Lisbon School of Economics & Management
Universidade de Lisboa

Master in Innovation and Research for Sustainability

Evaluation and Management of R&I Projects

Module III: Assessing R&D and Innovation Projects

Lecture 7: Evaluating R&D+I Projects

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2025

Summary for today

Module I: Introduction to R&D+I Management

Lecture 1: Crafting an R&D+I Strategy

- Overview of R&D + Innovation: Its importance and impact
- Exploring Innovation Types: Understanding the diversity in innovation

Lecture 2: Applying R&D+I Management

- Developing R&D+I Capabilities: Techniques to enhance innovation
- Implementing R&D+I: Strategies for effective teamwork and innovation
- Practical Components: Hands-on exercise to define a Thesis, a Roadmap of Innovation and OKRs

Module II: Project Lifecycle in R&D and Innovation

Lecture 3: R&D+I Project Fundamentals: From Conception to Market

- Project Initiation: Scope definition and scientific and technical merit
- Project Planning: Strategy development, identifying challenges, and risk assessment
- Practical Components: Hands-on exercise to define project scope using a short case study

Lecture 4: R&D+I Project Fundamentals: From Conception to Market

- Project Execution: Leading RD&I teams, fostering creativity, managing change, and overseeing project progress.
- Project Closure: Capturing lessons learned and assessing project impact on value creation.
- Practical Components: Checklist or templates for project closure activities, such as lessons learned and impact assessments
- Project assignment presentation & discussion

Module III: Assessing R&D and Innovation Projects

Lecture 5: Evaluating R&D+I Projects

- Core Evaluation Elements: Key factors in assessing projects, including technology feasibility and investment criteria.
- Practical Components: Analyze an R&D project to assess its value proposition and evaluation criteria using a checklist or template covering financial, technical, and market aspects

Lecture 6: Evaluating R&D+I Projects

- Business Model Design: Analyze phases, investments, outcomes, and financial/social impact.
- Financial Metrics: Explore profitability, cost of capital, and their role in assessments.
- MVP Definition: Learn to outline an MVP with essential features.
- Practical Activity: Calculate financial indicators like profitability and cost of capital for a sample project

Lecture 7: Evaluating R&D+I Projects

- Risk Management: Techniques for analyzing and mitigating project risks
- Practical Components: Framework to identify and prioritize risks for a hypothetical R&D+I project | Mitigation strategies for high-priority risks and discuss their potential effectiveness

Module IV: Real-World Case studies

Lecture 8, 9: Real-World Applications

- Presentation of Real Case Studies: discussion & analysis of how to evaluate a R&D+I project
- 20min to discuss project assignment

Lecture 10: Case Study

- Project assignment presentation & analysis

Module V: R&D+I Portfolio Management

Lecture 11: Performance Metrics for R&D and Innovation

- Aligning R&D projects with strategic goals beyond financial metrics
- Evolution of Performance Measurement Systems: Historical perspective and current trends
- Comparative Analysis of R&D Measurement Approaches

