Academia-Industry

Linda van de Burgwal, PhD

23 January, 2020

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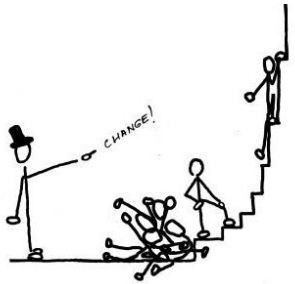

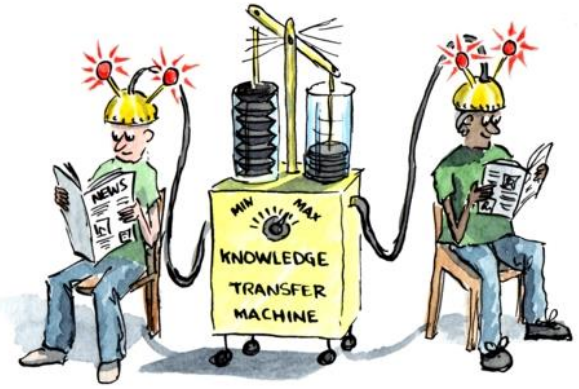

VALORISATION

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First money flow

Second money flow

Third money flow

EDUCATION

RESEARCH

SOCIETAL IMPACT

REVENUE

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First money flow

Second money flow

Third money flow

Fourth money flow

EDUCATION

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Definition of knowledge valorisation

- Whereas
- ***knowledge transfer*** highlights the formal transfer of academic knowledge to parties in the commercial sector for economic benefit,

- ***knowledge valorisation*** takes a broader scope and looks at "the creation of societal value from knowledge by translating research findings into innovative products, services, processes and/or business activities".

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Farming [1]
(land)

Industrial age[2]
(labour)

Knowledge society[3]
(Innovation)

Societies are moving toward
the *(knowledge)* society

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"Just as castles provided the source of strength for medieval towns, and factories provided prosperity in the industrial age,

universities are the source of strength in the knowledge-based economy of the twenty-first century."

Lord Dearing (September 2002)

Public money

Grants and subsidies

Contract research

University income

EDUCATION

RESEARCH

SOCIETAL IMPACT

REVENUE

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Societal Impact of Knowledge has Four Pillars

- Knowledge for knowledge

  (scientific, curiosity-driven research)

- Knowledge for culture

  (dissemination to and involvement of the general public)

- Knowledge for welfare (€)

  (products or services)

- Knowledge for wellbeing

  (policy advice, guidelines)

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Societal Impact of Knowledge has Four Pillars

Table 1 Framework for a broad societal impact of knowledge with examples for knowledge production, exchange and use within each of the domains

	Academic orientation with an impact on knowledge	Civil society orientation with an impact on culture	Entrepreneurial orientation with an impact on economy	State-governmental orientation with an impact on wellbeing
Knowledge production	Scientific publications	Lay publications	Patents, products	Guideline development, professional publications
Knowledge exchange	Lectures, scientific consultations	Speeches, courses for general public	Consultancy, contract research	Membership of professional associations, participation in policy research
Knowledge use	Citations	Use of (school) books	Use of patents and products	Use of guidelines Implementation of advice

van de Burgwal, L. H., Dias, A., & Claassen, E. (2019). *The Journal of Technology Transfer*, *44*(1), 1-20.

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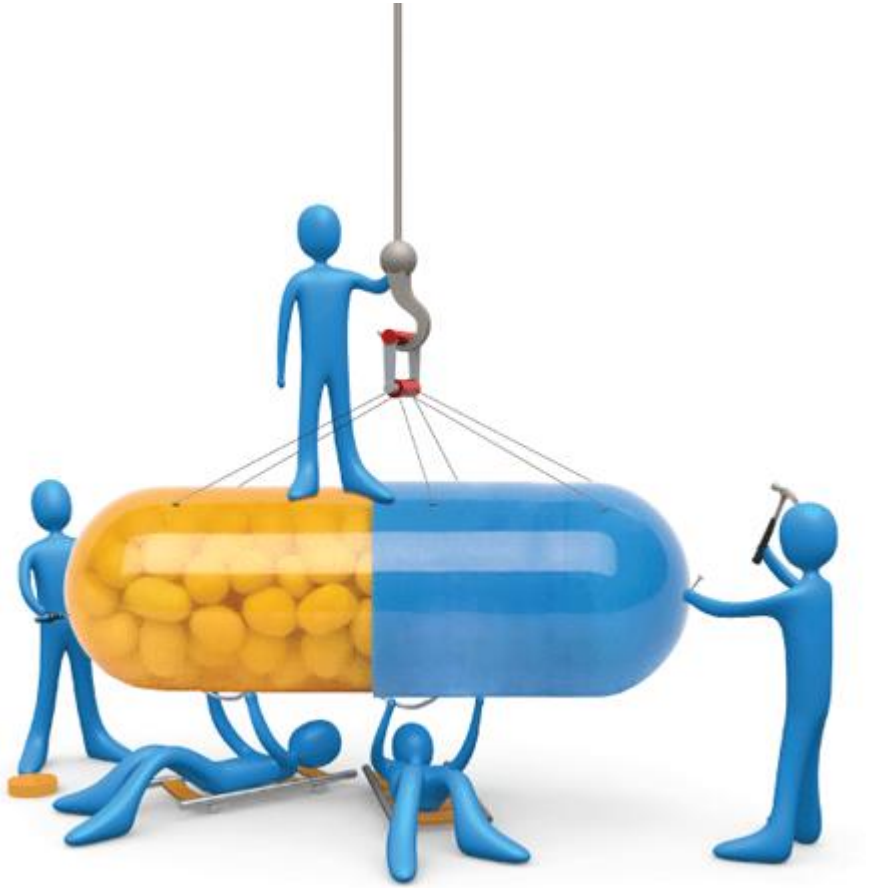

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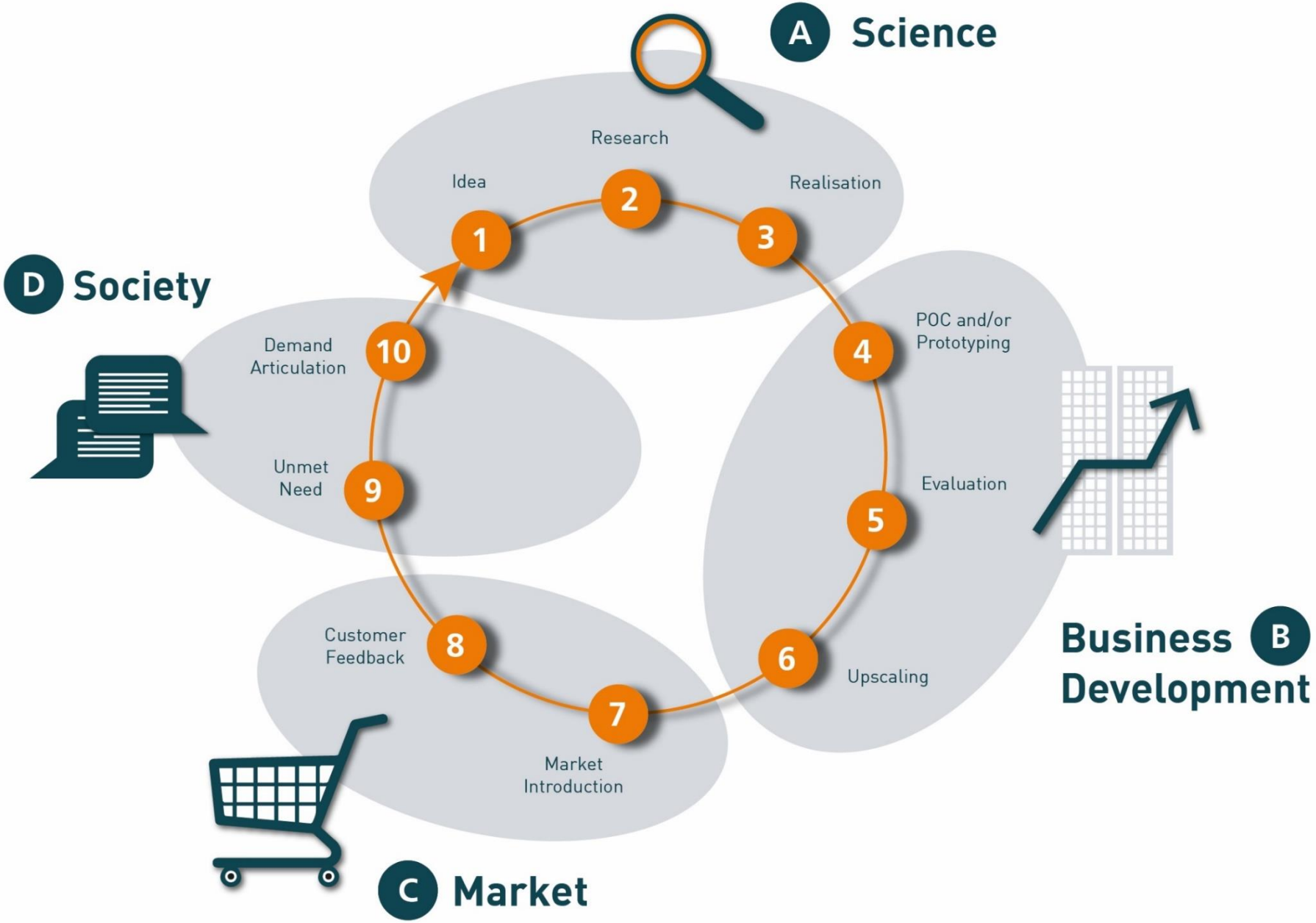

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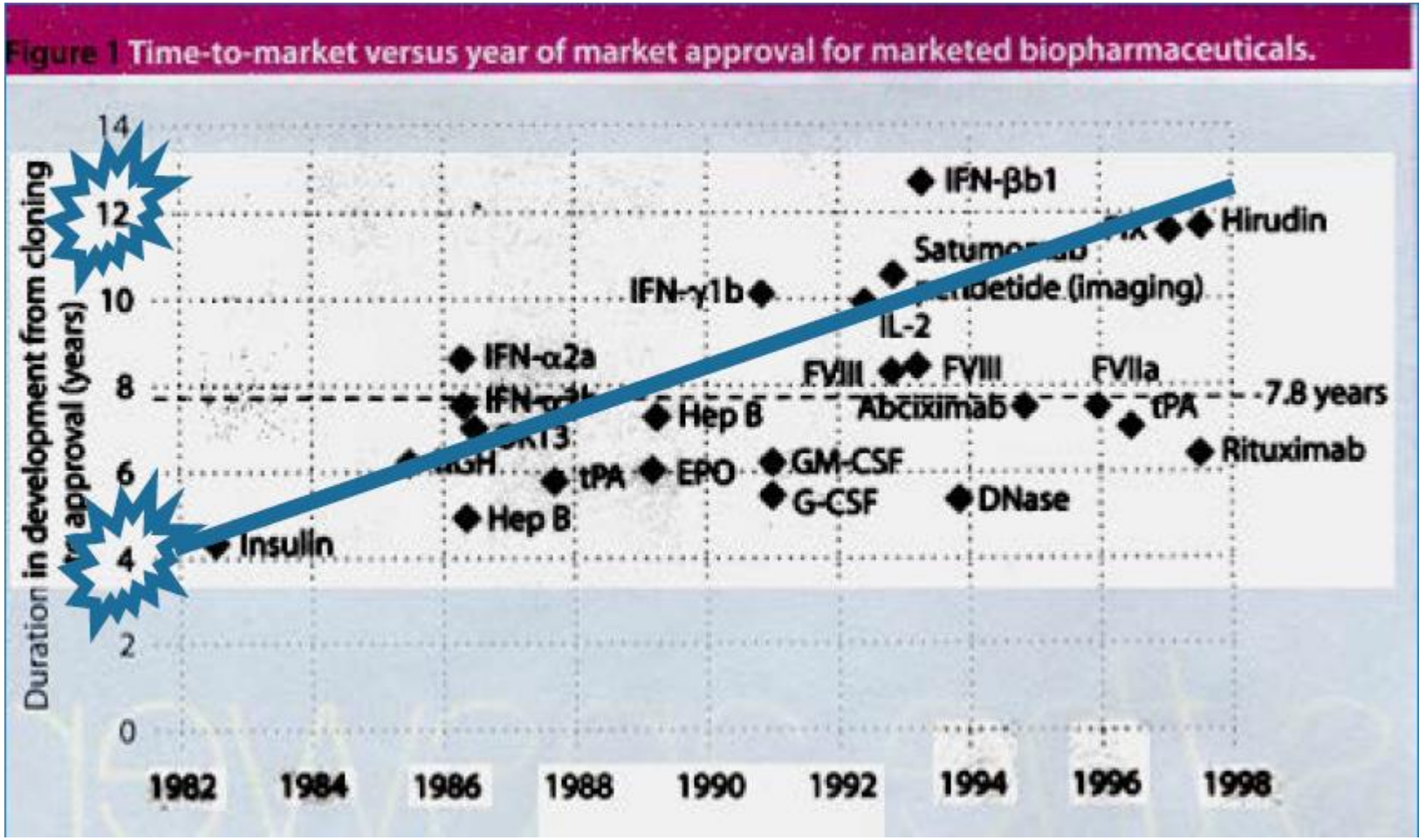
Drug development takes a lot of time…



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… money…

Figure 11: Increasing Cost to Develop One New Medicine

SOURCES: J. A. DiMasi and H. G. Grabowski, "The Cost of Biopharmaceutical R&D: Is Biotech Different?" *Managerial and Decision Economics*, 2007; J. A. DiMasi, *et al.*, "The Price of Innovation: New Estimates of Drug Development Costs," *Journal of Health Economics*, 2003.

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and innovation progr

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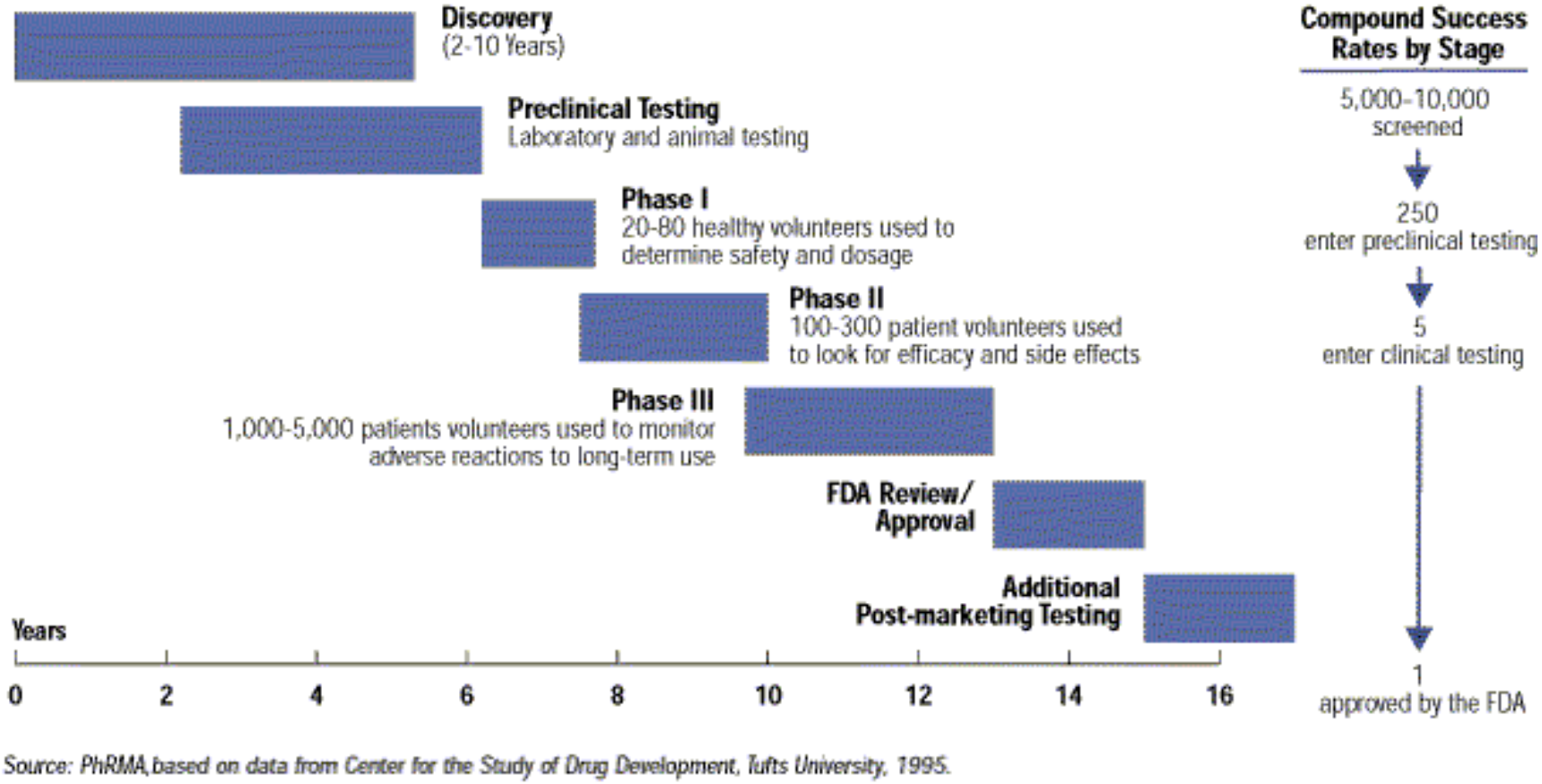
… is risky…



Source: PhRMA, based on data from Center for the Study of Drug Development, Tufts University, 1995.

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… and has become increasingly complex

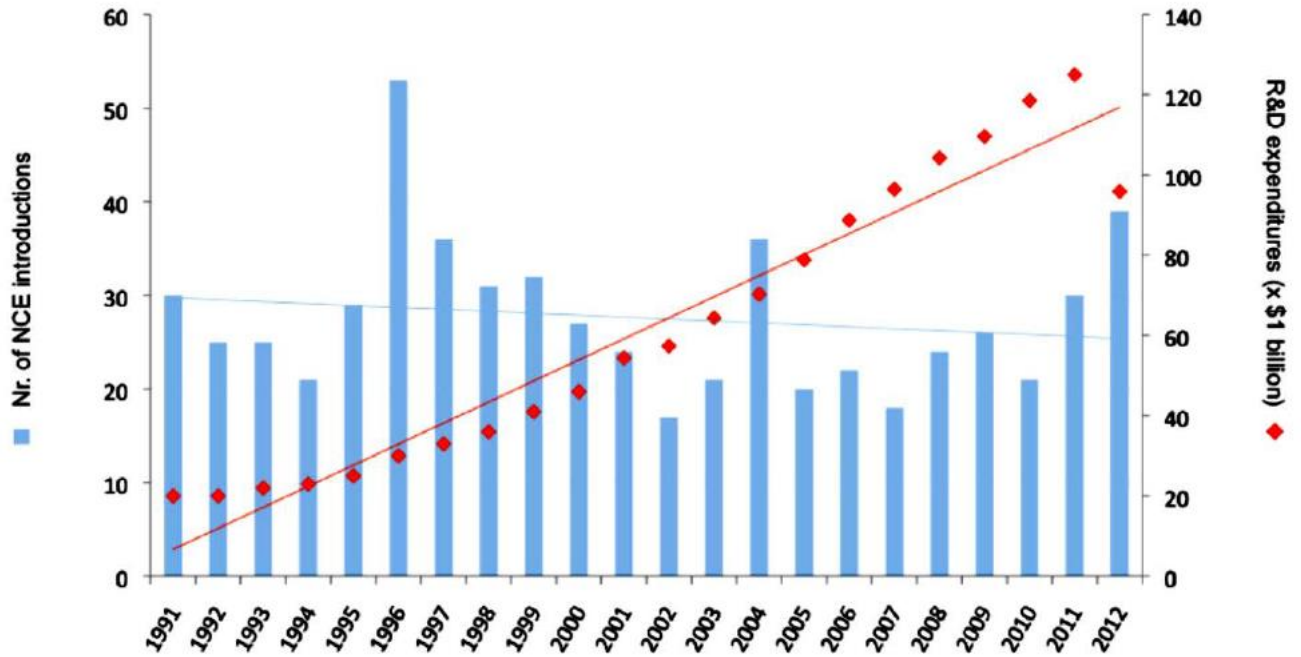

Figure 1. The pharmaceutical "productivity gap"; the considerable rise of R&D expenditures versus a stagnant pattern of New Chemical Entity (NCE) introductions (Data obtained from fda.gov, Medtrack and literature (Drews, 1998; EFPIA)).

