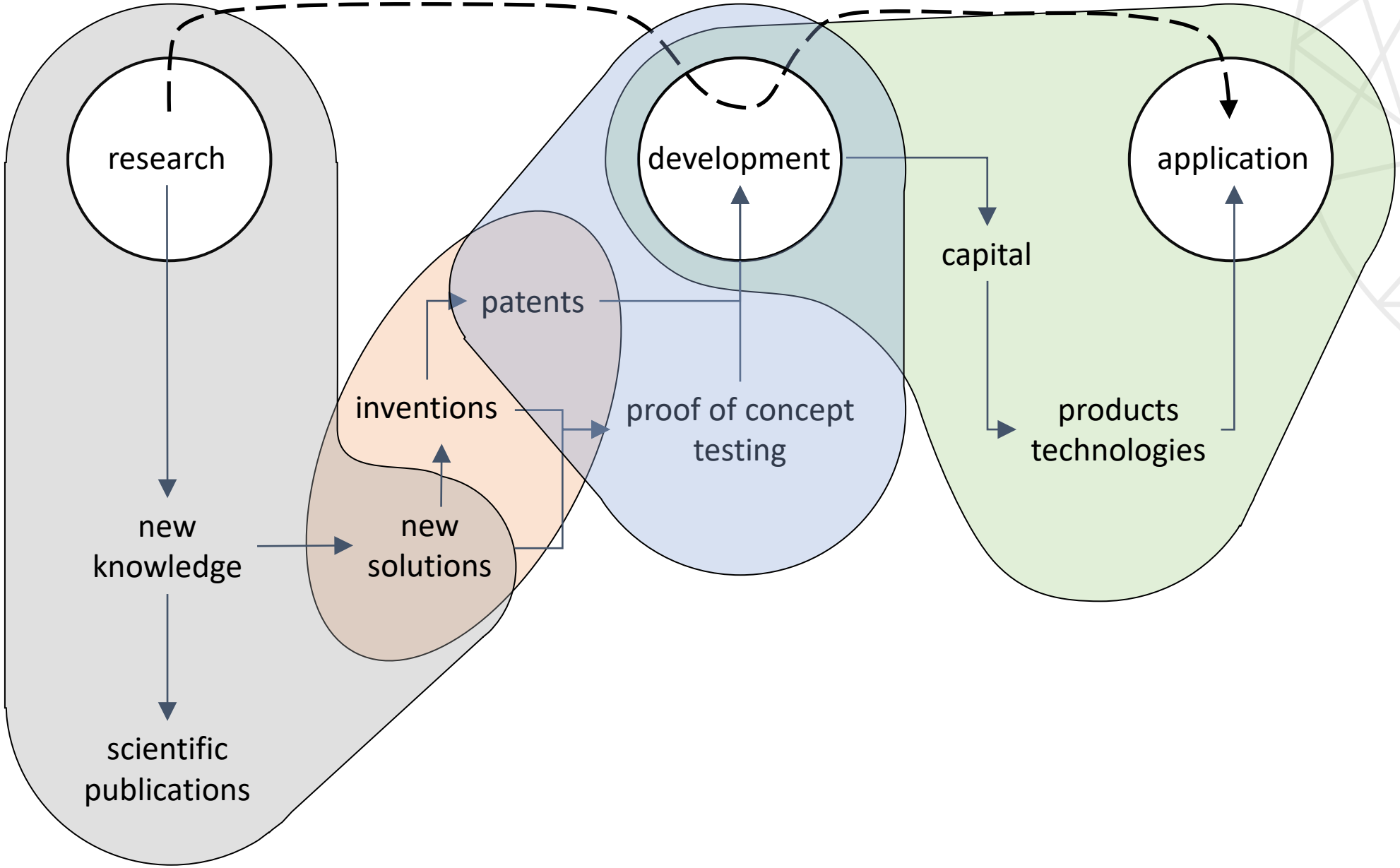
Knowledge Transfer

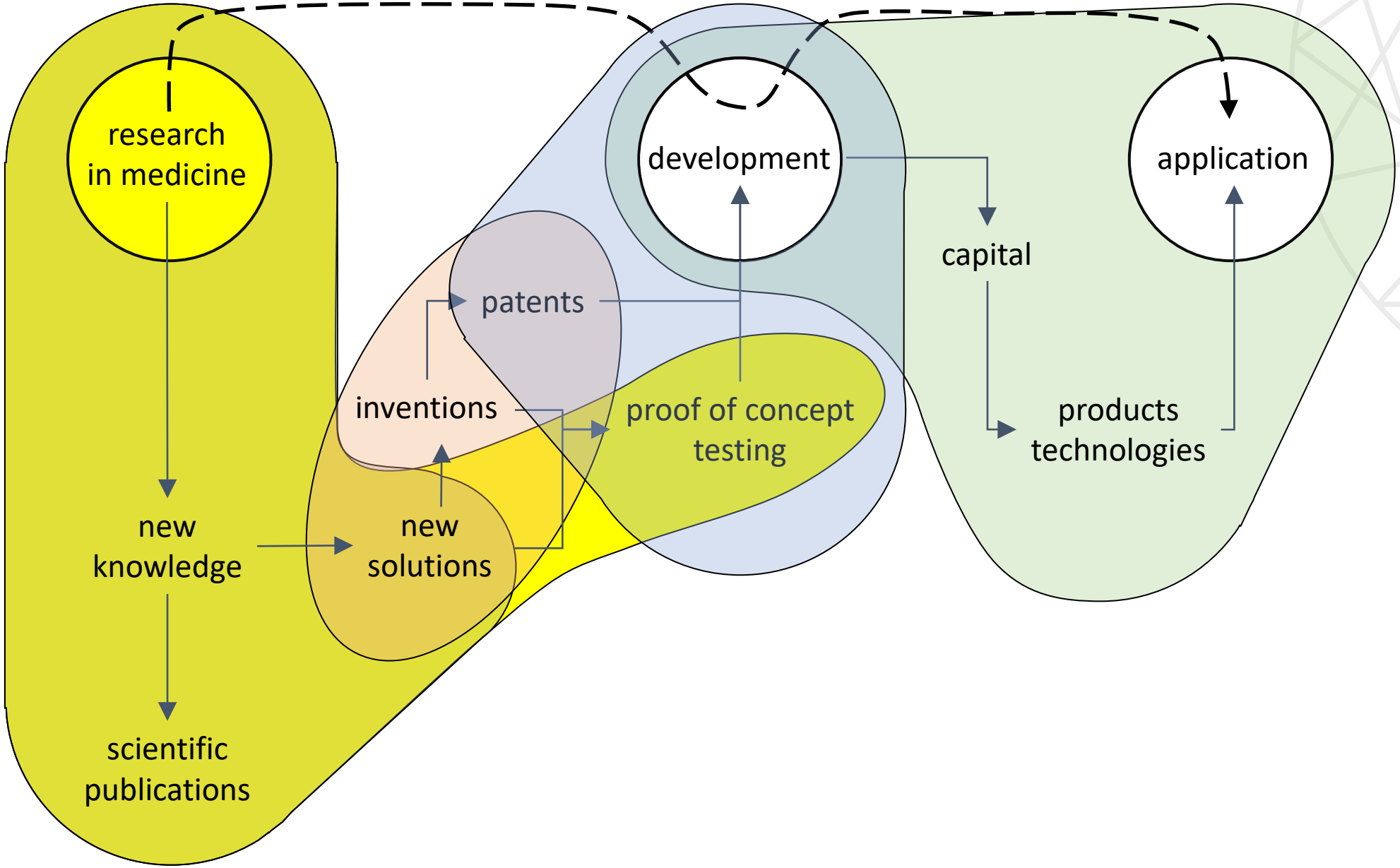
Knowledge Exchange

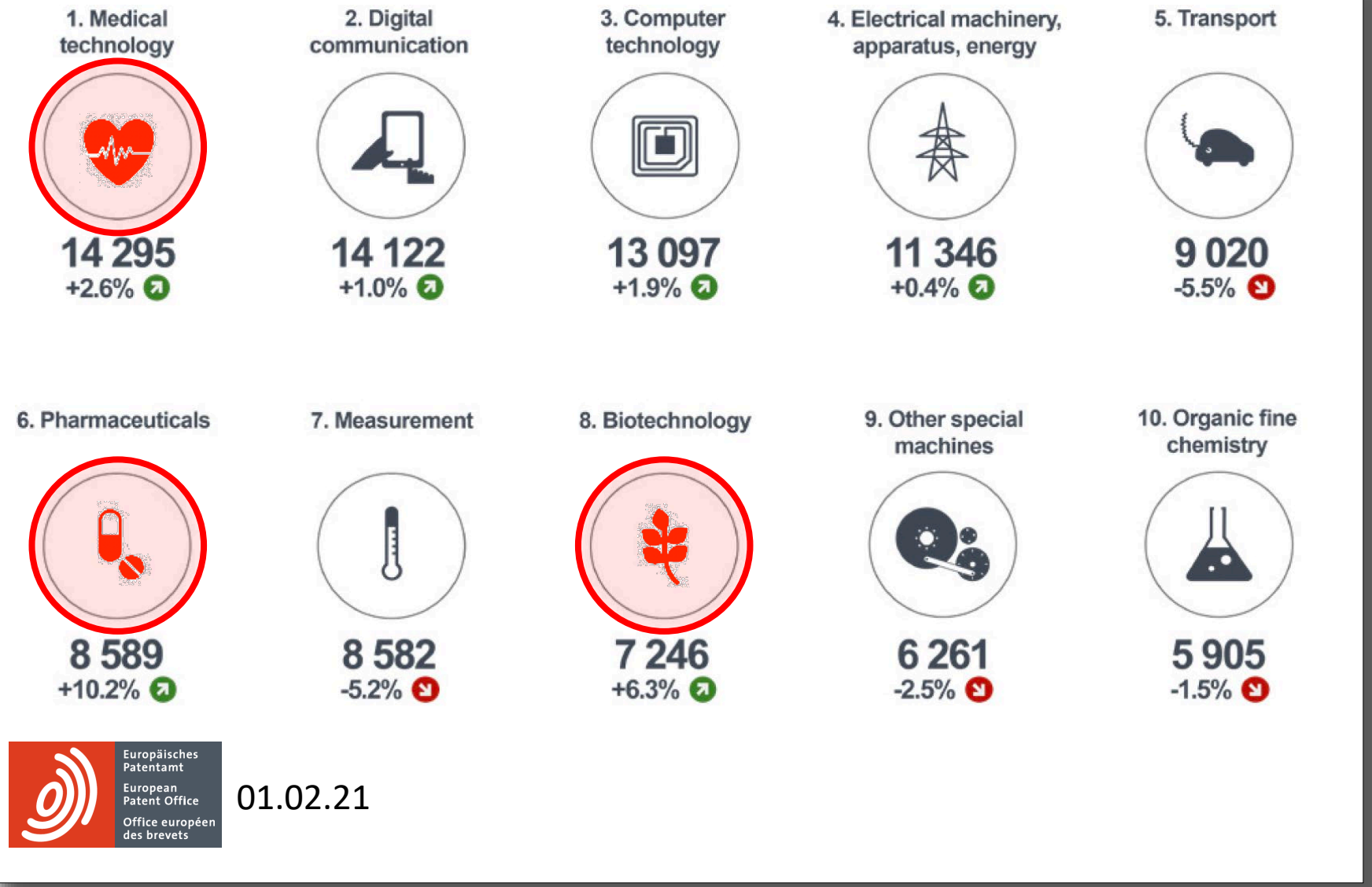
Cooperation among actors (researchers, students, institutions, companies) to generate the impact of research results in society.

Knowledge Transformations

Combinations of different research results to generate impact addressing innovation to solve complex problems. The knowledge transformation is a development activity which generates value both from research results and know how.


research
development
application
capital
patents
inventions
proof of concept
testing
products
technologies
new
knowledge
new
solutions
scientific
publications

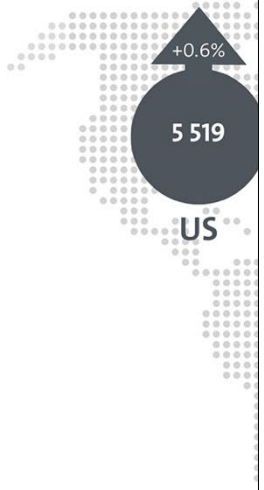

research
in medicine
development
application
capital
patents
inventions
proof of concept
testing
products
technologies
new
knowledge
new
solutions
scientific
publications


1. Medical technology
14 295
+2.6%
2. Digital communication
14 122
+1.0%
3. Computer technology
13 097
+1.9%
4. Electrical machinery, apparatus, energy
11 346
+0.4%
5. Transport
9 020
-5.5%
6. Pharmaceuticals
8 589
+10.2%
7. Measurement
8 582
-5.2%
8. Biotechnology
7 246
+6.3%
9. Other special machines
6 261
-2.5%
10. Organic fine chemistry
5 905
-1.5%
Europäisches Patentamt
European Patent Office
Office européen des brevets
01.02.21

