Guidebook of IP/Technology Transfer

Track 1
Entry-level Tech Transfer Professional

Topic 1.10.1
Assessing Tech Readiness, Proof of Concept, Process of Development

Assessing Tech Readiness, Proof of Concept, Process of Development

- Why is this important for the TTP to understand?
- What is “Technology Readiness”, and how is it determined?
- What is “Proof of Concept” and what role does it play in technology transfer?
- Understanding the “Process of Development” from invention →proof of concept→alpha, beta test→ pre-market prep and packaging → 1st sale

  is important for the TTP
- How can the TTP help improve Technology Readiness?

Assessing Tech Readiness, Proof of Concept, Process of Development

Why is all this important for the TTP to understand?

- Every new invention goes through various stages of development, from inception to sale
- At each stage, there is a risk vs. value factor:

  the earlier the stage, the higher the risk, the lower the value

  (risk = the technology will fail in some way)
- "Technology Readiness" is an indicator of the stage of development of a new technology

The Impact of Technology Readiness

The two part "equation":

- stage of development configures risk
- risk constitutes value

→Technology Readiness (stage of development)
directly tied to risk level

→Risk level
directly tied to value of technology, and the "ease" of licensing, commercializability

Stage of development vs. risk "equation"

Initial invention: highest risk

Proof of principle: high risk

Patent application: high risk

Prototype: medium risk

alpha-test (lowers prototype risk)

beta-test (further lowers risk)

Patent issued: medium risk

1st product sale: significantly lowered risk

Initial sales: lower risk

Repeat sales: lowest risk

Assessing Tech Readiness, Proof of Concept, Process of Development

What is "Technology Readiness", and how is it determined?

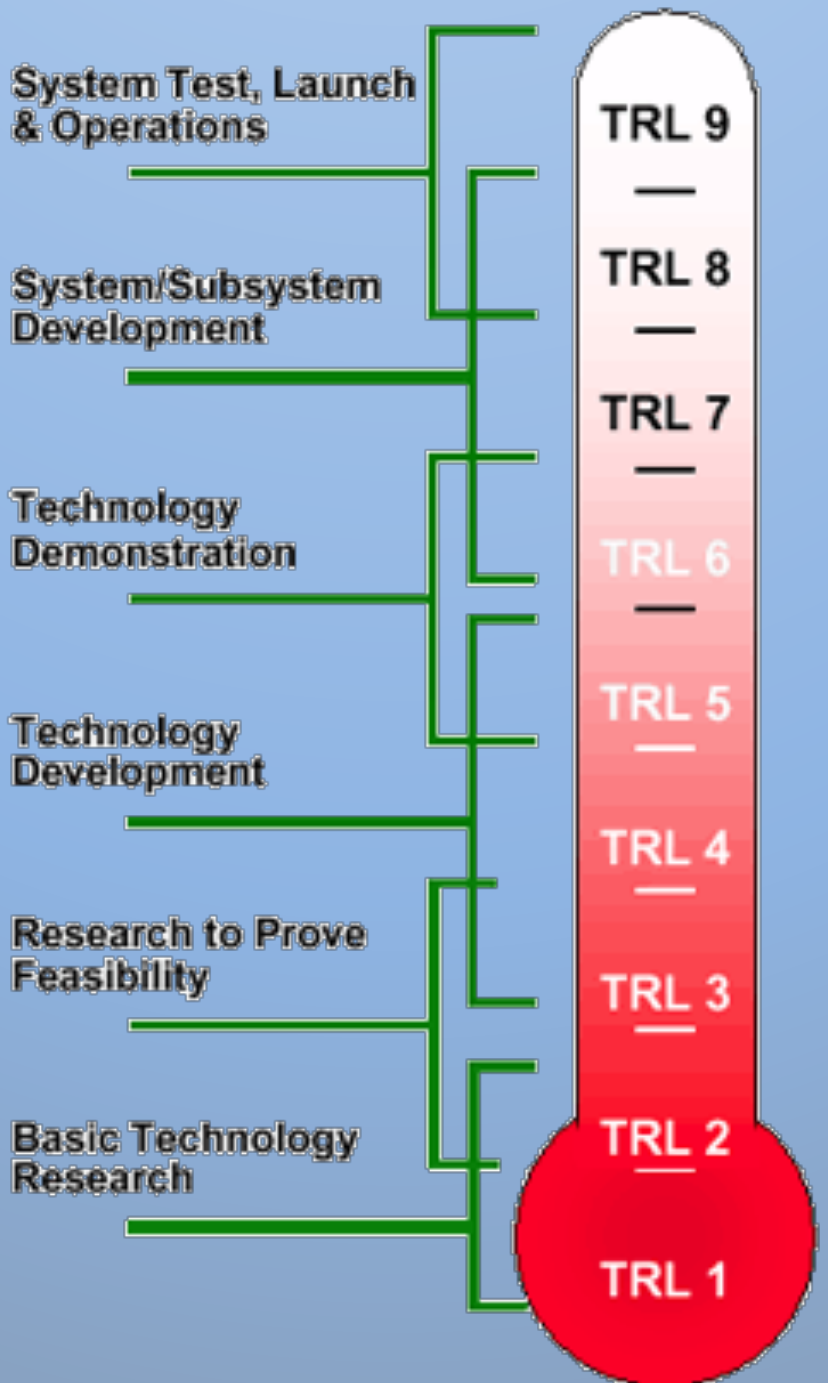
- Several typical stages of Technology Readiness
- Initial invention (the first discovery)
- Proof of concept (repeated, reproducible results)
- Numerous trials/experiments successful
- Field trial (out of the lab, "real world" conditions)
- First "proof of product"
- Prototyping
- Testing of prototypes, refining product
- Evaluation by potential customers