Technology and Investment, 2013, 4, 168-178
http://dx.doi.org/10.4236/ti.2013.43020 Published Online August 2013 (http://www.scirp.org/journal/ti)

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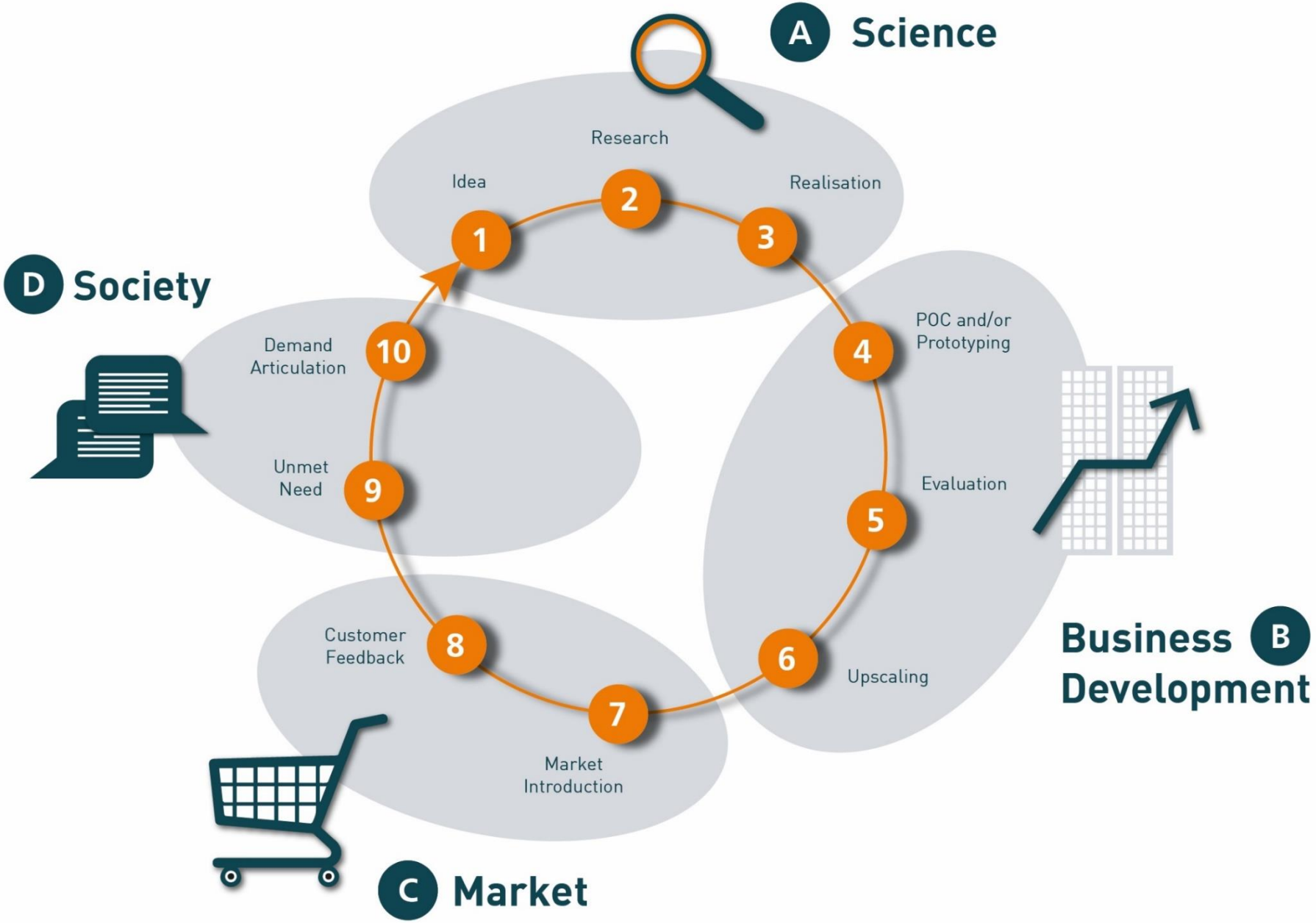
Now, consider your work at INITIATE.

How could you incorporate knowledge valorisation in your work?

This
and i



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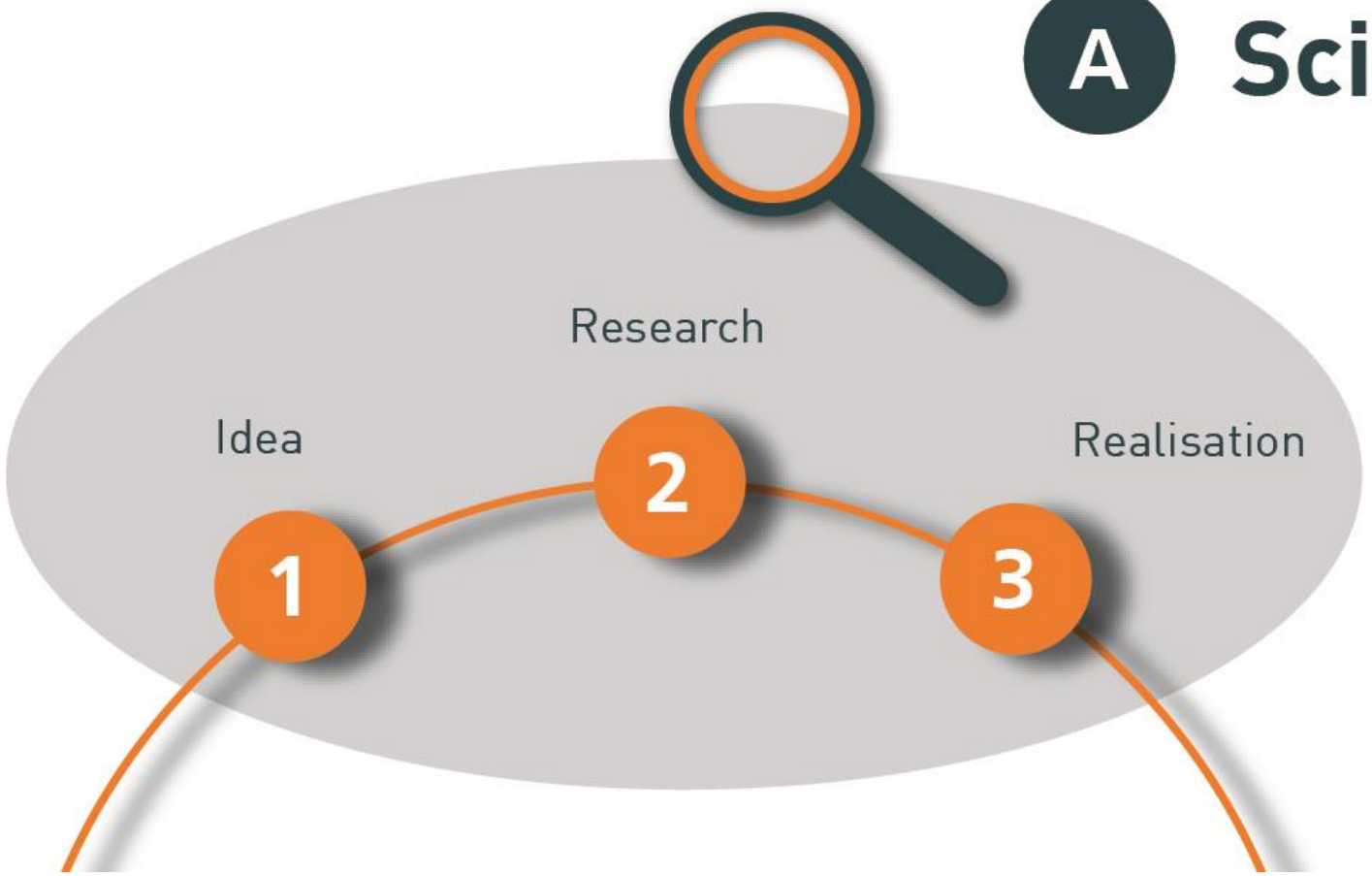
A Science



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Realization

publication (scientific / layman's / professional)
book
courses (MOOC)
report (policy / advisory)
guideline
database
instruments / tools
patent
designs
software
product
service

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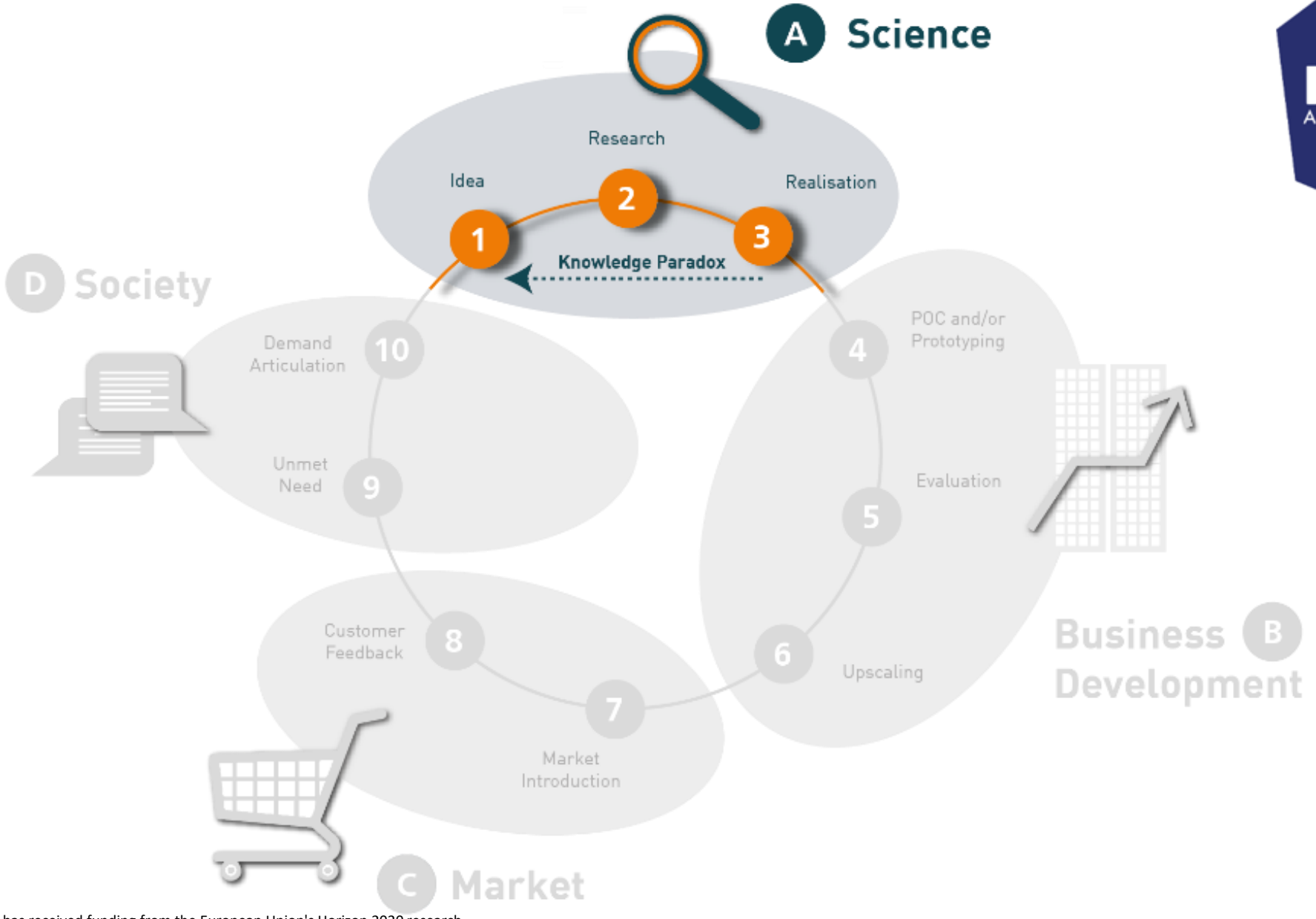

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Bridging the Knowlegde Gap

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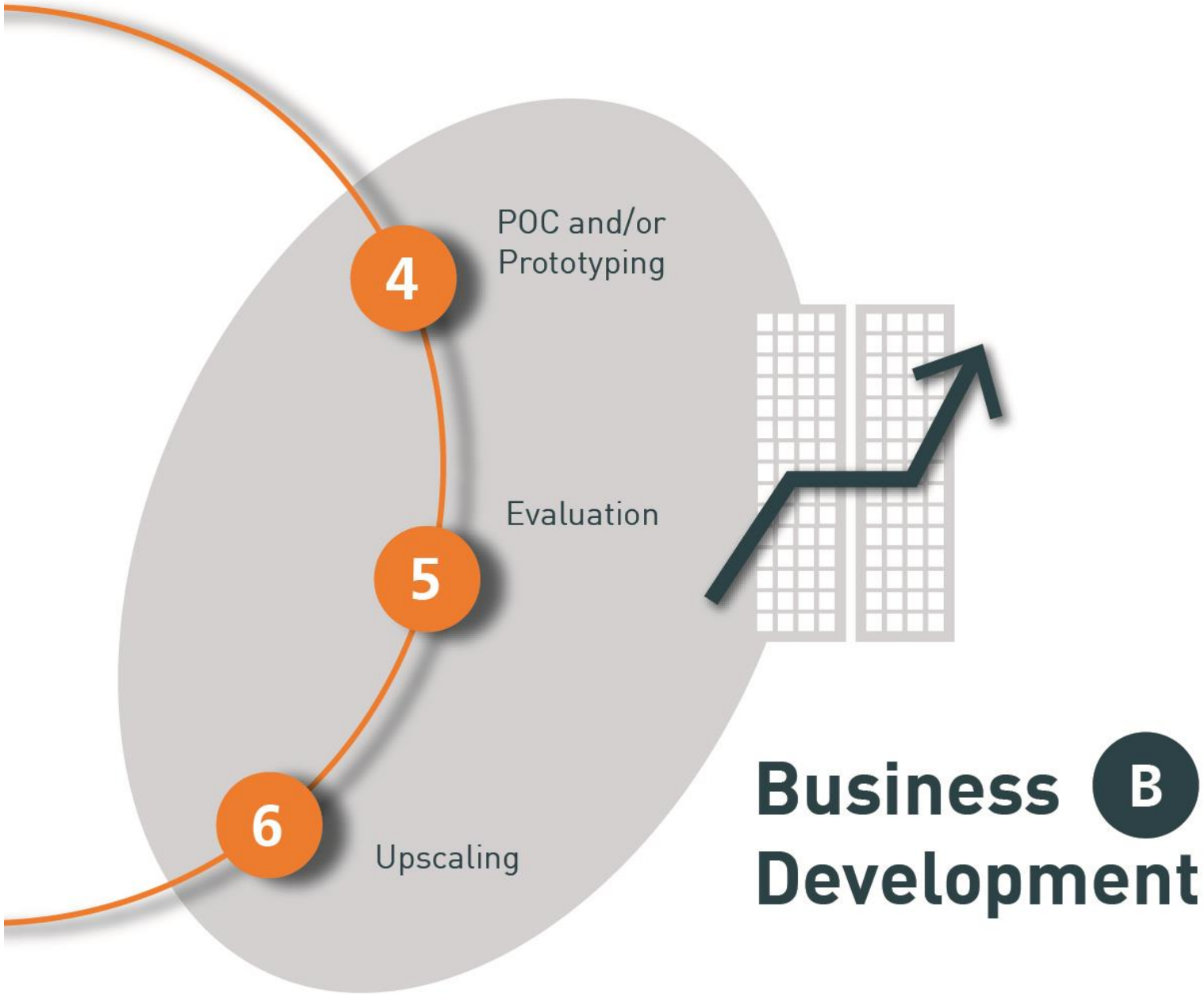

Business Development B

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MARIE CURIE ACTIONS

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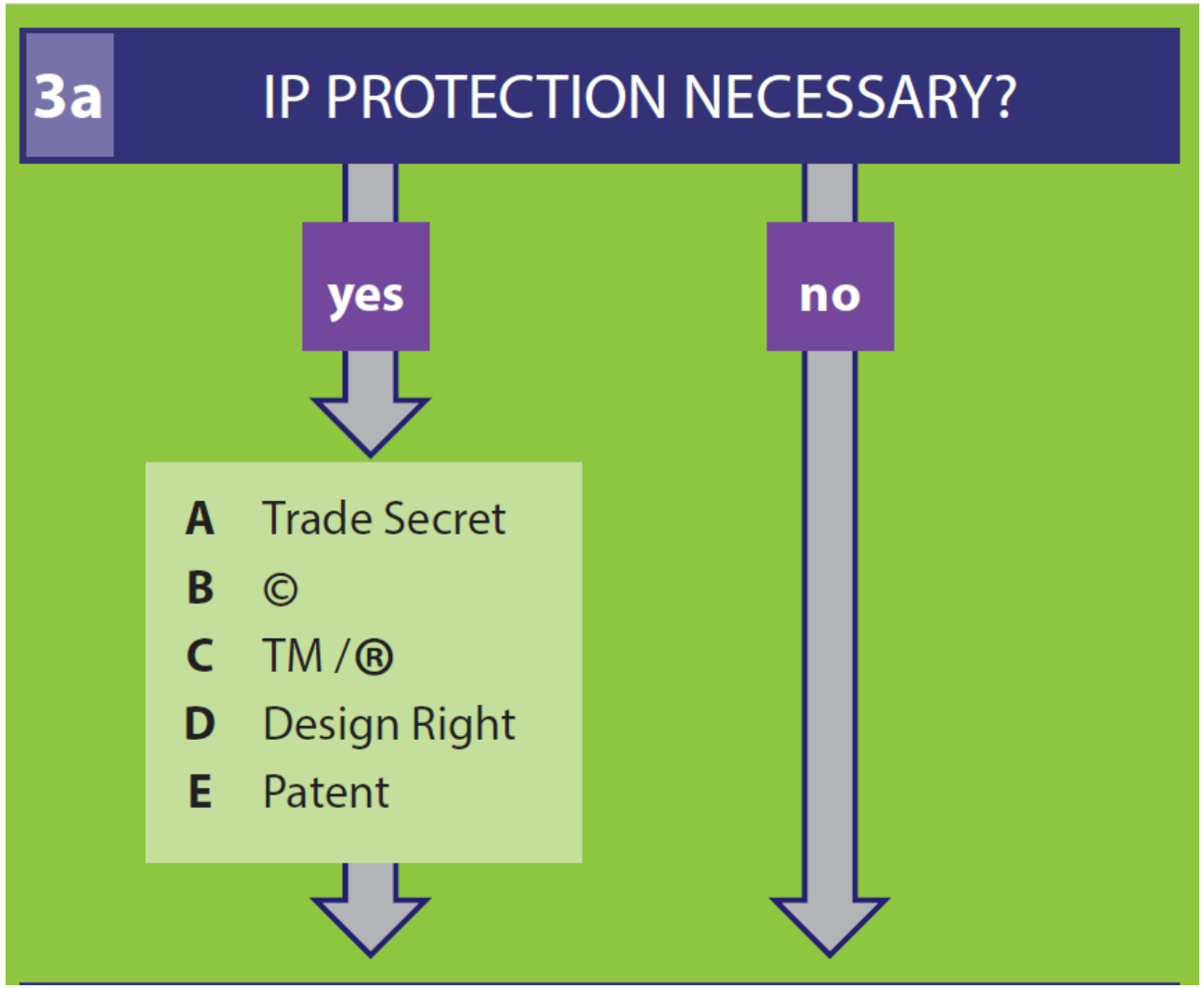

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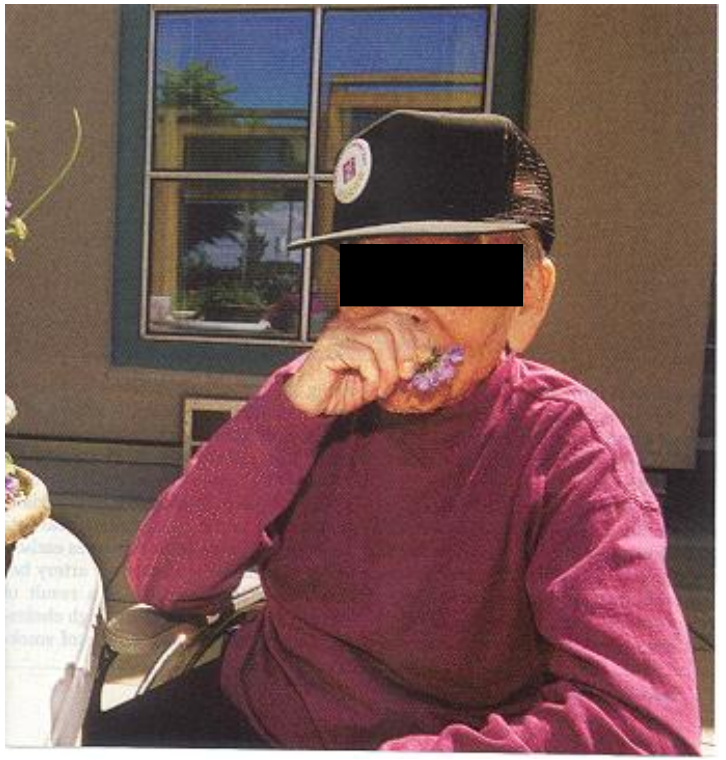
The patient’s perspective

- No patent
- No exclusivity
- No price premium
- No profit
- No investment
- No product
- No cure or treatment



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Intellectual property rights: ipr

Industrial rights:
(registration with governments)

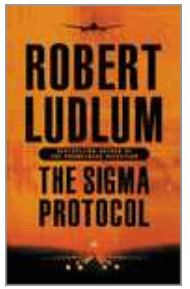
Patent law

Brands

Drawings and Model rights

Other rights:
(no registration necessary)