2020
Medical back in

The leading f the last ten y

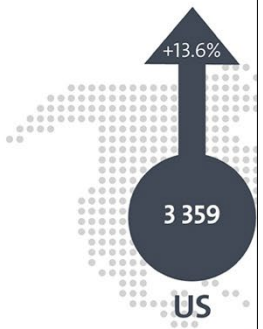
Countries of orig applications



2020
Pharma over 10%

Greatest gro ten technolo

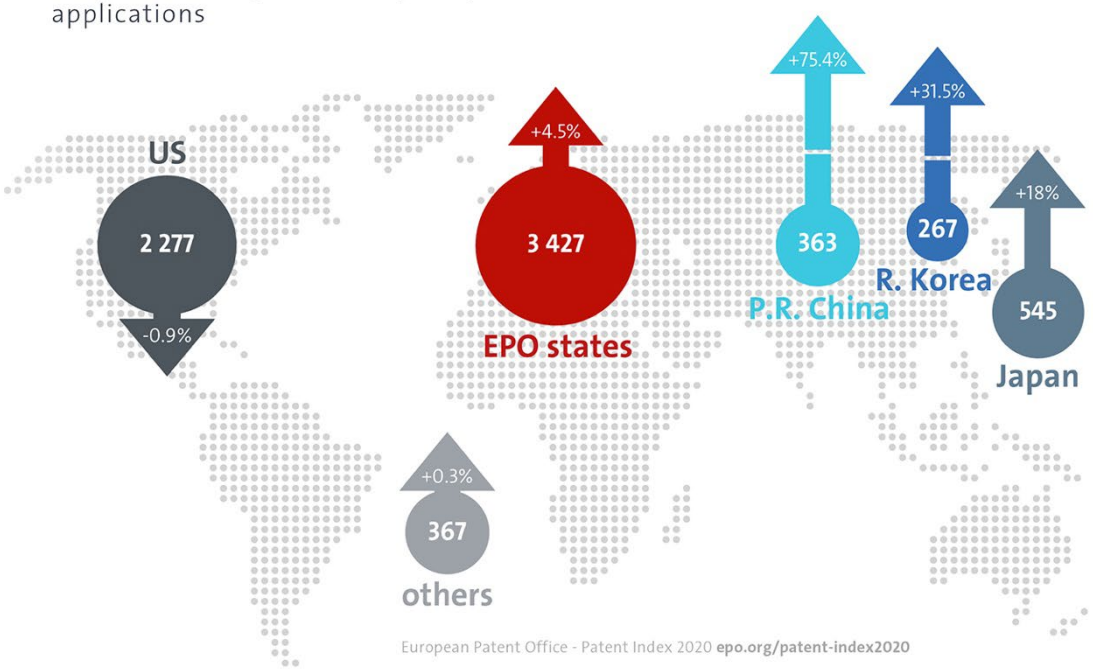
Countries of orig applications



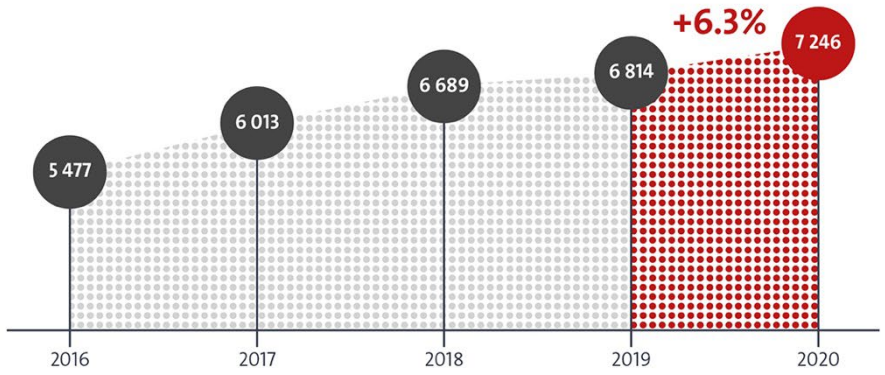
2020
Biotechnology filings up over 6%

Boom in filings from companies in Germany, Switzerland, UK and Asia

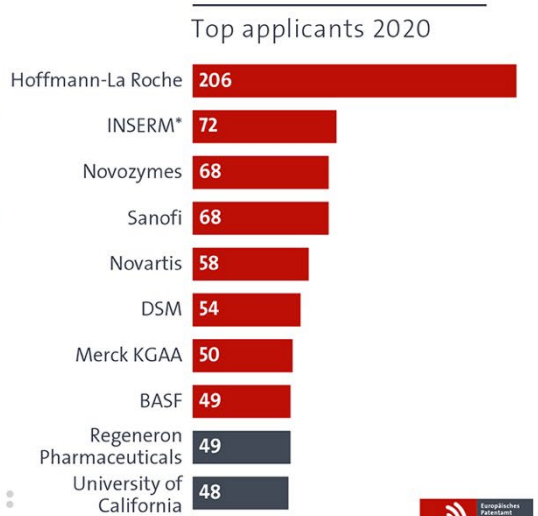
Countries of origin for European patent applications