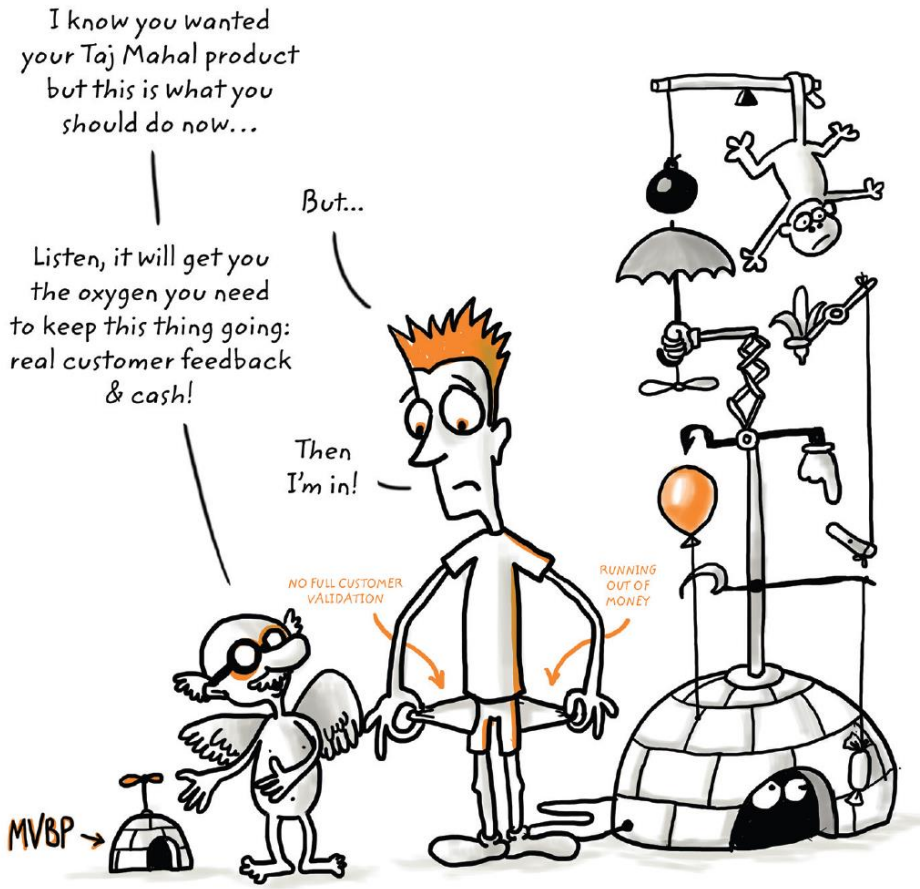
Lecture 12: Real-World Case Studies

- Discussion & analysis of how to manage a R&D+I portfolio

Minimum Viable Product

How to define an MVP

- Working prototype to test the waters,
- Avoid spending too much time and money building something you're not pretty sure is going to succeed,
- Only has the core functionalities of the product and/or service,
- Demonstrate that the functionality of the product meets the expectations of some early customers,
- Early costumers represent the larger target market,
- Not finished - still requires an investment of time and resources,



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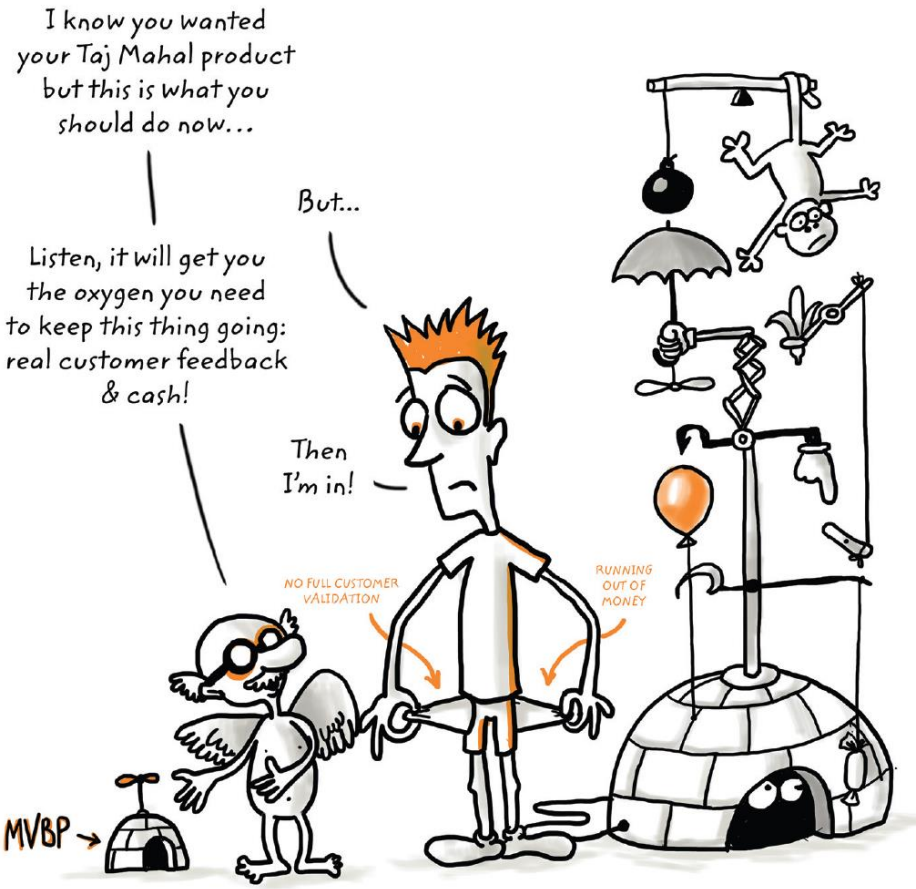
- Not a tool to test the market,
- Ultimate tool to test the market!