Copyright



Databases

Trade secrets

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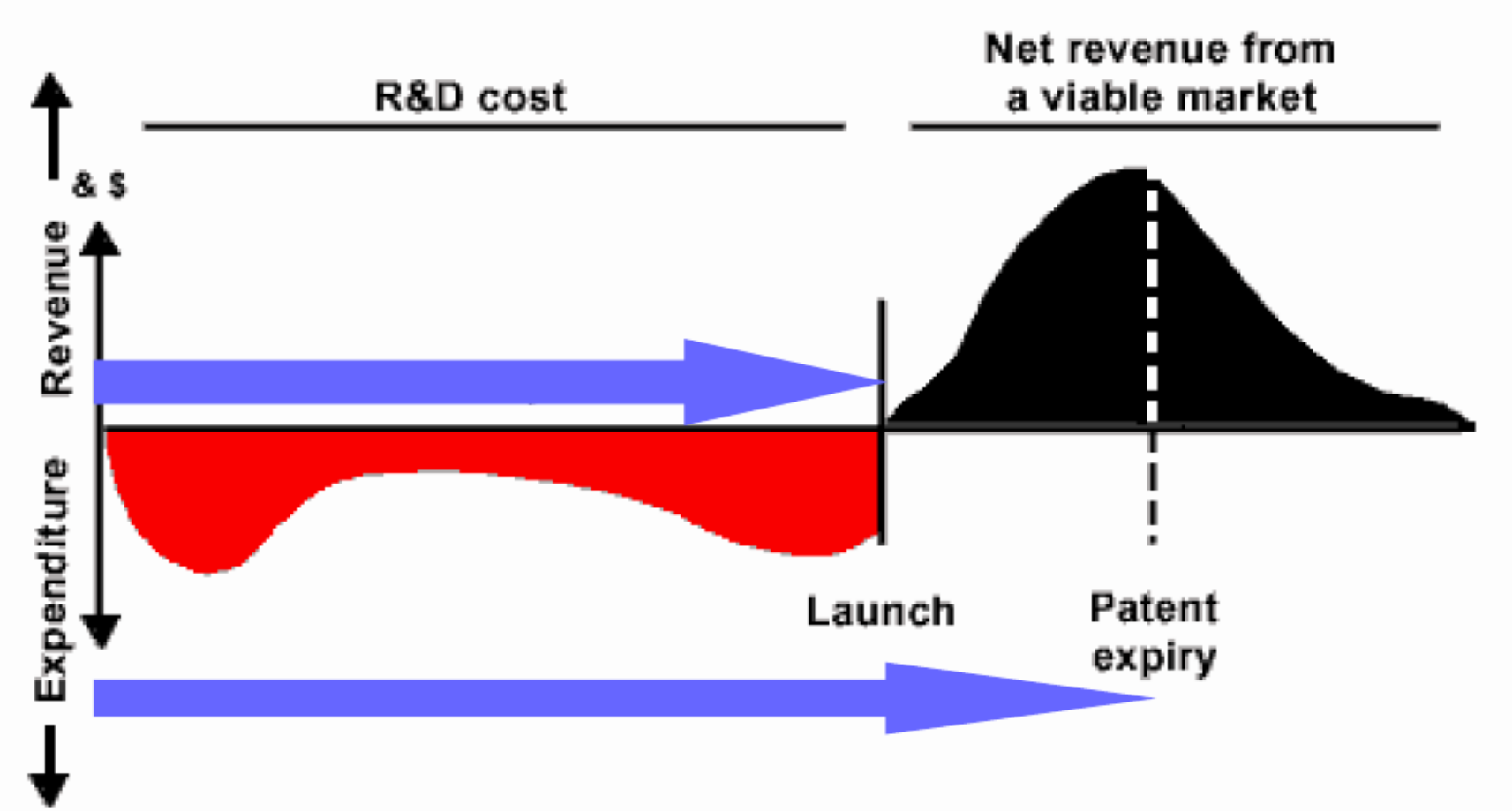

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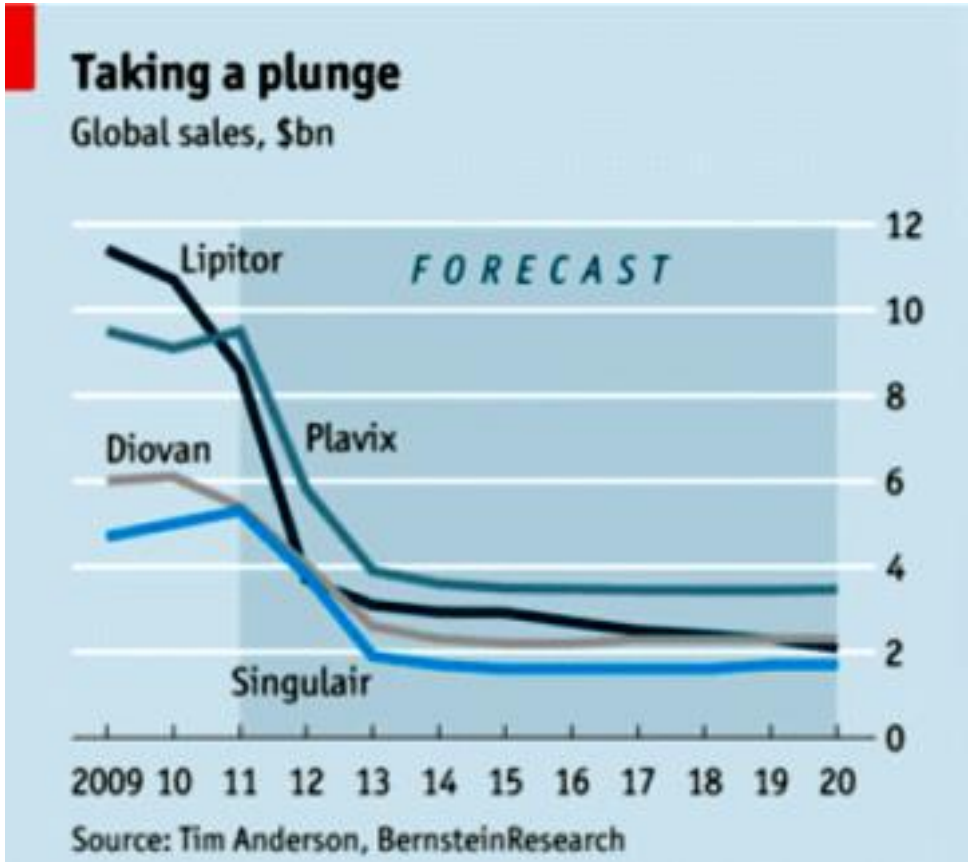

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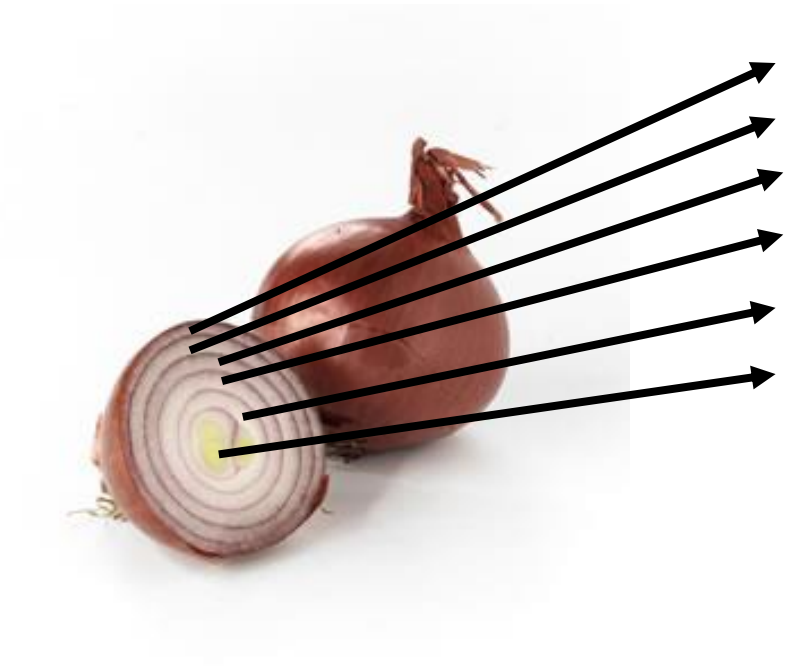
Intellectual property as layers around the core



1. REGISTERED TRADE MARK
2. BRAND
3. COPYRIGHT
4. REGISTRATION (DOSSIER)
5. PATENT
6. COMMERCIAL INTANGIBLES
7. MARKETING INTANGIBLES
8. TRADE SECRET
9. TECHNICAL INTANGIBLES

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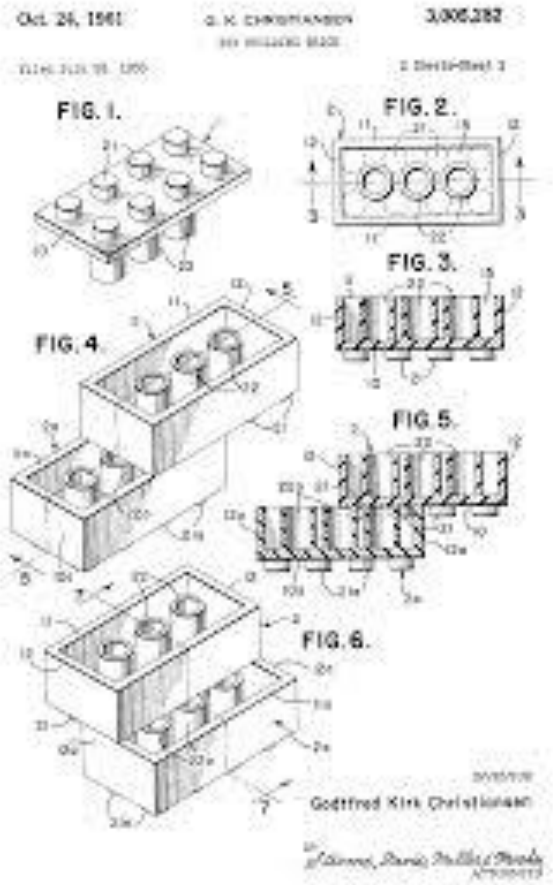
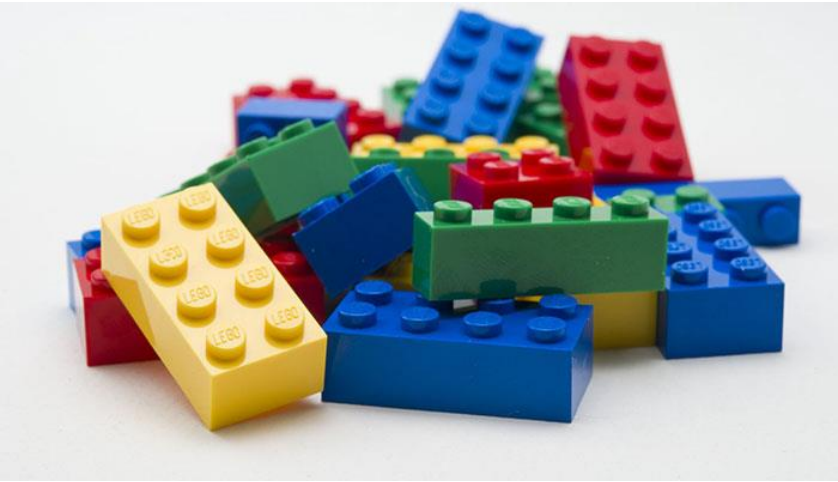
One product, multiple layers of protection

- Trademark
- Patent
- Copyright
- Design





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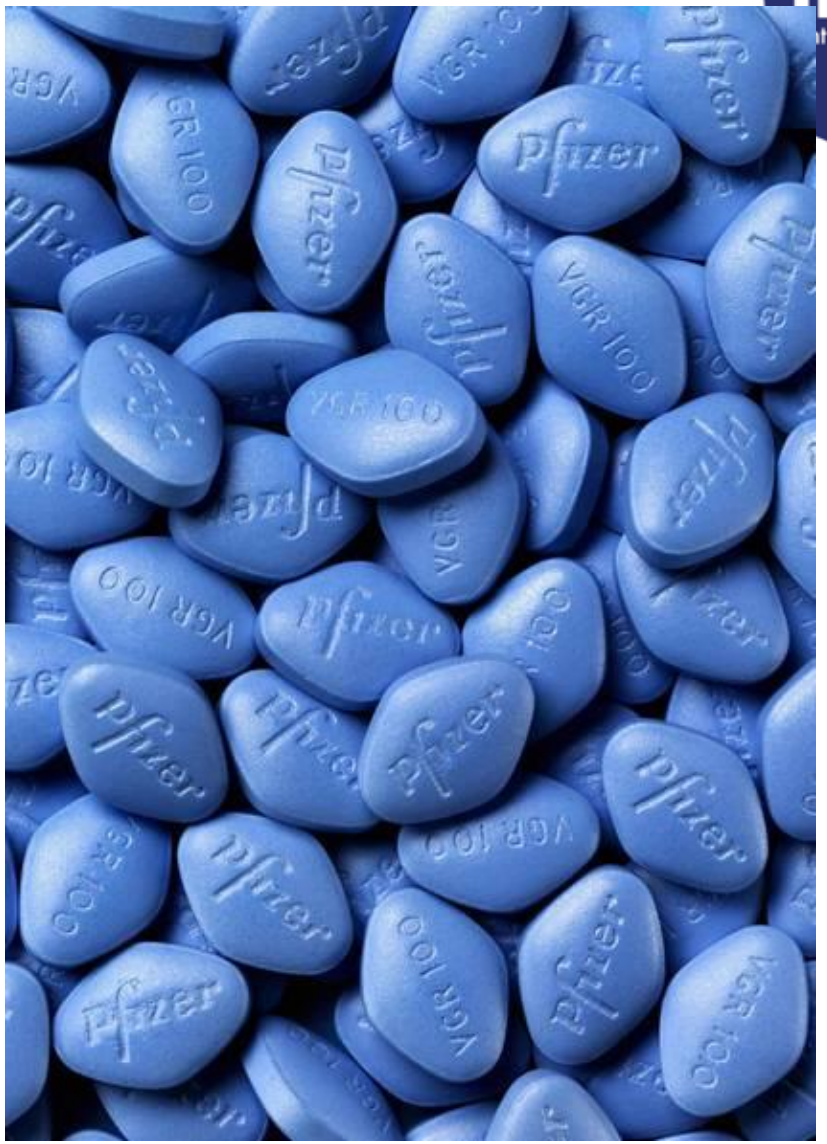
Famous anti-jet lag drug

- Original patent on reducing high blood pressure

- “sildefanil”



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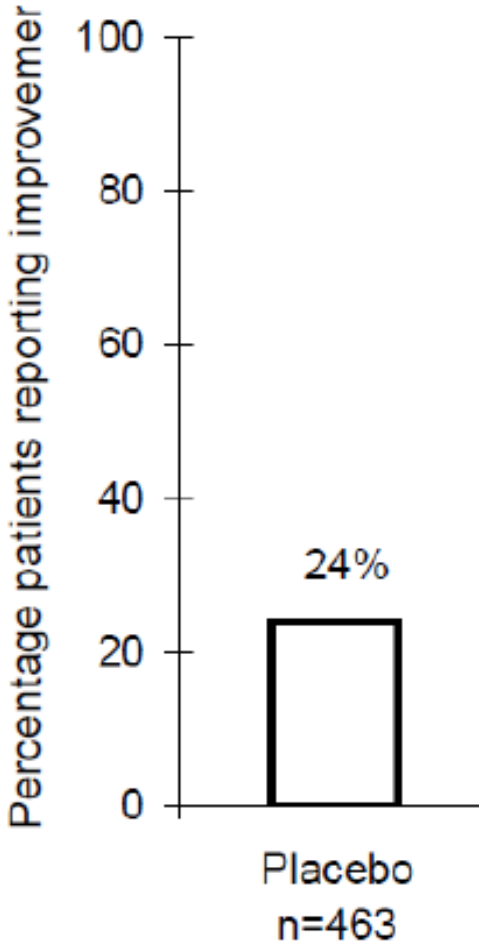
Placebo Effect: 24% report improvement on ‘fake’ Viagra



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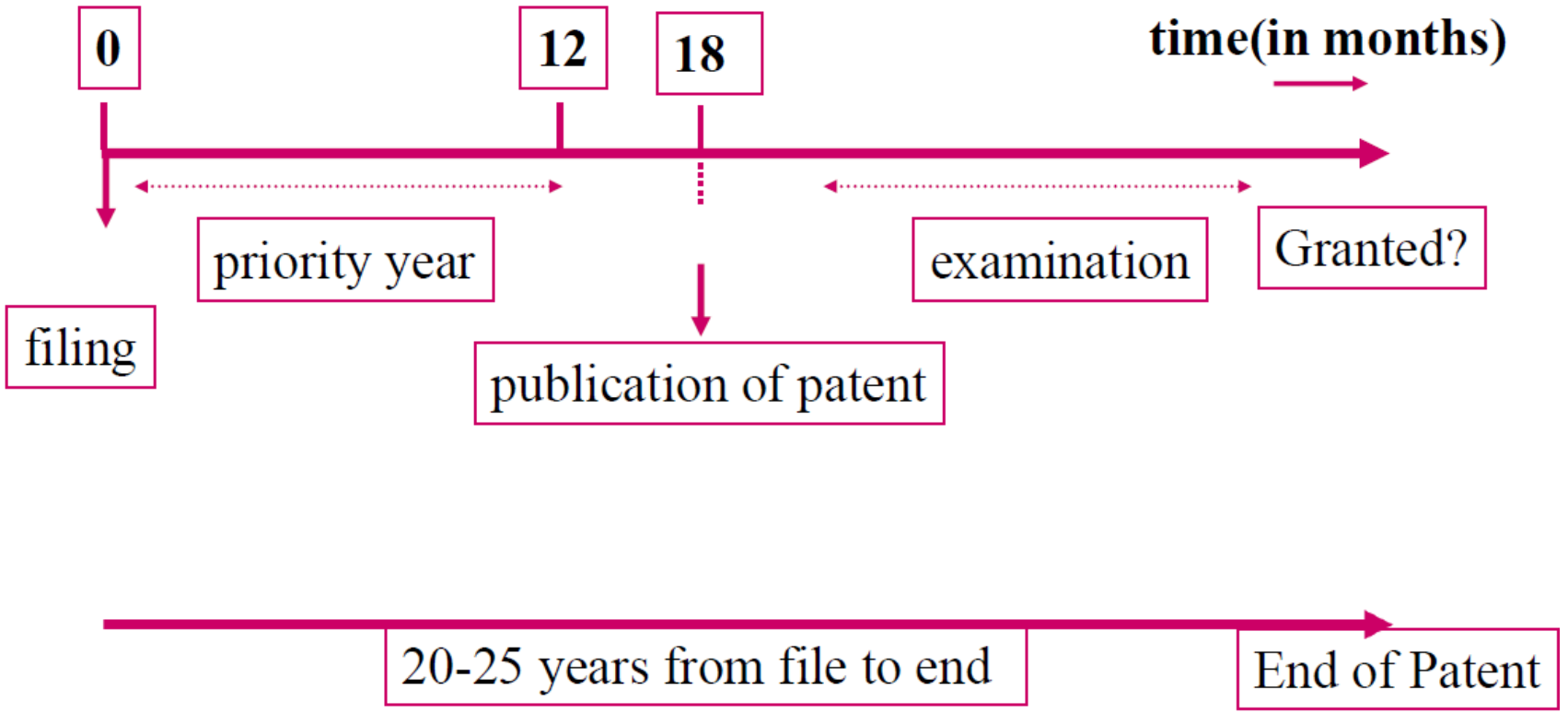
Patent procedure



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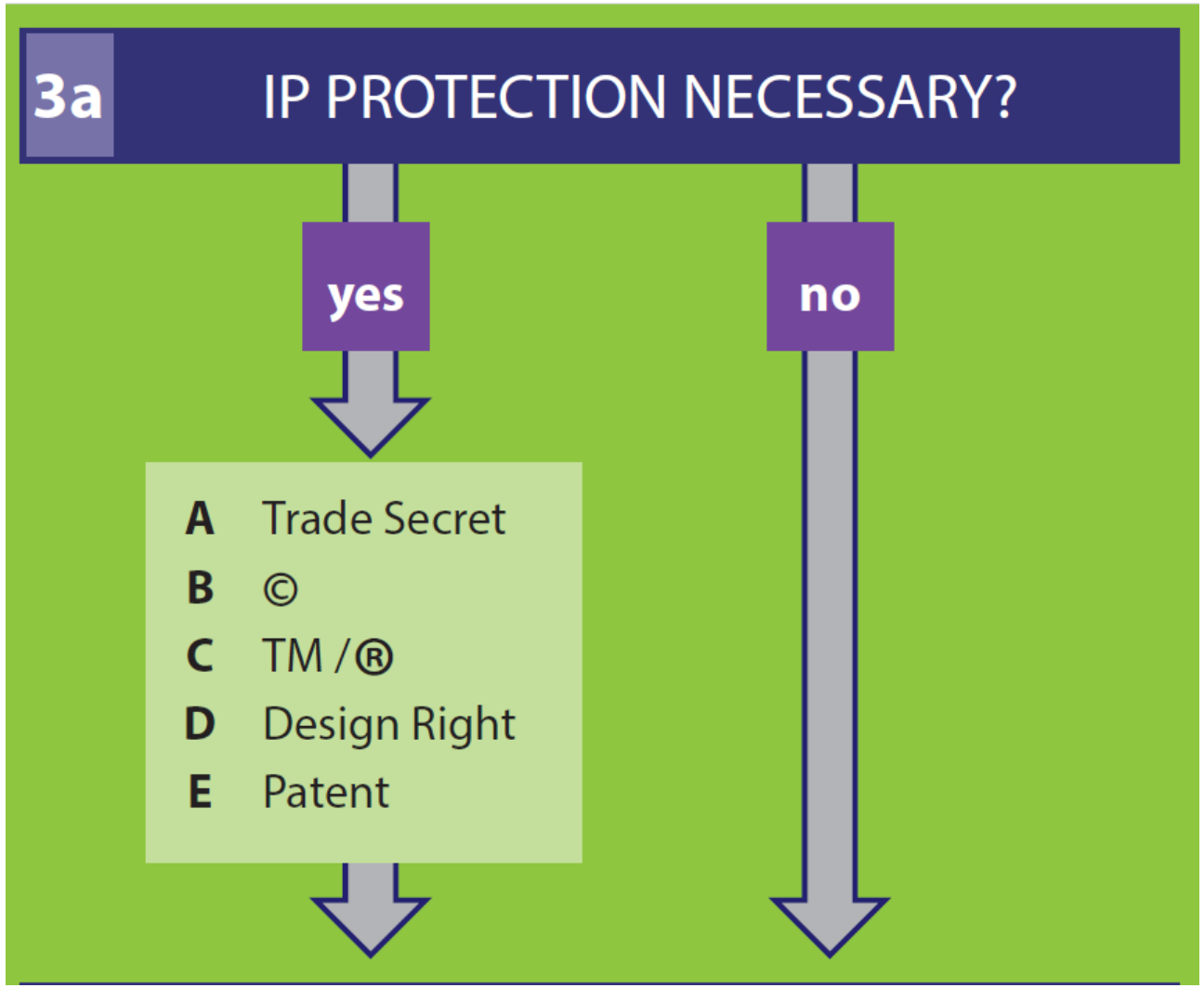

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Prior art

- Anything published on the day before filing a patent application
- First to invent (US) vs. First to file (ROW)
- Patent before you publish

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In view of predetermined patent life

- In a small “blockbuster” market of 1 billion annual sales, a delay of one day has a huge impact

- Gross turnover loss almost 3 million daily!