Total European patent applications in biotechnology



Top applicants 2020

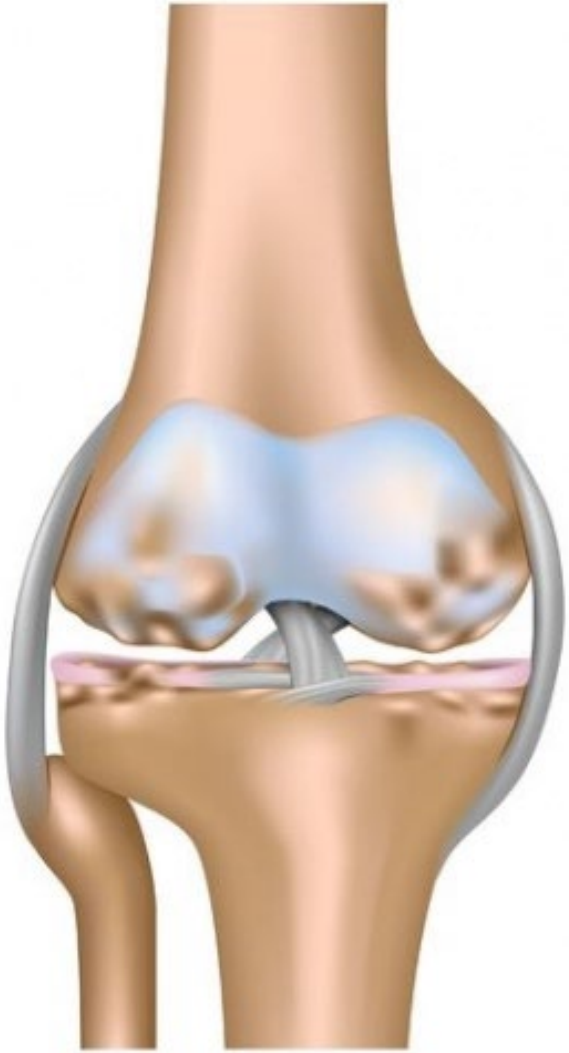


European Patent Office - Patent Index 2020 **epo.org/patent-index2020**

* Institut national de la santé et de la recherche médicale

joint prosthesis

standard technology

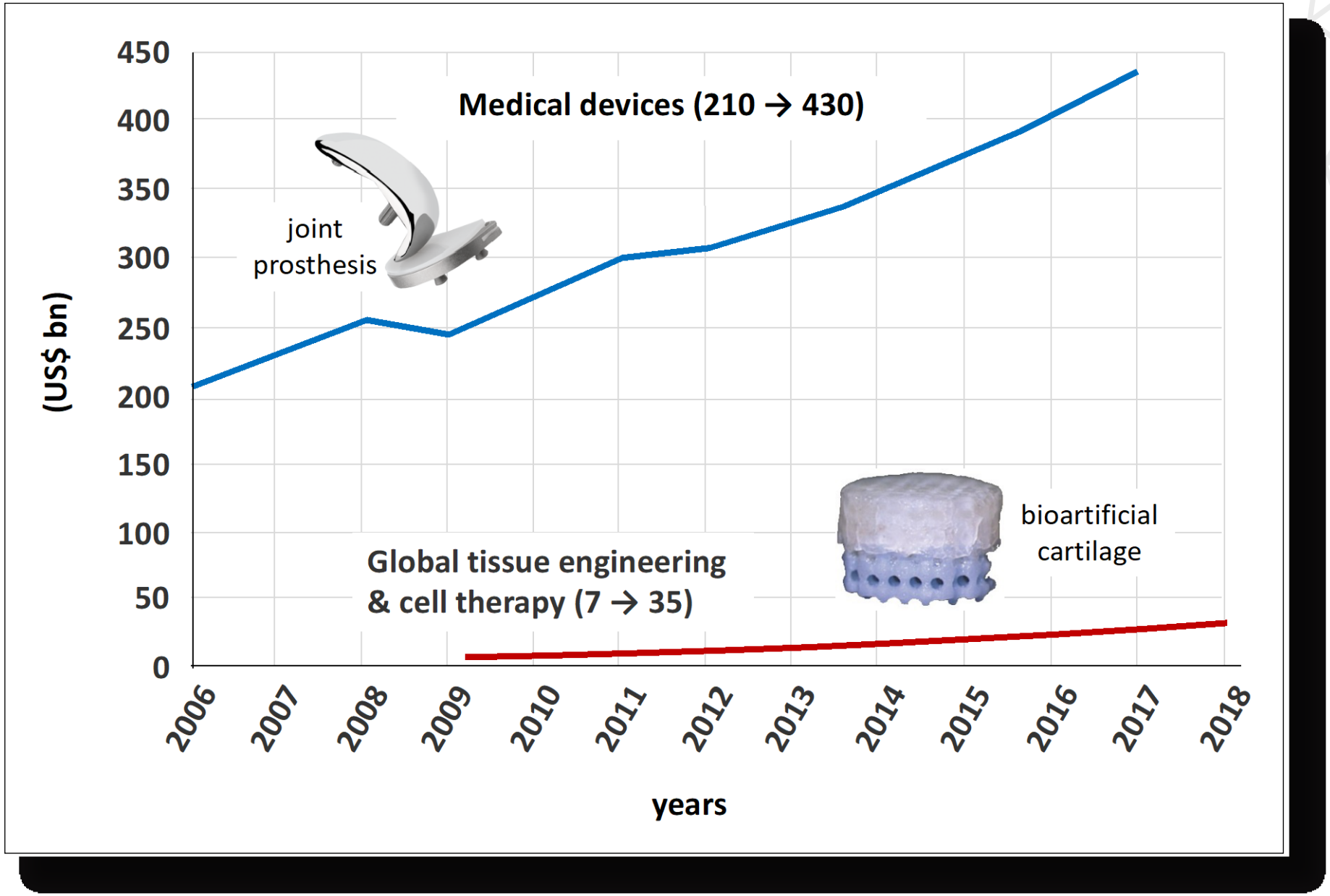


osteoarthritic knee