Minimum Viable Product

How to define an MVP

Create an MVP = your goal is to do the <u>least amount of work possible</u> to achieve <u>three key objectives</u>:

1. The customer gets value out of your product — you validate your work and quantify the Value Proposition,
2. The economic buyer pays for the product — you're probably not maximizing short-term profit yet, but you're showing a willingness of the economic buyer to pay something greater than zero,
3. You start a meaningful feedback loop with your customer to understand if your product works, and what is missing or needs to be refined — definition of priorities,



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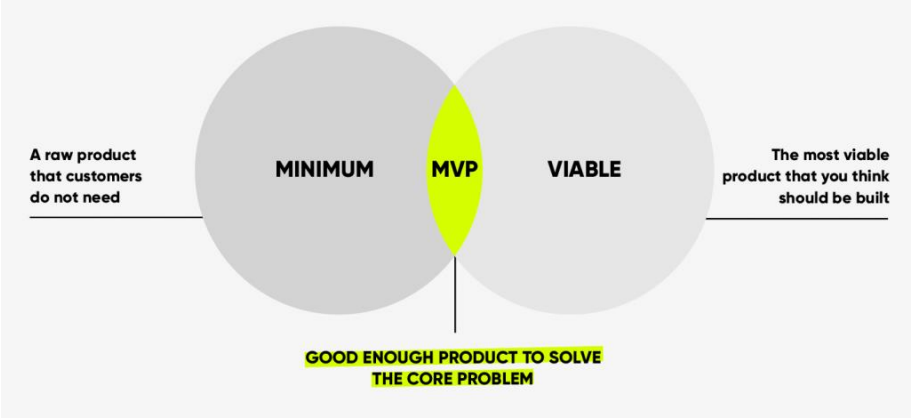
Minimum Viable Product

How to define an MVP

- Product not prototype - Do not allow to think that this is simply a test,
- "Fake it until you make it" – no investment or very limited investment in the first phase – Concierge MVP
  - Amazon – started selling books with no inventory or agreement
  - Took orders and ran to the store before shipping it
  - Lost money but tested the market – invested in real market data
- MVP level depends on the industry
  - Software companies say that if you are not embarrassed when you ship your first product, you shipped it too late
  - Medical equipment's… need to be final products



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Minimum Viable Product

Types of MVP

MVP Archetype	Description	Metrics	Observation depth	Hypothesis validation
Concierge	Hand-created experience you want a customer try	Qualitative observations of the individual steps of the experiment	High	Low
Wizard of Oz	Interface with a human under behind the curtain making things happen	Subject interaction with the interface and affinity for experience	Medium	Medium
Sales	Selling something before actually having it	General growth metrics: click-through, sign up, opened / responded emails	Low	High
Explainer videos	Videos describing how complex product works and what is special about it	Track engagement and analyze the demand	Low	Medium
Landing page	A page explaining the advantages of the product with an option to buy it	Analyze the demand and user behavior	Low	High
Piecemeal MVP	A usable product composed of already available tools instead of building new ones	Analyze the demand and validate the hypothesis	Medium	Medium
Single-feature product	Creating a product with only the core functionalities	Narrow down a target group, analyze feedback	Medium	Medium

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Minimum Viable Product

Examples

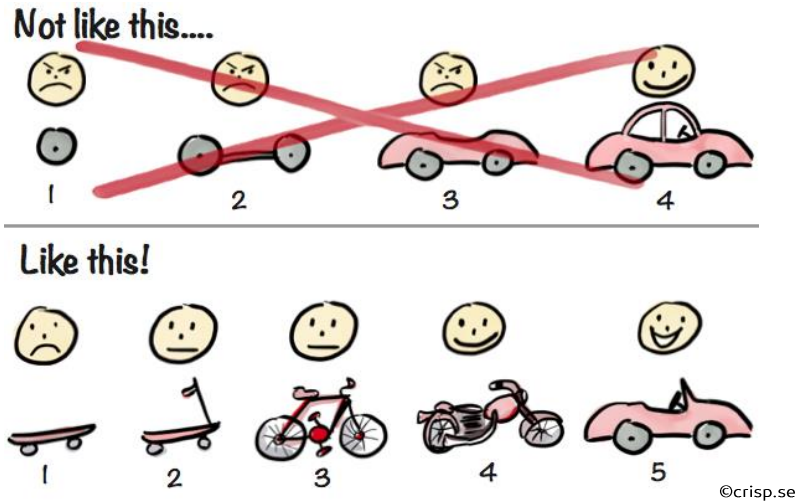
Minimum Viable Product

Exercise 9

Do an Internet search to find an example of a company that *concierged* elements of their MVP