- At royalty rate of 3%, that is 82.000 for licensor
- 100M market, 8.200
- 10M market, 820 or 24.600 per month!

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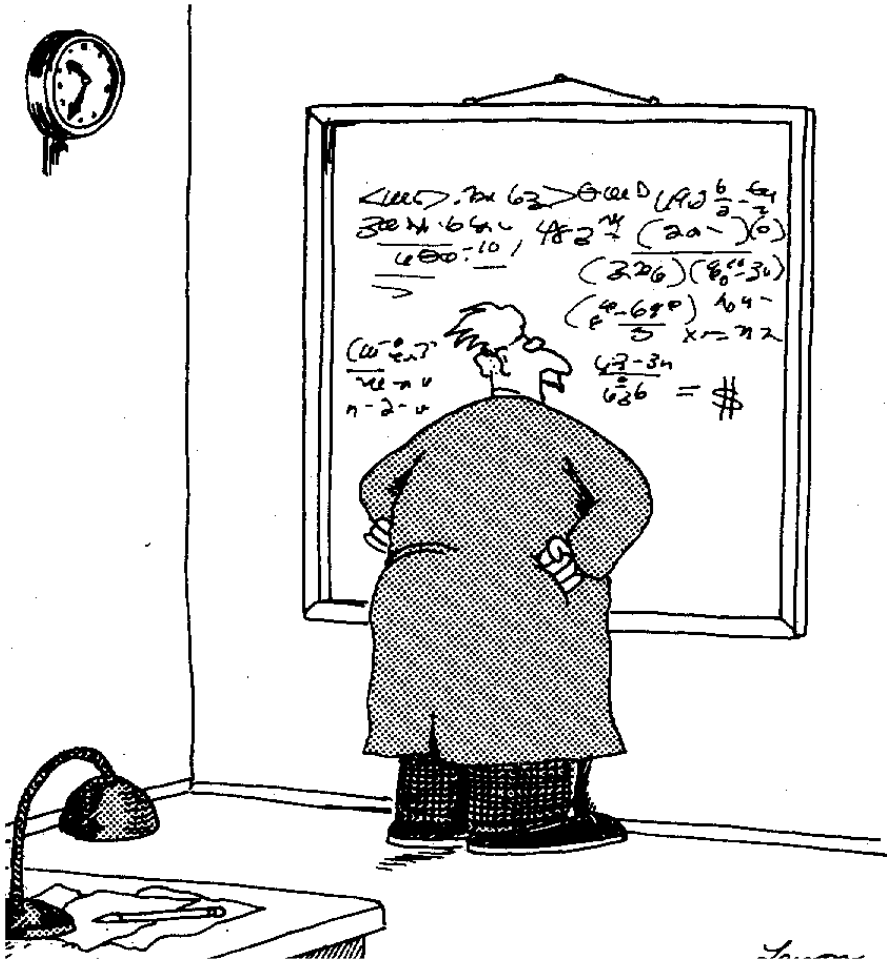
Time is actually money



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When to patent

Earlier	Later
Risk of being too late	More evidence to prove ‘utility’
	Better supported claims
	Longer (later) patent period

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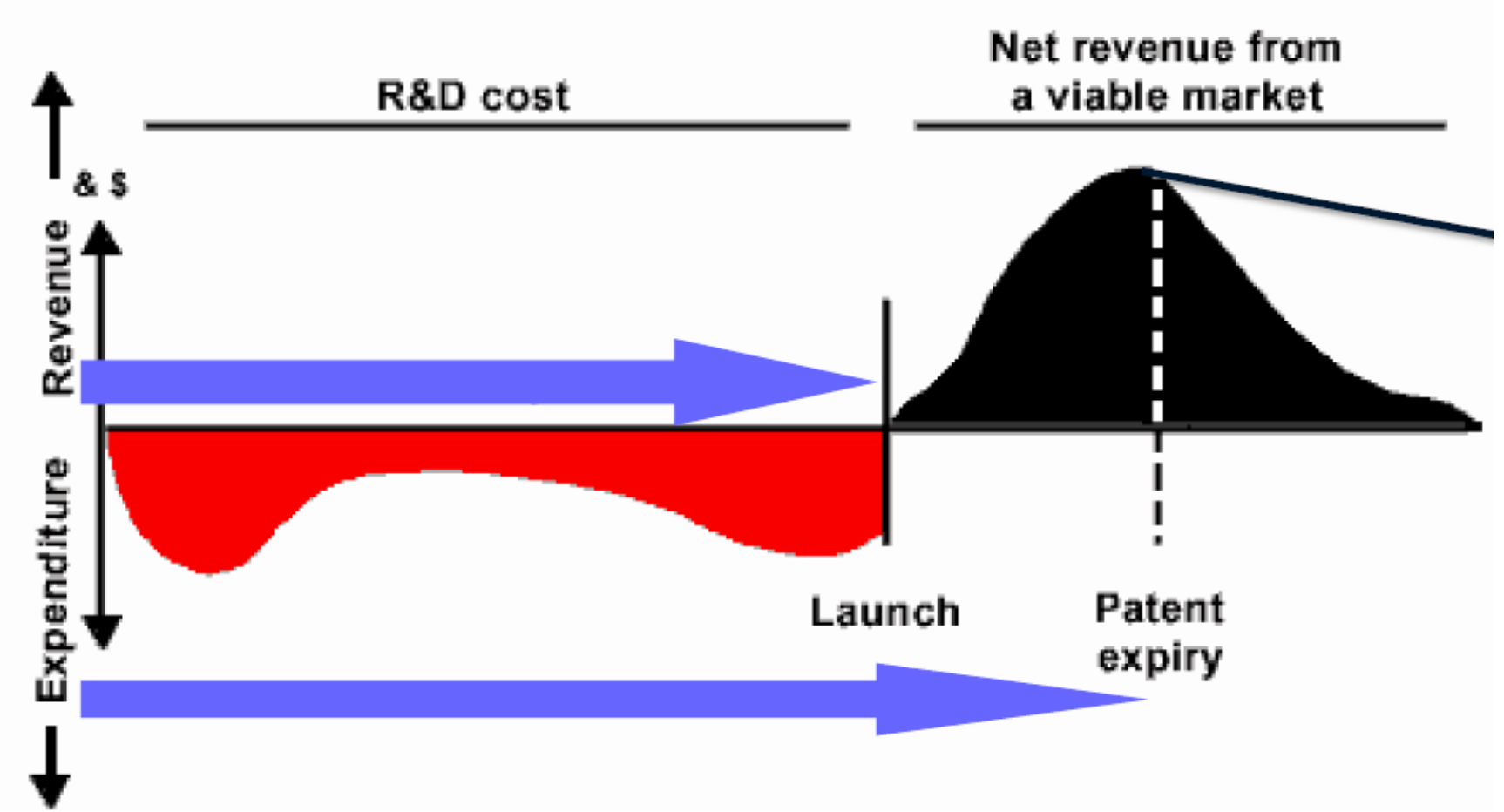
Evergreening



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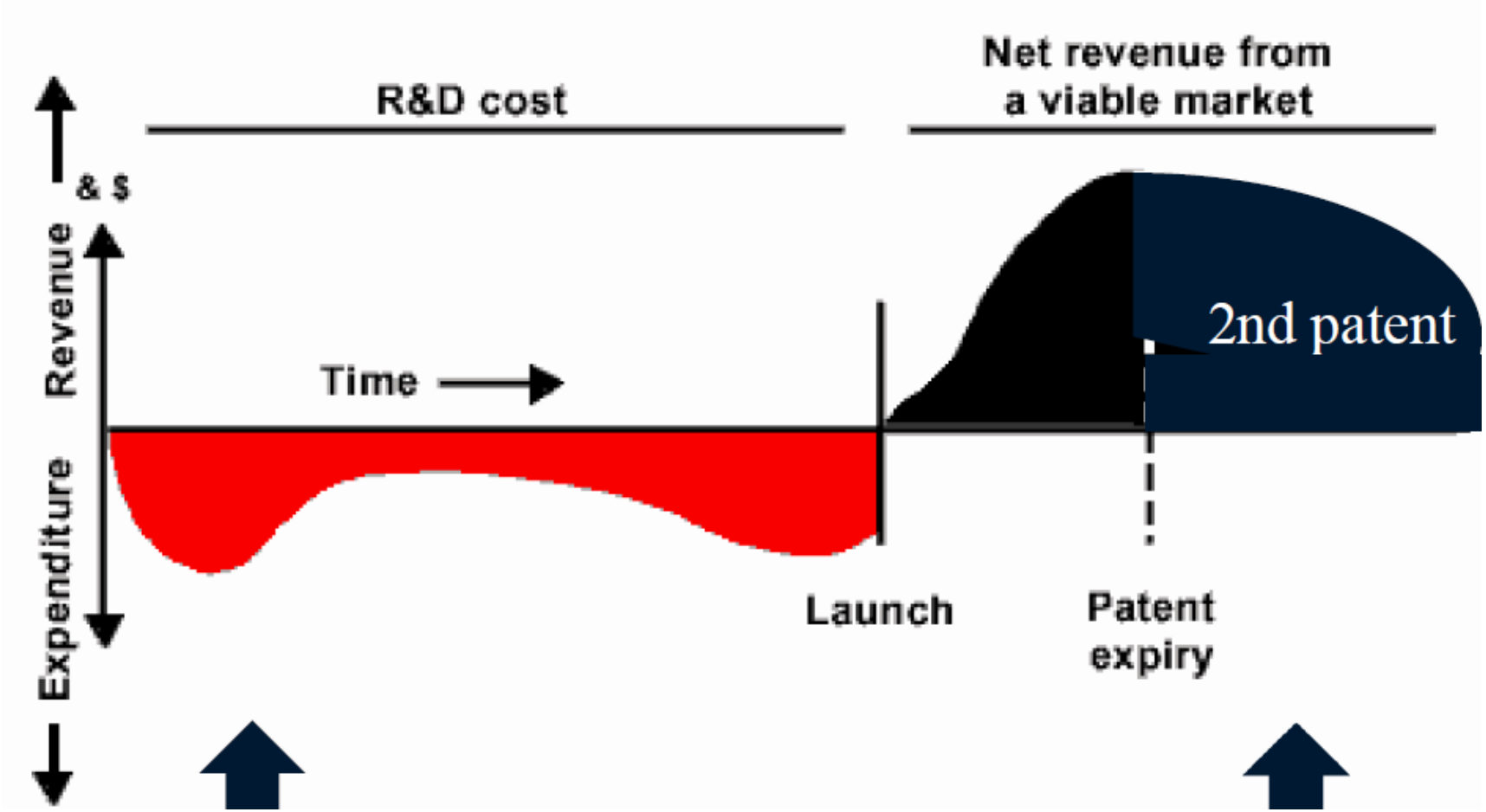

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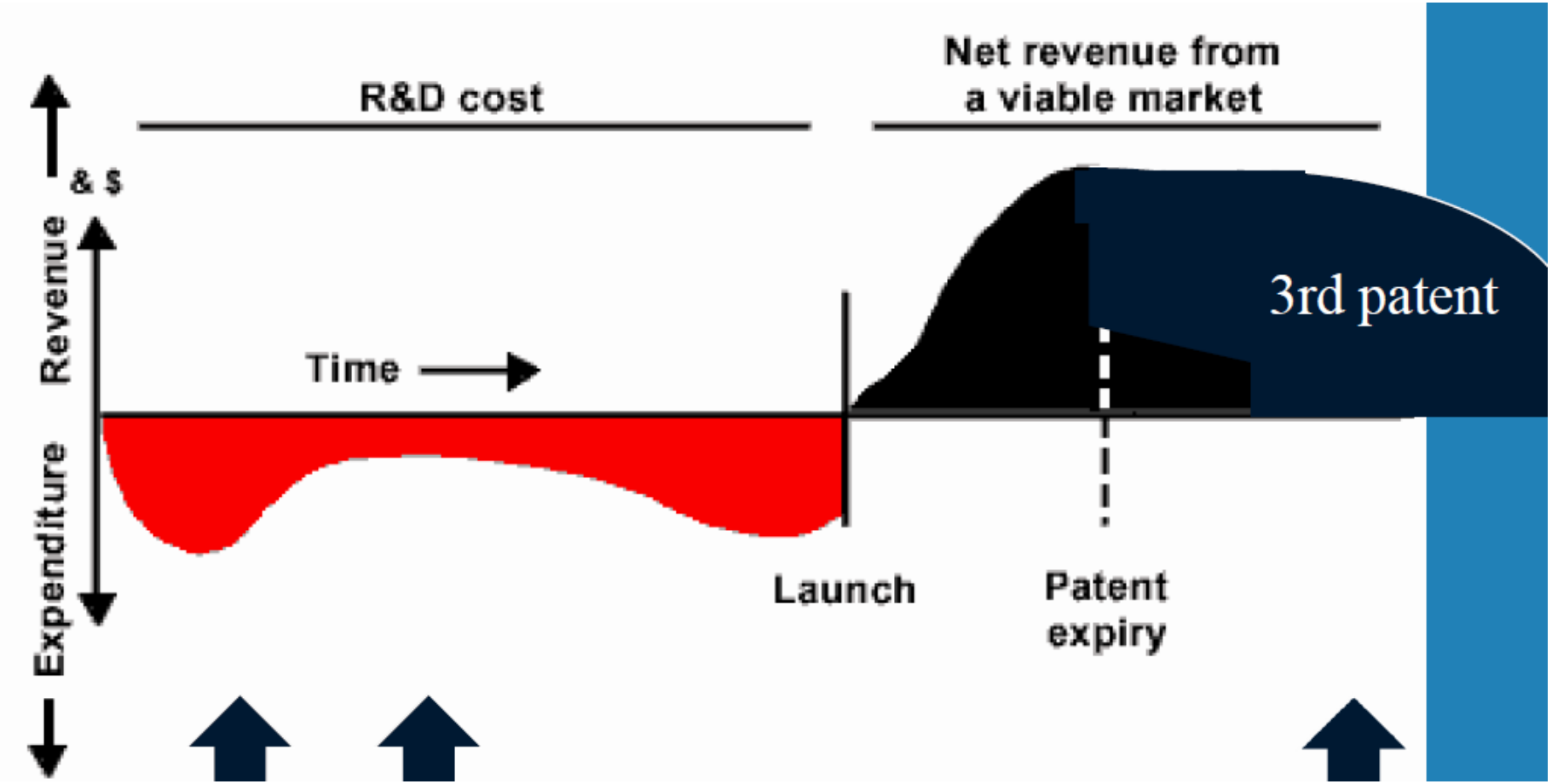

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Extending market exclusivity

- Multiple patents
- Brands
- Trademarks
- Design rights
- Copyrights
- Dossier data protection (8 years in EU)

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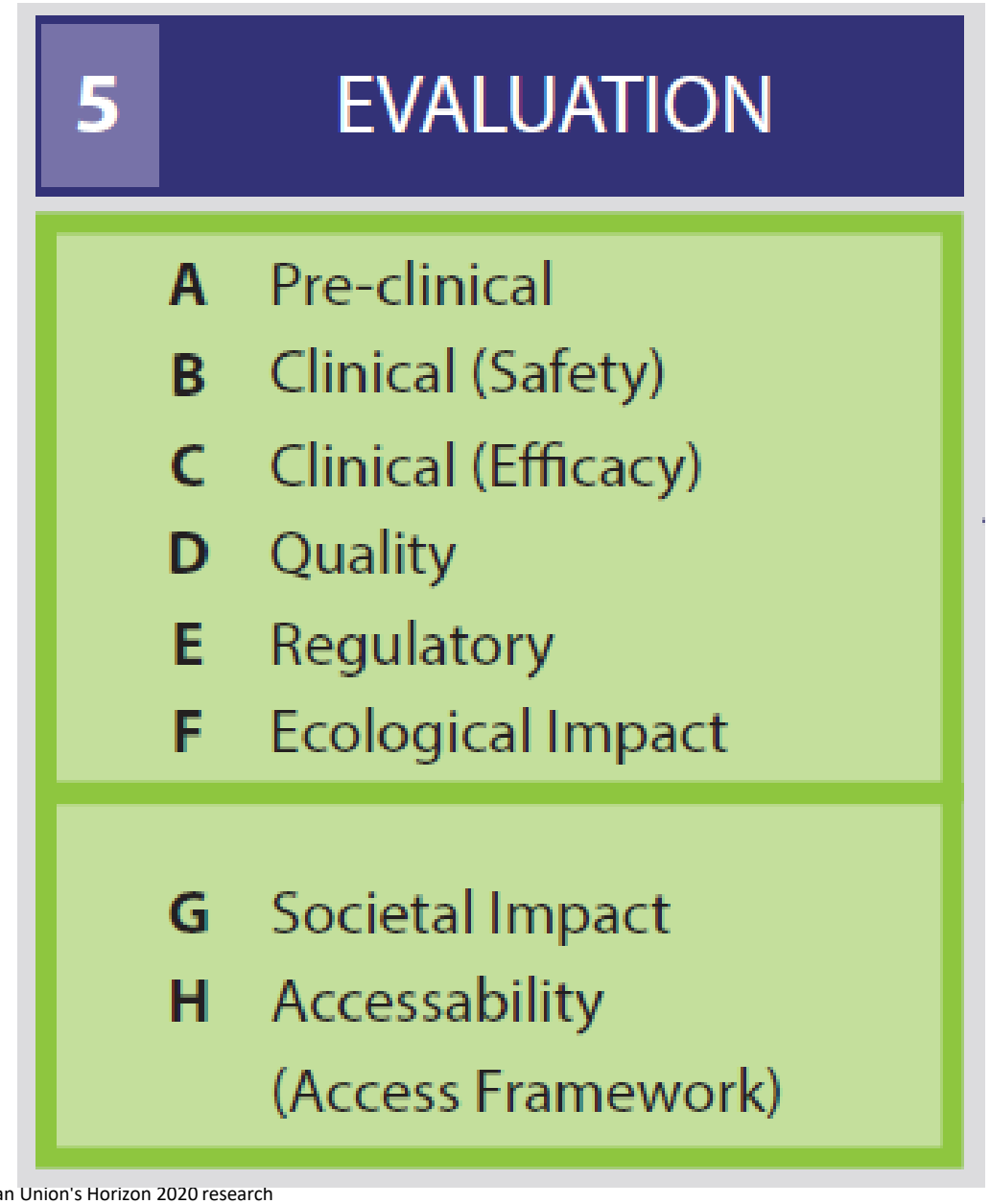

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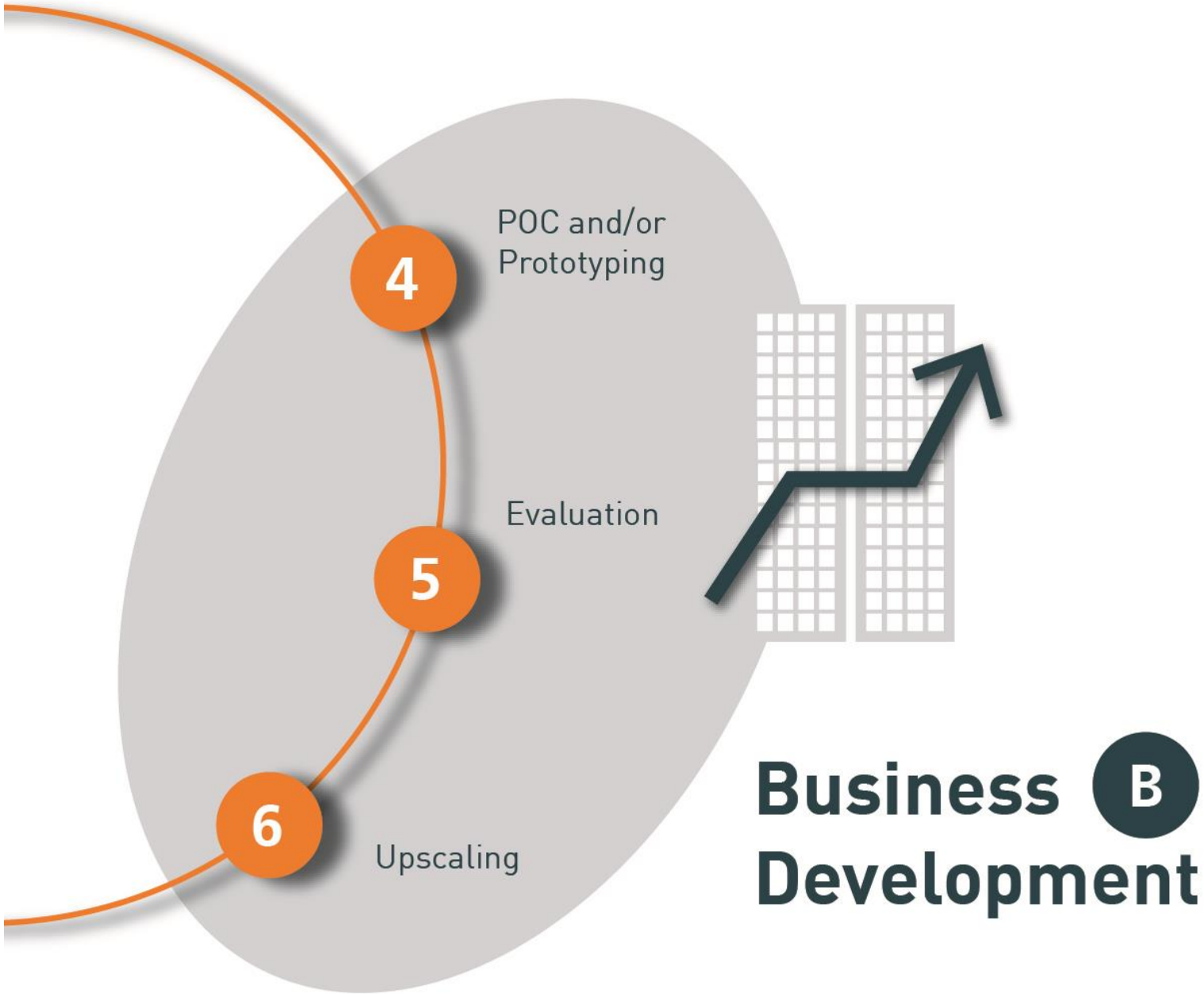

