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Research Exploitation Strategies and Business Models



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Capturing, assessing and protecting the project results (IP) is only the start!

- How can you get results used by the right people?
- You have to know who they are, what to tell them, and how to tell them.

“Your plan for the dissemination and exploitation of the project's results is key to maximising their impact.”

(from H2020 proposal template)



The Dissemination and Exploitation Plan

- Draft Plan at proposal stage is now **mandatory**
- Prepare more detailed strategies and plans **during the project**, including the project **results as a whole**
- **Coordinate** tasks to avoid conflicting messages and user confusion
- **Monitor and act on feedback** from dissemination, in order to get results **used (exploited)**



Extract from H2020 proposal template

- The (exploitation) plan, should be proportionate to the scale of the project, and should contain measures to be implemented **both during and after the end** of the project
- Your plan should give due consideration to the possible **follow-up of your project**, once it is finished
- Its exploitation **could require additional investments, wider testing or scaling up**
- Its exploitation could also require **other pre-conditions** like **regulation** to be adapted, or value chains to adopt the results, or the public at large being receptive to your results



The Dissemination and Exploitation Plan

What, Why, Who and How?

- Understand the landscape and get **strategic intelligence**
- **Who are the key targets (and why?)**
- **What** are the best exploitation routes?
- **How** will to get to targets and persuade them to **use** your results (strategies and plans)



Dissemination and Exploitation Plan

What are the assets and target users?

- **Who** are the target groups/markets?
 - **Why?** i.e. **what needs** will be addressed?
 - **What** will the benefit (**impact**) be? (and **why?**)
 - **Why** should they choose you (rather than the competition)?
 - **What** is the market structure and dynamics?
 - **What** is the value chain, and where do you fit?
- **What** are your objectives and messages for each target group?
- **How** will you communicate these messages
- **What will you do with those who respond?**



Dissemination and Exploitation Plan

For each target group..

- **What** are the relevant exploitable (usable) project outputs?
- What is the “**exploitation package(s)**”?
 - Collaborative project > bundles of IP
- Will formal **protection** of results support exploitation? If so why and how?
- Is **further work** (investment/funding) envisaged to develop the results to convince your targets (e.g. proof of concept/scale-up)?



Building the best “offer”

- What is the best “exploitation package”?
- Are you using ALL the project results?
- Can you improve it through partnering or acquisition?
- **working with others can enhance value and “unlock” the opportunity – i.e. to meet the need with a larger impact**



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Dissemination and Exploitation Plan

The routes to market

- What is the **exploitation roadmap**?
 - What must happen to get the project results to the market (and satisfy the need to deliver the impact)?
 - What barriers or enablers are on these routes (standards, IPRs, regulatory, ethical, etc.)?
- What is the **exploitation vehicle(s)**?
 - How can the results be accessed (e.g. new company, institution, etc.)?
- What are the expected **terms** for access and use?



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Exploitation Strategies
"How to get value from project results"




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Exploitation Strategies

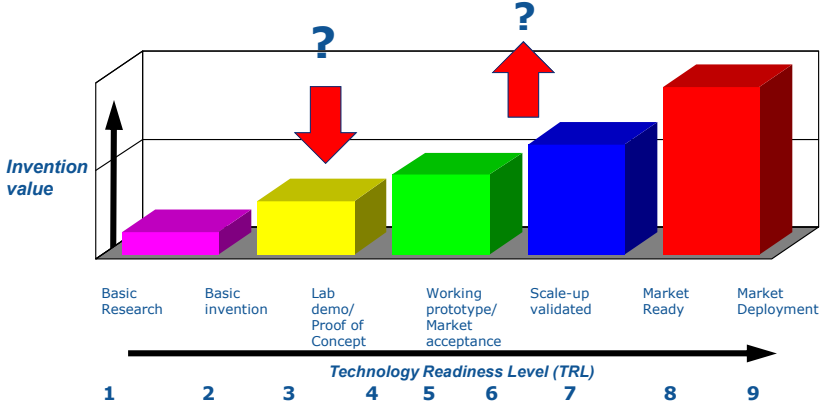
What's special about project results?