Make sure you find an example where the product fulfills all three criteria of an MVP — customer gets value, economic buyer pays for it, you engage customer in a feedback loop.

- What is their value proposition?
- What elements of the MVP did they concierge?
- How did they plan to automate those functions in a later release?
- How effective was their strategy?
- What would you have done differently?



Minimum Viable Product

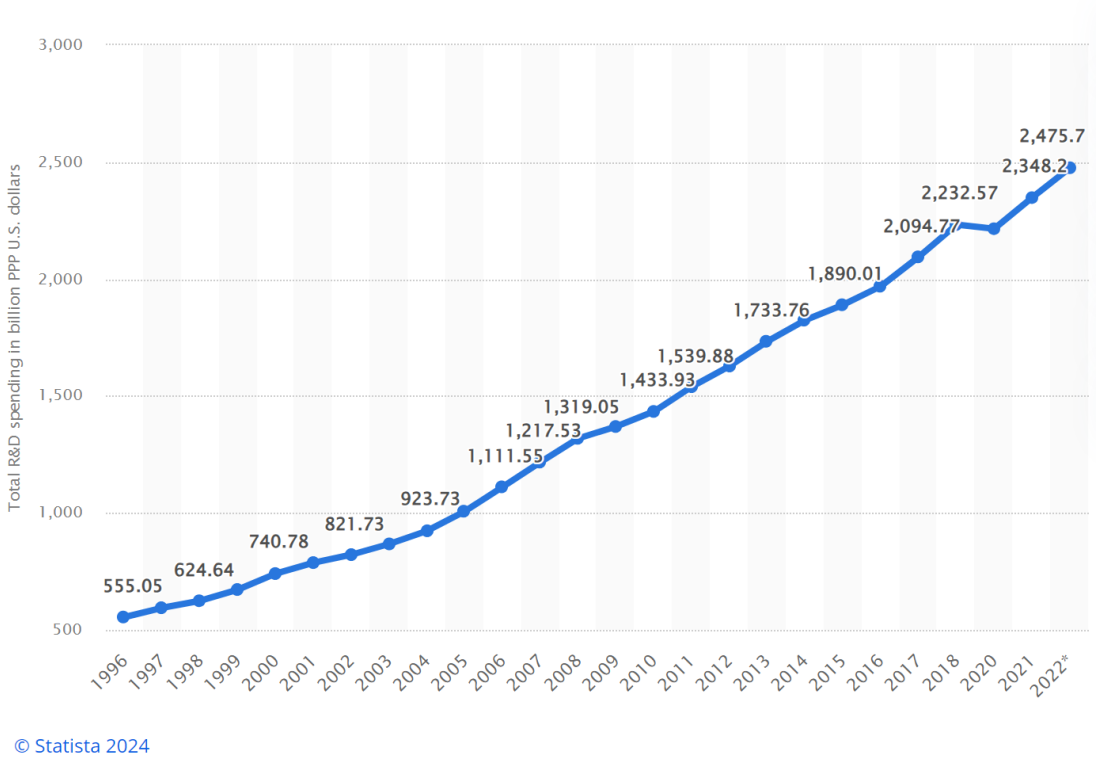
Do you need an MVP?

Not really...