Business Development B

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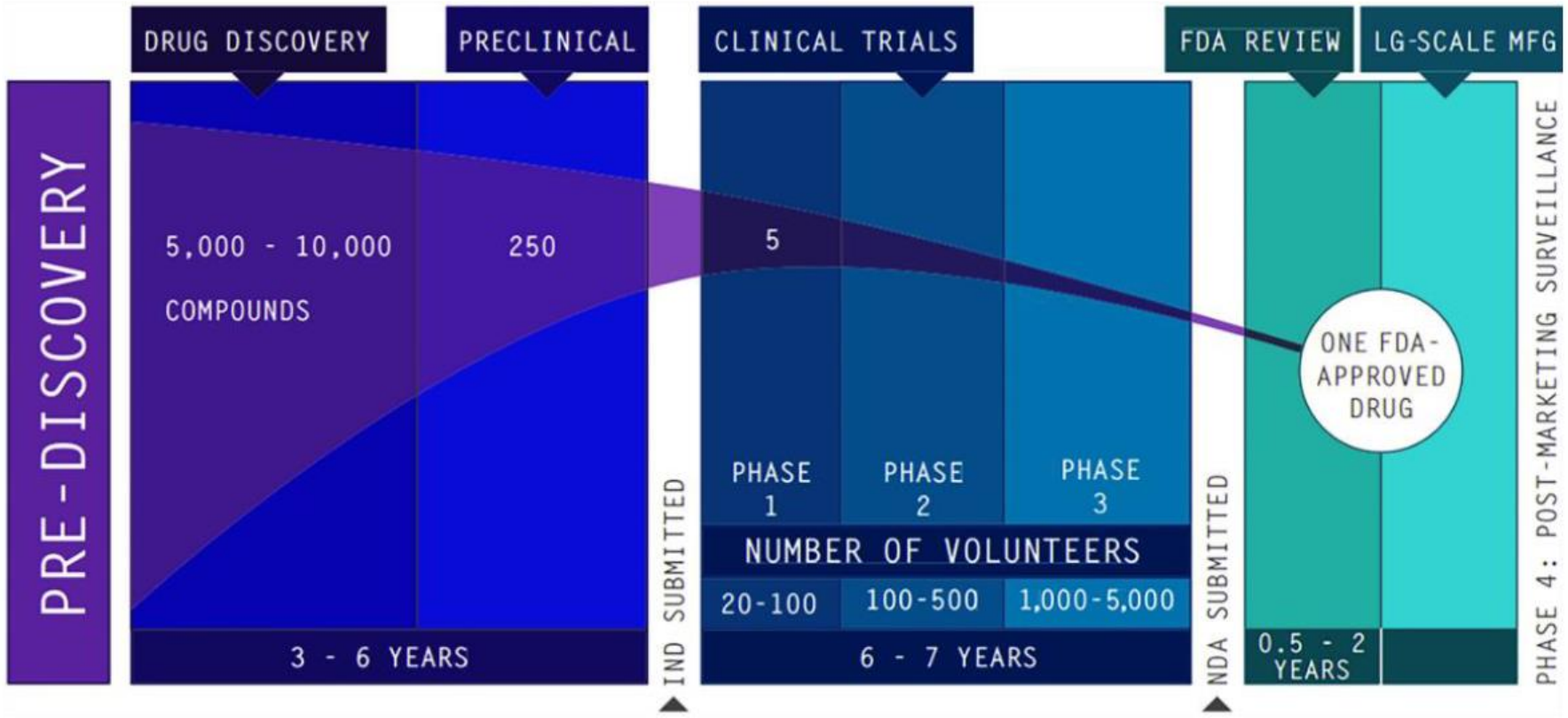
Life Sciences value chain



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Example failure rates clinical trials in drug development

	# of subjects	Length	Purpose	% drugs succesfully tested
Phase I	20 – 100	Several months	Mainly safety	60%
Phase II (exploratory / confirmatory)	Up to several 100s	Several months – 2 years	Short term safety; mainly effectiveness	30%
Phase III (confirmatory)	100s – to several 80.000	1 – 4 years	Safety, dosage & effectiveness	60%

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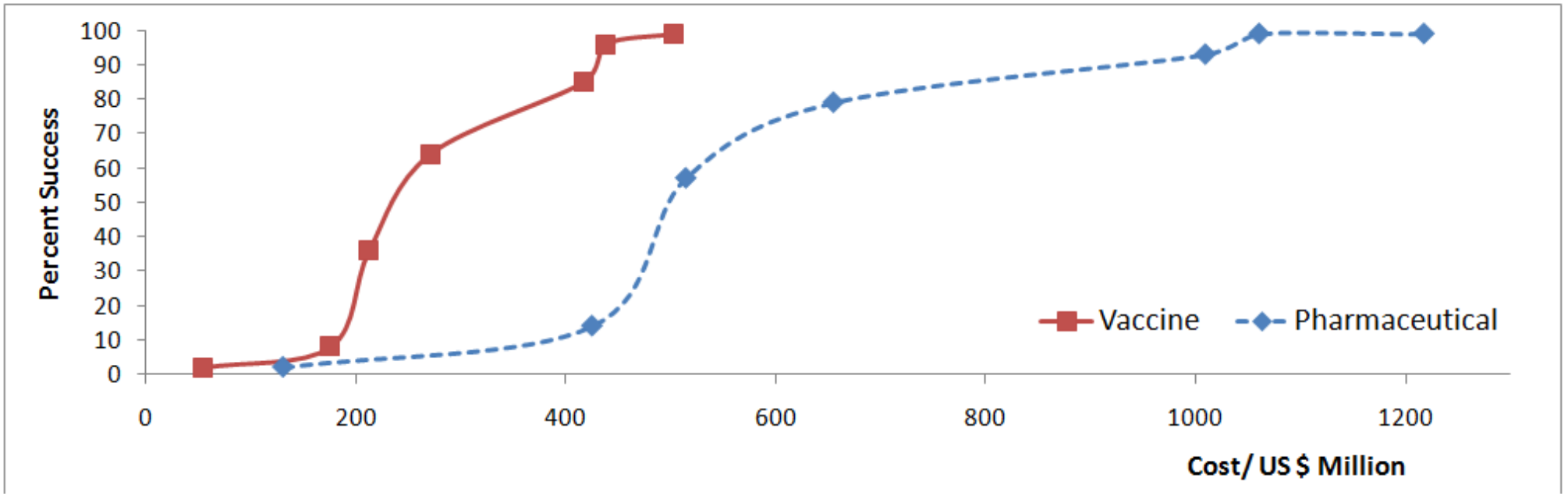
Differences in risks between pharmaceuticals and vaccines

FIGURE PART B: Risk Profile of Vaccine and Pharmaceutical Products



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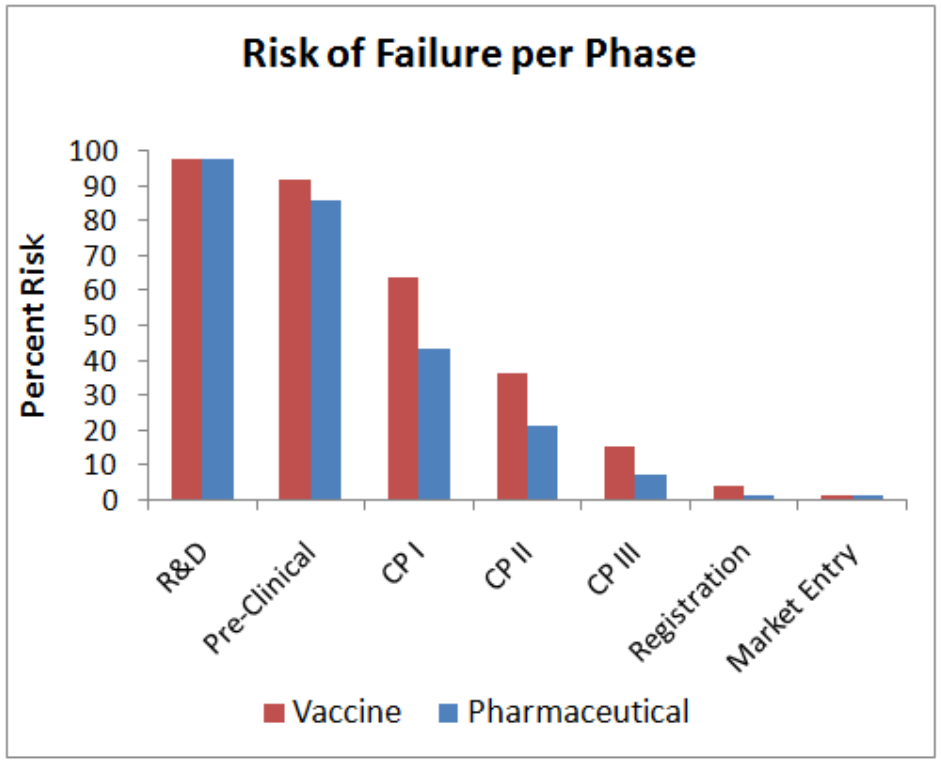
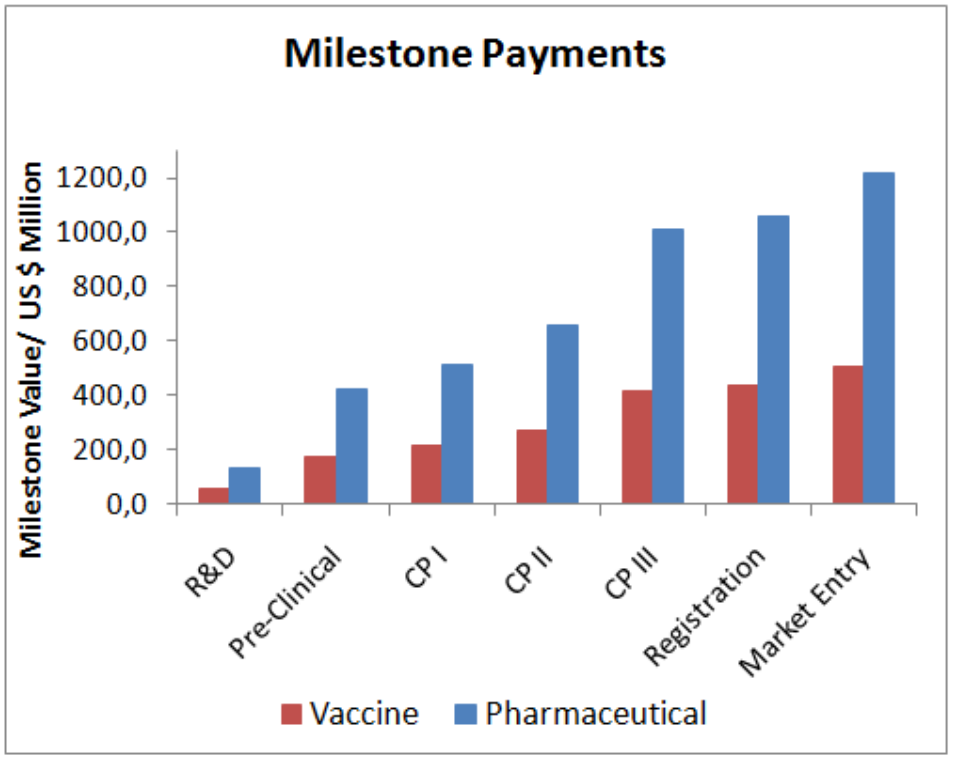
Lower risks correspond to lower milestone payments

FIGURE PART A: Risk and Milestone Payments





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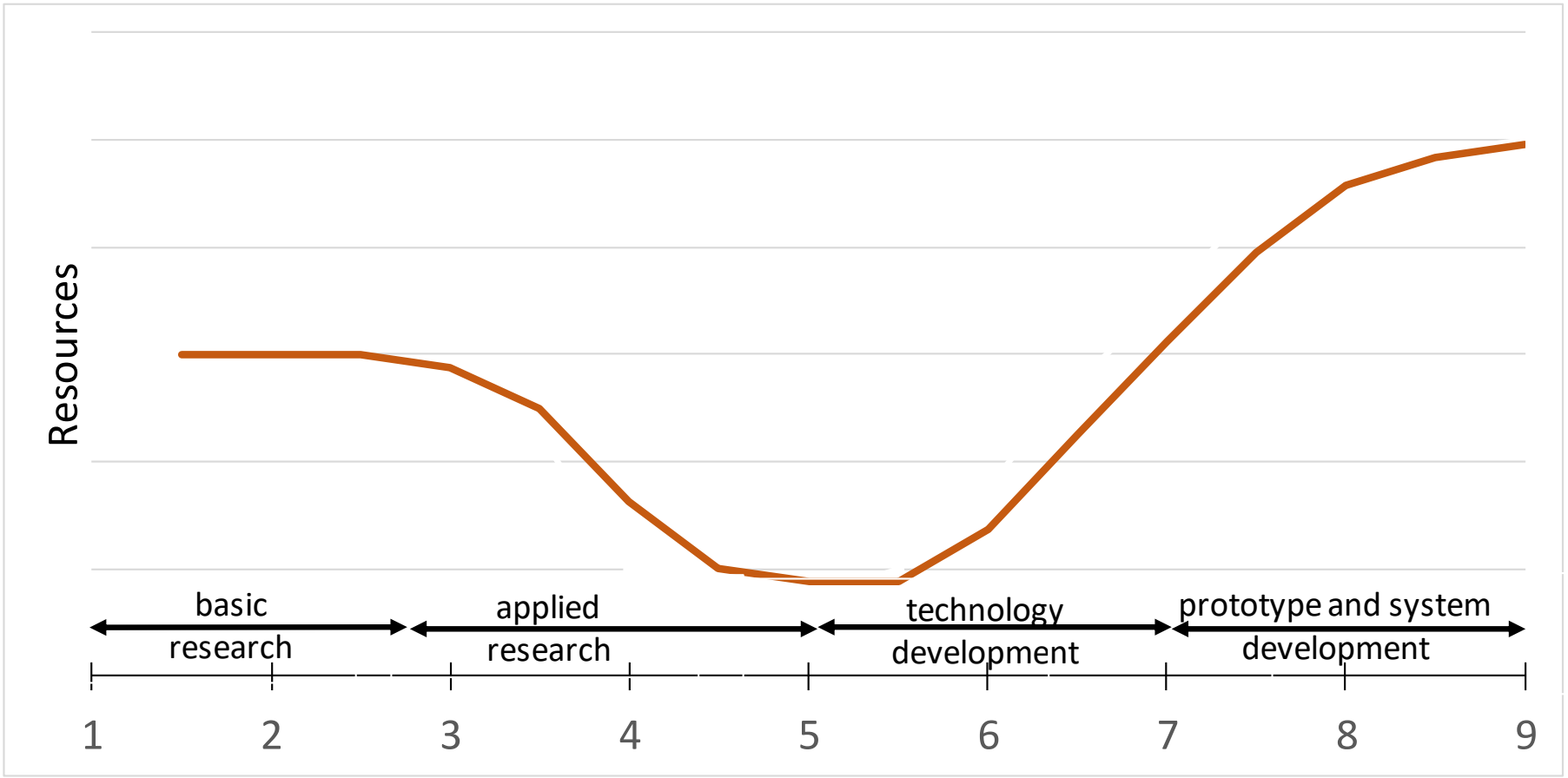
EU: Technology readiness levels



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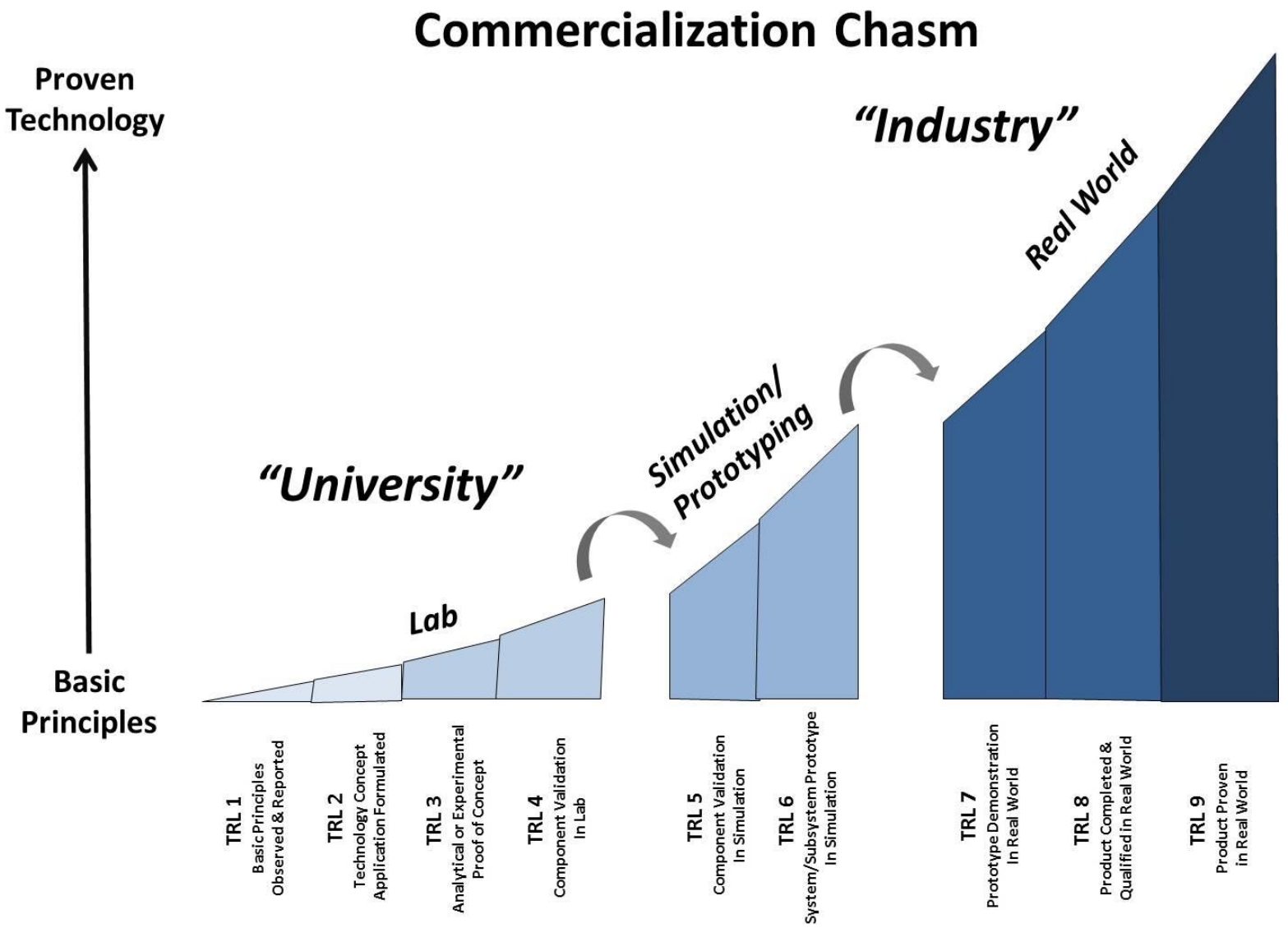
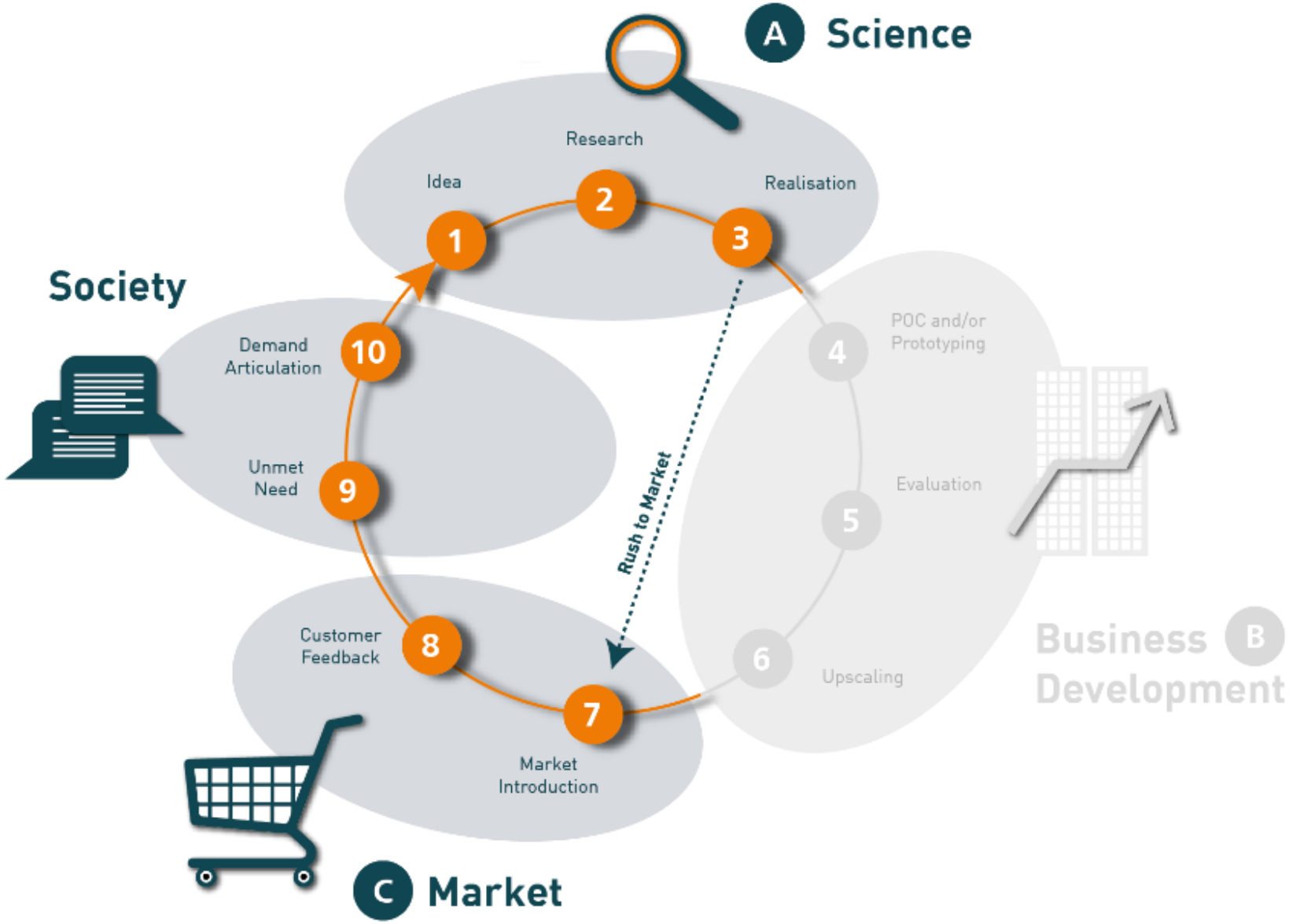
EU: Technology readiness levels