Assessing Tech Readiness, Proof of Concept, Process of Development

What is "Technology Readiness", and how is it determined?

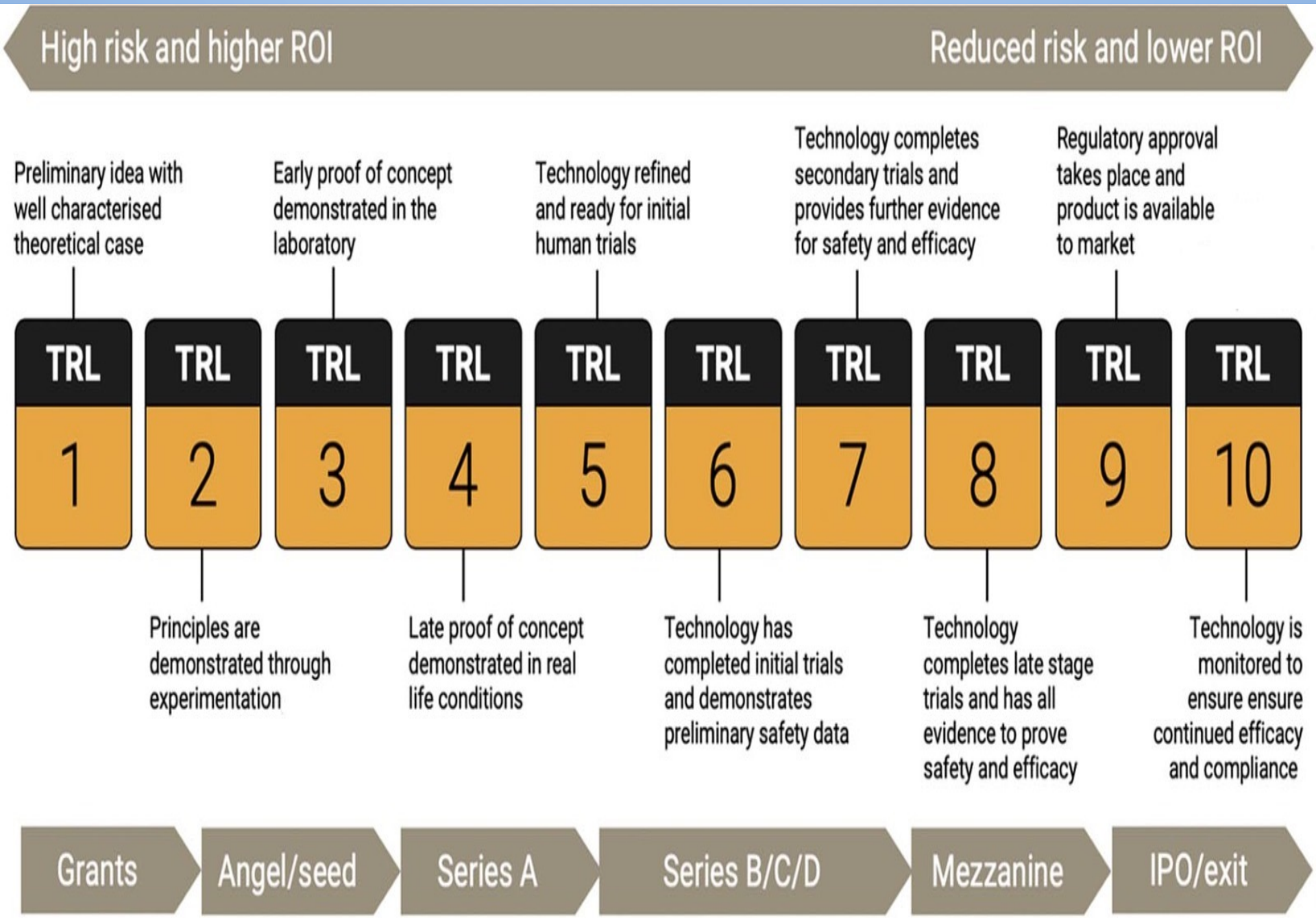
- Some use a standard scoring template (1-9)
- 1 = earliest stage/highest risk
- 5 = mid-stage/medium risk
- 9 = latest stage/lowest pre-sale risk