- Market test – validation,
  - Following Primary Market Research,
  - Quantified Value Proposition (QVP),
- High-level product specification,
- Verify how people respond by building a “mouse trap” usually through an early-stage proxy to qualify your prospect,
- Obtain data from probable buyers,
- Gain and/or increase engagement,
- Result interpretation following clear benchmarks and market assumptions

Funding

Total global spending on R&D from 1996 to 2022



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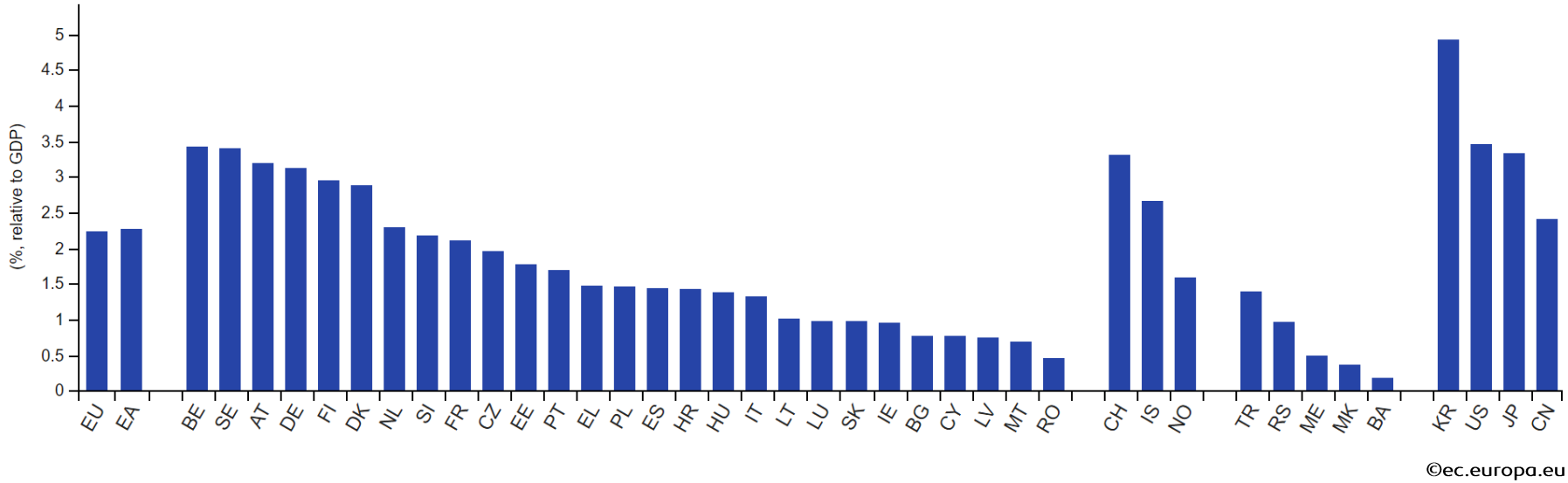
- R&D expenditure globally is significant, highlighting the importance of research and innovation,
- The exact amount varies yearly and across different regions and sectors,
- This substantial investment demonstrates the dedication of governments, businesses, and organizations worldwide to advance scientific knowledge,
- Fostering innovation is key to stimulate economic growth,