This project has rece
and innovation prog

https://initiate-itn.eu/



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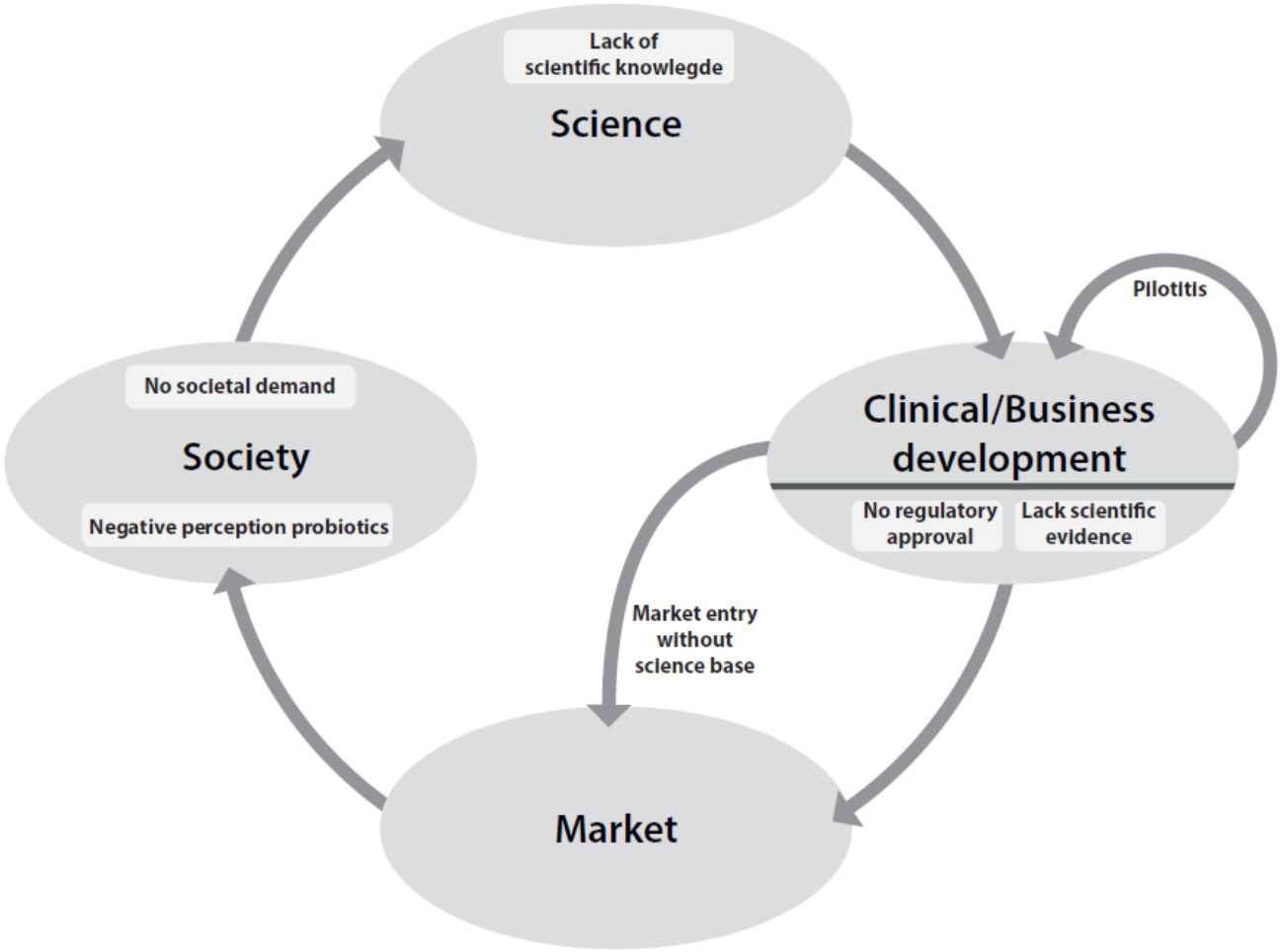
Rush to Market in Probiotics



Van den Nieuwboer, Van de Burgwal, Claassen, 2016

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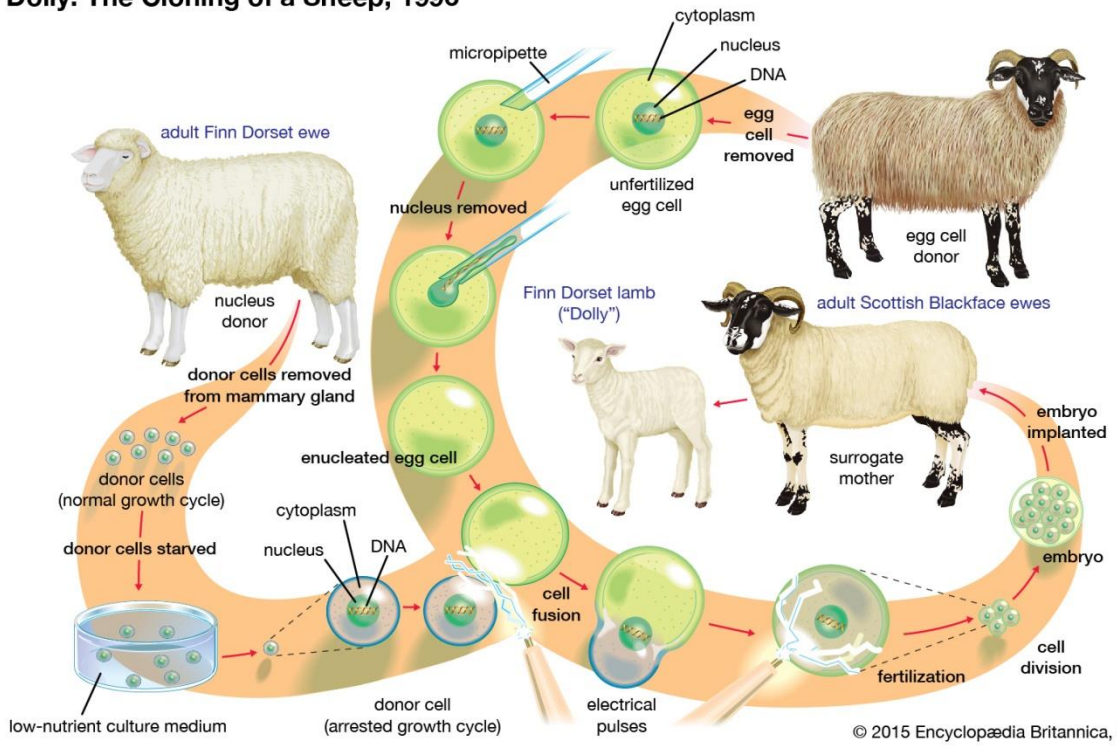
Bull Herman alive in the museum in Leiden, Naturalis

Dolly: The Cloning of a Sheep, 1996



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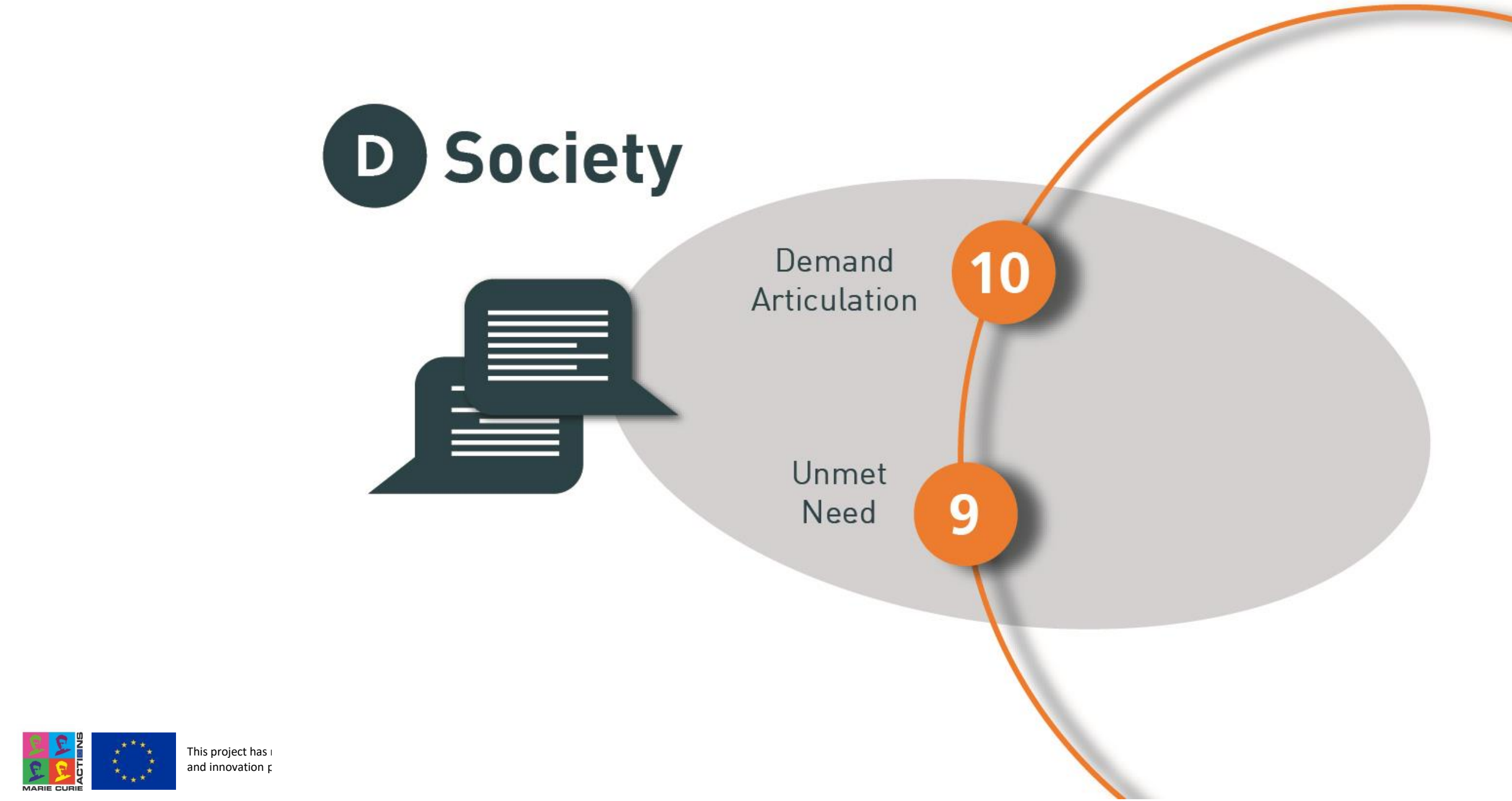

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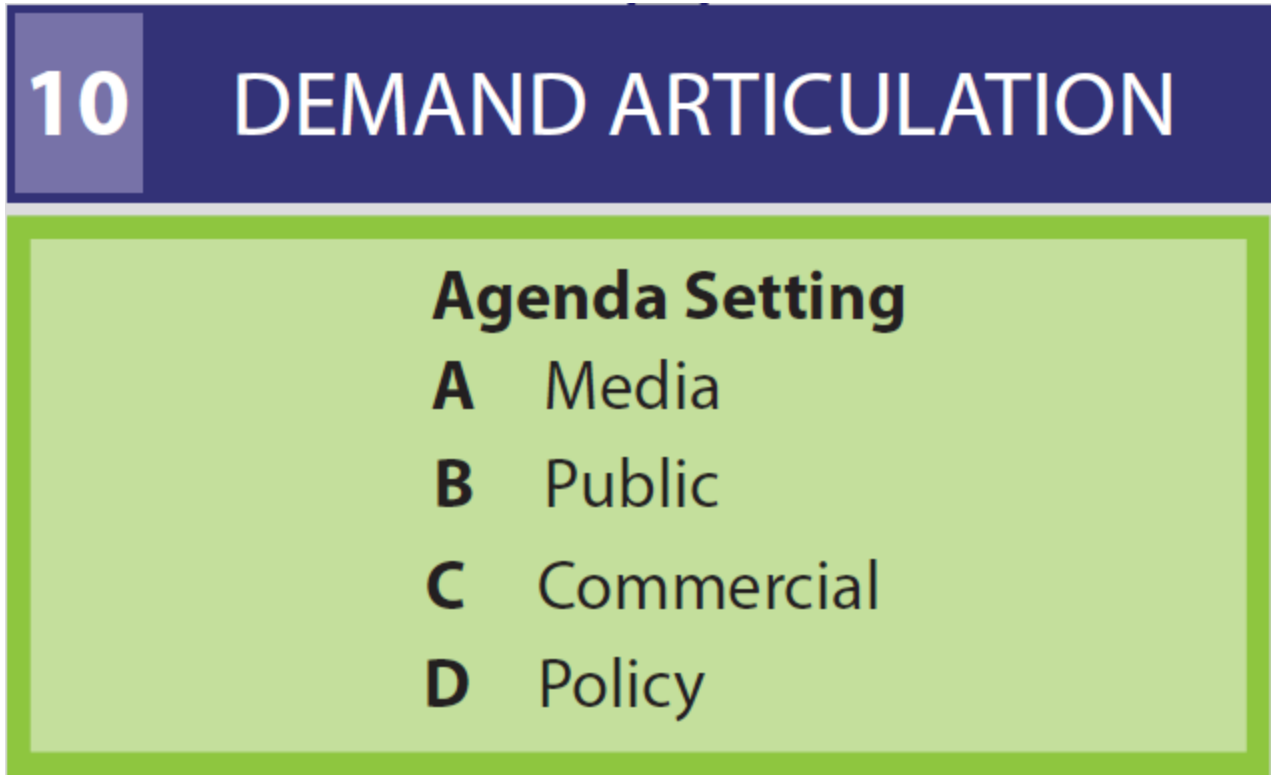

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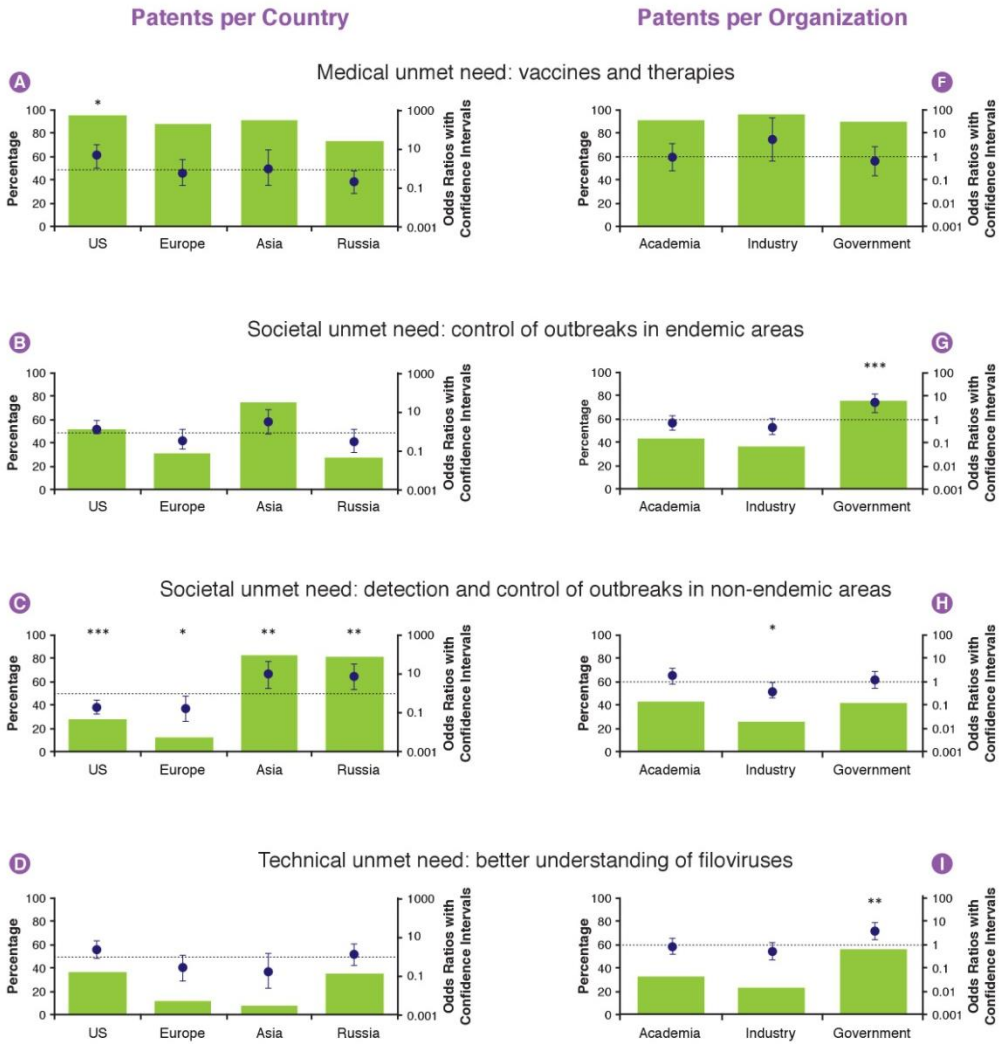
Demand A



Self-Centric and Altruistic Unmet Needs for Ebola: Barriers to International Preparedness

Linda H.M. Van de Burgwal, MSc; Leslie A. Reperant, PhD; Albert D.M.E. Osterhaus, Prof dr; Sorana C. Iancu, PhD; Esther S. Pronker, PhD; Eric Claassen, Prof dr

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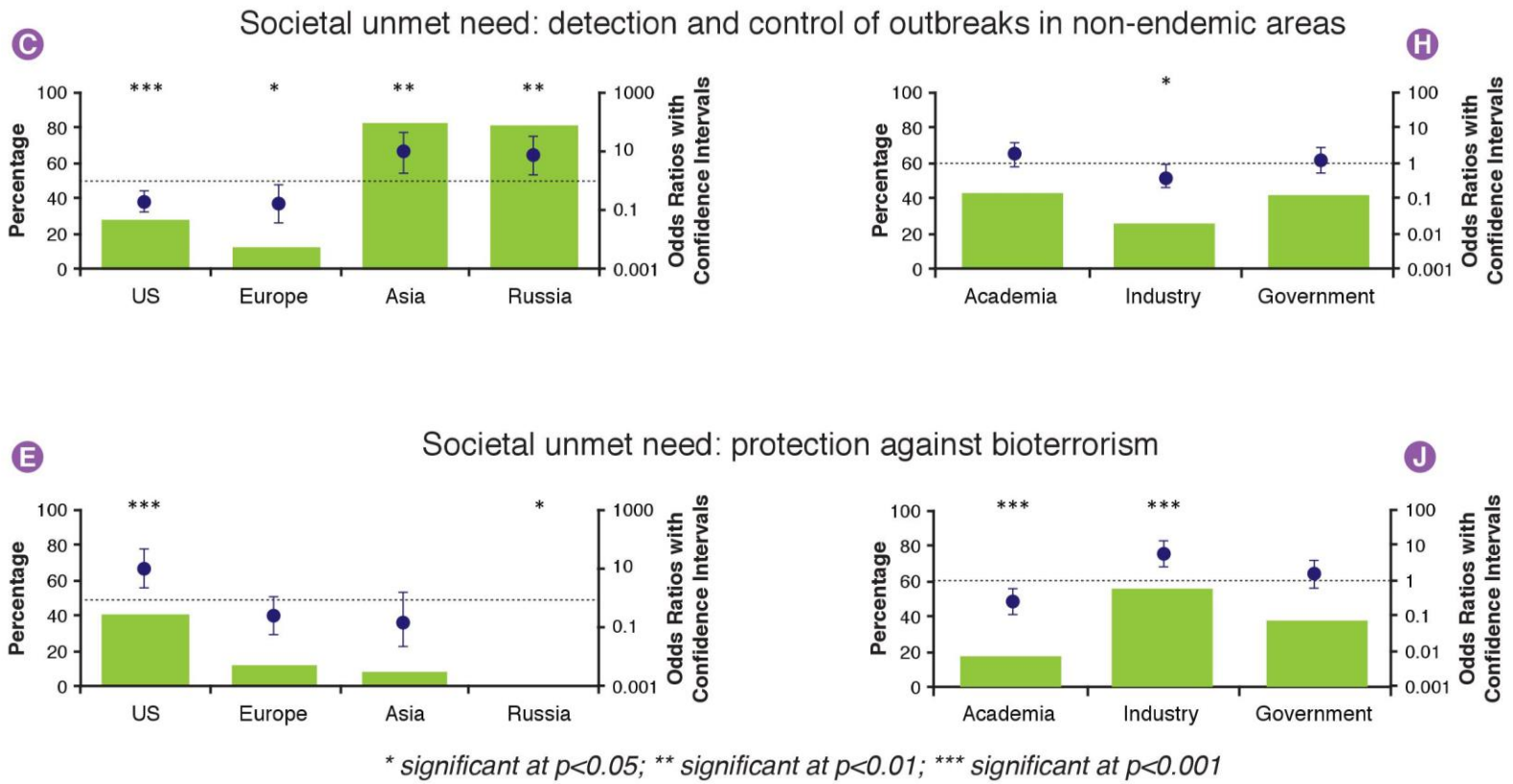
Demand Articulation