- Project outputs are often early stage (and not fully market ready)
 - **more work might be needed before investors can be convinced (overcoming the "valley of death")**
- Many research groups are working on the same challenges (no one has a monopoly on invention!)
 - **you might need to collaborate with others, or licence in technology, to build a credible package**
- Often new approaches are outside the "norm" or standard (so do not seamlessly integrate)
 - **you might need to convince the market that your solution has benefits over the accepted "norms"**

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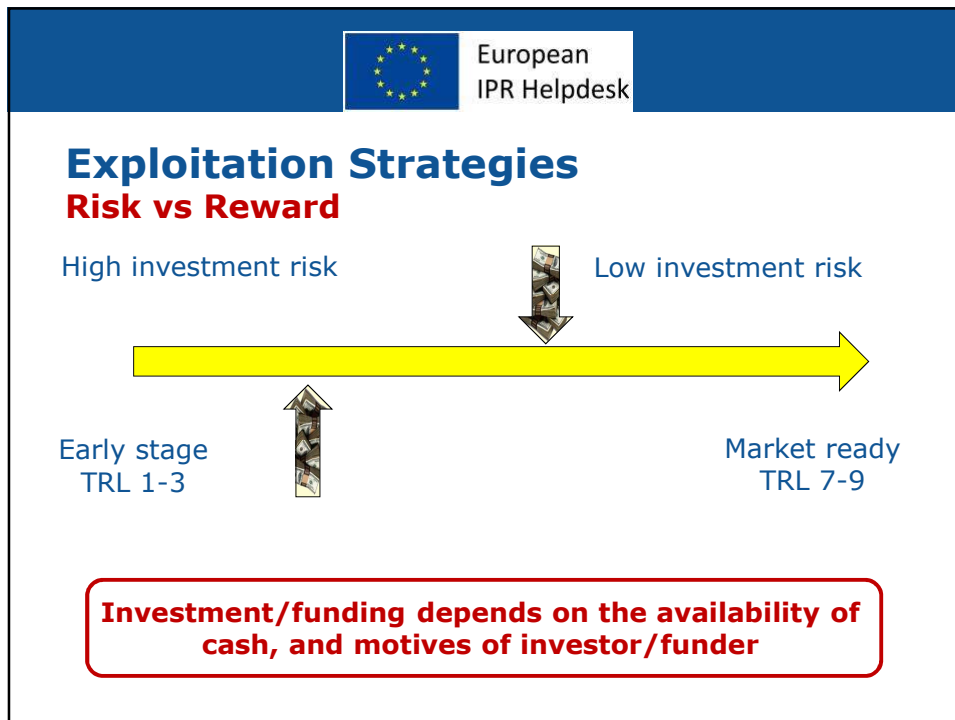
Exploitation Strategies

Who do you need to convince?



The chart illustrates the Technology Readiness Level (TRL) progression from 1 to 9. The vertical axis represents 'Invention value'. The horizontal axis represents 'Technology Readiness Level (TRL)'. The bars are colored: 1 (pink), 2 (yellow), 3 (green), 4 (blue), 5 (red), 6 (purple), 7 (orange), 8 (light blue), 9 (dark blue). A red arrow points down from a question mark above TRL 3, and another red arrow points up from a question mark above TRL 6.

TRL	Description
1	Basic Research
2	Basic invention
3	Lab demo/ Proof of Concept
4	Working prototype/ Market acceptance
5	Scale-up validated
6	Market Ready
7	Market Ready
8	Market Ready
9	Market Deployment




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Exploitation Strategies

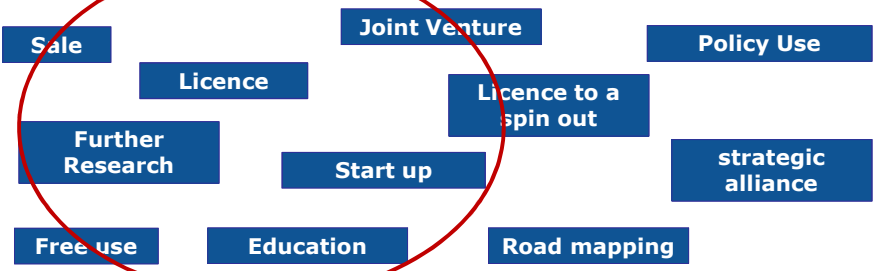
Some practicalities to address

- How far down “TRL” road do you need to go?
- Do you need to licence in 3rd party components, etc?
- Is more development/funding needed before you can convince an investor/partner?
 - what for - development, proof of scale-up, market validation, etc?
 - how much?
 - where can you get it from?
- How do you reach my target prospects (end-users, investors, commercialisation partners, research partners, etc)?

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Exploitation Models

- Project outputs are valuable assets which, like physical property, can be used and traded – bought, sold or leased, used in JV's, or as collateral
- But, unlike physical property there are many more ways of extracting value...



The diagram displays the following exploitation models in blue boxes:

- Sale
- Joint Venture
- Policy Use
- Licence
- Licence to a spin out
- Further Research
- Start up
- strategic alliance
- Free use
- Education
- Road mapping

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License or Start-up?

- **Licensing - licensee has expertise and resource**
 - Takes advantage of the expertise, resources and market know-how of companies already operating in the field.
 - Can address different fields of use and geographical areas
- **Start-up – must acquire expertise and resource**
 - A critical mass of expertise (management, financial, sales, marketing, manufacturing, technical, administrative), and an committed and enthusiastic team



Licensing?