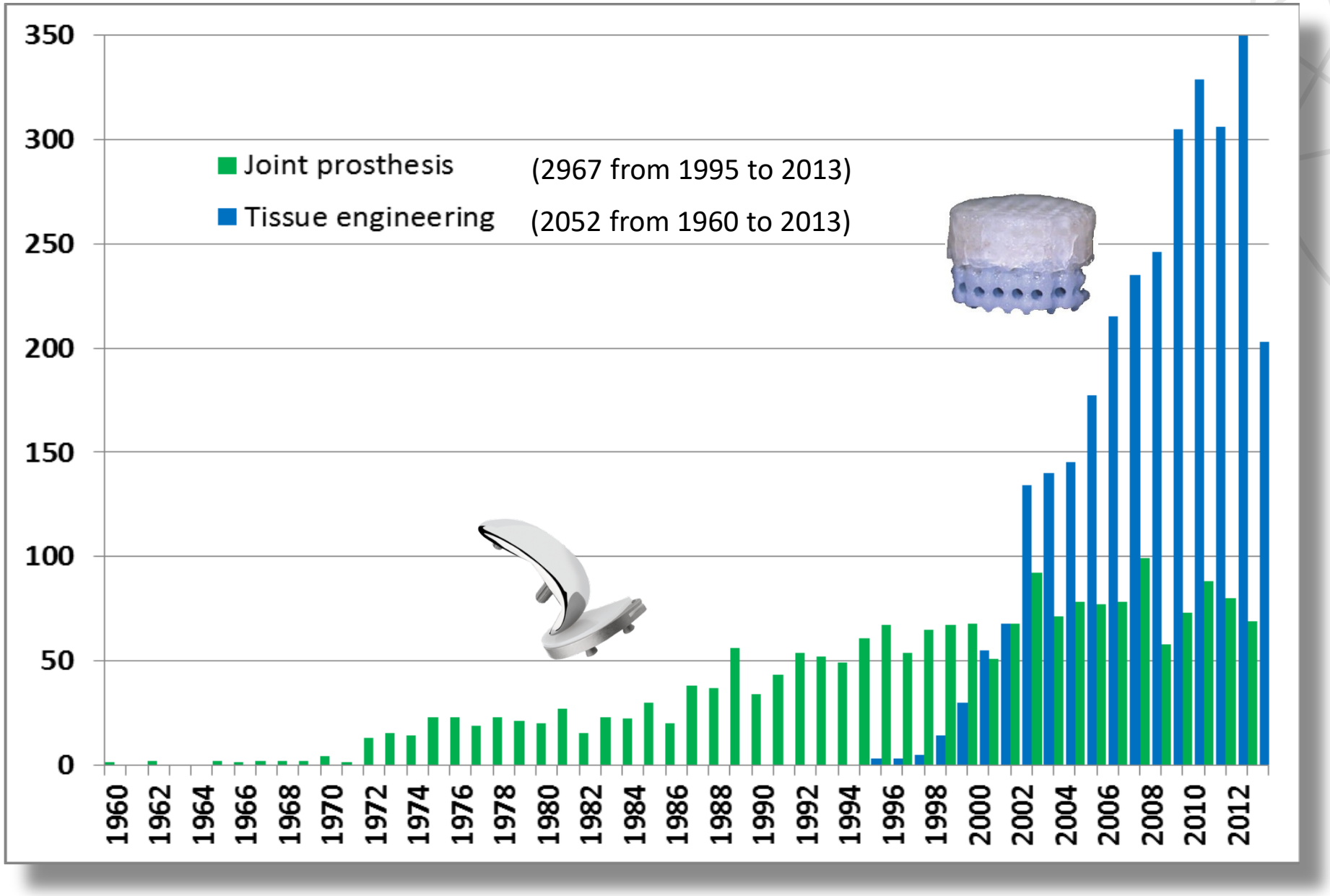
bioartificial cartilage

tissue engineering

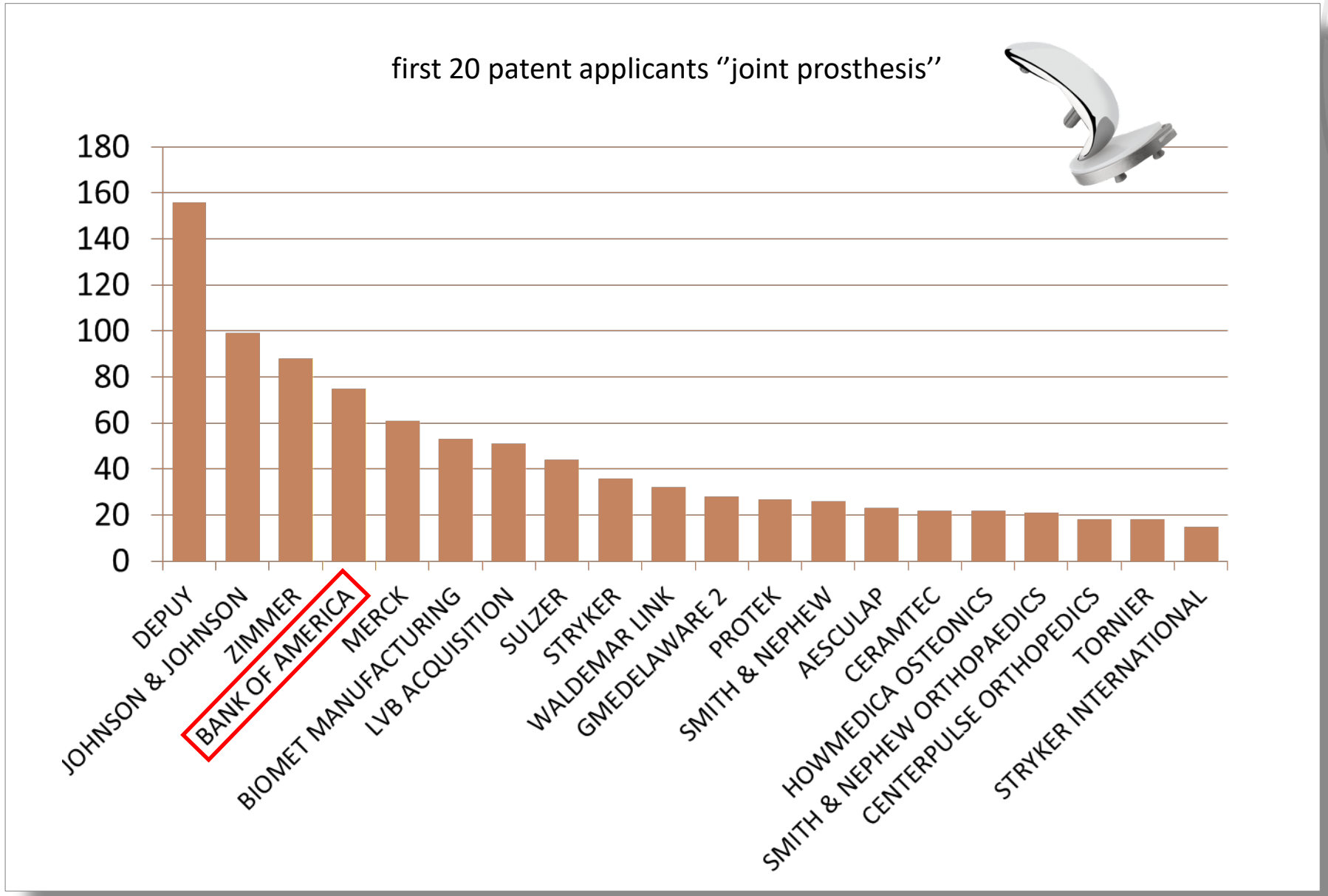
market trends



patent trends

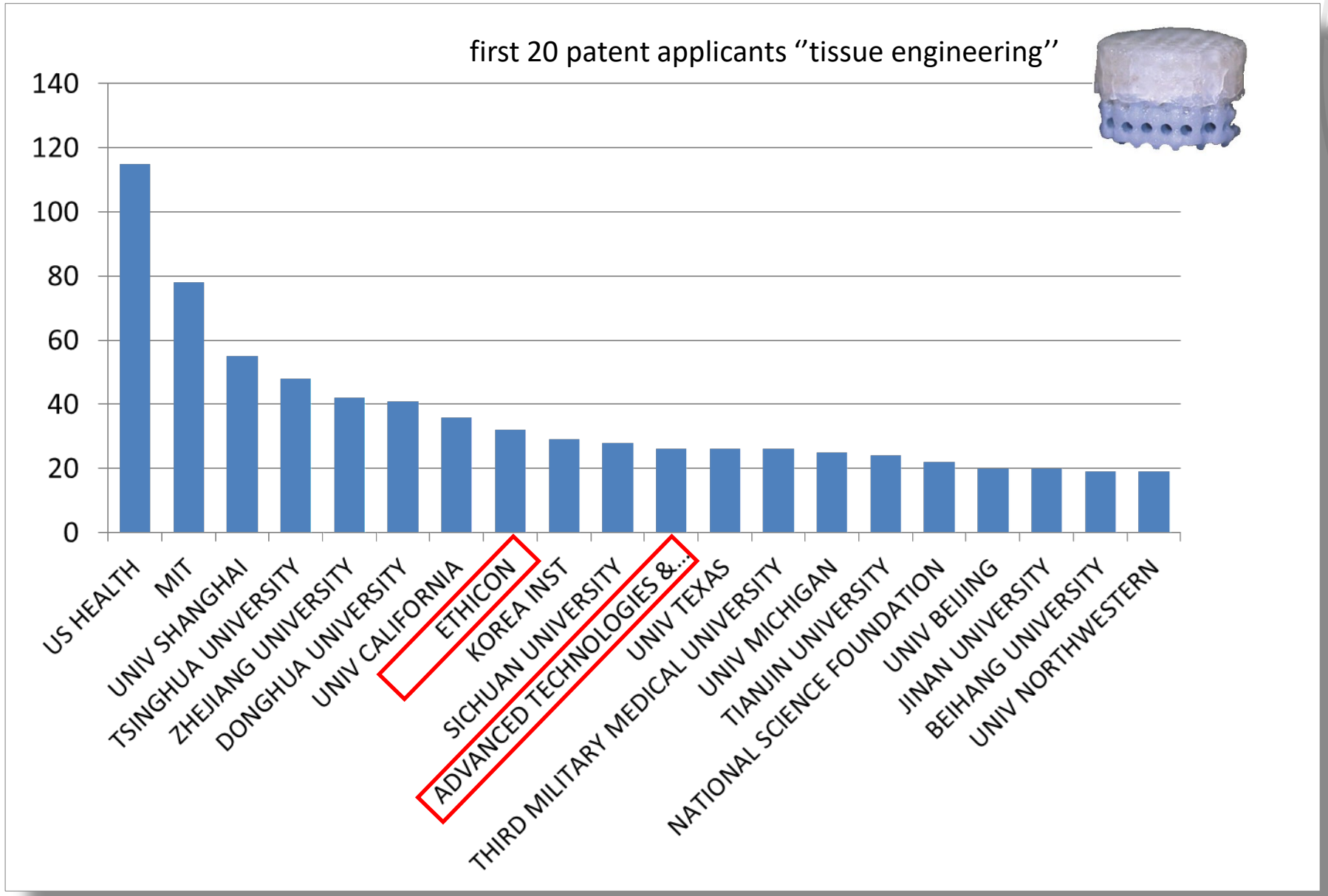


patent applicants

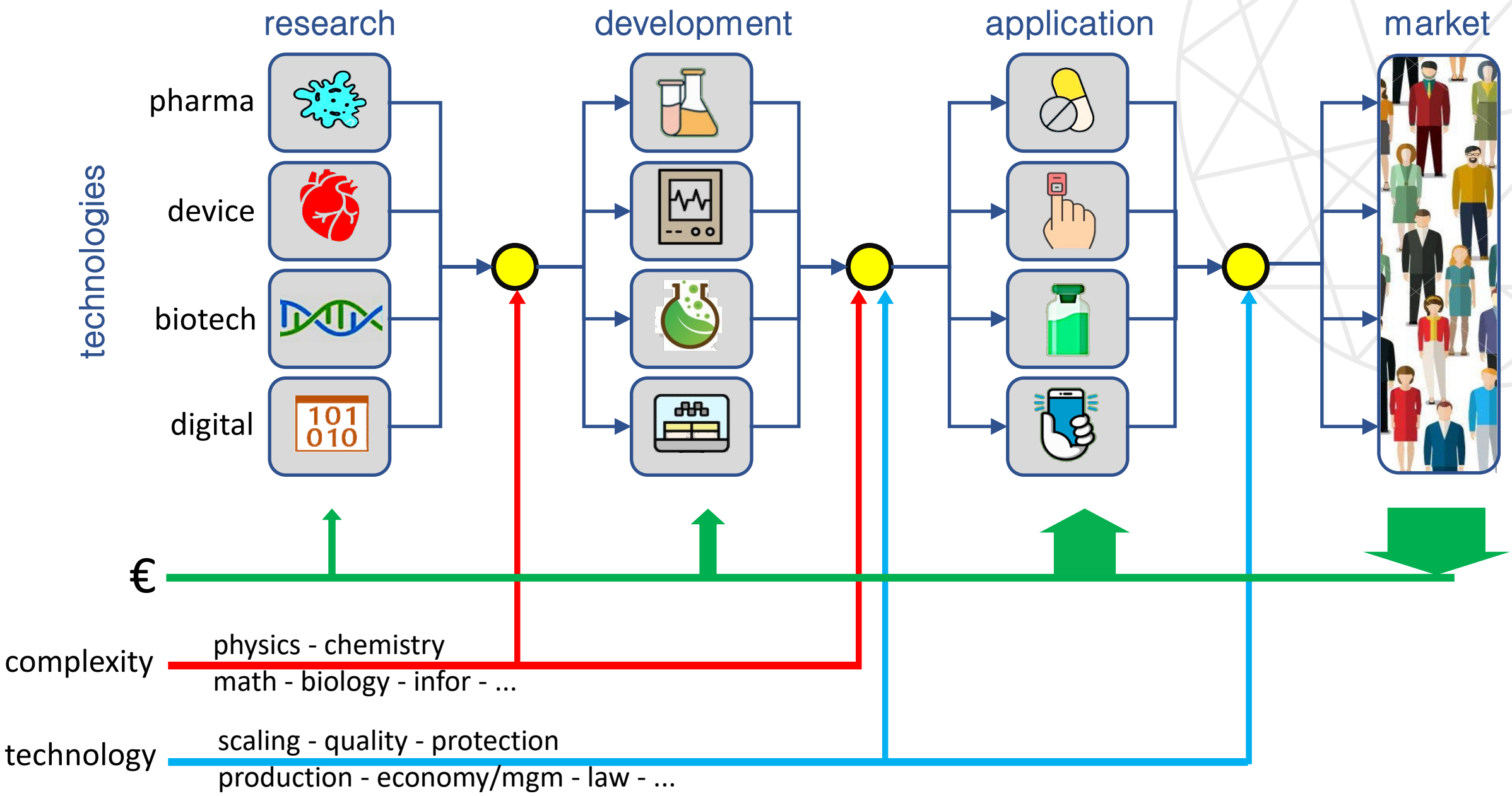


patent applicant networks
''joint prosthesis''

patent applicants



patent applicant networks
''tissue engineering''