Funding

Bigger economies tend to fund more RD&I

Gross domestic expenditure on research and development, 2022



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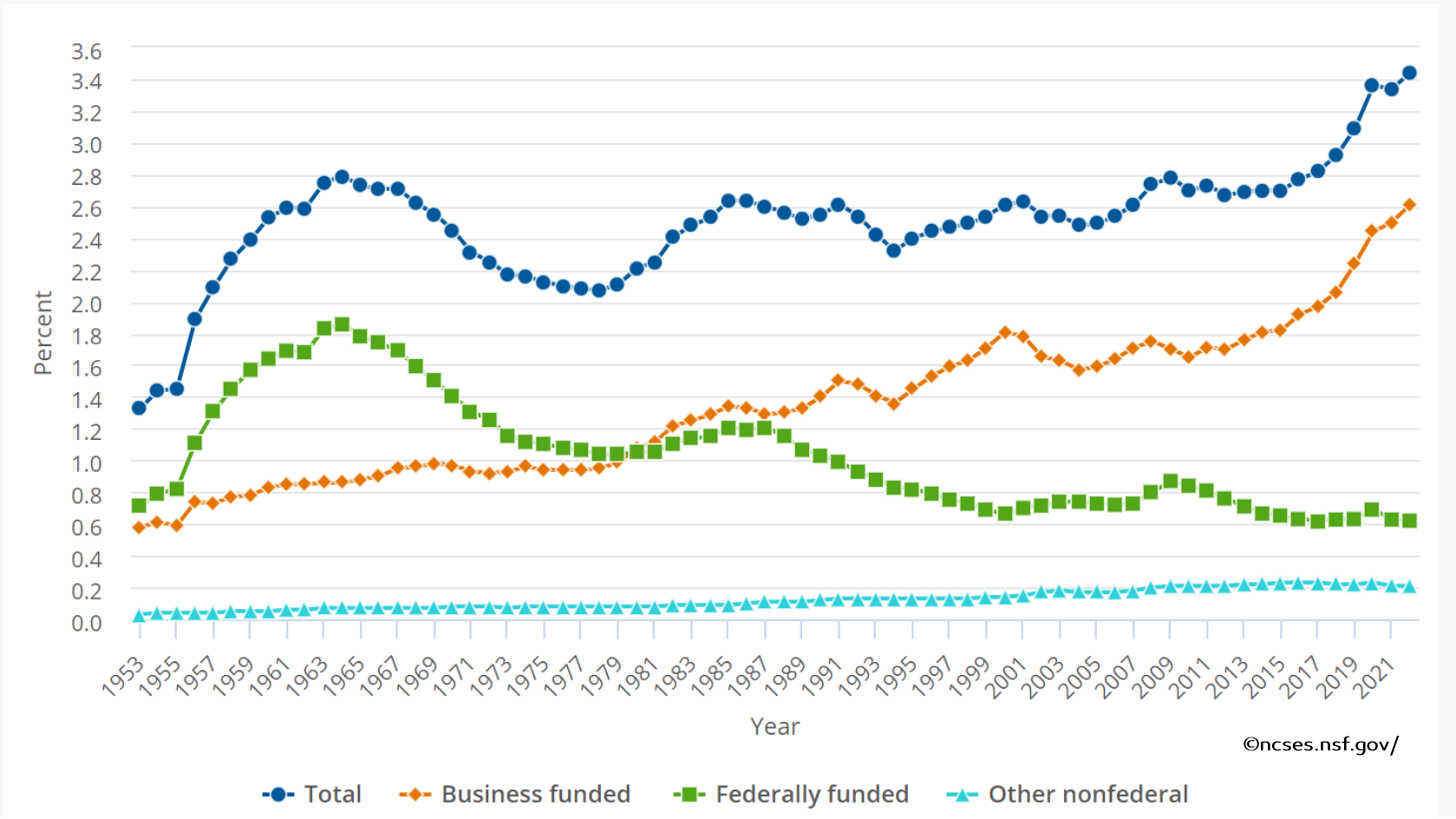
Funding

Bigger economies tend to fund more RD&I

Ratio of U.S. R&D to GDP, by source of funds for R&D: 1953–2022



Funding Mechanisms

Value Chain Approach

Research → **Development** → **Innovation**

1.Government Funding: Government budget allocation for R&D, aiming to drive innovation, scientific progress, and economic growth

2.Industry Investment: Companies, especially in sectors like technology, pharmaceuticals and others invest heavily in R&D to develop new products, enhance existing ones, and stay competitive

3.Academic Grants: Universities and research institutions secure funding through grants from government agencies, foundations, and other organizations to conduct research,

4.International Programs: Initiatives to provide funding for collaborative research projects spanning multiple countries, fostering global cooperation and knowledge exchange (European Commission),

5.Philanthropic Contributions: Nonprofit organizations and philanthropic foundations offer grants to support R&D projects focused on societal challenges such as healthcare, education, and environmental sustainability,

6.Crowdfunding Platforms: Emerging as a popular option - allows individuals and organizations to raise funds for R&D projects by soliciting contributions from a large number of people.

1.Specific funds - Funds developed for the implementation of technologies and solutions that are reaching the market (TRL>7) or already available, but with low adoption (e.g., Innovation Fund),