Granting the right to use your property (results) under certain agreed terms and conditions, such as

- Territory
- Field of use
- For a limited time
- For evaluation only
- Provided you do a good job with it!
- Etc

NB: Can the SME Partner(s) reach all market sectors and territories?



Open Source Licences

- Just another type of licence!
- Choose **only if appropriate and can be justified**
- Usually requires source to be made available (sometimes only on request)
- **Needs management**
- Many different versions and variations of OS licences
- Beware clauses which may affect commercialisation



License or Start-up?

- Same commercial objectives – different routes.
- **Who is in the best position to “productise” and to bring the project outputs to market?**
 - Further development?
 - Trials?
 - Regulatory approvals?
- **Choose carefully** - a start-up is (almost) a one-way street
 - Recruit a world class board
 - Recruit the best CEO you can find, and if the CEO is not delivering, find a new one



Exploiting research is a long term commitment **Working together for mutual benefit**

- It is important to work with partners who have the **will**, the **ability**, and the **resources** to develop the project results and bring them to market.
- Without this, the potential of the technology is unlikely to be realised – and there will be no benefit to anyone (and hence **no impact!**)



Get to know your exploitation partner

- Are they financially secure?
- Do they know the market?
- Do they have the necessary technical skills and resources to develop and manufacture the technology?
- Do they want your technology to “put it on the shelf” and so protect their own IP/patent position?
- **Also... help them get to know you**
- Convince them to invest their time and resources with you!



HELP!!

Many different skills and resources needed

- Scientific and technical
- IP Management and protection
- Commercial
- Legal
- Company Formation
- Entrepreneurial/Innovation Management
- Marketing
- Finance
- Etc



Find your innovation ecosystem


- An environment (ecosystem) which can support, stimulate and enable innovation.
- Can be **geographical clusters** (e.g. Cambridge, Silicon Valley, etc.), or **specific sectors** (e.g. Knowledge Transfer Networks, EIT KICs, etc.)
- The ecosystem does not only include researchers and industry, but access to **all the key players that make innovation happen**, such as VC's, business angels, entrepreneurs, matchmakers, support groups, users, policy makers, etc.



Financing

3 main stages


- **Financing early stage technologies to "make ready" for licence or sale**
- **Financing a start-up**
- Financing a company for growth and "exit" by investors

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Financing Innovation

Pre-seed and Seed Funding


Objectives	Sources
<ul style="list-style-type: none">• Market research• Make investment ready• Strengthen for licensing• Proof of Concept• Prototypes	<ul style="list-style-type: none">• Own funds• Friends & Family• Loans• Business Angels• Institution seed funds• EC SME Instruments

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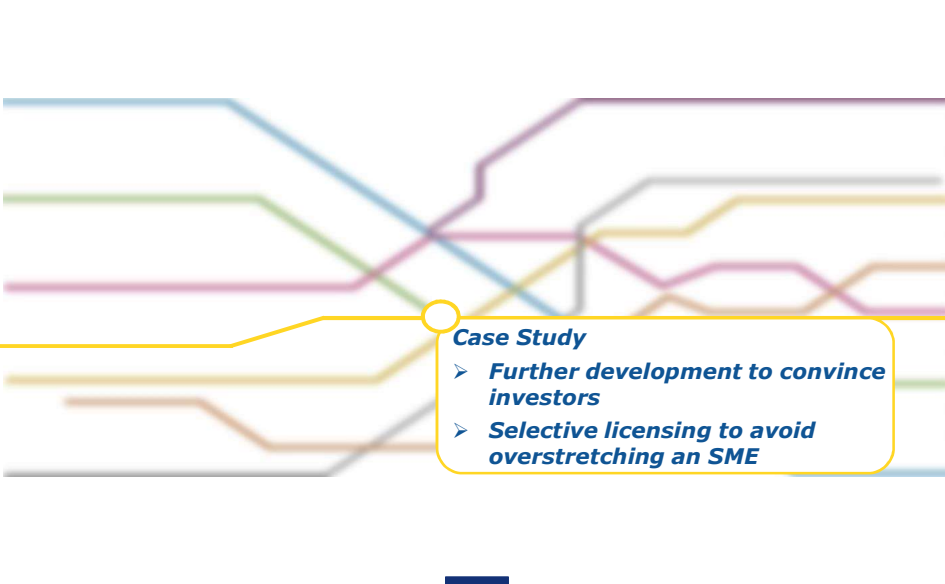
Financing Innovation

Start-up Funding

Objectives	Sources
<ul style="list-style-type: none">• Set up company systems• Early product development (making ready for market)• PR, marketing and sales	<ul style="list-style-type: none">• Business Angels• Institution seed funds• Early stage venture funds




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Case Study

- *Further development to convince investors*
- *Selective licensing to avoid overstretching an SME*



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Daily Disposable Contact Lenses

- Invented in Scotland. IP managed by BTG (IP investment and development organisation)
- Early exploitation efforts failed since the scale-up from lab to factory was unproven
- Money **invested in building a pilot plant**
- On success of pilot plant inventors were able to raise money to create a start-up (Award plc).
- IP licensed to the start-up **for UK only**.
- Award succeeded in making lenses and distributed them through a major UK outlet.