research
development
application
market
technologies
pharma
device
biotech
digital
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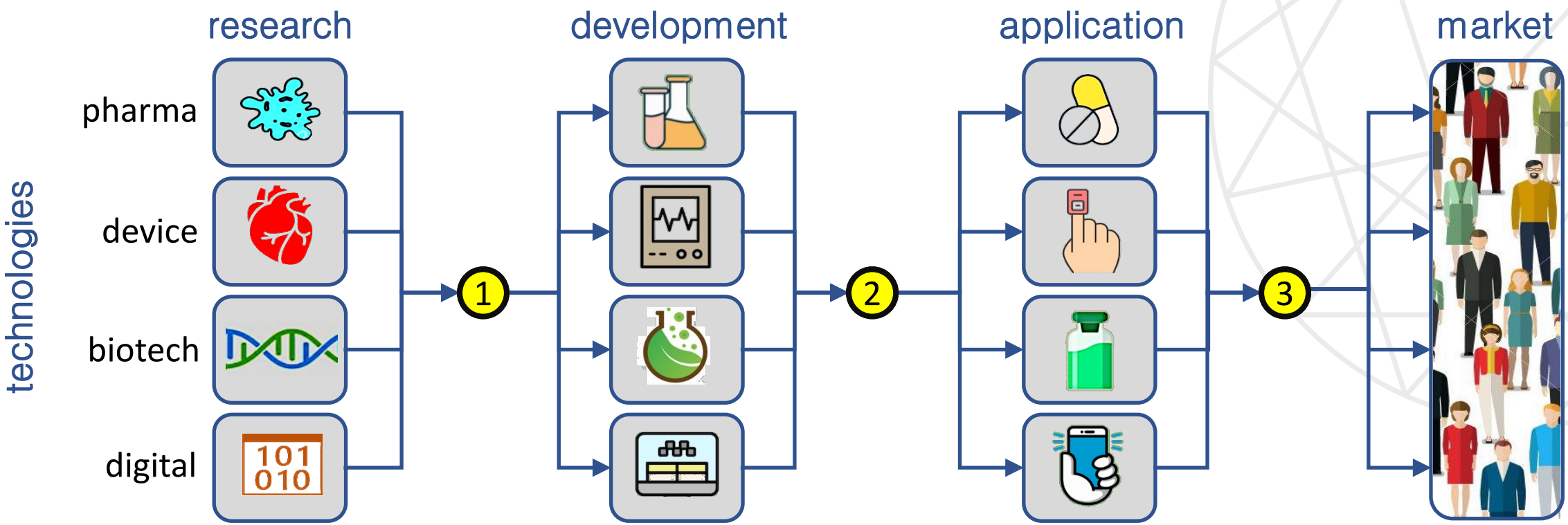
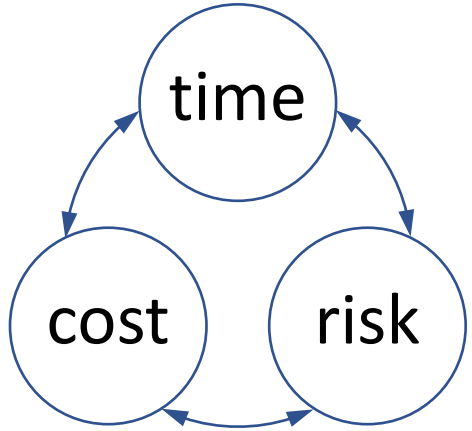
complexity
physics - chemistry
math - biology - infor - ...
technology
scaling - quality - protection
production - economy/mgm - law - ...