Different template examples:


System Test, Launch & Operations
System/Subsystem Development
Technology Demonstration
Technology Development
Research to Prove Feasibility
Basic Technology Research
TRL 9
TRL 8
TRL 7
TRL 6
TRL 5
TRL 4
TRL 3
TRL 2
TRL 1

TECHNOLOGY READINESS LEVEL (TRL)

Phase	TRL	Hardware	Software
Research	1	Basic principles	
	2	Concept and application formulation	
	3	Concept validation	
Development	4	Experimental pilot	
	5	Demonstration pilot	
	6	Industrial pilot	
Deployment	7	First implementation	Industrialization detailed scope
	8	A few records of implementation	Release version
	9	Extensive implementation	


High risk and higher ROI
Reduced risk and lower ROI
Preliminary idea with well characterised theoretical case
Early proof of concept demonstrated in the laboratory
Technology refined and ready for initial human trials
Technology completes secondary trials and provides further evidence for safety and efficacy
Regulatory approval takes place and product is available to market
TRL 1
TRL 2
TRL 3
TRL 4
TRL 5
TRL 6
TRL 7
TRL 8
TRL 9
TRL 10
Principles are demonstrated through experimentation
Late proof of concept demonstrated in real life conditions
Technology has completed initial trials and demonstrates preliminary safety data
Technology completes late stage trials and has all evidence to prove safety and efficacy
Technology is monitored to ensure ensure continued efficacy and compliance
Grants
Angel/seed
Series A
Series B/C/D
Mezzanine
IPO/exit

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What is What is "Proof of Concept"? What role does it play in technology transfer?

- Proof of Concept is the single-most critical event in the continuum of technology development
- Before PoC, there is no new technology, only a hope and dream that there might be one, someday
- After PoC, if successful, a new technology is "born"
- The failure rate for PoC is high
  - many (most?) ideas fail to meet the PoC launch-point
- The TTP should always be aware of the PoC situation with each technology in their portfolio

Assessing Tech Readiness, Proof of Concept, Process of Development

Understanding the "Process of Development"

- This is easy if a TTP has prior background in product development
- Without this background, the TTP should work to learn more about the process:
  - read about it
  - talk to product development professionals
  - listen to podcasts
  - join product development professional associations
- Discuss with inventors:
  - what work needs to be done next, in the future?
  - what will it cost (time and money) for these steps?

Assessing Tech Readiness, Proof of Concept, Process of Development

Understanding the "Process of Development"

- Discuss with industry contacts:
  - tell them about the technology, and its current stage of development
  - based on this…….
  - what work needs to be done next, in the future?
  - what will it cost (time and money) for these steps?
- Develop a mental picture of the steps required, what is involved (time, money, people)
- Mentally link the development process, inventiveness, market relevance, IP quality, Value Proposition….
- Into a coherent development "package" that the TTP will take into the license negotiation

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