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Meanwhile.....

- Further licensees were sought **in other territories.**
- Bausch & Lomb took a licence for the **US market.**
- They liked it so much they bought AWARD (inventors happy!)
- Bausch & Lomb granted an **exclusive worldwide** licence.
- Everyone was happy!

LESSON: Licensing by geographic area quickly established the market without overstressing the SME

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Case Study

- *multiple exclusive licensing*
- *fields of use*
- *Spreading risk*

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Factor IX


- For treatment of Haemophilia B
- A genetic disorder cause by deficiency or defect in Factor IX gene – an essential blood clotting protein
- Provides for treatment from safe, non-plasma-derived blood clotting agent
- In 1995, about 50% of the US haemophiliacs were HIV positive and 80% had Hepatitis C, having received contaminated blood products. 60% of those people died from AIDS.



Factor IX

Applications in many different fields of use

- Transgenic production in Sheep
- Recombinant production
- Gene therapy
- Strategy: **worldwide exclusive field-of-use** licences




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BeneFIX®


- GI launched BeneFIX® in USA in February 1997
- GI launched in Europe in January 1999 through Baxter Healthcare distribution
- Transgenic production failed

LESSONS:

- **Field of use licensing spreads the risks and increases potential impact**
- **Exclusive licensing allows new technologies to reach critical mass**




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Case Study

- **Extending learning life**
- **building market presence**
- **Importance of enabling technology**





Magnetic Resonance Imaging

- Nuclear magnetic resonance discovered in **1946** by Bloch & Purcell. Used for spectroscopic analysis
- The world's first MRI image was produced in the USA by Professor Paul Lauterbur in **1973**
- Basic techniques for medical imaging were developed at Aberdeen, Nottingham and Oxford Universities
- During **1974-80** a number of key inventions from research groups worldwide were patented



Magnetic Resonance Imaging

- The **strategic importance of** pooling the various inventions into **a portfolio** was recognised to maximise the returns and extend earning life.
- Complementary inventions from other sources continued to be added to the portfolio
- Role of Oxford Instruments in developing wide bore, high field magnets was critical **to enable practical machines to be built.**



Magnetic Resonance Imaging

- Commercially manufactured MRI equipment became available in **1983** and MRI was in clinical use by **1985**
- Between **1986-98**, over 95% of the world's MRI industry was licensed by BTG
- Company start-up was inappropriate due to large investments required
- Portfolio continued to grow as new IP was added, and so extended the earning "life".
- Original patents filed in 1974 expired in 1994, but revenue continued after then



MRI Lessons

- It's a marathon not a sprint! It can take a long time for a research result to impact the market
- Take-up can depend on enabling technology or infrastructure to become available
- Building a portfolio can add value, extend earning life and build market presence



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Case Study

- *Collaborating to build a better offer and unlock the market*



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Cholesterol Assay

- Pre-1970 smelly and dangerous to assay blood cholesterol
- 1971 UK researchers developed colorimetric assay systems
- Boehringer Mannheim filed patents at same time
- Market confused!!



Cholesterol Assay

- BTG & Boehringer - collaborate not compete
 - Cross-licensing, market sharing and revenue sharing
- Market now knew who to approach - no longer confused!
- 80+ licences signed

LESSONS: Collaborate to build a better offer and unlock the market opportunity by removing confusion

Check out other research groups – maybe you can build a stronger offering



Summary

- **Every situation is unique** – there are no templates and you cannot import “success”
- Analyse the landscape (market, technology, IP, etc) to get **strategic intelligence**
- Build the **most attractive “offer”** by:
 - building a portfolio of IP (i.e. not just patents!)
 - working with others
 - adding value through development
- Find the **people and resources** you need (technical, commercial, patent, legal, intermediaries, etc)



Summary

- Know **where you want to get to** (TRL Level)
- Know **who you need to convince**, and how
- Know **what further work/investment/funding** will be needed to convince them
- Choose the **most appropriate exploitation route**.
- **Think strategically**
 - manufacture/sell, or
 - JV, or
 - License, or
 - Startup, or
 - a combination



People **do not** buy technology...

They buy **goods and services**
that satisfy their **needs and wants**

It is about **People** not Technology



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