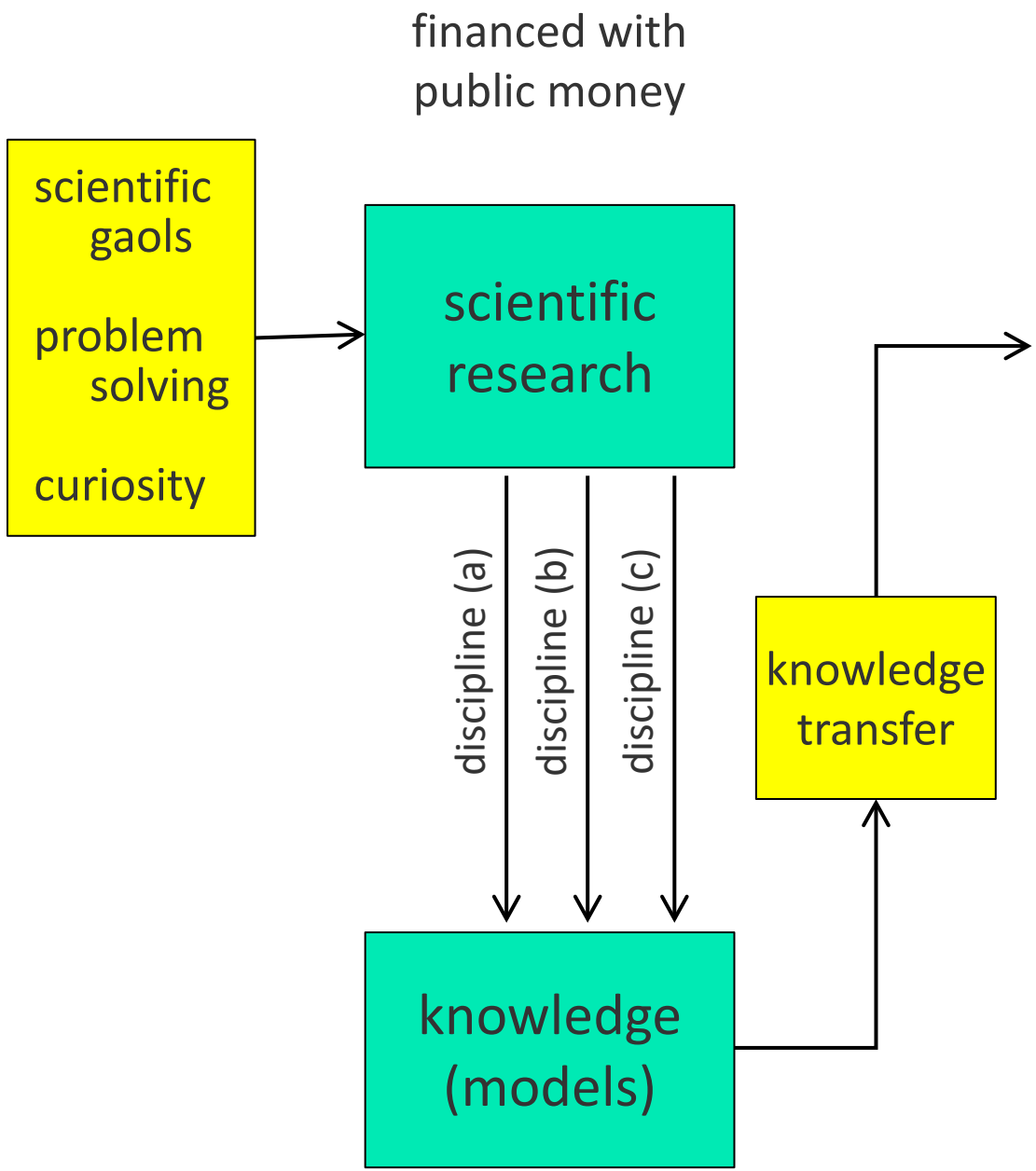


1 knowledge transfer (KT)

2 technology transfer (TT)

3 impact (I)