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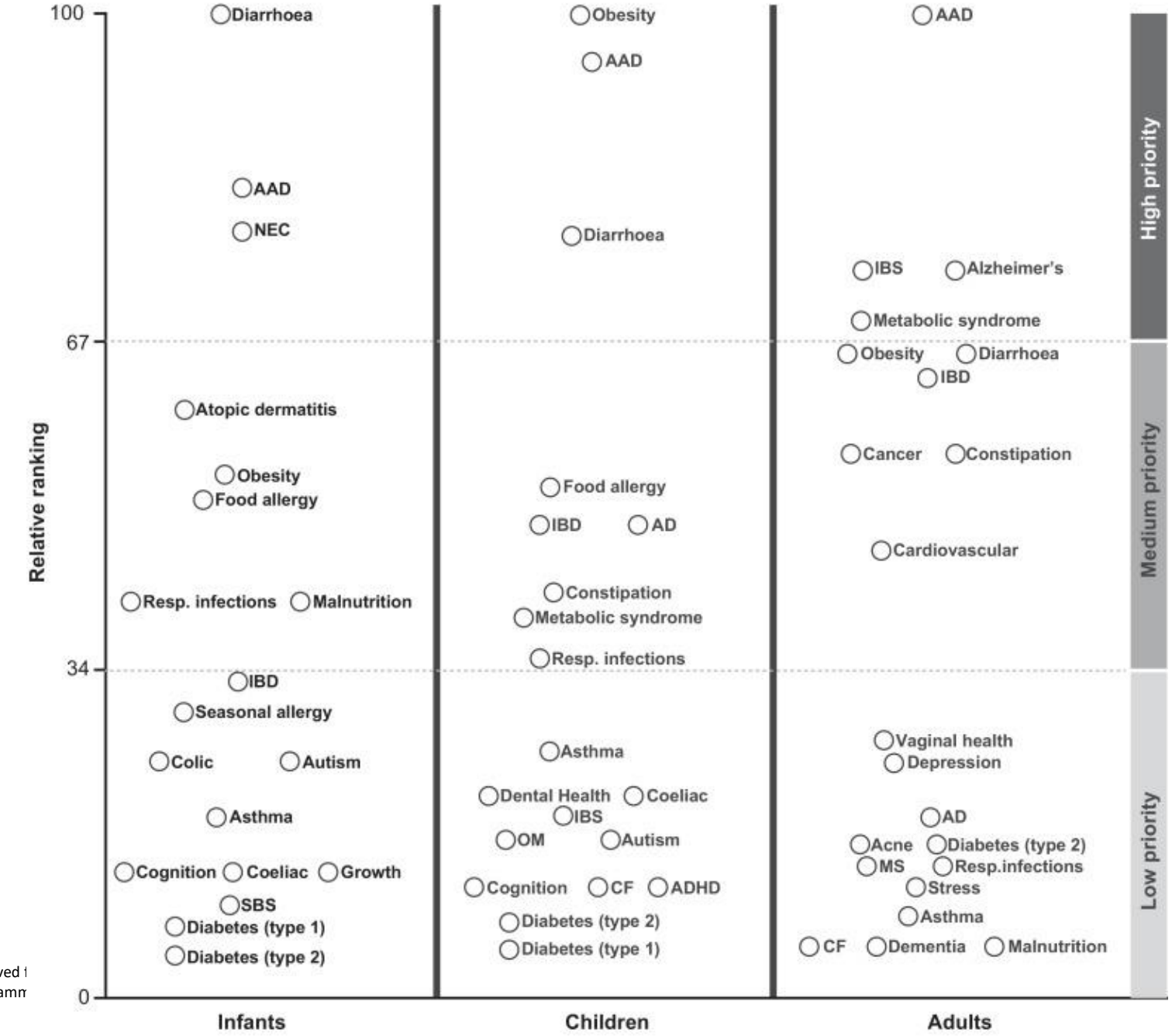
Clinical condition prioritization



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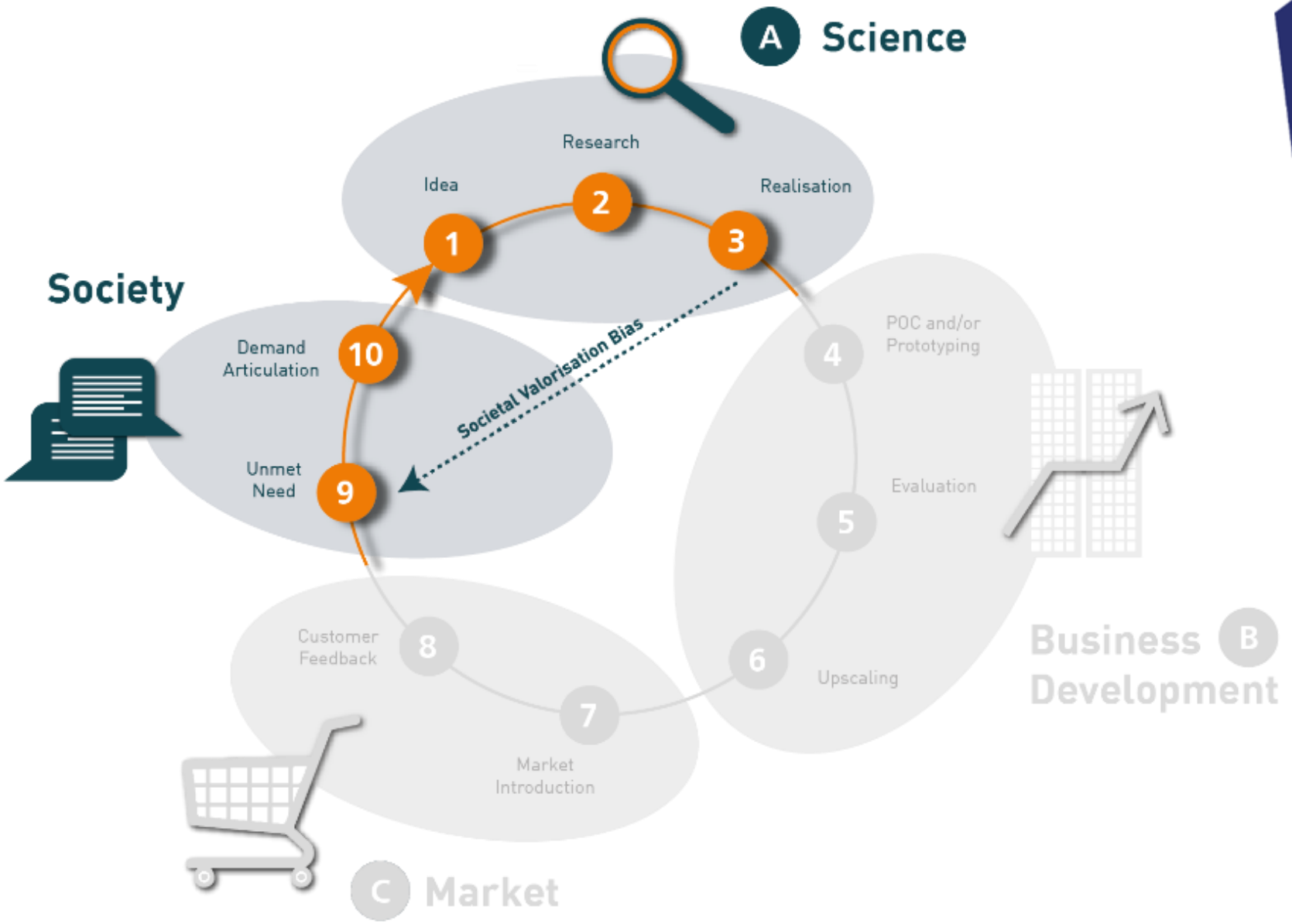

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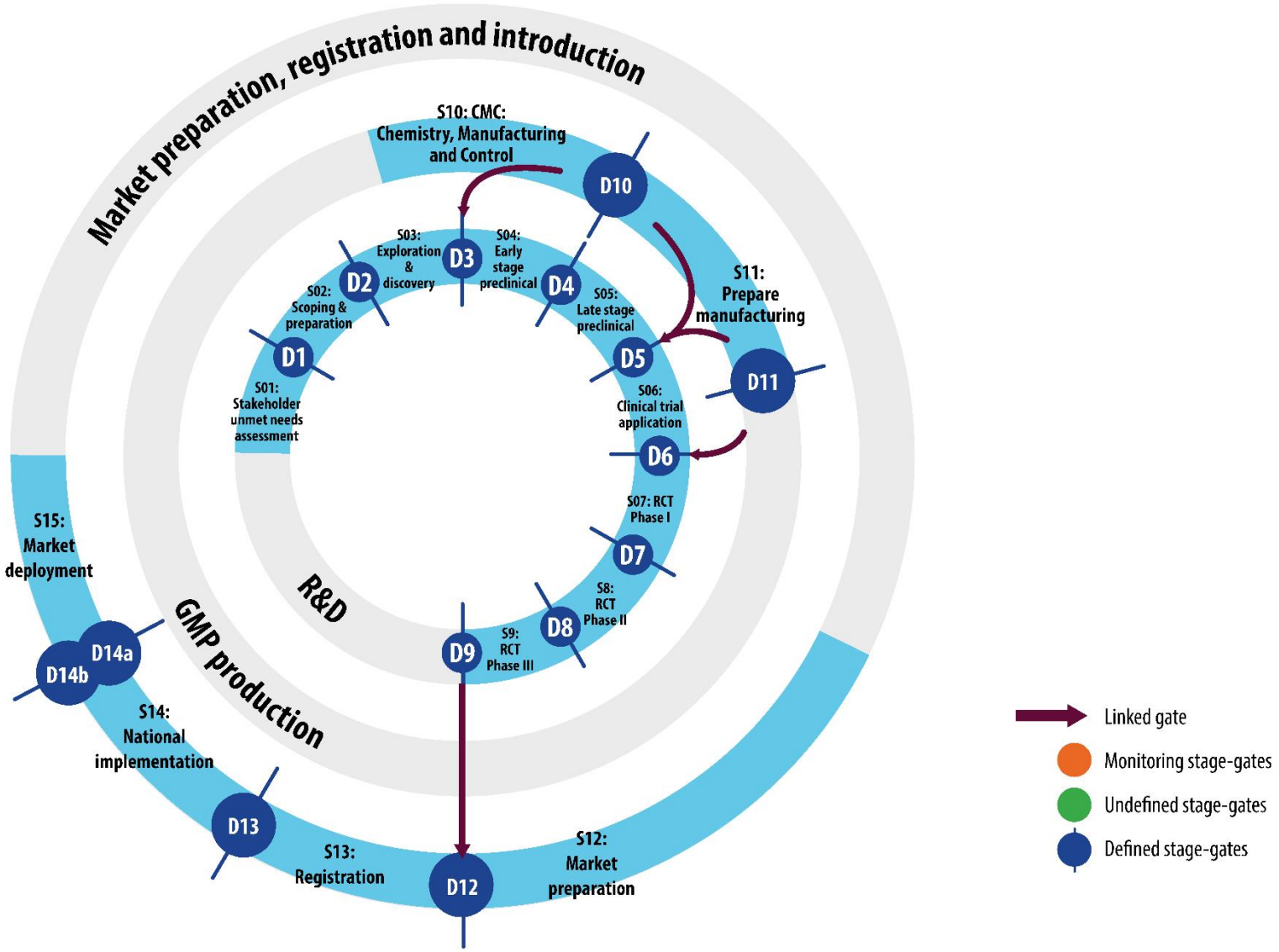

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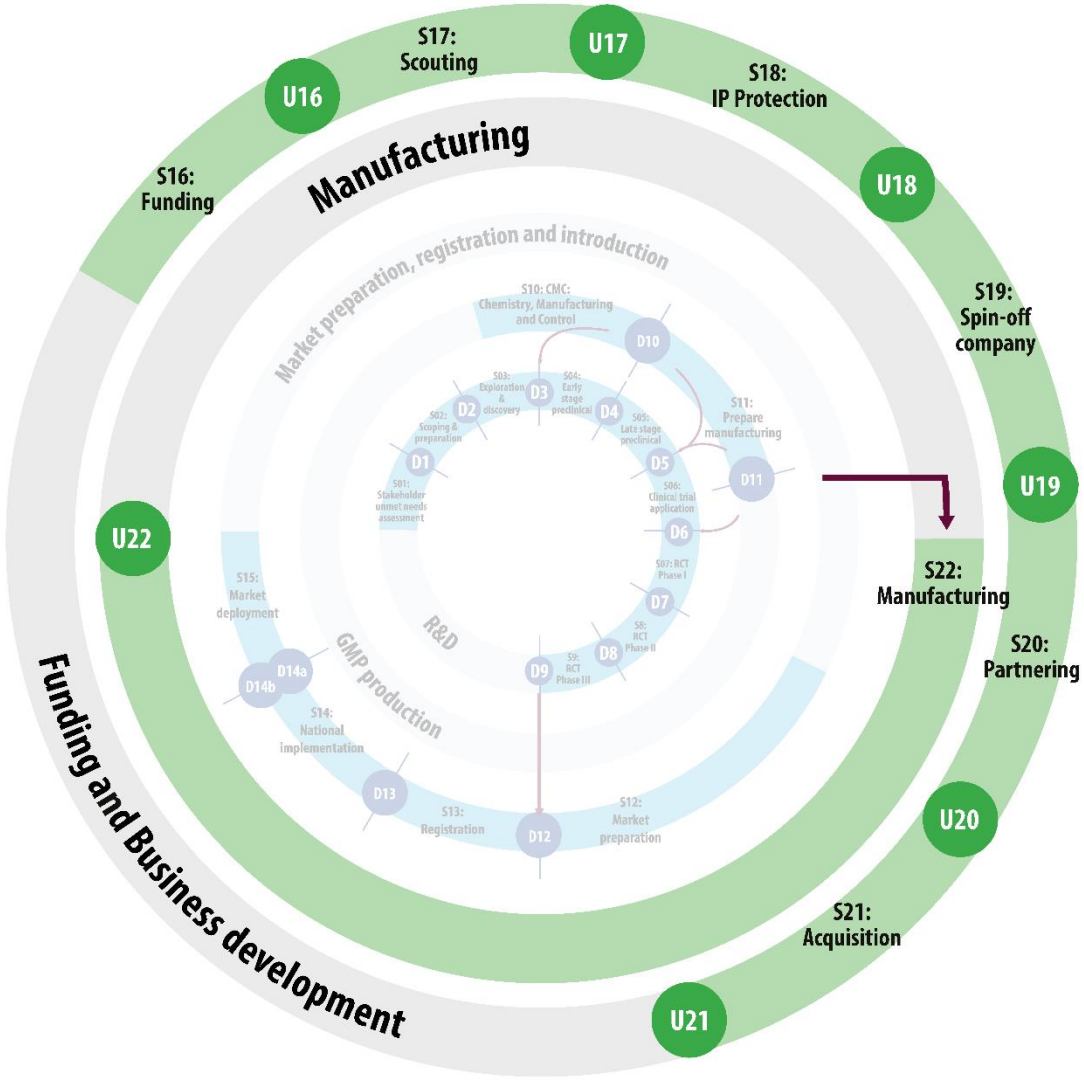

Linked gate

Monitoring stage-gates

Undefined stage-gates

Defined stage-gates

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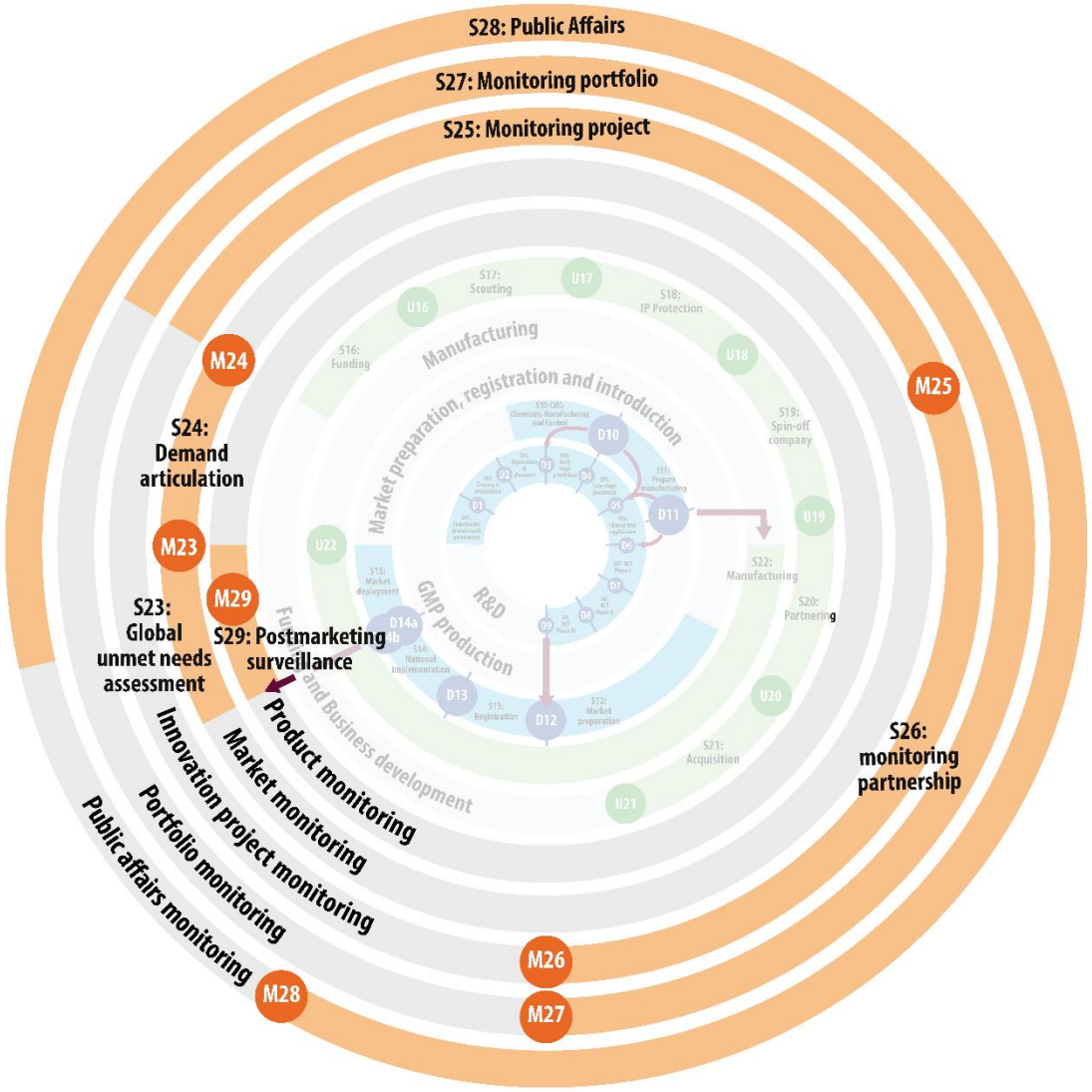

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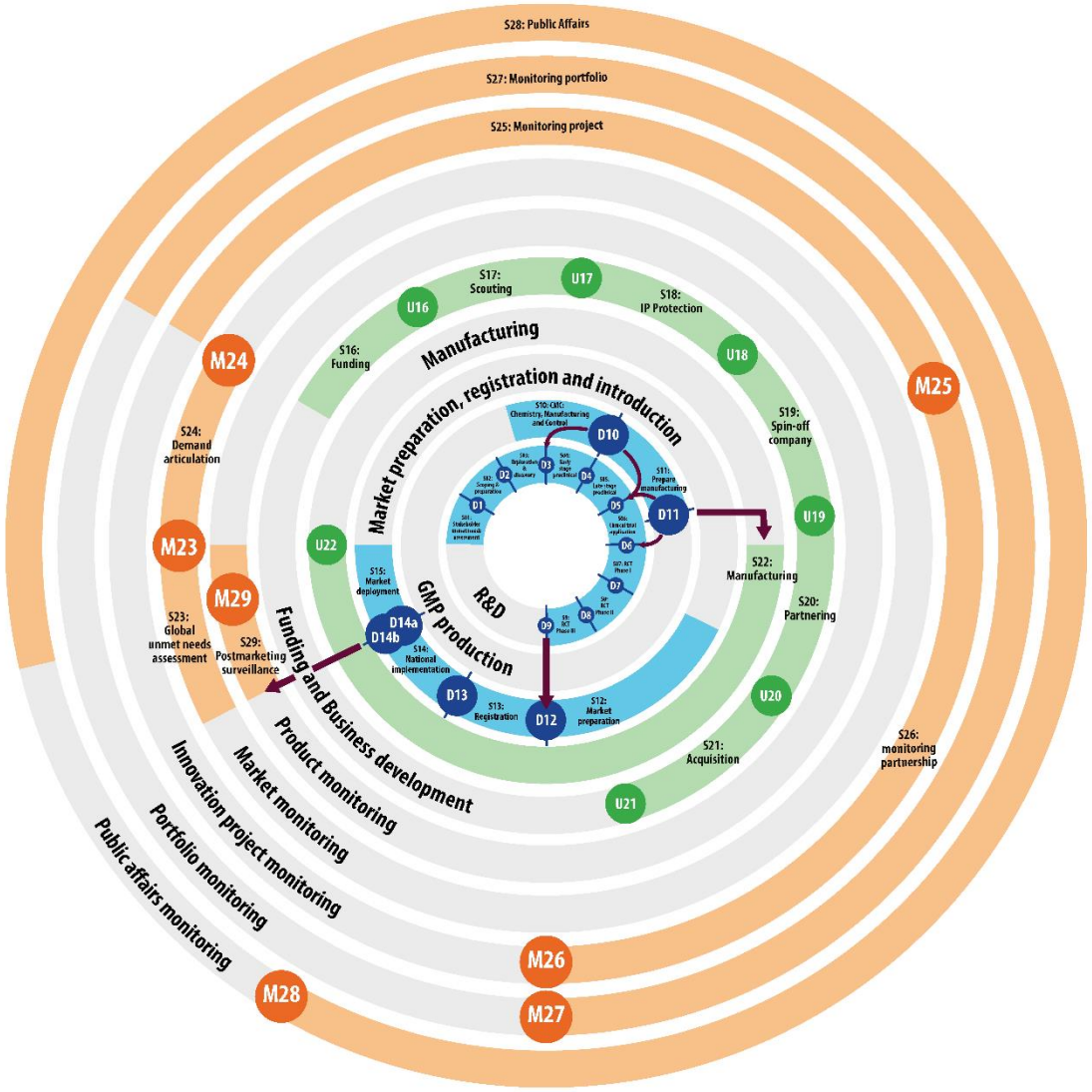