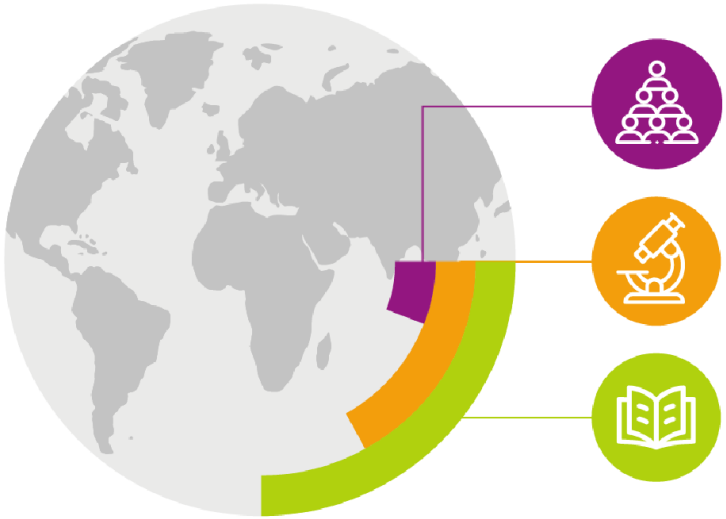
2. Venture Capital – Financing early-stage innovation (startups) with high growth potential in exchange for equity, providing capital and expertise to help them grow,

3.Government Loans – Specific terms of eligibility criteria focused on early-stage support,

4. Accelerator and Incubator Programs – Startups get funds, expertise and access to networks on specific industries.

Idea validation → **Product Development** → **Market Implementation**

While benefiting from world-class research and strong industries… Our knowledge and skills are our main resources

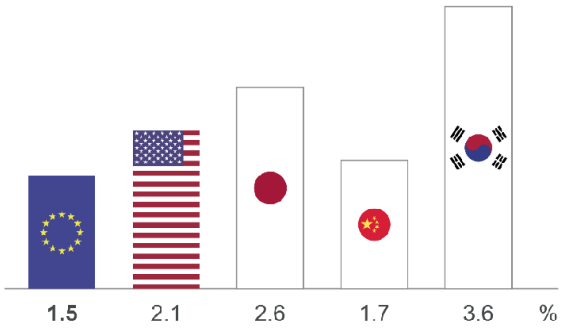


6% of the world's **population**

17% of global **R&D**

25% of all high-quality **scientific publications**

1.5% EU business **R&D investment**



EU figure is for 2019
Figures for USA, Japan, China and South Korea are for 2018. Figures represent R&D as % of GDP

…Europe can do better at transforming this into **leadership in innovation** and **entrepreneurship**

European Commission

Funding Mechanisms

Specific Funding – The Innovation Fund

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Idea validation → **Product Development** → **Market Implementation**

Funding

Venture Capital – Funding for Equity

- Seed Funding: Initial capital provided to support the earliest stages of a startup, often used for product development, market research, and early operations,
- Series A: Funding round typically used to scale operations, expand market reach, and further develop products or service,
- Series B: Funding round focusing on accelerating growth, increasing market share, and building infrastructure,
- Series C: Funding round aimed at further expanding the business, entering new markets, or acquiring complementary companies,
- Series D and Beyond: Often used for global expansion, strategic acquisitions, or preparing for an initial public offering (IPO).

Types of Funding Rounds for your Startup

Funding Round	Pre-Seed	Series A	Series B	Series C
Stage Focus	Proof of concept/ Prototype	Revenue Growth	Growth	Large scale expansions
Common Elements of Growth	Hiring	Development, Operations, Branding & Marketing	Hiring, Market expansion, Buying Businesses	Acquiring businesses, International markets
Amount of Investment	$10K-$1MM	$10MM	$15-25MM	~$50MM

Evaluate under the Framework

Exercise 10 (Advanced Version of Exercise 5)

Join in groups of 4/5:

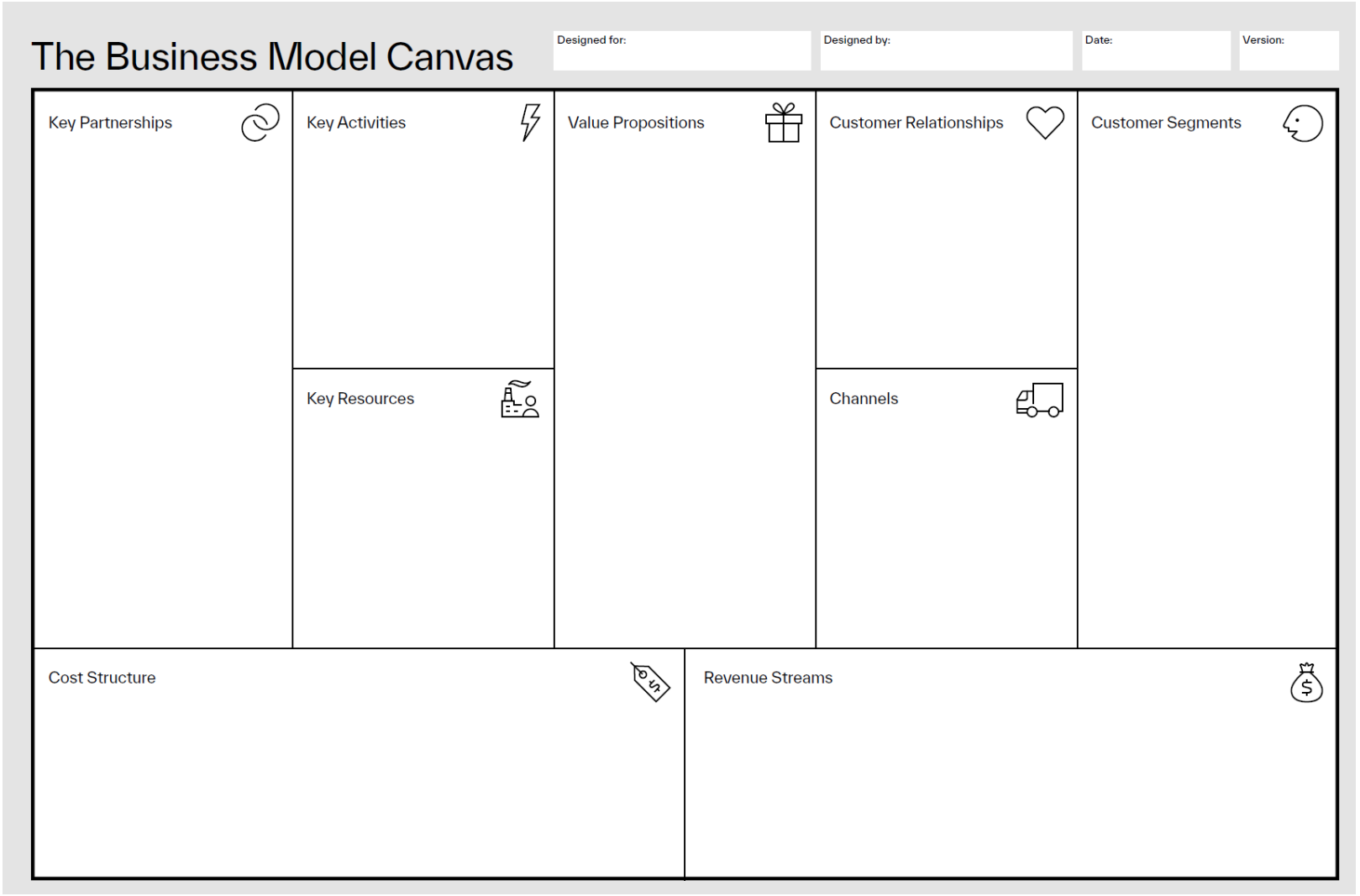
You get a proposal to participate in a project, already ongoing, that uses Solar Energy to desalinize water.

The technology is proven at a pilot scale and capable of "purifying" 500 liters of water per day. However, it is time to go to the next level, and that is why the researchers are looking for new investors

1. Knowing that water is a scarce element, evaluate:
   - What is the value proposition?
   - How do you evaluate the technology?
   - What financial info do you need?
   - What about the market for this?

Value proposition and value capture

Exercise 10



Evaluate under the Framework

Exercise 10 (Continued)

2. The project proponent refers that their market is divided as follows considering Portugal only:
    - TAM =800 kliters/year
    - SAM = 280 kliters/year
    - SOM = 190 kliters/year
3. What should be beachhead market for this project? What is the competitive advantage of this project for a geography like Iberia?
6. During the meeting the project proponent referred that they need an investment of 1,5M€ over the next 3 years. Despite investing in stages, you need to reserve that budget:
    - Considering that your deposits have an annual interest rate of 6%, what is the opportunity cost of not investing?
    - Using a discount rate of 8%, calculate the NPV and IRR –provide a comprehensive discussion on the results,
    - Are there any externalities that you can consider to valorise this project? (please check if there is IP related to this subject)
7. Evaluate the main risks involved in the project.

Read

- Paul Cheek - Market Testing Tactics, Venture Creation Tactics, 2023.

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