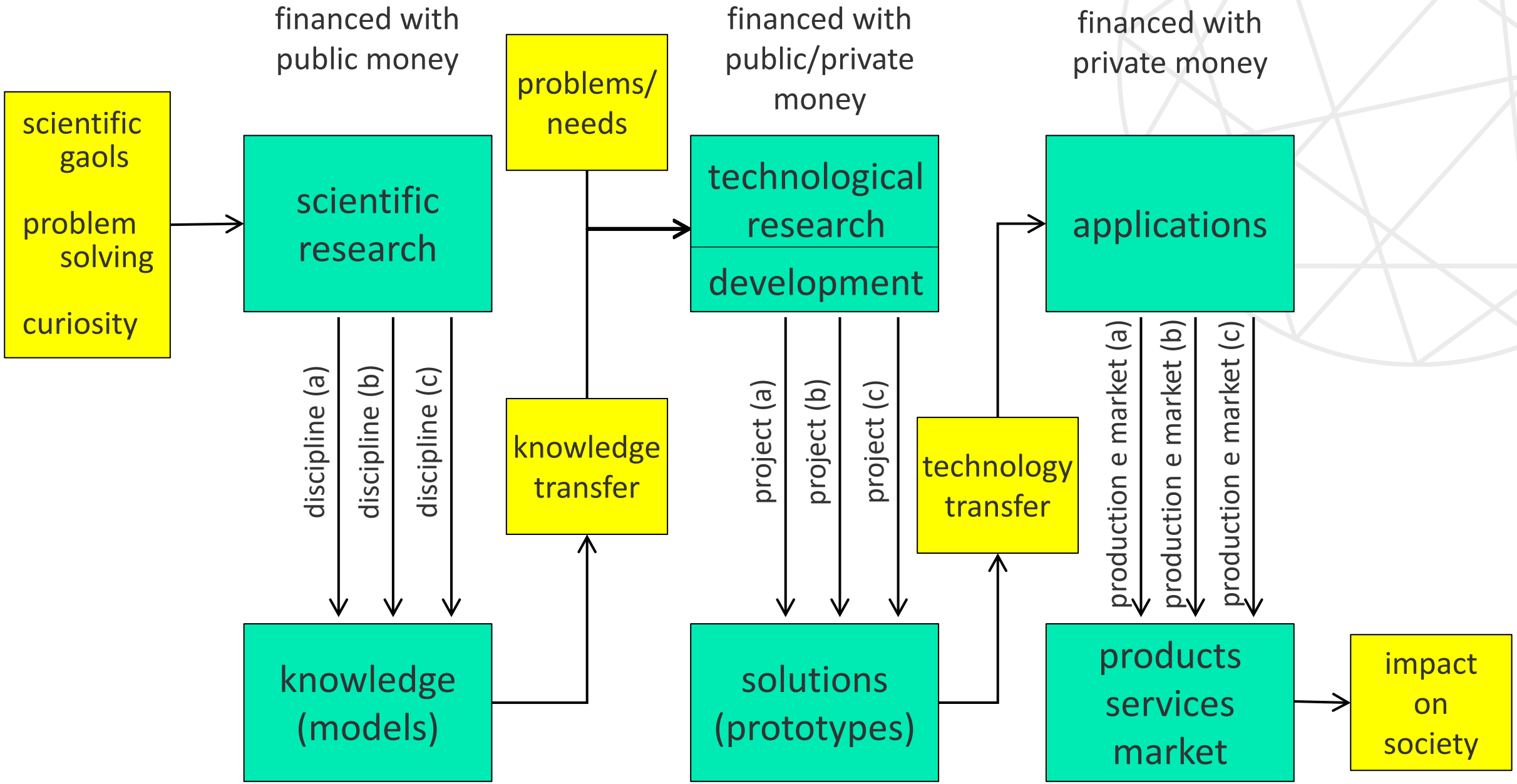


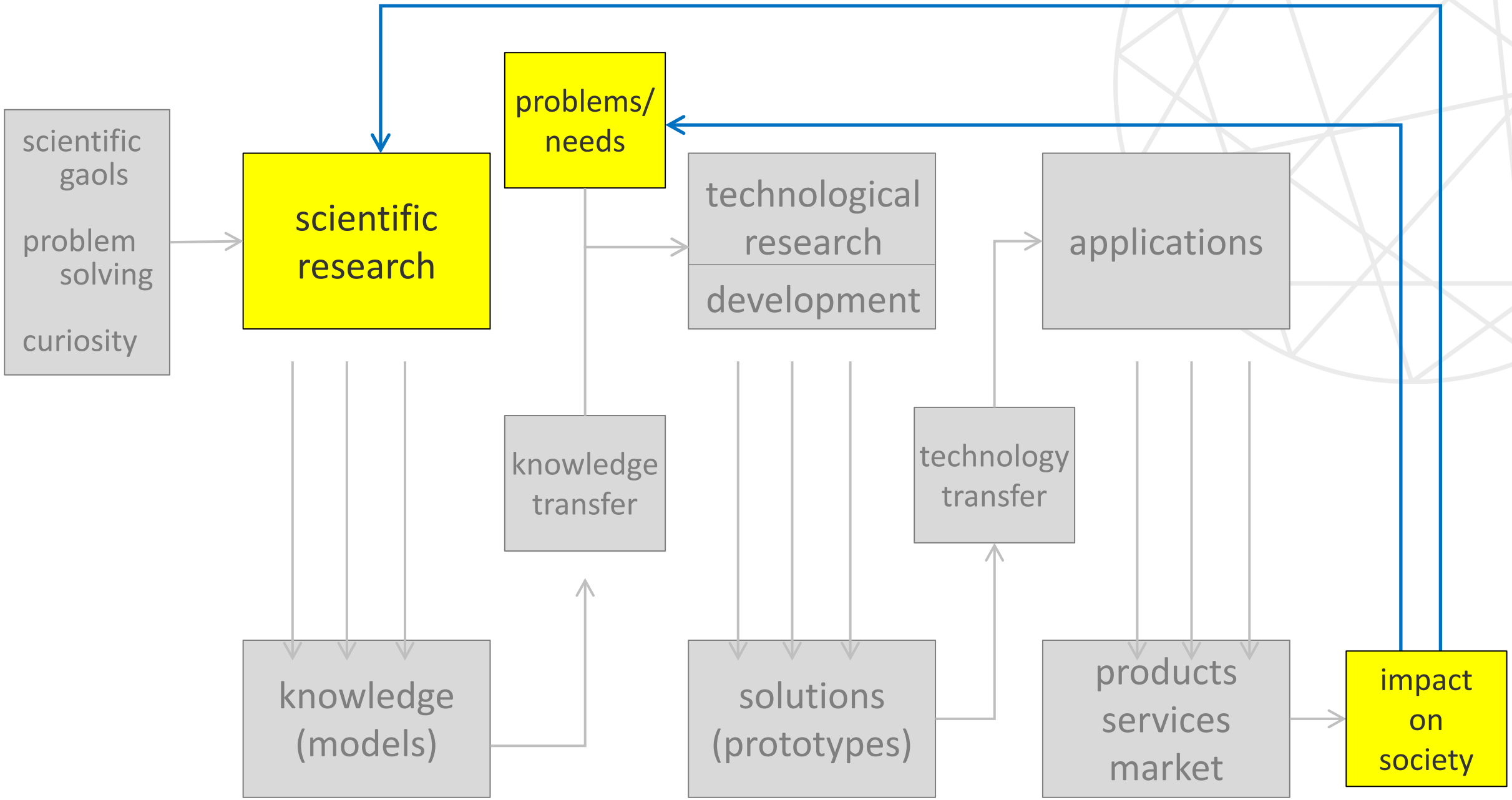
the scientific research is:

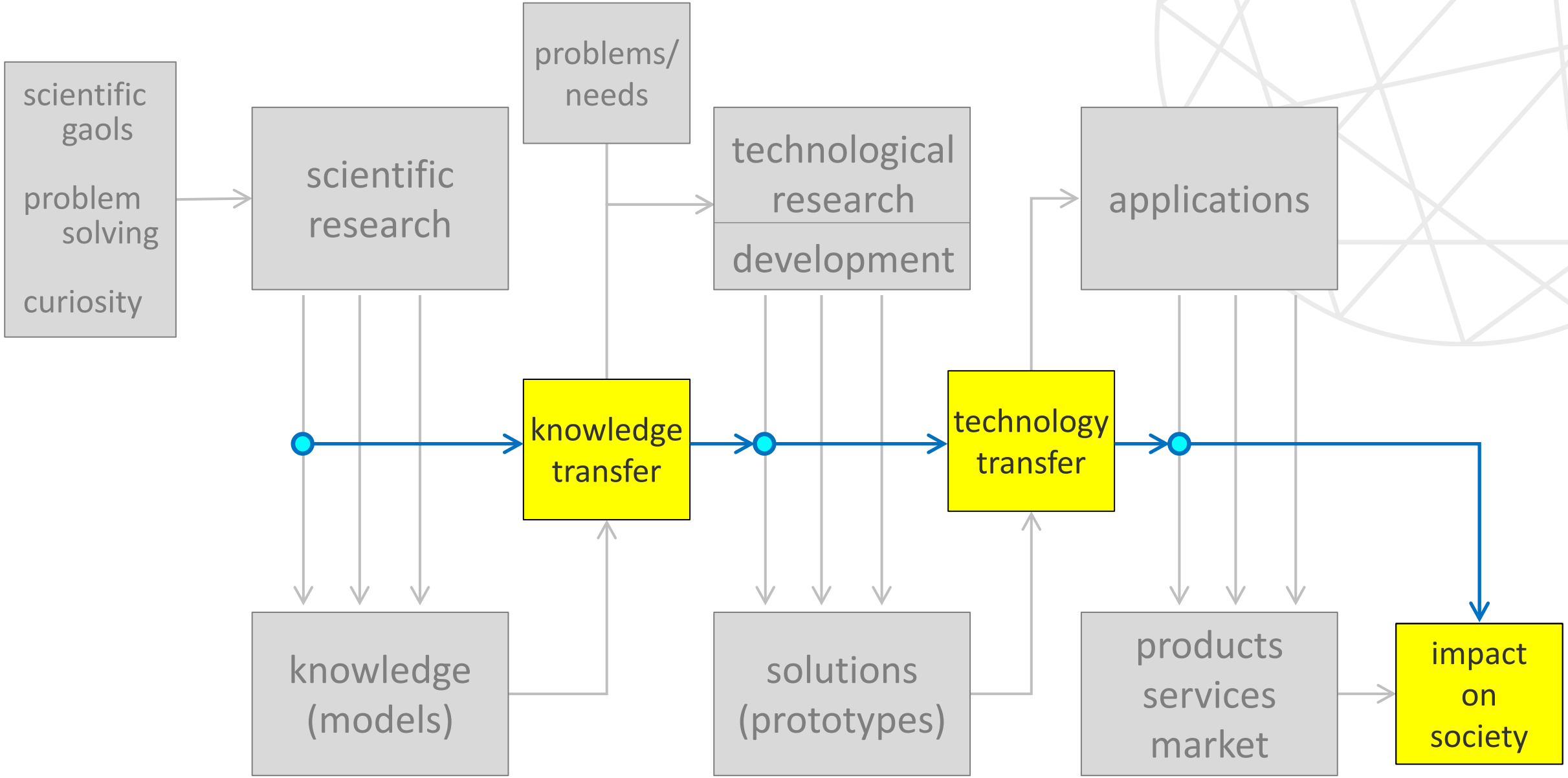
- independent
- disciplinary
- financed with public money

is the knew knowledge:

- useful?
- when?
- how?