Linked gate

Monitoring stage-gates

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Defined stage-gates

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Public money

Grants and subsidies

Contract research

University income

EDUCATION

RESEARCH

SOCIETAL IMPACT

REVENUE

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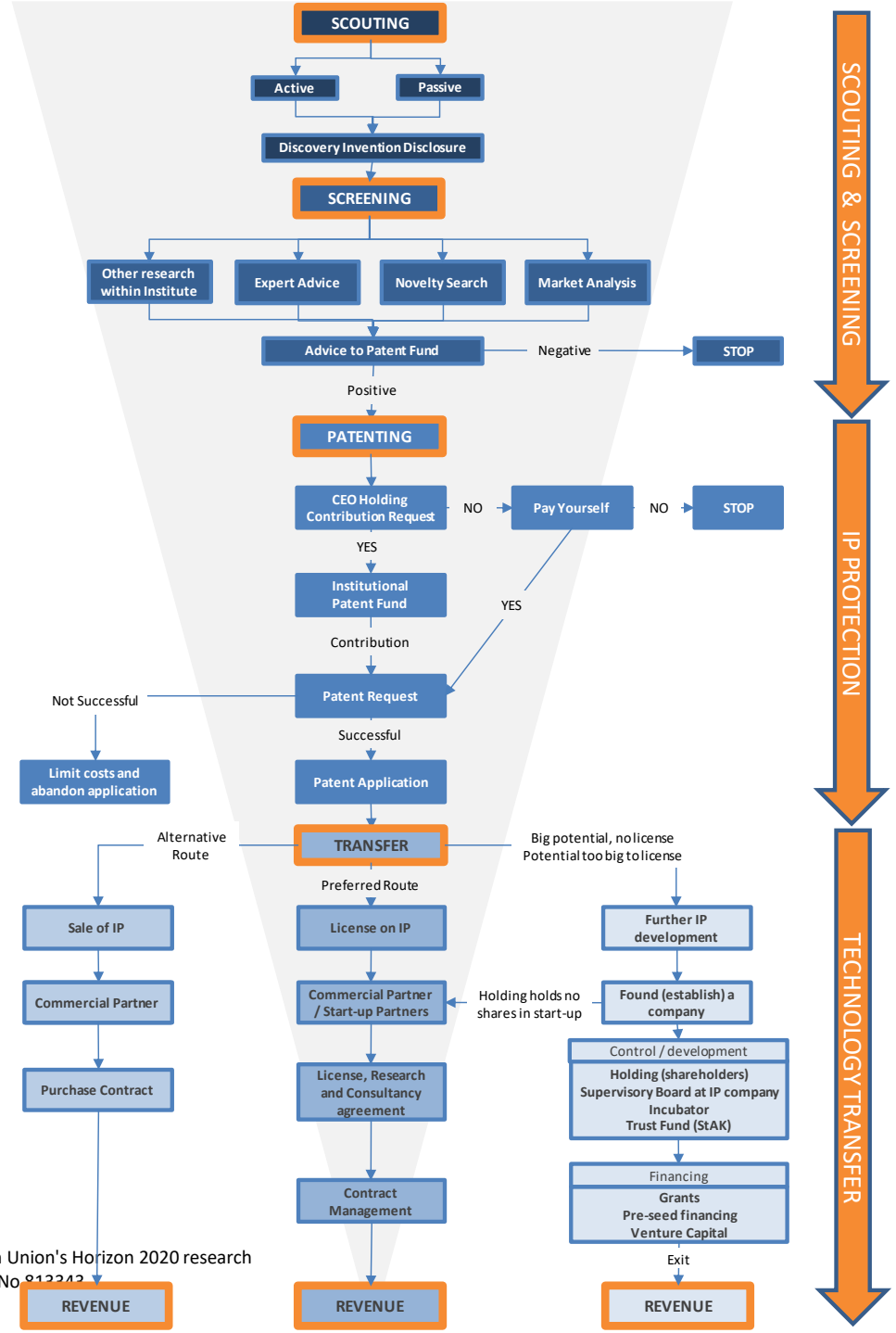

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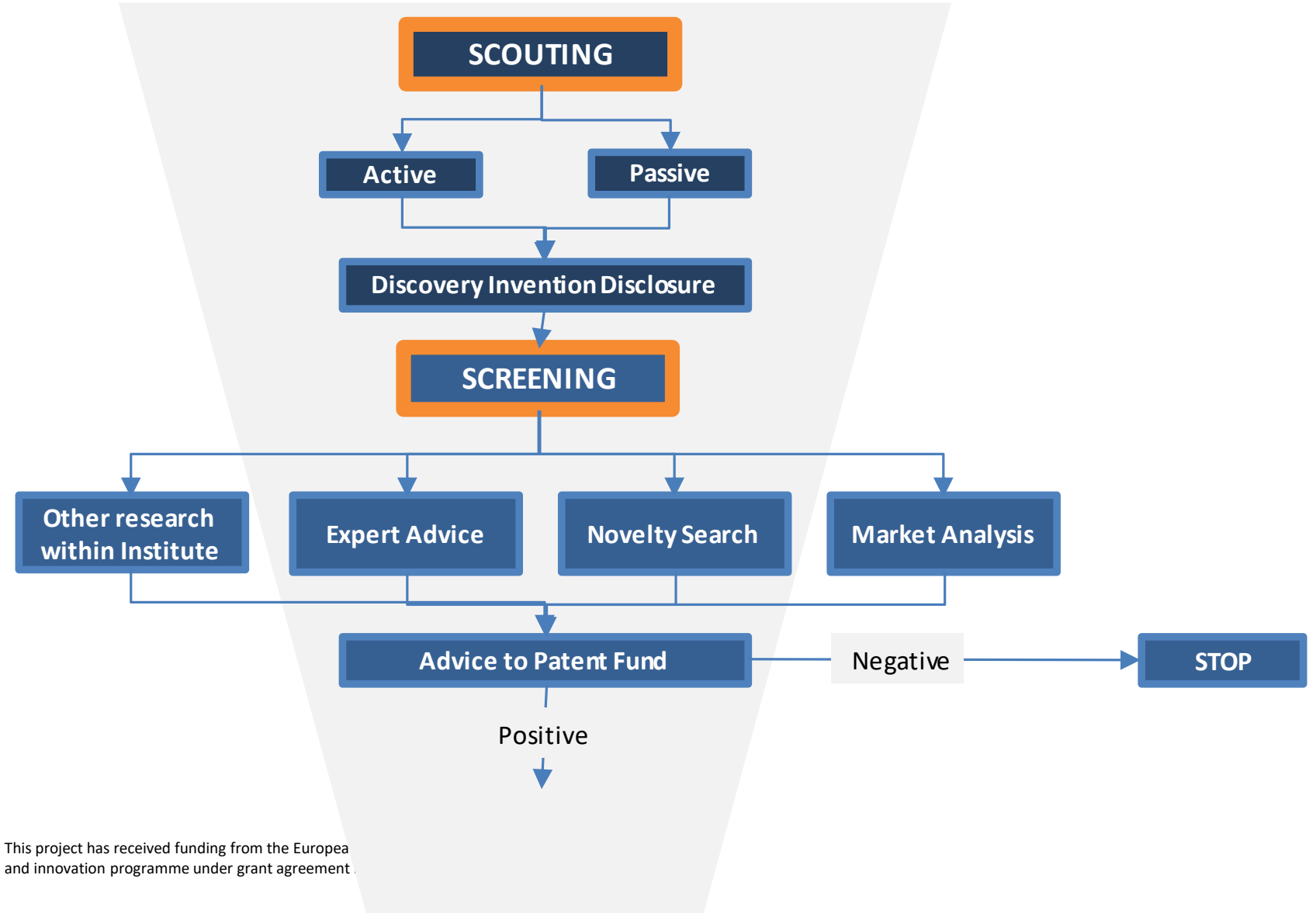

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SCOUTING & SCREENING

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Probability of Success

10) High P.O.S.	• Currently have the capability • Defined technology	• Have access to the channel • Have demonstrated ability to realize value • Strong evidence exists to support expected volume and margins
8)	• Partial proof of benefit or continual development required (e.g., hybridization) • Strong related capabilities	• Have a "roadmap" and access to some portion of the channel
6)	• Requires additional development to prove viable cost-benefit • Success is likely within 5 years	• Have proven related capabilities (e.g., have done it with x but not y) • Proven benefit but consumer behavior changes requires (e.g., cholesterol reduction)
4)	• Significant technical hurdles exist • Success will require time and resources (>5 years)	• Unproven value-capture mechanisms • Undeveloped channel - will likely require JV/alliance • Consumer behavior change required
2) Low P.O.S.	• Significant technical hurdles exist • Understand the "pathway" but unclear on ability to get there • Other companies have patent real estate	• No current channel access • Unproven value capture mechanism and unclear on ability to get there • Significant regulatory hurdles

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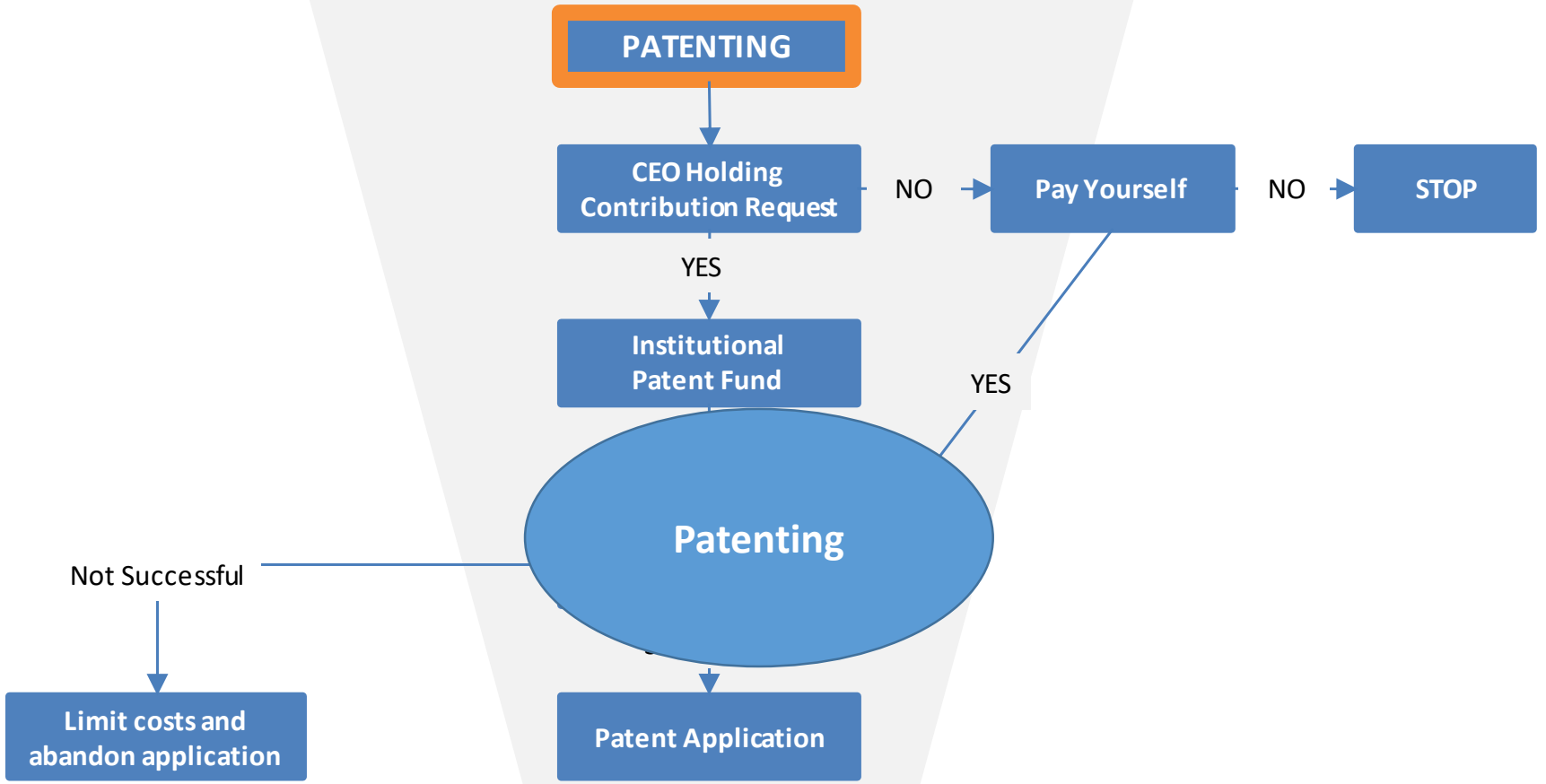

IP PROTECTION

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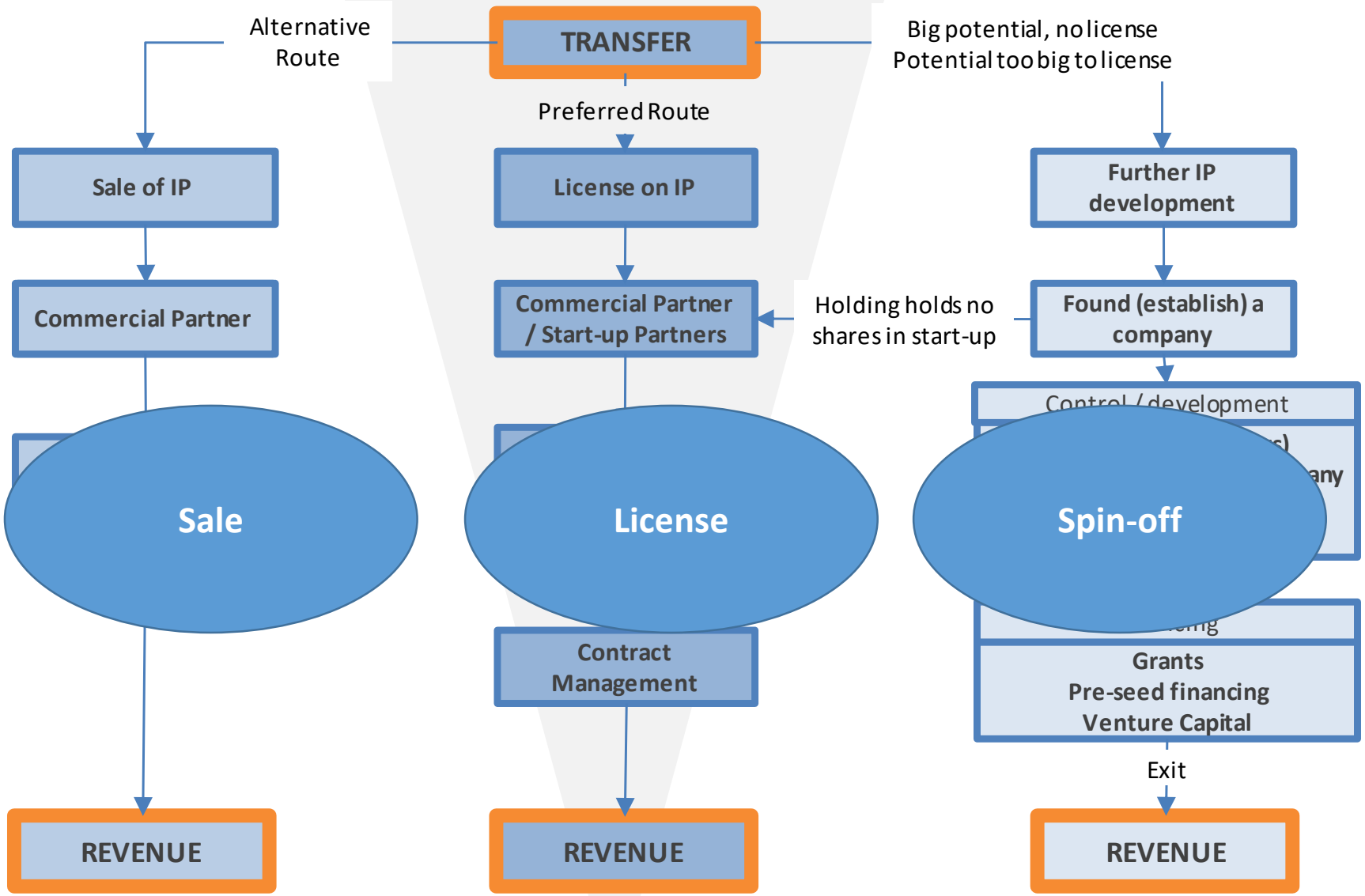

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KnowP – Societal Impact of Knowledge Projects

"Look what I found in the dumpster!
A perfectly good business plan!"

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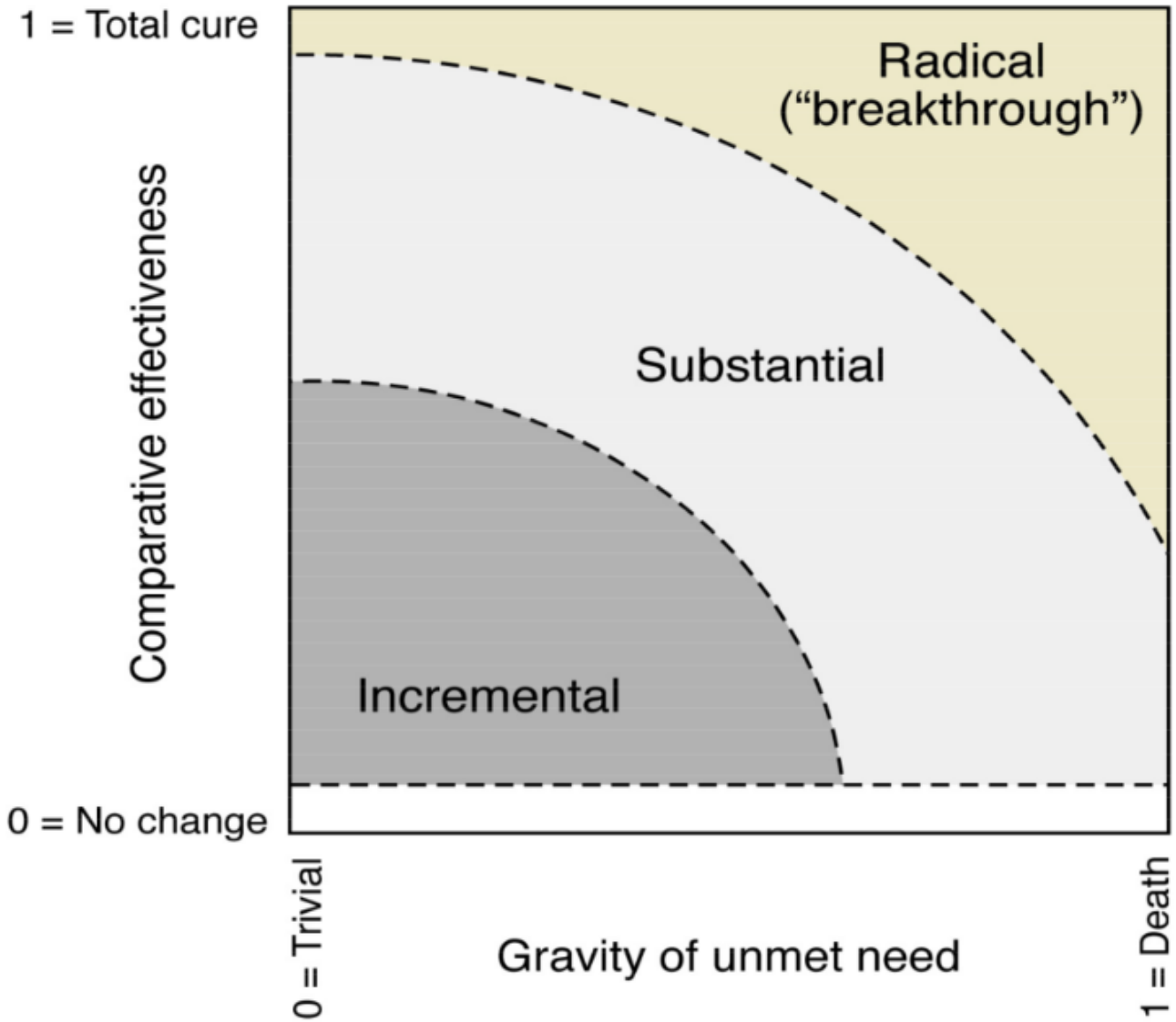

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Societal Impact of Knowledge Projects

M	Webinar topic	Group assignment
12	The life science value chain	Charting the value chain
15	Patenting in life sciences	Patent analysis
18	Customer Segments & Value Proposition	Market analysis
21	Key resources & Key Partners	Competitor analysis
24	Key activities	Roadmapping development
27	Financial aspects of your business plan	Drafting budget for future development
30	Financial statements	Drafting financial statements for business plan
33	SWOT / Evaluating Business Models	Refining and finalizing business plan
36	*Presentation of Valorisation Projects*	

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Business plan

- Entrepreneur
- Idea, mission & strategy
- External factors & liability
- IP, patents, trade secrets
- Marketing plan
- Production plan
- Personnel plan
- Management
- Financial plan

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A simple business plan

- How do we look in 1, 3, 5, 10 years from now?
- Who are my customers?
- Who are my competitors?
- What are my products?
  - PMC, turnover, COG, price, value, etc.
- Why would the customer buy at my place?
- What do I do when I reach my goals?
- What do I need to do that?

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Your KnowP projects

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