financed with public money
financed with public/private money
financed with private money
scientific gaols
problem solving
curiosity
scientific research
problems/ needs
technological research
development
applications
discipline (a)
discipline (b)
discipline (c)
knowledge transfer
project (a)
project (b)
project (c)
technology transfer
production e market (a)
production e market (b)
production e market (c)
knowledge (models)
solutions (prototypes)
products services market
impact on society


scientific gaols
problem solving
curiosity
scientific research
problems/ needs
technological research
development
applications
knowledge transfer
technology transfer
knowledge (models)
solutions (prototypes)
products services market
impact on society


scientific gaols
problem solving
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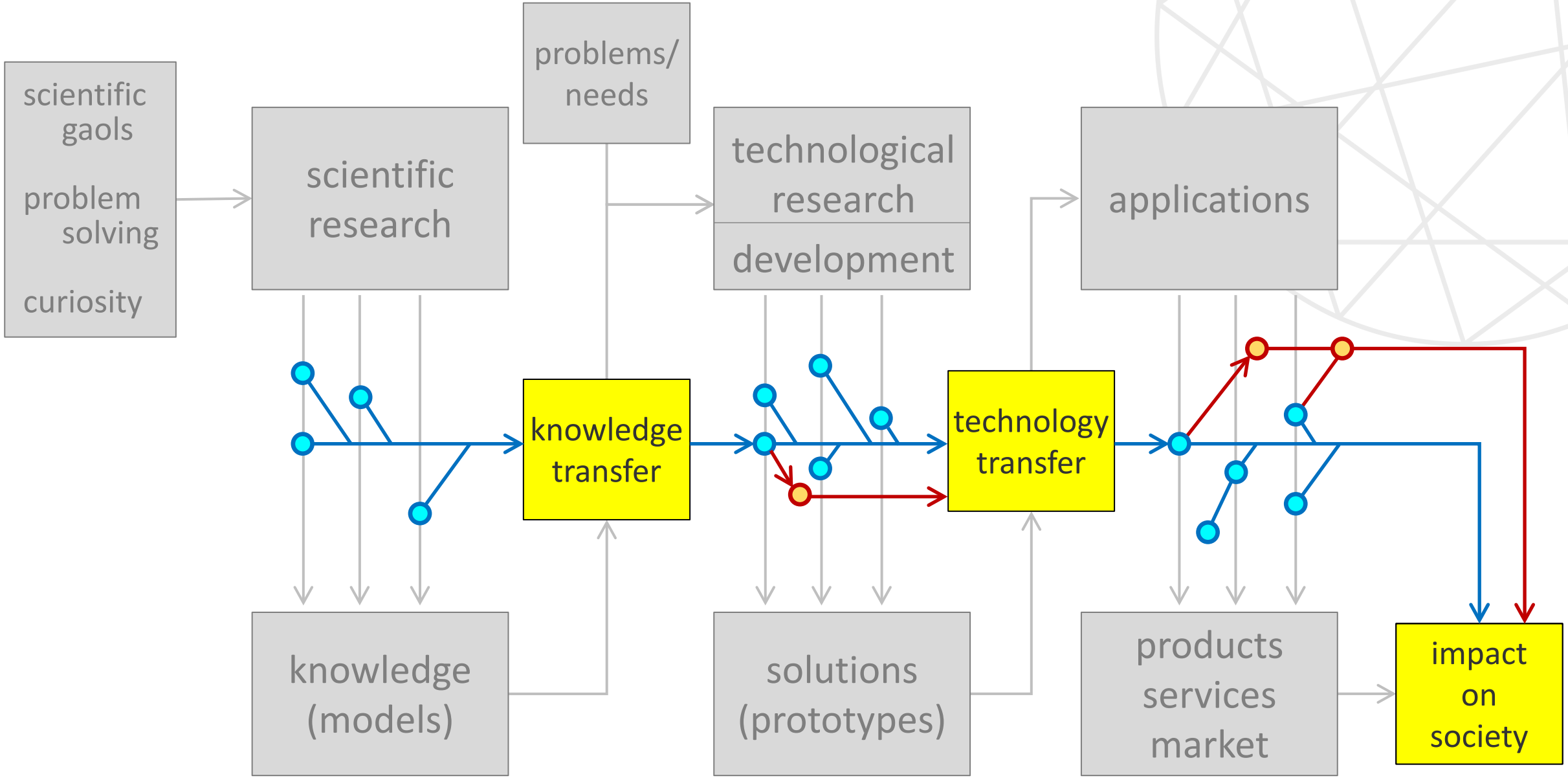
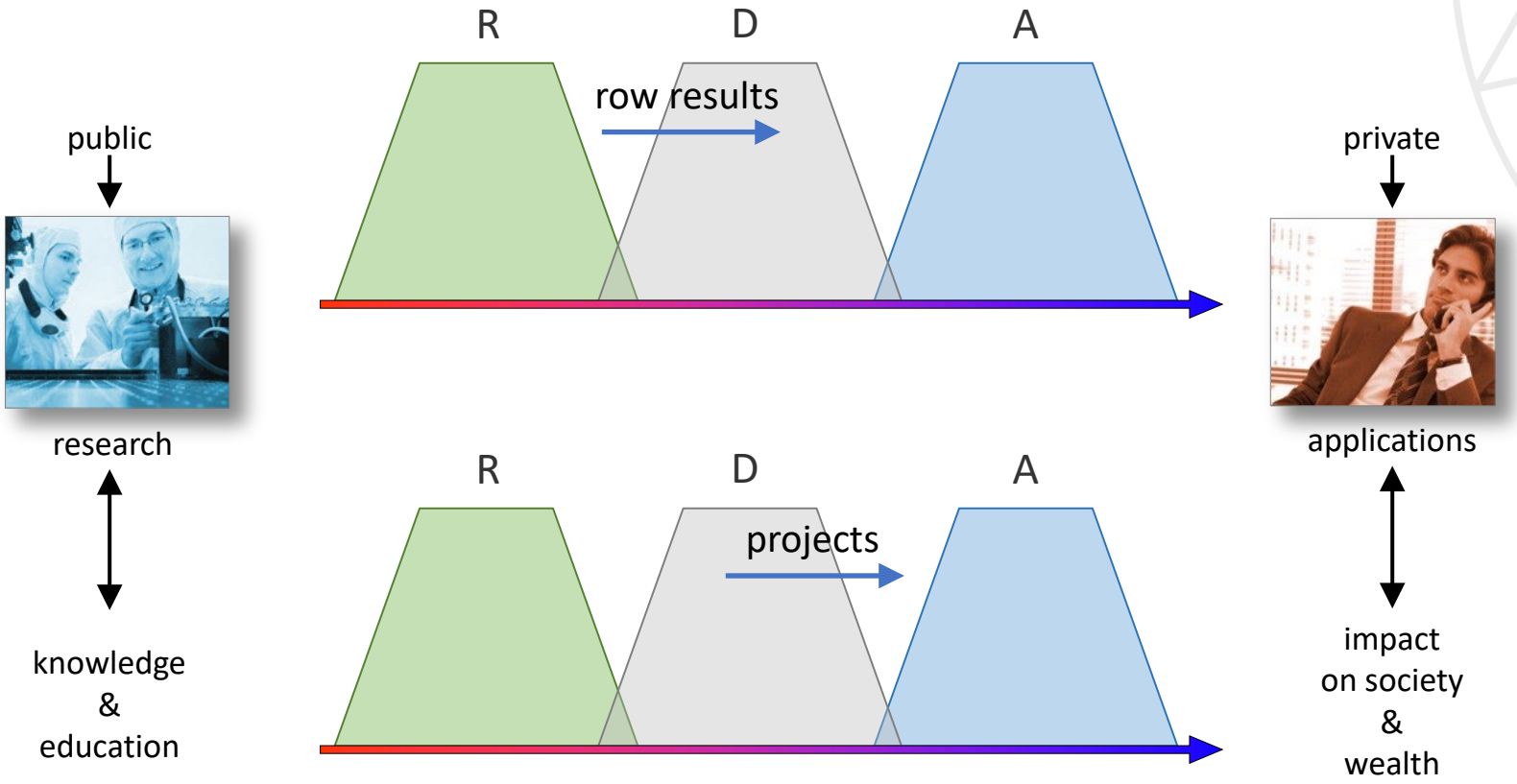
scientific research
problems/ needs
technological research
development
applications
knowledge transfer
technology transfer
knowledge (models)
solutions (prototypes)
products services market
impact on society


scientific gaols
problem solving
curiosity
scientific research
problems/ needs
technological research
development
applications
knowledge transfer
technology transfer
knowledge (models)
solutions (prototypes)
products services market
impact on society


R
D
A
row results
public
private
research
applications
R
D
A
projects
knowledge
&
education
impact
on society
&
wealth

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